

Factors Explaining Inter-municipal Cooperation in Service Delivery: A Meta-Regression Analysis

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Abstract

Inter-municipal cooperation is an important public service delivery reform. As with privatization, the drivers of inter-municipal cooperation are aimed at improving efficiency, gaining economies of scale and overcoming fiscal constraints. With the increase in cooperation, we see an increase in studies of the phenomenon and a focus on the role of professional management, challenges of monitoring and transactions costs of cooperation, and differences in take up of the reform across municipality size and geographic location. In this paper we provide a meta-regression analysis based on the existing multivariate empirical literature to explore what factors explain divergence in results in the existing empirical works. We find fiscal constraints, spatial and organizational factors and economies of scale are significant drivers of cooperation. Fiscal constraints lead to more cooperation, as do economies of scale, spatial location in a metropolitan region and presence of a professional manager. Divergence in results across models is explained by sample size, whether small municipalities are included, whether studies are conducted in the US, and whether studies employ logistic regression techniques. Insufficient number and homogeneity of studies prevent meta-regression analysis of politics, racial heterogeneity or transaction costs and these obstacles could be fruitful arenas for future research.

1. Introduction

Collaboration is an important local government reform (Agranoff and McGuire, 2003). Inter-municipal cooperation for service delivery is seen as an alternative to consolidation (Thurmaier and Wood 2004). Instead of focusing on amalgamating or consolidating governments, inter-municipal cooperation facilitates the functional consolidation of individual services across jurisdictions (Holzer and Fry 2011). The potential of sharing services as an alternative metropolitan regional governance reform was envisaged half a century ago by Ostrom, Tiebout and Warren (1961, p. 836), when they suggested that small municipalities could make use of special arrangements to act jointly to provide services when the municipal boundary is suboptimal. This can also help small municipalities confront limited managerial and technical capabilities (Mohr, Deller and Halstead, 2010; Deller and Rudnicki, 1992).

Cooperation can adopt a wide variety of forms (Feiock and Scholz, 2010; Feiock, 2013). The most recent national survey data from the United States shows inter-municipal contracting is now as common as contracting to for profits (Hefetz, Warner and Vigoda-Gadot, 2012). In Europe recent scholarly attention has been focused on inter-municipal cooperation, usually implemented by means of joint governance, as a way to address problems with sub-optimal local government size (Lago-Peñas and Martínez-Vázquez, 2013). This is especially true in continental Europe where there is a long tradition of many small municipalities (Gómez-Reino and Martínez-Vázquez, 2013). In Australia, cooperation and consolidation are both viewed as means to promote a more effective local government organization for the 21st century (Aulich, et al., 2011).

As with privatization, the drivers of inter-municipal cooperation are aimed at improving efficiency and gaining economies of scale, as well as helping to address fiscal constraints. However, motivators extend beyond these factors to include regional coordination and improved effectiveness of service delivery. Holzer and Fry (2011) published a review of the literature exploring a range of issues (economies of scale, motivators, obstacles and impacts). Sharing services also helps small rural and suburban communities confront limited managerial and technical capabilities (Bel et al., 2013; Mohr et al., 2010). Within the broader metropolitan region it also helps to counteract fragmentation and promote service coordination (Joassart-Marcelli and Musso, 2005).

With the increase in inter-municipal contracting, we see an increase in studies of the phenomenon and a focus on the role of professional management, challenges of monitoring and transactions costs of cooperation (Brown and Potoski, 2003; Marvel and Marvel, 2007; Girth et al., 2012; Hefetz and Warner, 2012), and differences in take up of the reform across municipality size and geographic location (Hefetz et al., 2012; Mohr, Deller and Halstead, 2010; Warner, 2006; Joassart-Marcelli and Musso, 2005). Although shared services delivery is a widespread phenomenon, no meta-regression analysis of the literature has been conducted. By contrast, systematic evidence is available on other reforms, such as privatization, where meta-regression analyses have been published on the factors explaining that policy (Bel and Fageda, 2009), and on the relationship between privatization and costs (Bel, Fageda and Warner, 2010).

A large enough number of empirical analyses on the motivations for inter-municipal contracting is now available in the literature.¹ This paper provides an extensive and in-depth analysis of the empirical evidence on the factors explaining inter-municipal contracting. We conduct a meta-regression analysis based on the existing empirical literature to permit a systematic analysis of the

¹ Another interesting strand of this literature is developing, concerning the question with whom governments cooperate (e.g. Andrew, 2009; Berardo and Scholz, 2010; and Shrestha and Feiock, 2013). Although interesting and innovative, it goes beyond the objectives of this paper.

similarities and differences in the results of empirical studies of motivations for inter-local contracting and the implications for public management.

