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Abstract

Inter-municipal communities are supposed to provide local public services more efficiently by exploiting economies of scale and reducing spillover effects among cooperating municipalities. In a diff-in-diff setting that exploits the staggered adoption of cooperation in France, we explore the impact of inter-municipal cooperation on both local public spending and revenues. We first find a sizable increase in local public spending which was not driven by wage bill expansion. Second, by using the decomposition of spending by function, we show that this increase was driven by urbanism policies. Third, we show that a quarter of this effect can be explained by the transfer of two policies: public transit and garbage collection. Overall, we conclude that scale economies, if existent, were clearly dominated by a "zoo" effect, i.e. the provision of new public services in small and former isolated municipalities.

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1 Introduction

In the past twenty years, several countries have reverted from the decentralization policies of the end of the 20th century. The main justifications of these re-centralization policies is to benefit from economies of scale in the production of local public services,

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to internalize spillover effects among cooperating municipalities and to reduce tax competition. However, existing empirical evidence on the ability of inter-municipal cooperation to meet these goals is mixed (see e.g. [Bel and Sebö, 2021](#) for a recent review).

In the Emilia Romagna region for instance, [Ferraresi et al. \(2018\)](#) find that being within an inter-municipal community reduces the total per capita current expenditures by around 5 percent, without affecting the level of municipal public services. This effect is shown to be persistent over time and to increase up to six years after entrance. In France on the other hand, [Breuillé et al. \(2018\)](#) documents that fiscal cooperation created an increase in total tax rates. While they cite institutional inefficiencies, tax competition, spillover effects, and the increase in public services as potential explanations for this increase, there is a lack of evidence on the respective importance of these mechanisms.

Confirming or not that the inter-municipal union is effectively increasing the local efficiency in providing public services still needs to be investigated using more complete data on budget accounts. More specifically, there is a need to investigate the impact of the reform on these specific spending coming from the transferred competences from the cooperating municipalities to the community. Do cooperation and the related expected economies of scale reduce the overall spending in the field of competences that were transferred from the municipalities to the community? The basic decomposition of spending by nature (operating vs investment) does not allow to make such investigations. Since competences refers to some fields of action, which are sometimes transferred to the communities, some informations on the range of competencies and the associated expenditure are needed.

The aim of this paper is to fill a gap in the literature, by considering a detailed database on spending and revenues made by French municipalities and by communities to explore the causal impact of inter-municipal cooperation on the expected economies of scale in the delivery of some local public services, which are transferred from the municipalities to the community.

We here exploit the characteristics of the French institutional setting to test the impact of inter-municipal cooperation on local budgets, and to isolate the effect of sharing specific missions from the overall effect of cooperation. Since 1999, the French government has favored the creation of inter-municipal jurisdictions based on large state grants, to solve the problem of “municipal fragmentation” in France. Inter-municipal communities are unions of several municipalities to enable collective financ-

ing and management of some local public services (essentially based on urbanism and economic development and planning). Currently, all French municipalities are grouped within larger jurisdictions (known as 'Etablissements Publics de Coopération Intercommunale' or EPCI).

To our knowledge, the originality of our paper is twofold. First, by using the decomposition of spending by function, we are able to determine the impact of inter-municipal cooperation on expenditures targeted to specific local policies. Second, by using data on transferred missions, we are able to estimate the effect of sharing specific policies conditional on cooperating, which allows us to disentangle the effect of transferring competences from modification of the tax regime.

We first find that total income from the municipality and the cooperation group increases substantially although municipal incomes fall. Overall, total per capita revenues increase by around €250. On average, per capita tax revenues increase by €118 per capita on entry and then stay constant, while state transfers rise by €40. These results are consistent with (Charlot et al., 2015, Breuillé et al., 2018) who show that in France, fiscal cooperation is shown to lead to an increase of tax rates by reducing tax competition. Since tax revenues increase, we may wonder how this new income is spent after integration. Turning to spending, we observe that current spending increases by €220 per capita the year of integration, and stays constant afterwards. Self-financing increases slightly on entry (by €47) but the effect is not persistent, while investment raises by around €150 per capita. While we can not exclude that scale economies were achieved in the provision of some local public goods by inter-municipal communities, these results show that they were clearly dominated by some other mechanism(s).

One hypothesis for this lack of reduction in spending would be that, by imposing a new layer of government on top of already existing municipalities, inter-municipal cooperation actually created inefficiencies by multiplying personnel expenditures. While we find a significant increase of the share of wage bill in current expenditures of municipalities, we find no significant effect on the share of labor in total expenditures (municipality plus group) after entering an inter-municipal community. Further, we see no significant difference between the community's center¹ — which could more effectively transfer workers to the newly created group — and other cooperating municipalities. All in one, these results indicate that the increase in spending was

¹The community's center, or *chef lieu* of the group is the head municipality in the cooperation group, in which the headquarters of the group are located.

not driven by labor costs and overlaps.

When investigating spending by function, we are able to measure the specific impact of cooperation on specific missions of the local government. Estimation results show that total (community and municipal) spending in urban policies and general services have increased while the other categories of total spending remained stable after the creation of the inter-municipal community. Further, we investigate the effect of the transfer of seven missions to the cooperation group: public transit, garbage collection, social housing, social aid, road maintenance, economic policy (enterprise zones), and sports and cultural infrastructures. Conditional on already being a cooperation group, we find no negative effect of transferring any of these policies. This shows that, even when keeping the fiscal regime constant, groups that transferred these competences did not reduce their total spending relative to those who did not. Further, we find significantly positive and economically large effects of public transit and garbage collection. These two policies alone rationalize one fourth of the estimated total effect of cooperation. This is consistent with the result by [Tricaud \(2019\)](#) that cooperating municipalities saw a sharp increase in their probability to be connected to a public transport infrastructure, one of the main components of urban policy expenses.

Our results seem to indicate that the increase in spending following integration was driven mainly by an increased provision of specific public services that municipalities were too small to provide on their own. While this does not rule out the reduction in tax competition as a mechanism for the total increase in public spending, it does show that the zoo effect ([Oates, 1988](#)) is an important mechanism. This explanation was also given by [Frère et al. \(2014\)](#), who find no effect of cooperation on total spending on the time period 1994-2003, and a decrease in spending interactions. Considering for instance public transit, it does not make much sense for a small municipality to develop a network on its own, as this network would only span its own territory and the feasibility of longer trip would depend on the level of provision of nearby municipalities and their will and ability to coordinate. By transferring this service to a higher level of government that covers a larger territory — the cooperation group — municipalities are able to internalize this externality and increase the service. Similarly for garbage collection, municipalities could for instance switch from a fixed collection point to proper collection services, while for economic policies they could decide to create common enterprise zones or services zones.

This article is also related to the recent existing literature on the effects of inter-

municipal cooperation on local spending. Focusing mainly on the impact of inter-municipal cooperation at the aggregate level, the results are mixed (see e.g. [Bel and Sebö, 2021](#) for a recent review). [Reingewertz \(2012\)](#), [Baskaran et al. \(2016\)](#), and [Cobban \(2019\)](#) find some evidence of efficiency gains in Israel, Germany, and Ontario. Yet, there is no evidence of cost savings in Denmark, the Netherlands, or Italy ([Blom-Hansen et al., 2016](#), [Allers and de Greef, 2018](#), [Luca and Modrego, 2021](#)).²

The paper is organized as follows, Section 2 describes the institutional background, and Section 3 our data. Section 4 illustrate our empirical approach. Section 5 comments our findings. Section 6 concludes.

