The Flypaper Effect in Municipal Finance: A Regression Kink Design

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- PRELIMINARY VERSION -

Abstract

We analyze the existence of a flypaper effect in local public finance. Kinks in the transfer schedule in the Canton of Vaud in Switzerland allow us to apply a Regression Kink Design and to estimate the causal impact of transfers on municipal expenditures and tax rates. Consistent with the literature, we find robust evidence that "money sticks where it lands" i.e. transfers have a positive local average treatment effect (LATE) on municipal expenditures, while leaving the revenue side unchanged. Moreover, by studying the heterogeneity of policy responses to transfers, we observe a "double" flypaper effect. It appears that money sticks even more where it used to land in the past. The second layer of the effect can be used to explain the flypaper effect described in the literature.

JEL-Codes: C21, H72, H77.
Keywords: Local Public Finance, Regression Kink Design, Flypaper Effect, Transfers.

1 Introduction

In many federations, transfers constitute a large share of municipal income. Receiving transfers influences local public choices in various ways. In response to transfers, municipalities might choose to reduce own-source revenues by e.g. lowering local tax rates or to increase the level of public expenditures. Examining the way municipalities respond to a resource inflow is important for understanding the efficiency consequences of local public finance, its redistributive effects as well as the effectiveness of fiscal stimulus packages which are frequently targeted to municipalities to stimulate local expenditures. In this paper we are interested in estimating the causal impact of transfers on local policy choices using a Regression Kink Design approach.

With a "frictionless" local policy making, any additional transfer should be spent on both tax rate reductions and expenditure increases where the exact split between these responses follows from constituents' preferences (Bradford and Oates, 1971). Empirical analyses highlight the observation that additional income from transfers implies public expenditures to rise over-proportionally and the expenditure rise might even be the only policy response that follows from higher transfer payments to local governments (Knight, 2002; Gordon, 2004; Dahlberg, Mörk, Rattsø, and Ågren, 2008). It appears that "money sticks where it lands", an anomaly which is called the *flypaper effect*, in analogy to flies that land on the paper made to catch them. Unraveling the causal effect of transfers on municipal expenditures and tax rates faces various empirical challenges. For instance, an OLS estimation is likely to suffer from strong endogeneity problems. Dahlberg, Mörk, Rattsø, and Ågren (2008) point at four potential sources of endogeneity in this context: (*i*) political negotiations between central and local politicians, (*ii*) central politicians' preferences for specific economic and/or political characteristics associated with their spending priorities, (*iii*) local socio-economic variables influencing taxation, spending and grant allocation, and finally, (*iv*) unobserved characteristics correlated with local policy choices and grant allocation.[1] Furthermore, the fiscal environment of municipalities should in principle allow for the absence of a flypaper effect. For instance, municipalities which do not have the discretion to adjust important taxes at a significant scale will be most likely prone to a flypaper effect, given the reduced behavioral scope to fiscally maneuver away from a flypaper effect.

[1]See also Besley and Case (2000) for an analysis of grant endogeneity using a simple model of political decision making.

We analyze municipal policy responses to transfer payments in the canton of Vaud, Switzerland. The fiscal environment of municipalities in the canton of Vaud allows us to address the aforementioned empirical challenges. First, municipalities have a huge degree of fiscal autonomy on the expenditure side as well as on the revenue side. Municipalities levy an income tax, a profit tax and a wealth tax, for instance. The income tax is an important source of revenues for municipalities and is a salient tax instrument. Lowering the income tax is well recognized by tax payers and is thereby associated with political benefits. To address potential endogeneity issues, we exploit an institutional detail in the transfer formula of the canton of Vaud. The amount of transfers received by each municipality is solely a function of its population. The transfer schedule across municipalities exhibits kinks at fixed population thresholds at which the per-capita amount of transfers for the population mass above the threshold increases. Hence, by comparing municipalities just above (treatment) and just below (control) the kinks, we can identify the causal effect of transfers on municipal expenditures and tax rates. The Regression Kink Design (RKD) which we employ in our analysis builds on the Regression Discontinuity Design (RDD) approach (Lee and Lemieux, 2010). The main difference is that, in the RKD, the discontinuity occurs in the first derivative of the treatment variable with respect to the assignment variable (Card, Lee, Pei, and Weber, 2015). In our context, the total amount of transfers kinks at the different population thresholds, while the per-capita transfer exhibits a discontinuity. We furthermore estimate a Heterogenous Local Average Treatment Effect (HLATE) and follow the suggested rules in (Becker, Egger, and von Ehrlich, 2013) who estimate HLATE in a RDD framework.