2) Empirical studies on inter-local cooperation: What do they tell us about drivers and obstacles?

We have been able to find 42 articles and working papers including multivariate analysis of factors explaining cooperation, as table 1 shows.² These studies include a total of 126 estimations where the dependent variable is a measure of the frequency of inter-municipal cooperation. Typically, the measure is (1) a dummy variable with one for cooperative delivery and 0 otherwise in single service studies; and (2) a percentage of the services each jurisdiction provides via cooperative delivery for multiservice studies. Interestingly, most works (35) study the US, either the whole country or one/several states. Seven works study countries other than the US.³

Next we provide a review of the most relevant results obtained regarding the most frequently used variables in these studies. We order our review based on the (decreasing) numbers of estimations that considered each type of variable.

Fiscal Constraints have been an important driver of local government reforms in the last decades, particularly as local government fiscal stress has grown in the 2000s (Hoene, 2004). Consistent with suggestions in Tiebout (1956) regarding taxpayers' reaction to increasing local tax burdens, fiscal constraints can trigger different types of government reform. Whereas privatization was seen as the primary reaction to these restrictions, cooperation is also a tool to create cost savings. Fiscal constraints have been operationalized by means of different variables, among which the most frequent are debt per capita, own revenues per capita, laws limiting debt, etc. Table 2 shows that three-quarters of the estimations in our data base included variables related to fiscal constraints. Among these, almost half the estimations in our data base have shown fiscal constraints to have a significant effect on cooperation.⁴ As expected, most of them find a positive effect of fiscal constraints. Results showing the opposite (a negative influence of fiscal constraints on cooperation) are relatively rare, less than half the number showing positive influence. Non-significant results are obtained in half the estimations.

² Bickers, Post and Stein (2009) conduct a multivariate analysis on drivers of cooperation that include (among others) population as independent variable. However, the information on the model they estimate is not detailed and precise enough for us to be able to include it in the meta-regression analysis. Yu-Chen and Kurt Thurmaier (2009) analyze impetus and motivation for inter-local collaboration, but their analysis is not homogeneous with the empirical literature we review. Feiock, Steinacker and Park (2009), Hawkins (2010) and Hawkins and Feiock (2011) conduct multivariate analysis to analyze factors driving joint ventures for economic development policy. This type of policy is focused on planning and is not directly comparable to local service delivery, which is the focus of our analysis.

³ Three additional works discuss inter-municipal cooperation among other types of service delivery but do not single it out in their empirical exercises or do not provide useful evidence for our analysis: Dijkgraaf, Gradus and Melemborg (2003) and Wassenaar, Groot and Gradus (2013) for the Netherlands, and Rodrigues Tavares and Araujo (2012) for Portugal. For Romania, Stănu (2011) conducts an empirical estimation for institutionalization of inter-municipal cooperation as opposed to keeping it informal, based on institutional characteristics. There are many interesting studies about the motivations for inter-municipal cooperation that do not employ multivariate empirical analysis. These include articles on Canada (Bish and Clemens, 2008; Sancton, 2005), Europe (Hulst and van Monfort, 2007; Swianiewicz, 2011) and Australia (Dollery, Akimov and Byrnes, 2009).

⁴ We take significance as evaluated by the authors in each work.

Table 1. Main characteristics of multivariate studies on drivers of inter-municipal cooperation in service delivery