2 Institutional context

In France, inter-municipal cooperation increased greatly with the 1999 Chevènement law. When only 5,069 municipalities were part of an inter-municipal cooperation structure in 1993, all of them were members of a such cooperation structure in 2014.³

There are three jurisdictional forms for French communities, based on demographic criteria: the communauté urbaine (CU), with a minimum of 500,000 inhabitants, the communauté d'agglomération (CA), 50,000 inhabitants with a member municipality bigger than 15,000 inhabitants, and the communauté de communes (CC) that does not require any demographic criteria.

The share of the French population covered by one of these structures increased from 28% in 1993 to 100% in 2014. In recent years, there was a large majority of the most integrated forms of cooperation — CC and CA — those two categories accounting for 98% of French municipalities in 2014. However, given the sizeable differences in population between the municipalities choosing these two modes of cooperation, CCs and CAs only account for two thirds of the French population, while Métropoles make up the rest.

The jurisdictional form involves some compulsory responsibilities. For instance,

²[Ermini and Santolini \(2010\)](#) also investigate the impact of inter-jurisdictional agreements in Italy on the extent of spending interactions, focusing on specific categories of expenditures. They find that, for the two spending categories where the partnerships are very active – police and road maintenance – strategic interactions among jurisdictions in voluntary partnerships are lower than among isolated municipalities. This outcome suggests that the benefits of spillovers may be internalized in specific cases.

³In the December 16, 2010 law made it mandatory for French municipalities to join a cooperation group by 2014. Let us note that in 2009, 94% of French municipalities had already chosen to join one (due to state grants).

a CC must take responsibility for at least one service in the category of “spatial planning”, and one in the area of “economic development and planning”. Similarly, CAs are required to take on one responsibility in each of four specific categories, and CUs are required to take responsibility for six. As a result, the most frequent services supplied by communities are economic planning and development, and garbage collection and treatment. This distribution of competences is related to the coordination between local policies and economies of scale, which are particularly important in network services.

Municipalities “democratically” decide which services will be delegated to the community among 14 categories (see Table A in the appendix). More precisely, every service considered – at the qualified majority – as being of “community interest” will be financed and managed collectively by the community. These decisions are made at the time that the community is formed, but changes are possible at any time, on the initiative of the municipal or community councils.

Functional cooperation allows for the cooperation entity to provide public services using its own taxes. The ways in which these taxes are set and interact with municipal taxes varies depending on the fiscal type of structure. French law allows for three different types of local business tax (*taxe professionnelle*): a single tax regime (*fiscalité unique*), an additional regime (*fiscalité additionnelle*) and a zone-specific regime (*fiscalité de zone*). The single tax regime is mandatory for CA establishments, and optional for CC and CU. In this setting, cooperating municipalities completely transfer their ability to levy the local business tax to the new cooperation entity. This gives rise to a unique business tax over the territory covered by the cooperating municipalities. At the opposite side of the spectrum are the additional cooperation groups. In this configuration, municipalities still decide freely on their property tax, while the cooperation structure is free to set an additional property tax rate, that applies uniformly to all the municipalities of the group. These communities levy 20% of the total tax revenues of the municipal block. Among them, 73% chose to transfer at least parts of their fiscal autonomy by choosing a single tax or a zone-specific system.

3 Data

We leverage accounting data for French municipalities and their groups over the 2000-2014 period.⁴ More precisely, we merge three sources of data. The first one (*comptes des collectivités*), for spending and revenues at the municipal level, is exhaustive from 2000 to 2014. The second one (still from the *comptes des collectivités*), for spending and revenues at the group level, is exhaustive on the 2007 to 2014 period. The third one, for functional accounting,⁵ is limited to municipalities with more than 3500 inhabitants and available from 2002 to 2011. Finally, we also gather data on the specific missions that were transferred to the cooperation group over the years. This data comes from the *BANATIC* database, that is available from 2007 to 2019 and exhaustive.

Combining these sources of data gives us three main estimation samples. The first one (Sample A), gathers all municipalities that entered a cooperation group after 2000, from 2000 to 2014. The second one (Sample B), gathers all the municipalities that cooperated after 2007. With this data, our dependant variable is total spending from the municipality plus the group. Before cooperation, this is simply municipal spending, so that when we restrict our sample to municipalities that cooperated after 2007 we can actually observe total spending from 2000 to 2014. These extra pre-treatment years can be used to increase the power of pre-trend tests. As discussed in [de Chaisemartin and D’Haultfœuille \(2020\)](#), the estimation of the l -th dynamic effect requires to test parallel trends for the $l + 1$ last pre-treatment periods. As our data only allows us to estimate 5 years of post-treatment dynamic effects, we restrict Sample B to the 2001-2014 range, which allows us to exploit all of the available information in testing the parallel trends assumption up to 6 years before the treatment. Sample C gathers municipalities with a population greater than 3500 inhabitants that started cooperating after 2002, from 2002 to 2011. Finally, for the estimation of the effect of transferring a particular mission to the group, we adopt a diff-in-diff strategy comparing cooperating municipalities that do transfer a mission to those who don’t. Since the data on competences is available since 2007, we gather in sample D all the municipalities that are part of a cooperation group since before 2007, and we focus the estimations on the 2007 to 2019 period.

Table 1 describes our main variables at the municipal level as well as the

⁴Data is actually available until 2019, but later years are not informative in our DiD setting because by 2015 all municipalities are treated.

⁵This dataset was provided by Brice Fabre ([Fabre, 2017](#))

Table 1: Descriptive statistics over the three samples

	Sample A		Sample B		Sample C		Sample D	
	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
<i>Municipality only, before cooperation</i>								
Total revenues	915.10	1226.87	1099.27	1694.70	1376.59	685.71		
Taxes	415.44	642.85	518.69	877.06	799.79	470.01		
Transfers	199.38	178.91	226.66	207.83	264.47	133.21		
Total current	706.56	948.27	844.95	1311.05	1205.34	603.54		
Wage bill	209.29	219.63	248.89	271.85	545.17	258.18		
S.-f. capacity	138.54	424.87	171.42	575.97	94.78	175.63		
Investment	399.91	801.72	473.58	946.44	370.59	336.26		
<i>Total (group plus municipality), after cooperation</i>								
Total revenues			1436.56	1719.45	1533.57	511.39	1266.89	680.19
Taxes			695.25	1082.37	851.65	332.98	631.51	470.76
Transfers			289.77	231.05	321.02	108.49	260.70	164.41
Total current			1138.55	1293.89	1343.43	452.51	1041.73	566.34
Wage bill			348.73	334.00	597.31	219.10	348.19	211.80
S.-f. capacity			211.51	569.25	129.09	158.79	162.06	270.28
Investment			606.87	1092.71	469.40	269.26	499.52	583.44
Population	1400.11	5971.35	1185.04	3600.80	13021.21	14952.23	1635.96	9372.36
Cooperate	0.73	0.44	0.31	0.46	0.58	0.49	1.00	0.00
Number of observations	254796		42429		5921		364339	
Number of groups	1322		625		298		2354	

Descriptive statistics of main budget variables. Sample A: all municipalities that entered a cooperation group after 2000, from 2000 to 2014. Sample B: all municipalities that entered a cooperation group after 2007, from 2001 to 2014. Sample C: municipalities with a population greater than 3500 inhabitants that entered a group after 2002, from 2002 to 2011. Sample D: all municipalities that entered a group before 2007, from 2007 to 2019. All variables in Euros per capita. Cooperate is a dummy equal to one if the municipality is a member of a cooperation group in a given year.

cooperation status of municipalities over the three samples for municipalities with and without a cooperation group. All accounting variables are expressed in Euro per capita. Sample A has 254,796 observation pooling 14 years of data, corresponding to the 18,200 municipalities that entered a cooperation group after 2000. In total, they enter 1,322 distinct cooperation groups.⁶ Their average population is 1,400 inhabitants. Sample B on the other hand has 42,429 observations over 13 years, corresponding to the 3,264 municipalities that entered a cooperation group after 2007. Because on average big municipalities started cooperating earlier, they are relatively smaller than their counterpart in population A (1,185 inhabitants against 1,400). They also tend to have a bigger budget before cooperation, as they spend more per capita (€844.95 against €706.56, receive more taxes (€518.69 against €415.44) and invest more (€473.58 against €399.91). Finally, sample C only contains 5,921 observations, corresponding to the 657 municipalities with a population of more than 3,500 inhabitants that entered a cooperation group after 2002. Before cooperation, they have higher per capita revenues (€1376.59) and current expenses (€1205.34) than the two other groups, but lower investments (€370.59).