This analysis reveals the existence of a double flypaper effect. This effect appears to be a plausible explanation of why the literature observes the well-known flypaper effect. This anomaly in local public finance seems to be due to the fact that municipalities tend to spend additional income transfers where they already used to spend relatively more in the past. The double flypaper effect might be understood as an inertia phenomenon in the sense that spending on a particular expenditure program today will attract additional transfer income spending on the same expenditure in the future. The insight has implications for the way federal fiscal stimulus packages, which are intended at stimulating local spending, should be designed. While the flypaper effect in itself is conducive to the effectiveness of such programs, the double-sidedness of the flypaper effect might undermine it, provided the municipalities has spent relatively more on items

which are not prioritized by the fiscal stimulus program.

The paper is organized as follows. Section II presents our empirical approach, including basic descriptive statistics and the identification strategy. Section III displays and discusses the empirical results. Finally, Section IV concludes.

2 Empirical Approach

2.1 Descriptive Statistics: Kinked Transfer Schedule

We are interested in the causal effect of equalization transfers on municipal expenditures and tax rates. To address potential endogeneity issues, we exploit a particularity in the transfer formula of the canton of Vaud to set a quasi-experimental design. The amount of transfers received by each municipality is a function of its population, solely. However, each inhabitant does not attract the same amount of transfer. The amount of transfer g_{it} received by municipality i in year t is calculated as follows:[2]

$$g_{it} = \begin{cases} 100 * [Pop < 1000] \\ + 350 * [1001 < Pop < 3000] \\ + 500 * [3001 < Pop < 5000] \\ ... \end{cases}$$

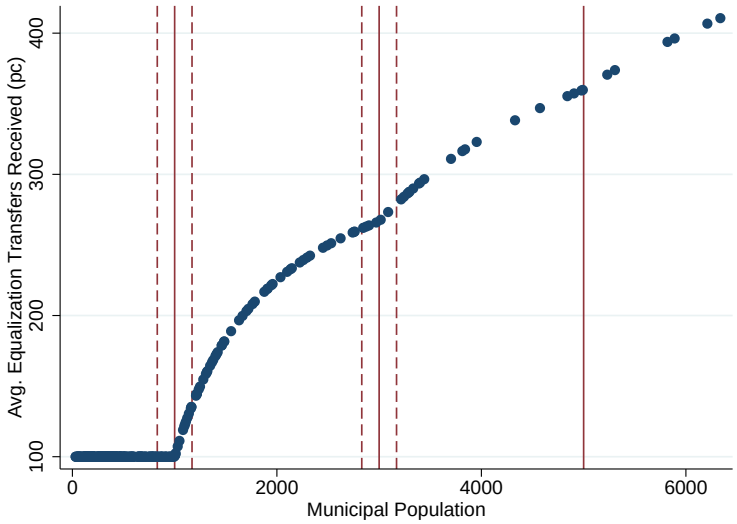
For example, a municipality with 1,154 inhabitants will receive 1,000 * 100 CHF + 154 * 350 CHF = 153,900 CHF. Hence, as shown in Figure 1, the amount received per capita in function of the population exhibits several kinks at precise thresholds [3]. In the present descriptive statistics, we deliberately focus on the first kinks as our empirical analysis will focus on the two first ones.