Authors	Number of Estimations	of year sample	Sample	Country	service	Method	Size
Morgan et al (1988)	1	1982	56	USA	multi	OLS	>25000
Campbell & Glynn (1990)	2	1984	158	USA – GA	multi	OLS	counties
Ferris & Graddy (1991)	2	1982	309	USA	multi	Logistic	>25000
Morgan & Hirlinger (1991)	7	1983	615	USA	multi	OLS	>25000
Ferris & Graddy (1994)	1	1982	350	USA	multi	Logistic	>25000
Warner & Hefetz (2002)	6	1992-97	303-1056	USA	multi	Logistic	>2500
Brown & Potoski (2003)	4	1997	48538	USA	multi	Logistic	>2500
Joassart & Musso (2005)	1	1982-90-97	1333	USA – CA	multi	Logistic	All
Krueger & McGuire (2005)	4	1997	2825	USA	multi	Logistic	>2000
Shrestha (2005)	4	1990-99	4100	USA	multi	OLS	>400000
Tiller & Jakus (2005)	3	1993	95	USA – TN	landfills	Logistic	counties
Rodríguez & Tuirán (2006)	4	2002	2425	México	multi	Logistic	All
Warner (2006)	3	1992-97-2002	1031 to 1414	USA	multi	Logistic	>2500
Wood (2006)	1	2003	46	USA – KS, MO	multi	OLS	>2500
Leroux & Carr (2007)	10	2005	314 to 316	USA – MI	multi	Logistic	All
Tavares & Camões (2007)	4	2006	719	Portugal	multi	Logistic/Poisson	All
Brown et al (2008)	2	1997	18510	USA	multi	Logistic	>2500
Lamothe et al (2008)	2	2002	9037	USA	multi	Logistic	>2500
Bae (2009)	2	2002	2011	USA-GA	multi	Logistic	All
Carr et al (2009)	1	2005	3675	USA – MI	multi	Logistic	>10000
Girard et al (2009)	1	2004	1422	USA – NH	multi	Logistic	All
Jung & Kim (2009)	6	2002	238 to 3033	USA	Multi	OLS	> 2500
Sundell et al (2009)	5	2008	289	Sweden	Multi	OLS	All
Zullo (2009)	4	2002	1530-2183	USA	Multi	OLS	Counties
Krueger & Bernick (2010)	2	1997	3664	USA	Multi	Logistic	>2500
Kwon & Feiock (2010)	2	2003	1072	USA	Multi	Logistic	>10000
Leroux et al (2010)	1	2004	919	USA	Multi	Logistic	>50000
Levin & Tadelis (2010)	5	1997-2002	18588 to 19244	USA	Multi	Logistic	>1115
Mohr et al (2010)	1	1995-97-2004	36605	USA –IL,NH,WI	Multi	Logistic	All
Krueger et al (2011)	2	1997	25429	USA	Multi	Logistic	>2500
Leroux & Pandey (2011)	1	2004	117	USA	Multi	OLS	>50000
Mazzalay (2011)	4	2007-08-09	380 to 552	Argentina-CO	Multi	QAP	All
Shrestha & Feiock (2011)	2	2002	1216 to 1305	USA – GA	Multi	Logistic	>2500
Hefetz & Warner (2012)	4	2007	898 to 4745	USA	Multi	Logistic	>2500
Hefetz et al (2012)	4	1992-97, 2002-07	1304 to 1418	USA	Multi	Logistic	>2500
Hefetz et al (2012WP-A)	2	2007	1432	USA	Multi	Logistic	>2500
Hefetz et al (2012WP-B)	2	2007	570-904	USA	Multi	Logistic	>2500
Reinagel & Strichth (2012WP)	2	2010	471	USA	Multi	Logistic	All
Bel et al (2013)	1	2008	92	Spain – AR	solid waste	Logistic	All
Jung & Jeong (2013)	2	1990-95-2000	22935	USA	Multi	Logistic	> 20000

de Mello & Lago (2013)	8	2009	393 to 3757	Brazil & Spain	Multi	Logistic	>5000
Bel et al (forthcoming)	1	2008	80	Spain – AR	solid waste	Logistic	All

Note: Number of observations obtained from the corresponding study. QAP: Quadratic Assignment Procedure.
Source: Authors' elaboration

Table 2. Synthesis of descriptive results for the main explanatory variables in studies of inter-municipal cooperation in service delivery

Fiscal constraints			Community Wealth		
Positive	29	31.5%	Positive	16	20.8%
Negative	16	17.4%	Negative	11	14.3%
Non-significant	47	51.1%	Non-significant	50	64.9%
Total	92	100.0%	Total	77	100.0%
Economies of Scale (population)			Spatial Effects		
Positive	17	20.5%	Positive	33	55.9%
Negative	34	41.0%	Negative	4	6.8%
Non-significant	32	38.5%	Non-significant	22	37.3%
Total	83	100.0%	Total	59	100.0%
Organizational Factors (Manager)			Racial homogeneity		
Positive	27	44.3%	Positive	4	11.1%
Negative	6	9.8%	Negative	7	19.4%
Non-significant	28	45.9%	Non-significant	25	69.4%
Total	61	100.0%	Total	36	100.0%
Transaction Costs			Politics		
Positive	12	40.0%	Only 11 papers		
Negative	6	20.0%			
Non-significant	12	40.0%			
Total	30	100.0%			

Note: Community wealth is considered to be a driver of cooperation when per capita income has a negative and significant relationship with cooperation. Spatial effects measures geographic proximity as in city/suburb and is a driver of cooperation when it has a positive and significant relationship with cooperation. Economies of scale is considered to be a driver of cooperation when population has a negative and significant relationship with cooperation.
Source: Authors' elaboration.