Table 1 also describes, for samples B and C, the sum of the per-capita revenues and spending of the municipality and the group, for cooperating municipalities. In both samples, total current expenditures on average higher than their municipal counterparts (by €293.6 in Sample B and €138.09 in sample C). As such, these descriptive statistics go against the realization of strong economies of scale that would have allowed to reduce total spending. We provide more rigorous evidence in that direction in the next sections.

We also supplement these data with spending data organized by function. There are nine functions in total, ranging from urban planning to sports infrastructures. More detail on each category can be found in appendix. We describe total (municipal plus group) spending over all of these functions in Table 2, over the entirety of sample C, and specifically for cooperating and non-cooperating municipalities. First, we note that the first spending category is "general spending" (€438.6 per capita), followed by Urban policies (€225.15), Education (€147.44) and Sports and youth (€107.66). Urban policies groups all the "network" systems (like tap water, sewage systems and public transport), as well as garbage collection, road maintenance and urban

⁶Over the years, some municipalities switched groups and some groups merged, so that group id may change over the years for a given municipality. The number of distinct groups is counted using the 2014 ids.

Table 2: Descriptive statistics, current expenditures by function

	Total		Before coop.		After coop.	
	Mean	s.d.	Mean	s.d.	Mean	s.d.
Total	1138.77	458.30	1125.40	544.91	1148.64	381.72
General	39.38	13.83	39.67	15.09	39.17	12.82
Urban	19.61	7.58	18.69	7.68	20.29	7.43
Culture	5.36	3.30	5.18	3.27	5.50	3.31
Economic	1.59	2.23	1.54	2.68	1.64	1.84
Education	13.71	5.58	14.04	6.14	13.47	5.12
Family	3.87	3.96	3.80	4.01	3.92	3.93
Housing	0.43	0.89	0.47	1.05	0.39	0.75
Security	3.89	2.43	4.16	2.56	3.69	2.30
Social	2.94	2.86	3.26	3.05	2.71	2.69
Sports	9.22	4.29	9.19	4.31	9.24	4.28

Descriptive statistics of the functional spending data over Sample C: municipalities with a population greater than 3500 inhabitants that entered a group after 2002, from 2002 to 2011. Data represents total spending aggregating municipal and group level data. All variables are in Euros per capita.

renewal. Education concerns the maintenance of school buildings, and extracurricular activities and accommodations. Teachers and school employees are paid directly by the State. Finally, Sports and youth expenditures group the expenditures on stadiums, swimming pools and other outdoors infrastructures, as well as subventions to sports and youth clubs.

Comparing non-cooperating to cooperating municipalities, we can see a modest increase in total spending, that seems to be driven mainly by general expenditures, urban and cultural policies, while some categories of spending such as security and social policies appear to decrease slightly.

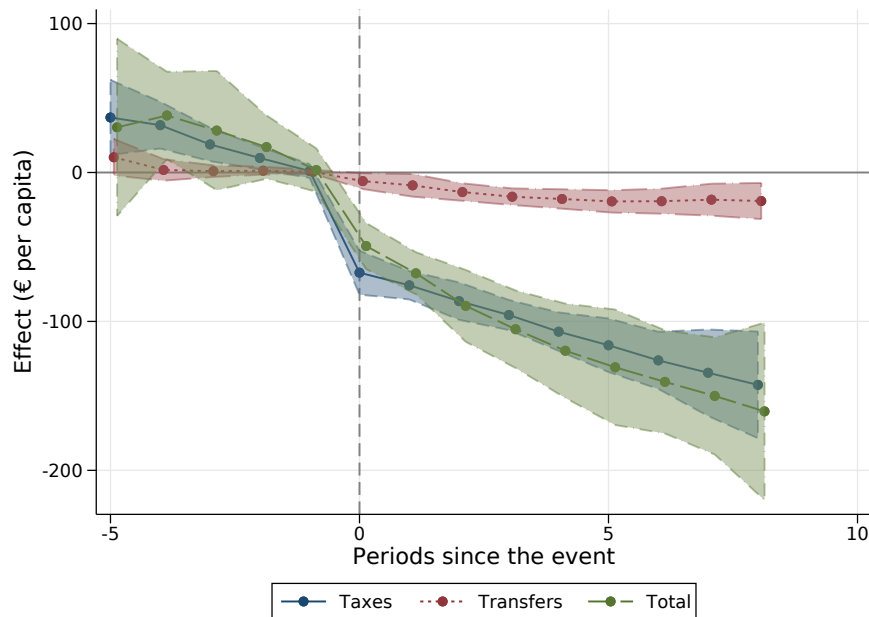
4 Results

4.1 Municipal budget

We estimate the effect of cooperation by exploiting the staggered adoption of cooperation. We use the estimator of [de Chaisemartin and D'Haultfoeuille \(2021\)](#), which is robust to treatment heterogeneity, but we do not address potential selection into treatment. This does not seem to be a problem however, as placebo tests for

pre-event trends pass for all our estimations. Further, focussing on taxes, [Breuillé et al. \(2018\)](#) reports instrumented coefficients that are remarkably close to the raw DiD estimates. Our main specifications concern total revenues, investment, wage bill and current expenditure, all per capita. In this section, we use the full sample of municipalities that started cooperating from 2000 to 2014 (sample A).

Figure 1: Effect of cooperation on municipal revenues.