The kinks in the transfers schedule are mirrored by similar kinks in the municipal expenditures representation. For example, expenditures on municipal goods exhibit a kink at the same threshold as the transfer schedule (Figure 5, Appendix). Overall, these descriptive statistics point at a potential causal effect of transfer on municipal expenditures.

[2]The full formula is presented in Appendix A

[3]To insure the visibility of these kinks, all municipality with a population over 9000 habs (4.7% of all municipalities) are not represented in Figure 1. A figure including all municipalities is available upon request.

Figure 1: Equalization Transfer (pc) depending on the Municipal Population (2011)



2.2 Data Description

All data used in this paper is provided either by the Federal Statistical Office (OFS) or by the Cantonal Statistical Office of Vaud (SV). All variables are gathered at the municipal level. We study the period from 2011 to 2014 as the transfer mechanism was entirely modified in 2011 following a 2009 cantonal law. The transfer mechanism in Vaud contains three parts. On top of the transfer based on municipal population, which we will analyze in this paper, the mechanism contains a transfer based on fiscal capacity and one on special expenditures, i.e. expenses on forrests and transports. The population based transfer is fully independent from the two others. These two other transfers vary smoothly with municipal population. Moreover, it is important to note that the transfers based on municipal population are not attached to any particular expenditures. Municipalities are free to decide where to spend the transfers received. Concerning the outcome variables, we use the accounting figures provided by the Cantonal Statistical Office. Additionally, note that our analysis takes place within the 2011-2016 legislative period. Hence, political outcomes remain constant over the period studied.

Finally, our dataset contains demographic and geographic data, as well as information concerning municipal revenues.

2.3 Identification Strategy: Regression Kink Design

Our approach, labeled Regression Kink Design (RKD) by Nielsen, Sorensen, and Taber (2010), is similar to the Regression Discontinuity Design (RDD) in that it fits local parametric polynomial regressions around a threshold. The distinction lies in the fact that in the RKD, the threshold is a kink and not a cutoff, i.e. the cutoff is observed in the first derivative. Similarly to the RDD case, sharp and fuzzy RKD are distinguished depending on whether the treatment is entirely determined by the assignment into treatment. As the amount of transfer received is entirely determined by the municipal population (Figure 1), a *sharp* RKD is adopted in this paper. Additionally, as per capita transfers are declining as population reaches the cutoff, we allow for different slopes around the kink following Litschig and Morrison (2013).

With our identification strategy, we aim at estimating both the LATE and the HLATE of transfers on municipal expenditures. Following Lee and Lemieux (2010) and Card, Lee, Pei, and Weber (2015), our starting point is a pooled local OLS regressions with fixed effects estimating both effects:

$$(1) \quad Y_{it} = \quad \tau T_{it} + \sum_{p=1}^{\bar{p}} [\nu_p (v_{it} - c)^p + \mu_p (T_{it} * (v_{it} - c))^p] \; + J_{it}$$

$$(2) \quad Y_{it} = \quad \beta_1 T_{it} + \beta_2 SY_{i,t-1} + \beta_3 T_{it} * SY_{i,t-1} + \sum_{p=1}^{\bar{p}} [\nu_p (v_{it} - c)^p + \mu_p (T * (v_{it} - c))^p] \; + J_{it}$$

With: $J_{it} = \psi_k X_{it} + \theta_1 a_i + \theta_2 b_t + \epsilon_{it}$

With: Y_{it} refers to the outcomes of interest (per capita). T_{it} is 1 if a municipality is above the kink, 0 otherwise. τ is the treatment effect at the pooled-cutoff. $SY_{i,t-1}$ represents the share of spending on Y relatively to all expenditures in municipality i at year $t-1$. X_{it} refers to the covariates. a_i and b_t are municipal and year fixed effects, respectively. ϵ_{it} is the error term.