Community Wealth: Governments generally cooperate when it is in their self-interest, and may tend to exclude governments with higher costs or lower fiscal capabilities from cooperative agreements (Lowery 2000). Because of this, wealthy communities may engage less frequently in cooperation (Warner and Hefetz, 2002; Hefetz, Warner and Vigoda-Gadot, 2012a). However, wealthy communities can also be desired partners for cooperative agreements, because of their ability to contribute to the funding of the service (Kown and Feiock, 2010). This would work in the opposite direction, and make wealthy communities more prone to collaborative arrangements. This

diversity in theoretical expectations regarding community wealth is well reflected in the results obtained in the empirical studies. Almost two thirds of the available estimations have considered community wealth as an explanatory variable for cooperation, usually specified as income per capita. No significant relationship has been found in two thirds of the estimations. Much less frequent are estimations with significant results for community wealth, and they are almost evenly split between positive effect (21%) and negative effect (14%). Therefore, theoretical expectations on community wealth are divergent, and empirical results so far do not help to solve the question.

Scale Economies: Based on theory and insights in a set of seminal papers by Hirsch (1959), Oates (1972), Mirrlees (1972) and Dixit (1973), optimal size for service provision has formed an essential part of the analysis of local government services. Volume of service, size of population, and dispersion of population are the three dimensions on which the optimal geographic scale depends (Deller 1992, Ladd 1992). Much empirical attention has been given to economies of scale. Sonenblum, Kirlin and Reis (1977) focus on scale issues and extra-local spillovers in service delivery arrangements. Stein (1991) conducted a thorough analysis of the first ICMA survey (1982) and argued that service characteristics would be the most important driver of contractor choice. Among these dimensions, size of population is the variable most frequently used in empirical works analyzing factors explaining cooperation. This is explained by the fact that data on population is more readily available than data on volume of output when a single service is analyzed, and because population is the best indicator of volume of output when the analysis is of multi-service character. Most studies expect cooperation to be negatively related to population (i.e. Warner and Hefetz, 2002; Levin and Tadelis, 2010; Bel, Fageda and Mur, forthcoming). Almost two thirds of the estimations in our sample use number of inhabitants as an explanatory variable for cooperation, and the most frequent result is that population has a negative and significant association with cooperation. Thus, frequency of cooperation decreases as population increases, as expected from theoretical views on economies of scale.

Spatial Factors: Inter-local cooperation frequently involves geographic proximity of the cooperating municipalities. In this regard, cities and suburbs in metropolitan regions represent a market of similar size municipalities in close proximity. Thus, cooperation affords cities and suburbs the opportunity to exploit economies of scale or increase quality of the services (Morgan and Hirlinger 1991, Warner and Hefetz 2002). Almost 60% of the estimations in the database included variables related to cities and suburbs as drivers of cooperation, as shown in table 2. Among these estimations, more than half have found the variable to be significant. A vast majority of significant results are positive: More than half of total estimations consider the variable, and 90% of those found the variable to be significant. Therefore, the results are largely consistent with theoretical expectations.

Organizational Factors (Manager): The council-manager form of city government is understood as less subject to political interference than the mayor-city model, and thus may serve as a driver for service delivery reform. There is a consistent theoretical expectation that manager-cities will engage more frequently in collaborative arrangements (Brown and Potoski, 2003, Hefetz, Warner and Vigoda-Gadot, 2012b). Almost half the available estimations analyze the relationship between council-manager form of government and frequency of collaborative agreements. More than half of the estimations find the manager variable to be significantly related to cooperation, and among these estimations where manager is significant, 80% find a positive association between manager and cooperation, consistent with theoretical expectations.