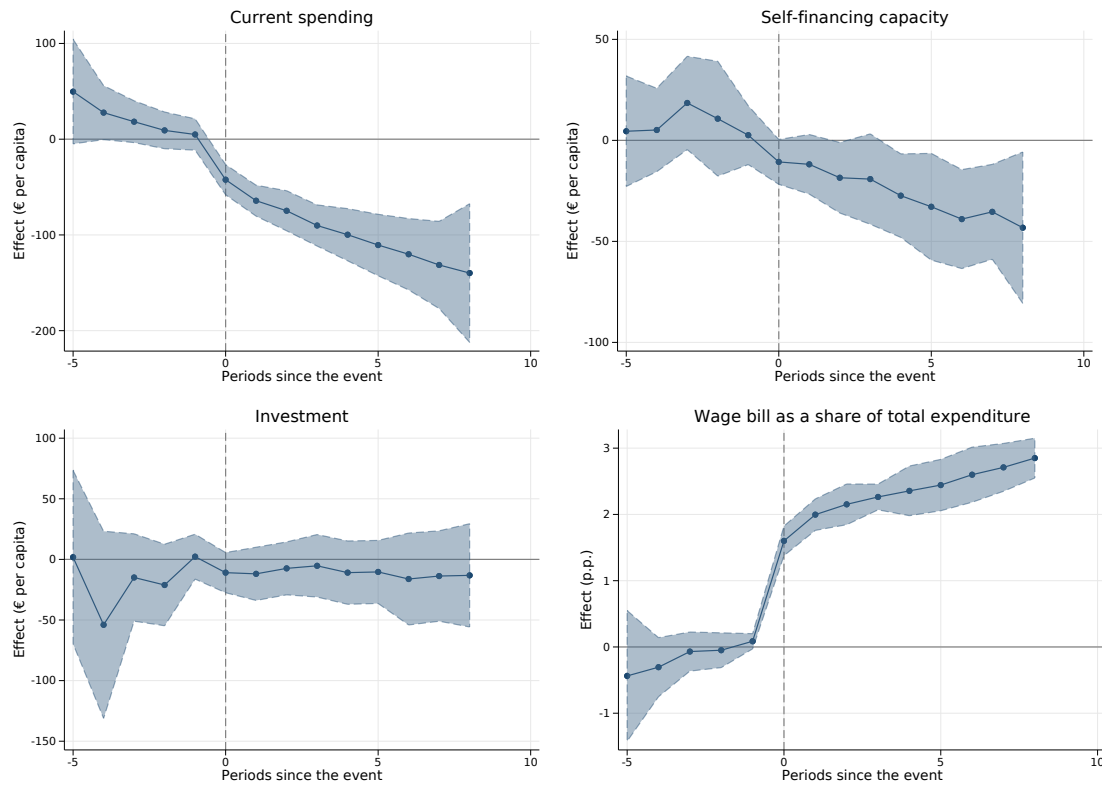


Effect of entering a cooperation group on municipal revenues. Estimations on all municipalities from 2000 to 2014 (sample A).

First, in Figure 1, we show that the results by [Breuillé et al. \(2018\)](#) on municipal tax revenues still hold when using the estimator of [de Chaisemartin and D'Haultfœuille \(2020\)](#) and with our extended time coverage. As municipalities transfer their competences and set their taxes on the same fiscal basis as the cooperation group, they see their fiscal revenues go down. The instantaneous effect on tax revenues is €67 per capita (18.1% of the average before cooperation) and goes down to €143 per capita (38.5%) eight years after the event, although tax revenues were on a significant pre-trend two years and more before the treatment which implies that long run effects should be taken with caution. State transfers also go down substantially. The instantaneous loss in state transfers is €6 per capita (3%) and stabilizes at €19 (10%) five years after treatment. Turning to total municipal revenues, they go down by €49

per capita (5.8%) the year of the treatment to €160 (18%) eight years after joining the group.

Figure 2: Effect of cooperation on municipal spending.



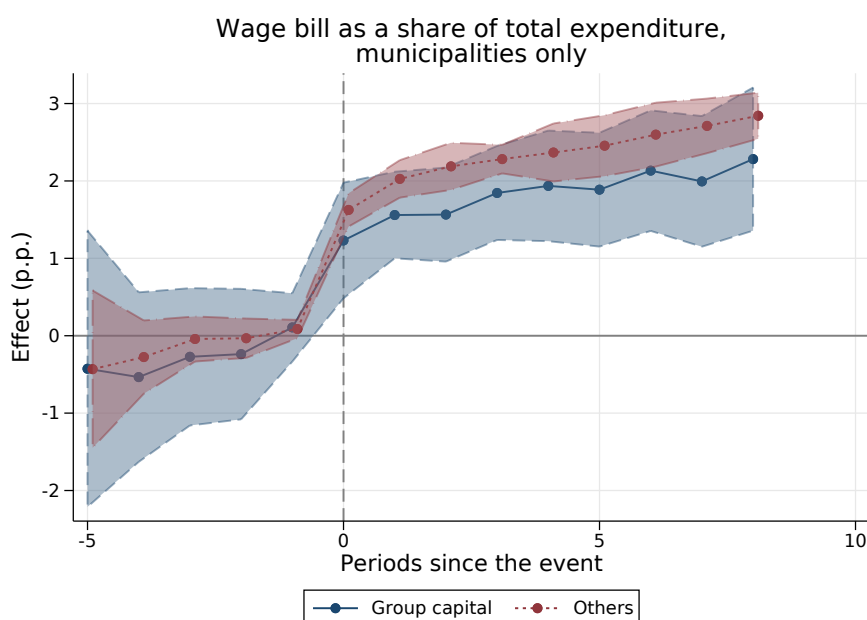
Effect of entering a cooperation group on municipal spending. First panel is total current expenditures, second is cash flows, and third and fourth are respectively investments and the share of wage bill in total current expenditures. Sample A.

Turning to spending, Figure 2 shows the effects of cooperation on current expenditures, cash flows, investment and the share of wage bill in current expenditures. As depicted in the first panel, the reduction in revenues is not entirely matched by the reduction in current expenses, that go down by €36 per capita (a 6.3% reduction w.r.t. average before entry) the first year, and up to €127 after eight years. This translates (panel 2) into a reduction of the self-financing capacity of municipalities, but has no significant (although the point estimates are negative, panel 3) on investments.

Interestingly, wage bill decreases proportionately less than the rest of current expenditures, leading to a raise in the share of wages in total expenditures (panel 4) of 2.9 percentage points (from a baseline of 29.26% before entry) after eight years.

This increase in the share of wages in the production function of local services could come either from a change in the production function of municipal services or from rigidities in the adjustment of labor force. Public services production could change either because municipalities focus their supply on different services that are more labor intensive than others, or because they reduce their total output and the labor intensiveness of public services production decreases with production size. On the other hand, civil servant jobs are highly protected, and it could be that municipalities face rigidities when they try to layoff civil servants or transfer them to the cooperation group.

Figure 3: Effect of cooperation on the share of wage bill in current expenditures.



Effect of entering a cooperation group on the share of wage bill in total current expenditures, for group capitals and for other municipalities. Sample A.

This second explanation seems unlikely for two reasons. First, the share of wage bill does not decrease to its baseline level, even after eight years of being part of a cooperation group. If civil servants were resisting transfer or if municipalities had troubles laying them off, this effects should not be permanent. After a few years, municipalities should manage to bring their wage bill back down by not replacing the workers who voluntarily move or retire. Second, we also try to indirectly test the role of rigidities in workers transfers by comparing the effect of cooperation on

the group capital to the one on regular members. When transferring civil servants in another administration, they cannot directly refuse the transfer but they can make it more costly by asking for moving compensations if their new place of work is in a different municipality than the former one. As the offices of the group are located in the capital municipality, and very often in the same or an adjacent building to the mayors office of the capital, these moving costs should be lower for the capital of the group. More precisely, we test this hypothesis by running two separate DiD event studies, one restricted to municipalities that will become or currently are the capital of their group, and another one on municipalities that are not and will never be. As we show in figure 3, although the point estimates are slightly lower, group capitals still experience an increase in wage bill share and there is no significant difference between the effect on the capital and the effect on other municipalities, discrediting transfer costs as an explanation.