$v_{it} - c$ refers to the distance to the pooled-cutoff with v_{it} being the pooled population of municipality i at year t and c being the pooled-cutoff. To gain statistical power and analyze the effects at different levels, we pool the two first kinks at zero and analyze them jointly. The pooled municipal population, v_{it}, is then negative for all municipalities below the kink and c is equal to zero. Pooling requires the treatment effect to be of comparable intensity across the kinks. However, even if the effects in both kinks are not

identical, the difference is small enough to constitute at worst a minor issue. Moreover, as argued by Litschig and Morrison (2013), economies of scale in the provision of public services are likely to be present, resulting in a smaller difference of the treatment effects. p refers to the polynomial order employed with $\bar{p} = 4$ being the highest order included. Following Fan and Gijbels (1996) and Card, Lee, Pei, and Weber (2015), h refers to the "rule-of-thumb" (ROT) optimal bandwidth which is equal to 170. [4]

However, the estimation of (2) by fixed effects OLS is likely to be biased because municipal expenditures at year t on good x is regressed on the share of expenditures on the same good in the total municipal expenditures at year $t-1$. To retrieve consistent estimates in this dynamic case, we use Feasible Efficient Generalized Method of Moments (FEGMM) where lagged variable are used as instruments. Both estimates from fixed effects OLS and FEGMM are displayed and discussed in the results. FEGMM is chosen over the more classical first difference estimation as it allows us to maximize our sample size. Roodman (2009) discusses this issue in full detail. Year dummies are included in the estimation.

If the assumptions of the RKD are fulfilled, covariates and fixed effects are not required for identification. However, Ando (2013) encourages the use of fixed effects and covariates in the RKD: "The inclusion of covariates and the introduction of fixed effects model might significantly improve RKD estimations". Moreover, Becker, Egger, and von Ehrlich (2013) show, in the RDD case, that when analyzing heterogeneous treatment effects, fixed effects should be included. Therefore, we include municipal fixed effects.

Additionally, to investigate whether the effect is in line with the flypaper effect, we need to insure that no effect is observed on the revenue side. To do so, the impact of transfers on tax rates and municipal revenues is estimated using (1) and (2).

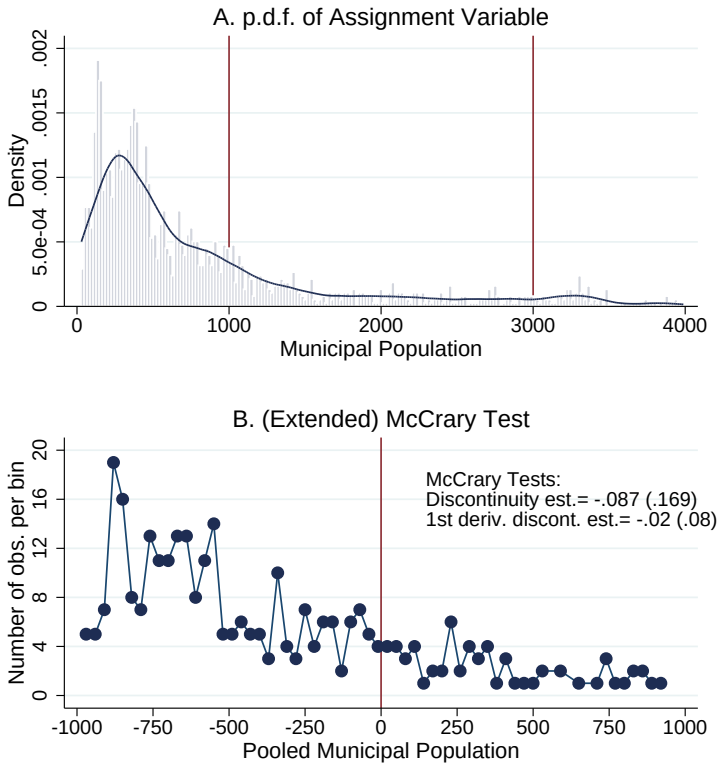
2.4 Validity of the RKD Approach

The key identifying assumption is that all variables except treatment and outcomes vary smoothly around the kinks. An important feature of the RKD is that this assumption is empirically testable. We begin by plotting the distribution of the assignment variable

[4]The ROT optimal bandwidth is computed following Carpenter and Dobkin (2009) and Card, Lee, Pei, and Weber (2015). $h_{ROT} = c(\sigma^2 \frac{R}{D})$ where c is a constant for the kernel (c = 3.93), R is the range of the running variable, D is the average second derivative of the expectation function, σ^2 is the mean squared error obtain from fitting the regression (1) and (2).

around the kink (Figure 2A).