Racial homogeneity/heterogeneity: Heterogeneity undermines local cooperation because it imposes higher transaction costs (Feiock, 2007). Racial homogeneity/heterogeneity have been seen since the 1990s as potential drivers of transaction costs involved in the governance of the cooperation (Leroux and Carr, 2007; Kown and Feiock, 2010). However, less than one third of the available

estimations (33) and little more than one quarter of the studies (12) have included specifications of racial homogeneity/heterogeneity. Two thirds of the estimations find racial homogeneity/heterogeneity non-significant, and twice as many find a negative effect of homogeneity (8) as find a positive association (4). Several factors can explain these results. First, two of these works (Morgan, Hirlinger and England, 1988; Morgan and Hirlinger, 1991, together include eight estimations) specify the variable as a proxy for private interests and political factors (rather than transaction costs related factors). Therefore, there is divergence in what the variable measures. Second, and more important, it could well be that the theoretical foundation for the relationship between racial homogeneity/heterogeneity and cooperation (governance transaction costs) is weak, and that the relationship is not relevant.

Transaction costs: Much more relevant appear to be transaction costs derived from the characteristics of the service (as different from those transaction costs derived from governance structures and arrangements). Transaction costs have been applied widely in the analysis of cooperation (Brown and Potoski, 2003; Lamothe, Lamothe and Feiock, 2008; Carr, Leroux and Shrestha, 2009; Levin and Tadelis, 2010; Shrestha and Feiock, 2011; and Hefetz and Warner, 2012). Because cooperating governments share similar objectives, inter-local cooperation may be subject to lower transaction costs than privatization (Brown, 2008). Empirical research has shown that inter-municipal cooperation is preferred to for profit contracting when services have higher transactions costs due to asset specificity and lack of competition (Girth et al., 2012; Hefetz and Warner, 2012; Levin and Tadelis, 2010). In spite of the important theoretical and conceptual work available on transaction costs, the empirical evidence is still quantitatively limited. Only 32 estimations have included variables reflecting Transaction Costs. However, among these estimations 40% find a positive and significant relationship (more service related-transaction costs are associated with more cooperation) and only six find a negative relationship. Overall, and consistent with theoretical expectations, cooperation is typically found to be higher when services are more asset specific⁵ and other factors related to transaction costs are present (Brown, Potoski and van Slyke, 2008; Lamothe Lamothe and Feiock, 2008; Levin and Tadelis, 2010; Hefetz and Warner, 2012).

Finally, we note that ‘political factors’, another type of variable usually considered in the empirical analysis of local government reform, is seldom used in empirical analysis on drivers of cooperation. Only eleven papers –and 28 estimations- consider variables reflecting political factors, and the estimations are divided between those that consider political orientation of elected politicians, and others that consider the type of election (i.e. election at large). The diversity in the way the political variables are specified is very wide. Therefore, we cannot specify expectations about the influence of political factors on cooperation.

3. Empirical strategy: data and methods.

Our database is formed by the 42 works we were able to identify that conduct multivariate studies of factors explaining inter-municipal cooperation in service delivery and provide enough information to be included in the meta-regression. These papers are described in table 1 above. These works include a total of 126 estimations. We gathered papers published in the fields of Economics, Public Policy, Public Administration, Political Science, Urban Studies, and Area Studies. We also included unpublished papers presented in international meetings specializing in public policy, and/or available in large working paper collections, such as Econlit, Social Science Research Network, Proquest, and Repec-Ideas. The data base was built by the authors.

⁵ When an estimation has divergent results for different variables approaching transaction costs (usually: asset specificity, ease of measurement, and difficulty of contract management) we give prevalence to asset specificity, because it is the most solidly established factor in economic and public policy theories.

There are different reasons why analyses that focus on a single topic have a large variation of empirical results. Among these, Stanley and Jarrell (1989) emphasize three types of categories for these reasons: (1) uniqueness of the data sets used in each particular study; (2) biases induced by model misspecification, and (3) distinctive statistical methods. We use meta-regression analysis to analyze the pattern and diversity of findings in the empirical studies. In this way, we are able to appraise if significant relationships in works that study drivers and obstacles of inter-municipal cooperation depend heavily on the individual characteristics of each study. Meta-regression analysis has been used frequently in economic and public policy research (Connor and Bolotova, 2006), after it was introduced in the late 1980s. Recently it has been used to analyze variability of empirical results in the field of public local services and local government (i.e. Bel and Fageda, 2009; Bel, Fageda and Warner, 2010; Carvalho, Marques and Berg, 2012). We are not aware of any meta-regression analysis published to explain the differences between empirical results in studies on drivers and obstacles of inter-municipal cooperation, thus our research contributes to filling this gap.