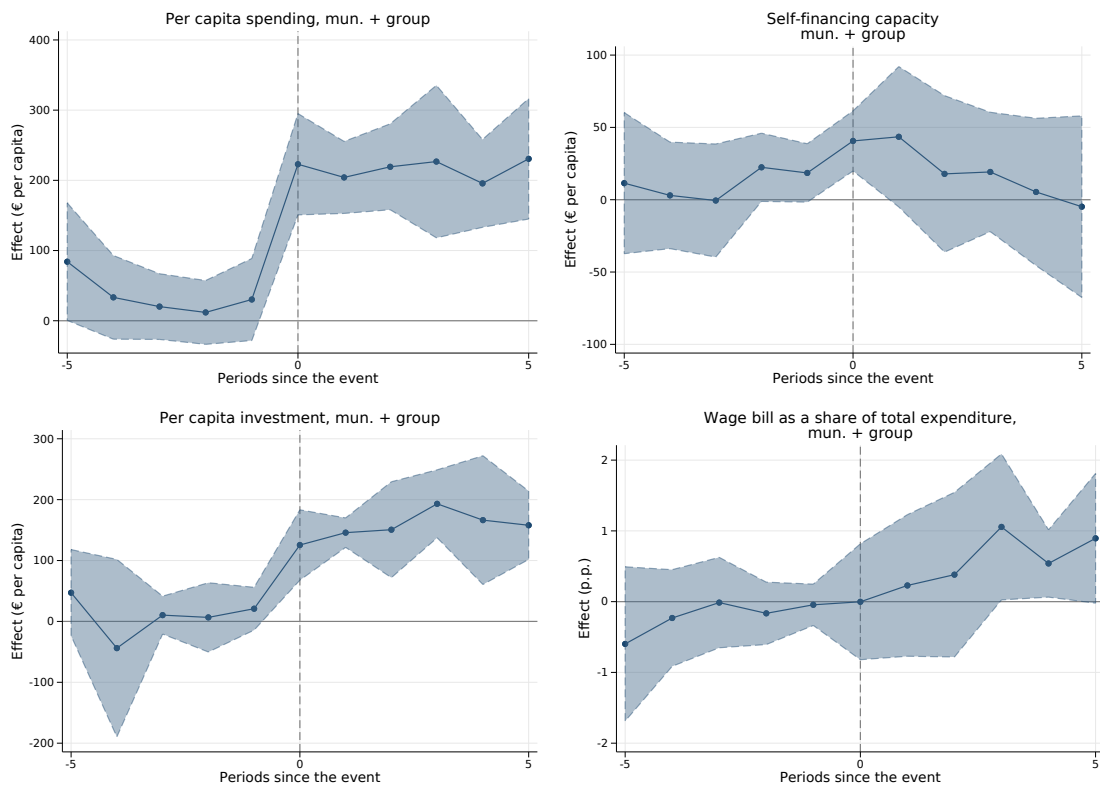
4.2 Effects at the municipal block level

In this subsection, we look at the impact of cooperation on total revenues and spending from both the cooperation group and the municipality. We construct these variables by summing over per-capita expenses at the municipal and the group level, which corresponds to assuming a repartition of group expenses that is proportional to the population share of the municipality in the group total.

First, consistent with Breuillé et al. (2018) and Tricaud (2019), although municipal incomes fall, total income from the municipality and the cooperation group increases substantially (Figure 7 in appendix). On average, per capita tax revenues increase by €118 per capita on entry and then stay constant, while state transfers rise by €40. All in one, total per capita revenues increase by around €250. This increase, mainly driven by tax transfers, corresponds to 21% of the average revenue of municipalities the year before cooperation.

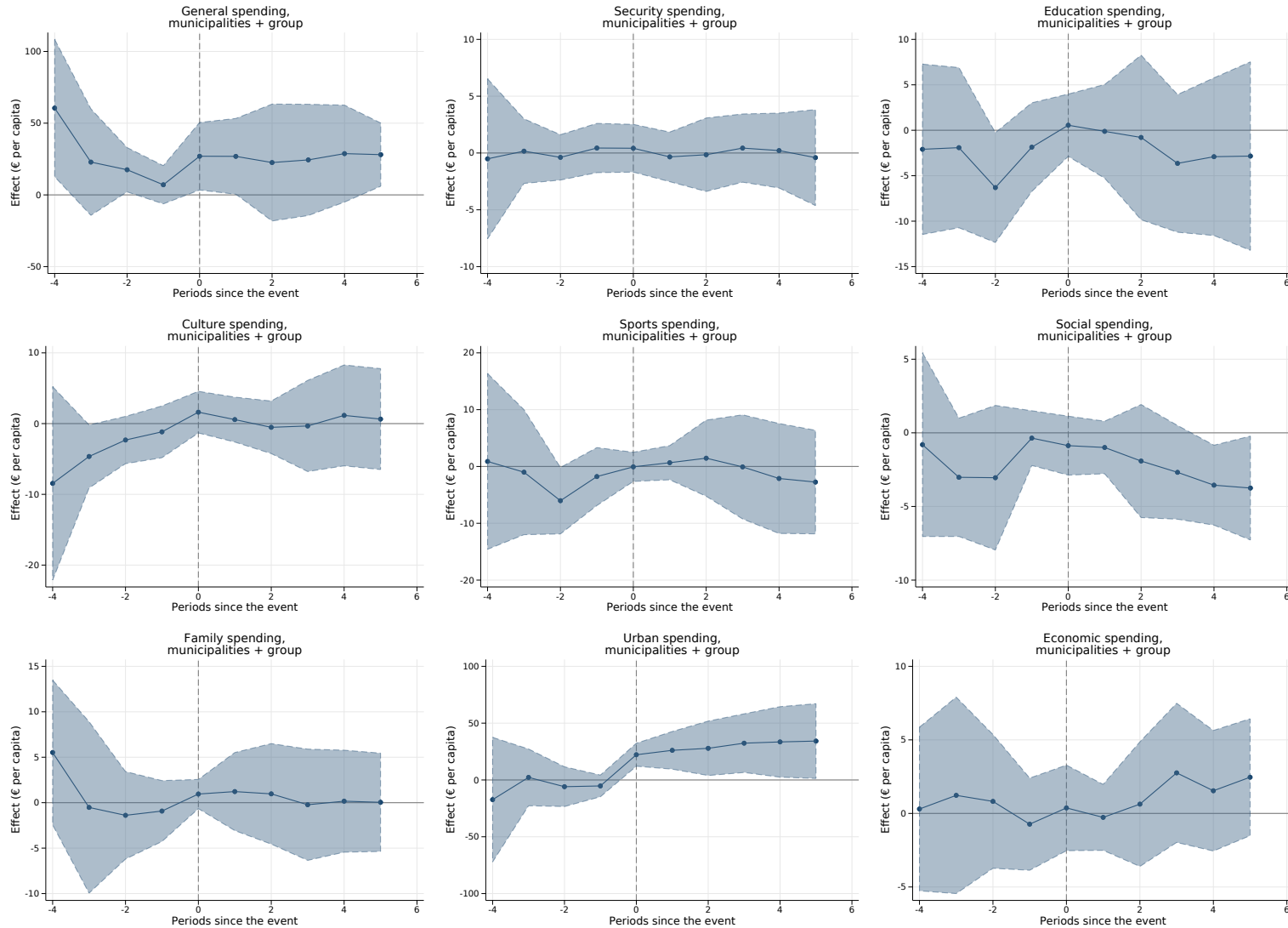
Turning to spending, this increase in revenues is spent in its entirety. As shown in Figure 4, total spending increases by €220 per capita (24% of the pre-treatment average) the year of integration, and stays constant afterwards. Self-financing increases slightly on entry (by €47) but the effect is not persistent. Investment nonetheless raises by around €150 per capita, a 33% increase with respect to the pre-treatment average. Further, we see no significant effect on the share of labor in total expenditures on entry, and only a small and slightly significant effect after three years. This lack of effects

Figure 4: Effect of cooperation on total spending.