Figure 2: Equalization Transfer (pc) depending on the Municipal Population (2011)



No kink in the distribution is graphically detected. To confirm this initial diagnosis, we performed a McCrary test and its extension by Landais (2013) to assess the continuity of the variable and of its first derivative around the threshold. The results of both tests, displayed in Figure 2B, reject the existence of both a discontinuity and a kink.

Table 1 displays the results of the same tests for all covariates. The existence of a discontinuity or a kink is rejected in all cases.

Finally, two cantonal laws threaten our estimation strategy. First, the transfer schedule was designed to incentivize municipal mergers. A problem of self-selection would occur if municipalities strategically merged to have a population just above the transfer threshold. However, Figure 3 shows that municipalities did not merge strategically to obtain more transfers as no concentration of merger output (input) is observed just above or below the kinks. In any case, we already tested rigorously for population sorting and the existence of a kink in population was rejected.

The second rule that might weakened our analysis is that municipalities above 1'000

Table 1: Smoothness of the Covariates

Polynomial Specification	Quadratic		Cubic		Quartic	
Bandwidth	ROT		ROT		ROT	
Pretreatment Covariates	Yes		Yes		Yes	
	FE		**FE**		**FE**	
	I	se	II	se	III	se
Dependent variable (Y): Less than 20						
Treatment	0.0014	(0.0034)	0.0015	(0.0028)	0.0042	(0.0036)
Dependent variable (Y): More than 60						
Treatment	0.014	(0.030)	-0.0091	(0.036)	0.025	(0.044)
Dependent variable (Y): Female						
Treatment	-0.0070*	(0.0040)	0.0034	(0.0048)	0.0044	(0.0071)
Dependent variable (Y): Net Migration						
Treatment	-0.012	(0.0094)	-0.0080	(0.013)	-0.0055	(0.017)
Dependent variable (Y): Density						
Treatment	0.021	(0.016)	0.026	(0.021)	0.018	(0.019)
Dependent variable (Y): Solidarity						
Treatment	1.74	(20.0)	14.1	(26.1)	6.34	(37.2)
Dependent variable (Y): Facture						
Treatment	-23.1	(51.9)	-6.00	(69.5)	-28.5	(95.5)
Dependent variable (Y): Help Transport						
Treatment	57.5	(72.3)	66.5	(115)	-128	(114)
Dependent variable (Y): Help Forest						
Treatment	-51.5*	(29.4)	-73.1	(44.7)	-81.7	(57.5)
Dependent variable (Y): Council Members						
Treatment	-6.18	(5.46)	-9.38	(6.62)	-9.55	(9.15)

Notes: Robust standard errors in parentheses. Fixed effects: Year and municipality. Cluster at municipal level.
*** Significant at the 1 percent level
** Significant at the 5 percent level
* Significant at the 10 percent level

inhabitants must have an elected council while the municipalities below generally have an assembly. However, the threshold for having a council was increased from 800 to 1'000 inhabitants in 2005. Municipalities between 800 and 1'000 were allowed to keep a council if wanted. Overall, only 3 municipalities switched back to an assembly. Our results are robust to the exclusion of these municipalities. Additionally, the councils of the municipalities above the kink can contain between 35 and 70 members while for those below the council size ranges from 25 to 45 members. We rigorously tested above whether a kink is observed at 1'000. The presence of such kink was not significant. Descriptive statistics in Figure 4 lead to the same conclusion.