Effect of entering a cooperation group on total (group + municipality) spending. First panel is total current expenditures, second is cash flows, and third and fourth are respectively investments and the share of wage bill in total current expenditures. Estimations on all municipalities that entered a cooperation group after 2007 (sample B).

Figure 5: Effect of cooperation on total spending, by function.



Effect of entering a cooperation group on total (group + municipality) spending. First panel is total current expenditures, second is cash flows, and third and fourth are respectively investments and the share of wage bill in total current expenditures. Estimations on municipalities with a population greater than 3500 inhabitants that entered a cooperation group after 2002 (Sample C).

at the group level, particularly at the entry year goes to reinforce the assertion of the previous section that the effect observed on municipalities is probably not driven by the cost of transferring workers, but by more structural changes to the production function of municipal public services.

4.3 Spending by function

To further investigate the effects of cooperation on local spending, we also gather data on spending by function. In these data, every expense from the local government is categorized into one of ten functions. We give a description of each of these categories in appendix. Due to data limitations, we restrict the analysis to municipalities with more than 3500 inhabitants that entered a cooperation group after 2002 (sample C).

In Figure 5, we report the effect of entering a cooperation group on each category of spending. The only two functions for which cooperating leads to a significant increase in spending are general services and urban policies. For all other services, the effect is null, and even negative for social policies.

While this result indicates that the increase in spending when joining a cooperation group is concentrated on urban policies (mainly public transit and road maintenance), this fact alone does not allow us to conclude on the role played by the provision of those particular public goods in the global increase in spending. Indeed, it could for instance still be caused by reductions in tax competition.

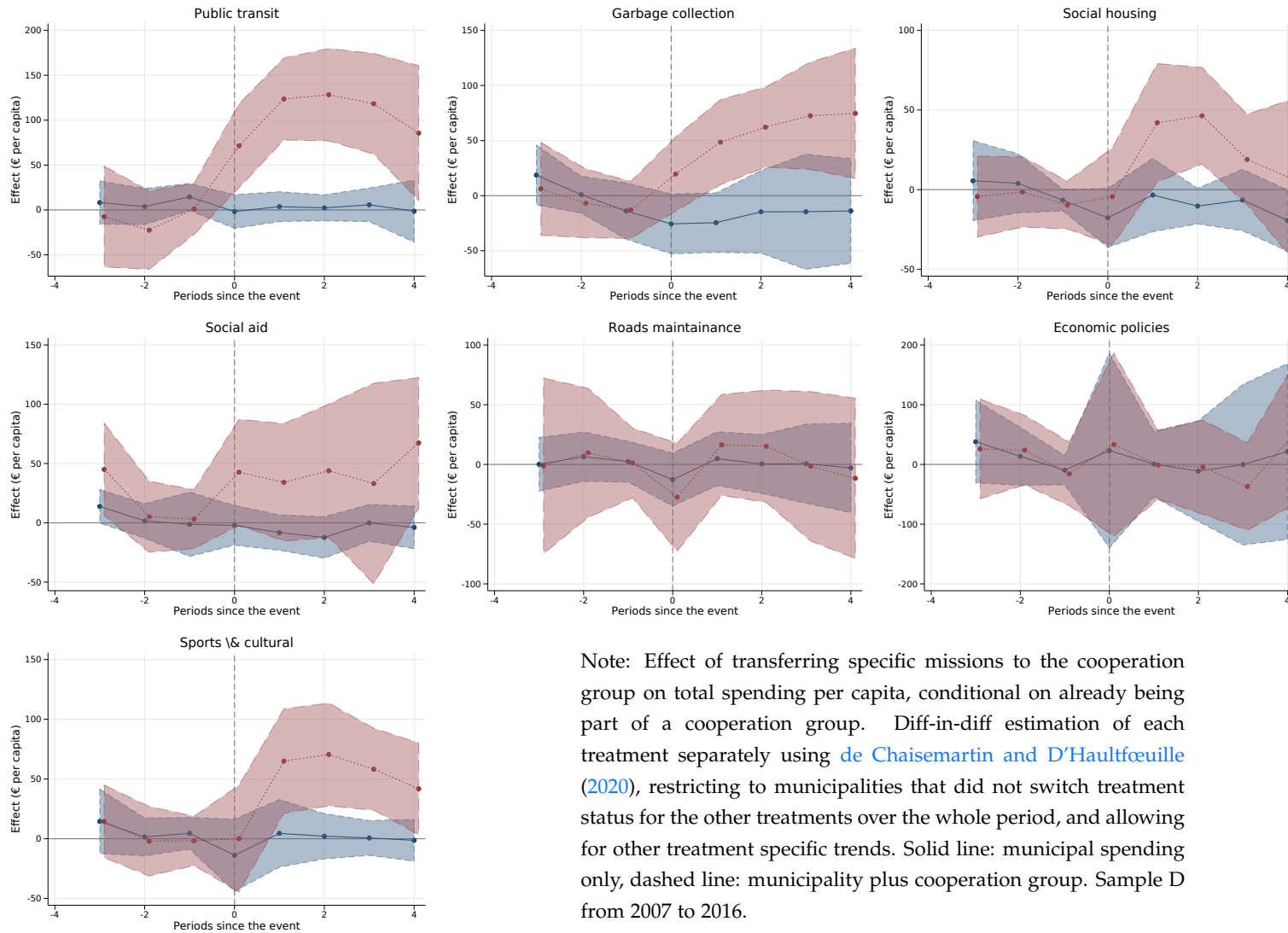
To further investigate the role played by particular public services on total expenditures, we investigate in the next subsection the effect of transferring specific missions to the cooperation group, conditional on already belonging in a group.

4.4 Effect of transferring missions

In this subsection, we examine more closely the spending of local governments when they deepen their cooperation by transferring and additional competence from the municipality to the cooperation group. Because our data on functional accounts is thin and only spans the years 2002 to 2012, while our data on competences starts in 2007, we do not look at the specific impact on spending by function, but focus on total current expenditures instead.

More specifically, we restrict the estimation to municipalities already cooperating in 2007 and estimate the effect of transferring the management of some particular missions to the cooperation group. This way, we are able to estimate the additional

Figure 6: Effect of transferring missions total spending, controlling for other functions



Note: Effect of transferring specific missions to the cooperation group on total spending per capita, conditional on already being part of a cooperation group. Diff-in-diff estimation of each treatment separately using [de Chaisemartin and D'Haultfoeuille \(2020\)](#), restricting to municipalities that did not switch treatment status for the other treatments over the whole period, and allowing for other treatment specific trends. Solid line: municipal spending only, dashed line: municipality plus cooperation group. Sample D from 2007 to 2016.

spending caused by deepening the integration of local public good provision net of the effect of tax competition that happens when municipalities start sharing their tax base with the group. We focus on public transit, garbage collection, social housing, social aids, road maintenance and sports and cultural infrastructures. We chose these competences as they cover the main missions of French municipalities and cooperation groups.

The main problem with estimating the causal effect of each policy separately is that transfers of distinct competences do not happen randomly but are positively correlated: when municipalities choose to deepen their cooperation, they often vote several transfers of competences at the same time. Indeed, in Table 4 we report the results of two way fixed effects regressions of each treatment variable on the other treatments. We see that the coefficients are positive and often significant.

One would therefore like to be able to estimate jointly the effect of each policy, or at least find a method to control for the other treatment variables when estimating the effect of one particular policy. We implement two solutions to try to estimate effects net of the other transfers.