Figure 3: Input and Output of All Mergers (2011-2014)

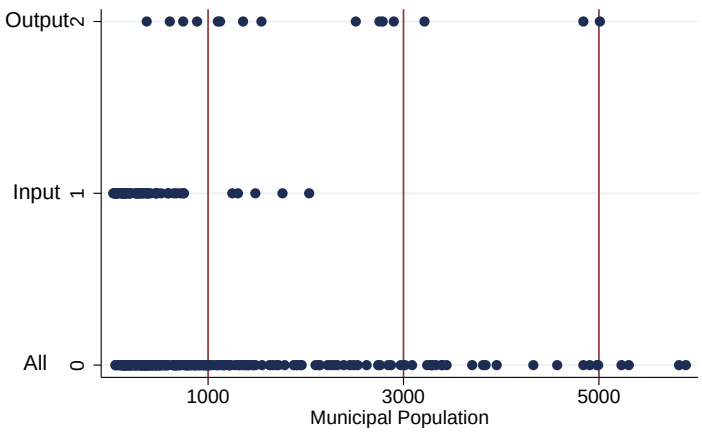
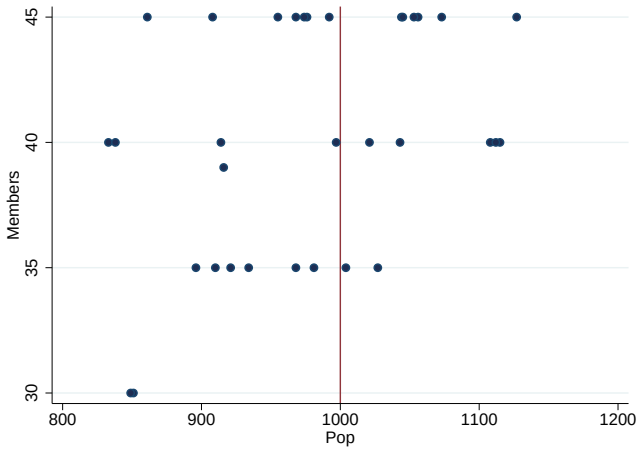


Figure 4: Number of Council Members (2011-2016)



3 Empirical Results

3.1 Results

This section displays the empirical results. Table 2 and table 3 present estimations of (1) and (2), respectively. In table 2, panel A displays the estimated causal impact of transfers on expenditures, while panel B studies the impact on tax rates and municipal revenues[5]. Columns I-VIII present results using a second, a third, a forth and a fifth order polynomial. Within each group, the second column is estimated with municipal and year fixed effects, while the first is not. The preferred polynomial order (in bold)

[5]Full tables are available upon request.

is chosen according to the Akaike information criterion (AIC).