First, we compute diff-in-diff estimates robust to heterogeneous treatment effects using the estimator of [de Chaisemartin and D'Haultfœuille \(2020\)](#), restricting the sample to municipalities that did not change treatment status on the other treatment variables for the estimation period and allowing for different non-parametric trends in each treatment status. Therefore, we measure the effect of transferring one mission amongst municipalities that did not change their transfer status for any other mission during the period. Because a lot of municipalities deepened their cooperation in 2017, the pool of municipalities with constant status until 2018 is tiny. Therefore, we restrict the sample to 2007-2016 and to those municipalities that kept other treatment status constant over this period, so that we do not lose too many observations.

Second, we run a traditional two-way fixed effects regression that includes all the treatments at the same time. Because we already have seven treatment variables we do not try to add dynamic effects to this specification. An additional concern for our estimation would be that transfers coincide with changes in the tax regime of the group, which would create reductions in tax competition that could drive changes in spending. We also report specification where we control for the tax regime of the group.

We report the result of the separate estimates in Figure 8 in appendix, where we run regressions separately for each treatment without trying to control for their correlation.

Table 3: TWFE regressions of total spending on mission transfer indicators

	Municipality plus group		Municipality only	
Public transit	109.3*** (8.746)	108.3*** (8.688)	7.436 (4.027)	7.510 (4.018)
Garbage collection	27.57** (10.08)	27.68** (10.04)	-22.41*** (6.298)	-22.48*** (6.308)
Social housing	12.21 (6.389)	7.587 (6.425)	-7.358* (3.120)	-8.325* (3.315)
Social aid	6.949 (8.686)	7.403 (8.609)	-5.728 (3.446)	-5.608 (3.414)
Roads maintainance	16.83* (8.097)	13.33 (8.019)	1.023 (3.756)	-0.0260 (3.847)
Economic policies	-7.549 (13.18)	-14.13 (13.12)	29.37** (9.478)	24.79* (9.633)
Sports & cultural	13.87 (7.133)	11.52 (7.043)	0.329 (3.897)	-0.168 (3.833)
Observations	364339	364339	364339	364339
Tax regime dummy	No	Yes	No	Yes

Standard errors in parenthesis. Standard errors clustered at the cooperation group level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Estimations on Sample D. All regressions include year and municipal fixed-effects.

All the estimates are significantly positive, except for social aid and economic policies. Interestingly, public transit has the highest positive impact on spending, with point estimates around €100 per capita. Regarding municipal expenditures, they decrease slightly for some policies (garbage collection and roads maintenance), but the point estimates are low (less than €20 per capita) and not significant in the long run, although quite precisely estimated.

Turning to our first control strategy, the effects of public transit, garbage collection and sports and cultural expenses stay positive and significant, while the effect of the remaining competences become less clear. Social housing still has a positive effect one and two years after entry, but it fades away after three years.

Our second control strategy yields very similar results. Public transit is the mission

that yields the highest increase in spending, with an estimated increase of €108 per capita, followed by garbage collection (€28), while social housing, social aid, economic policy and road maintenance all have non-significant effects. Further, these results are robust to controlling for the type of tax regime.

On average, the share of municipalities sharing these missions in sample C (municipalities that cooperated after 2007) is 22.8% for public transit and 93.8% for garbage collection. Assuming that the estimates in sample D generalize to sample C, these three competences alone are therefore responsible for a $0.228 \times 108.3 + 0.938 \times 27.68 = 50.7\text{€}$ increase in total public spending, which corresponds to a quarter of our estimated total effect of cooperation. This seems to indicate that the increased provision of specific public services that municipalities were too small to provide on their own was an important driver of the total increase in public spending. While this does not rule out the reduction in tax competition as a mechanism for the total increase in public spending, it does show that the zoo effect (Oates, 1988) is an important mechanism. Considering for instance public transit, it does not make much sense for a small municipality to develop a network on her own, as this network would only span her own territory and the feasibility of longer trip would depend on the level of provision of nearby municipalities and their will and ability to coordinate. By transferring this service to a higher level of government that covers a larger territory — the cooperation group — municipalities are able to internalize this externality and increase the service. This explanation is consistent with the results of Tricaud (2019) that the probability to be connected to a transport network increased strongly after joining a cooperation group. Similarly for garbage collection, municipalities could for instance switch from a fixed collection point to proper collection services.

5 Concluding remarks

In this paper, we show evidence that inter-municipal cooperation, instead of decreasing total spending through economies of scale, leads to a sizable increase in local public spending. Further, we argue that this increase does not seem to be driven by wage bill expansion.

Moreover, we show it was driven by urban policies and general services. By nature, these functions (public transportation, network maintenance) are prone to generating positive externalities whereby the marginal benefit of these services increases with the level of provision of neighboring municipalities. Exploring the specific effect of

transferring the responsibility of some services to the group, we did not find any significant reduction in spending for any of the services we considered. Instead, we found significant and large positive effects for the transfer of public transportation and garbage collection, which are all services that could have seen an improvement in their quality following an enlargement of their provision zone.

While we can not exclude that scale economies were achieved in the provision of some local public goods by inter-municipal communities, they were clearly dominated by either an increase in public services or reductions in tax competition. Our results add evidence in favor of the second explanation, whereby the provision of new public services for rather small municipalities drove a sizable share of the increase in local public spending following cooperation. To further investigate the existence or not of the economies of scale, at the community's level we plan to complement this study using data on services quantities and use the effect of the French reforms in 2010 and 2015, which mandated mergers between former existing inter-municipal communities if their population was too small, to explore the relationship between group size, spending and cost effectiveness. Moreover, we can also not rule out an increase in the cost of providing some of the services, due to some forms of negative economies of scale, for instance because with small municipalities, the cooperation group is by essence fragmented, which can decrease the cost effectiveness of providing some services [Hortas-Rico and Solé-Ollé \(2010\)](#). A measure of territorial fragmentation should therefore be included in this next step of the analysis.