Table 2: Flypaper Effect I

	I	II	III	IV	V	VI	VII	VIII
Polynomial Specification	Quadratic	Quadratic	Cubic	Cubic	Quartic	Quartic	Quintic	Quintic
Bandwidth	ROT	ROT	ROT	ROT	ROT	ROT	ROT	ROT
Pretreatment Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	OLS	**FEOLS**	**OLS**	**FEOLS**	**OLS**	**FEOLS**	**OLS**	**FEOLS**
PANEL A: Municipal Expenditures								
Dependent variable (Y): **Expenditures on Personnel**								
Treatment	-114	-16.11	3.46	**4.24**	**104**	27.68	171	56.12
	(86.3)	(30.741)	(112)	**(27.881)**	**(131)**	(28.825)	(173)	(44.484)
Observations	173	173	173	173	173	173	173	173
R-squared	0.515	0.238	0.532	0.262	0.545	0.265	0.546	0.277
Dependent variable (Y): **Expenditures on Municipal Goods**								
Treatment	**55.9**	38.25**	86.9	39.90**	199*	76.96***	216	**119.33*** **
	(53.7)	(16.542)	(64.1)	(19.347)	(115)	(22.518)	(139)	**(34.175)**
Observations	173	173	173	173	173	173	173	173
R-squared	0.308	0.253	0.310	0.259	0.334	0.279	0.335	0.302
PANEL B: Municipal Revenues and Tax Rates								
Dependent variable (Y): **Total Revenues**								
Treatment	3.82	**118.45**	201	62.17	**458**	84.96	548	101.40
	(178)	**(80.442)**	(226)	(105.892)	**(284)**	(169.359)	(450)	(219.847)
Observations	173	173	173	173	173	173	173	173
R-squared	0.904	0.867	0.905	0.868	0.912	0.873	0.912	0.874
Dependent variable (Y): **Revenues from Local Taxes**								
Treatment	-102	**20.11**	0.19	3.05	**23.9**	-84.69	11.6	-104.75
	(113)	**(78.302)**	(153)	(105.879)	**(212)**	(172.692)	(285)	(216.857)
Observations	173	173	173	173	173	173	173	173
R-squared	0.961	0.917	0.962	0.918	0.964	0.920	0.964	0.920
Dependent variable (Y): **Revenues from Fines**								
Treatment	-2.91	**-0.77**	**-5.60**	-0.67	-6.26	-0.37	-8.54	0.15
	(2.23)	**(0.937)**	**(3.83)**	(0.979)	(4.92)	(1.185)	(6.79)	(1.171)
Observations	173	173	173	173	173	173	173	173
R-squared	0.453	0.103	0.483	0.104	0.490	0.108	0.495	0.120
Dependent variable (Y): **Income Tax Multiplier**								
Treatment	**-2.47**	1.89	-2.77	-3.01	-3.16	-3.04	-0.14	**2.30**
	(1.81)	(2.263)	(2.38)	(2.716)	(3.06)	(3.237)	(3.57)	**(2.920)**
Observations	171	171	171	171	171	171	171	171
R-squared	0.512	0.141	0.517	0.204	0.526	0.204	0.533	0.272
Dependent variable (Y): **Property Tax Rate**								
Treatment	**0.026**	0.03	-0.063	0.05*	-0.097	**0.04**	-0.049	0.05
	(0.077)	(0.024)	(0.078)	(0.029)	(0.095)	**(0.038)**	(0.13)	(0.050)
Observations	171	171	171	171	171	171	171	171
R-squared	0.193	0.204	0.198	0.213	0.201	0.215	0.215	0.216
Dependent variable (Y): **Heritance Tax Rate**								
Treatment	**10.5**	-3.58	4.12	-2.02	5.55	-2.81	9.34	**-1.04**
	(14.7)	(5.872)	(18.0)	(5.398)	(21.9)	(6.364)	(26.6)	**(4.305)**
Observations	171	171	171	171	171	171	171	171
R-squared	0.275	0.252	0.280	0.264	0.284	0.264	0.285	0.342

Notes: Robust standard errors in parentheses. Fixed effects: Year and municipality. Optimal Polynomial Order (AIC) is in bold. Cluster at municipal level.
*** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level

In line with the flypaper effect literature, a significant local average treatment effect of transfers on municipal expenditures is observed. The impact of treatment on expenditures on municipal goods is large and significant. Treated municipalities spend more (per capita) in these expenditure categories than those below the kink. Our preferred specification is the one in column VIII as fixed effects are revealed significant by a standard F-test. The AIC is used to chose the best polynomial order. On the contrary, almost no significant homogeneous effect is observed when looking at expenditures on personnel. The finding on personnel does not mean that no effect is present. As the municipalities are small in population and as the transfers do not represent very large amounts, it is not surprising that the effect goes through municipal goods and not through personnel as municipal goods are highly divisible.

Table 2 also shows that no significant impact of transfer on municipal revenues or tax rates is observed. This finding constitute the second part of the classical flypaper effect. Municipalities tend to spend additional transfer income on expenditures and do not touch their tax rates. Hence, it appears that money does stick where it lands.

Table 3 investigates the heterogeneity of policy responses to transfers. The results displayed provide evidence of a positive heterogeneous local average treatment effect (HLATE) across municipalities. It appears that municipalities that used to spend relatively more on municipal goods will tend to spend even more when receiving more transfers. The results obtained by FEGMM corroborate the estimations using fixed effects OLS; and are in line with the LATE observed above. Concerning the choice of the best FEGMM specification, a trade-off exists between the polynomial order used and the number of instruments required. This is due to the fact that a higher polynomial order requires the use of a higher number of lagged variables as instruments. However, the consistency of the results across specifications renders this question minor in our case. This finding is new in the literature and can be used to explain the mechanism behind the flypaper effect. It appears that money sticks even more where it already landed in the past. We call this effect a *double flypaper effect* because money sticks twice. It first sticks on the municipalities by going directly in additional expenditures; and a second time by sticking to the expenditures on which it already landed in the past. This second part of the effect can be considered as the original one as it seems to cause the first part of the effect.

Table 3: Double Flypaper Effect:

	I	II	III	IV	V	VI	VII
Polynomial Specification	Linear	Quadratic	Quadratic	Cubic	Cubic	Quadratic	Quadratic
Bandwidth	ROT	ROT	ROT	ROT	ROT	ROT	ROT
Pretreatment Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	FEGMM	**FEOLS**	**FEGMM**	**FEOLS**	**FEGMM**	**FEOLS**	**FEGMM**
Dependent variable (Y): **Expenditures on Personnel**							
Treatment	322	**-4.49**	137	1.64	-163	18.5	-177
	(343)	**(44.2)**	(390)	(55.5)	(345)	(66.6)	(318)
SPersonel (t-1)	**10.3**	0.017	6.39	-0.67	1.85	-1.19	5.48
	(9.13)	**(3.96)**	(8.68)	(4.33)	(8.20)	(4.58)	(8.11)
Treat_x_SPersonnel	-11.9	**-0.44**	-5.40	-0.60	1.82	-0.22	-1.55
	(11.8)	**(1.58)**	(13.1)	(1.76)	(10.8)	(1.74)	(7.89)
Dependent variable (Y): **Expenditures on Municipal Goods**							
Treatment	-249**	**-65.2**	-274***	-62.3	-200***	-43.9	-216**
	(98.3)	**(40.3)**	(87.6)	(44.2)	(74.4)	(46.3)	(105)
Sgoods (t-1)	12.3	**-7.89****	13.4	-8.00**	22.9*	-7.91**	23.1*
	(11.0)	**(3.17)**	(13.6)	(3.14)	(12.5)	(3.17)	(12.1)
Treat_x_Sgoods	17.4***	**5.35*****	17.7***	5.32***	13.3***	5.43***	14.7***
	(5.43)	**(1.67)**	(4.59)	(1.73)	(4.15)	(1.85)	(4.99)

Notes: Robust standard errors in parentheses. Fixed effects: Year and municipality. Optimal Polynomial Order (AIC) is in bold. Cluster at municipal level.
*** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level

4 Conclusion

We have analyzed the causal impact of equalization transfers on municipal expenditures applying a Regression Kink Design. This analysis revealed the presence of a double flypaper effect. This effect appears to be a plausible explanation of why the literature observed the well-known flypaper effect. This anomaly in local public finance seems to be due to the fact that municipalities tend to spend additional income transfers where they already used to spend relatively more in the past. The double flypaper effect can be understood as an inertia phenomenon in the sense that spending on a particular expenditures today will attract additional transfer income spending on the same expenditure in the future.

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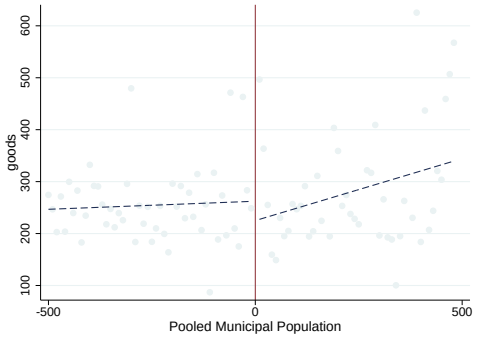
Appendix

Figure 5: Municipal expenditures depending on its population

(a) Expenditures on Goods



(b) Expenditures on Personnel