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A Definitions

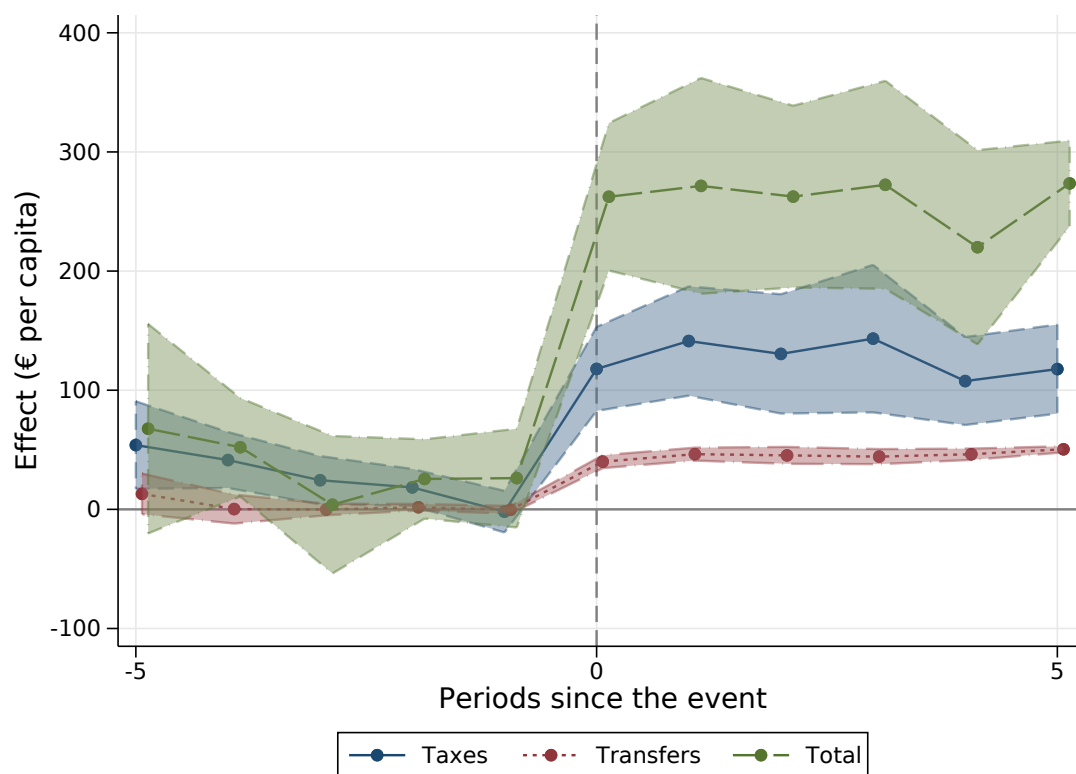
0. General: IT, administrative and support services, cemeteries, and in general all expenses that cannot be filed elsewhere;
1. Security: Police, firefighters and prevention programs;
2. Education: Schools and associated extracurricular activities and services (sports, health, school canteens, accommodations and boarding and school buses);⁷
3. Culture: public libraries, theatres and museums, as well as financial support to cinemas, galleries, festivals, professional artists and amateur clubs;
4. Sports and youth: swimming pools, stadiums and other infrastructures for sports and outdoors activities, as well as youth clubs and day care centers (excluding preschools);
5. Social and health: mainly social policies such as foster cares, relief programs and professional insertion programs, as well as centers and infrastructures for the disabled. This category can also include a small share of health infrastructures such as dispensaries, maternity wards and abortion centres, but public hospitals and emergency rooms are financed by higher levels of government and the public health insurance system;⁸
6. Family: services for senior citizens (from nursing homes to senior citizen's clubs), family discounts of municipal services, and daycare centers and preschools.
7. Housing: aids to social housing organizations and construction companies;
8. Urbanism: tap water and sewage system, garbage collection, cleaning services, public transport, road maintenance, public parks, urban renewal and forestry and river management as well as environmental conservation policies;
9. Economic policies: open markets and business assistance.

⁷It should be noted however that in France, teachers and school employees are paid directly by the ministry of education, and municipalities only manage primary schools. They mainly finance building renovations and extra-curricular activities. Higher levels of education are managed either by the county, the region or the state, although municipalities might co-finance some extra-curricular activities and services.

⁸For instance in 2008 10% of this category came from health services at the municipal level and 3% at the group level, while the remaining were social services (OFGL, 2010).

B Additional results

Figure 7: Effect of cooperation on total revenues.



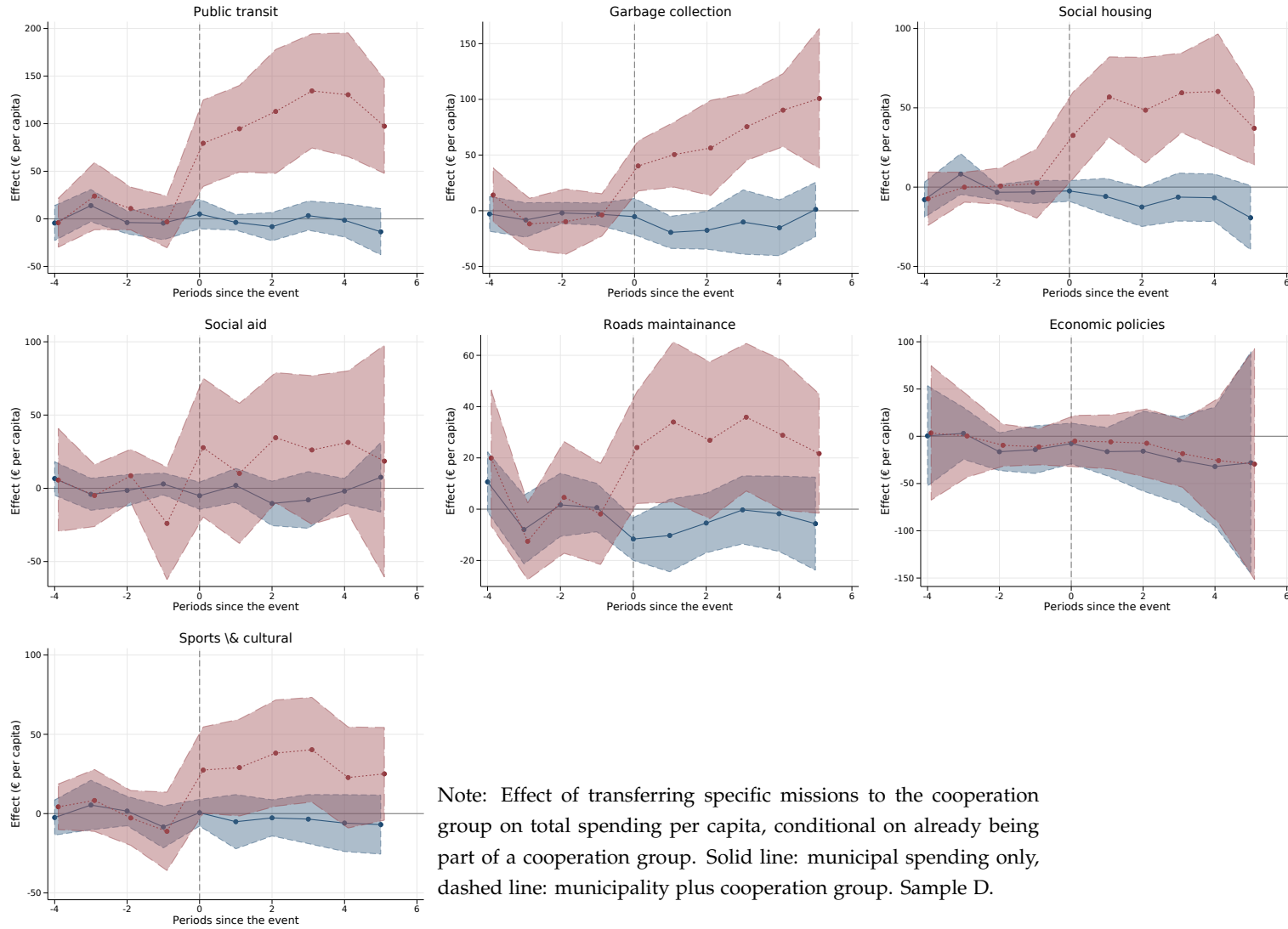
Effect of entering a cooperation group on total (municipality and group) per-capita tax revenues, state transfers and total revenues. Estimations on all municipalities that entered a cooperation group after 2007 (sample B).

Table 4: Correlation between transfer treatment variables

	PT	GC	SH	SA	RM	EP	SC
Public transit	1						
Garbage collection	0.0652***	1					
Social housing	0.314***	0.0780***	1				
Social aid	0.0521***	-0.00281	0.101***	1			
Roads maintainance	0.157***	0.0118***	0.151***	0.0731***	1		
Economic policies	0.0580***	0.0737***	0.149***	0.00952***	0.0893***	1	
Sports & cultural	0.159***	0.103***	0.214***	0.0770***	0.173***	0.146***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 8: Effect of transferring missions total spending.



Note: Effect of transferring specific missions to the cooperation group on total spending per capita, conditional on already being part of a cooperation group. Solid line: municipal spending only, dashed line: municipality plus cooperation group. Sample D.