The most frequently applied empirical strategy in meta-regression analysis is that suggested by Stanley and Jarrell (1989),

$$b_j = \beta + \sum \alpha_k Z_{jk} + e_j \quad j = 1, 2, \dots, L \quad (1)$$

where b_j is the reported estimate of β of the j th study, β is the true value of the parameter of interest, Z_{jk} are the meta-independent variables that measure relevant characteristics of an empirical study, and α_k are the coefficients associated with those independent variables.

The initial empirical strategy for implementing the meta-regression is to use the coefficients or t -statistic values estimated in each study as a dependent variable in the meta-regression. The works on factors explaining inter-municipal cooperation have used a wide variety of variables to test the relationship between cooperation and economic and organizational factors. Thus the number of homogeneous t -statistics that we have been able to identify is every limited. Our objective is to analyze whether the relationships we are interested in are significant. To do so, we follow the strategy applied by Garcia-Quevedo (2004) and by Bel and Fageda (2009).⁶

We construct a set of dependent variables as dummy variables that take a value of one if a study finds a significant relationship between inter-municipal contracting and the corresponding set of explanatory variables: fiscal, economic, organizational, and spatial. Table 3 displays the set of dependent variables, and the set of independent variables (moderator variables) that concern particular characteristics of the empirical studies. Note that we do not include specific regressions for racial homogeneity and transaction costs, because the small number of available estimations does not allow us to conduct a sensible estimation.⁷

We specify the dependent variables as follows:

Fiscal constraints: We find a significant influence of fiscal constraints on inter-municipal cooperation when variable(s) that capture this effect has(ve) a positive influence on cooperation. The variables most commonly used are debt burden, tax burden, own fiscal revenues, and supra-local regulation limiting local taxation and debt.

⁶ Other meta-regressions analyses of special interest within the economic and public policy literature have been applied to the effect of immigration on wages (Longhi et al., 2005), the effects of common currency on international trade (Rose and Stanley, 2005), and environmental inequities (Ringquist, 2005).

⁷ In fact, neither the estimation nor the single variables were significant for these two factors. The results can be reported upon request. Recall that we could not even run regressions for politics because we did not have enough observations.

Community wealth: We find a significant influence of community wealth on inter-municipal cooperation when the variable that captures its effect has a negative influence on cooperation. The variable is usually specified as income per capita.

Economies of scale: We find a significant influence of economies of scale on inter-municipal contracting when the variable that captures this effect has a negative influence on cooperation. By far, the variable most commonly used is population size.

Spatial factors: We find a significant influence of spatial factors on inter-municipal cooperation when the variable that captures this effect has a positive influence on cooperation. The variable most commonly used is city in a metropolitan area or suburb.

Organizational factors: We find a significant influence of manager-type of government on inter-municipal cooperation when the variable that captures this effect has a positive influence on cooperation. The variable most commonly used is council-manager form of local government.

The independent variables used are those common in meta-regression analysis, reflecting particular characteristics of the studies: year of data collection, number of observations, geographical area and method of estimation. These variables reflect the type of categories used to explain variations, such as the uniqueness of the data sets, or distinctive statistical methods. Furthermore, area and time differences may reflect institutional contexts or learning over time. As in Bel and Fageda (2009), we include two additional characteristics of the studies: whether the studies are single-service or multi-service, and whether small municipalities are included in the sample or not.

Table 3. Variables used in the meta-regression analysis

Dependent variable	Description	Number observations
Fiscal constraints (FC)	Dummy variable that takes value one if a study finds a significant (positive) relationship between variables for fiscal constraints and cooperation	92
Community wealth (CW)	Dummy variable that takes value zero if a study finds a significant (negative) relationship between variables for wealth and cooperation, and a value of one otherwise	77
Scale economies (SE)	Dummy variable that takes value zero if a study finds a significant (negative) relationship between variables for population and cooperation, and a value of one otherwise	83
Spatial Factors (SF)	Dummy variable that takes value one if a study finds a significant (positive) relationship between city in metropolitan area or suburb and cooperation	59
Organizational Factors (OF)	Dummy variable that takes value one if a study finds a significant (positive) relationship between manager-type government and cooperation	61
Independent (Moderator) variables	Description	Number of observations
<i>Year</i>	Year of collection of data for dependent variables	126
<i>Sample</i>	Number of municipalities included in the considered sample	126
<i>Continent</i>	Dummy variable that takes value one when studies refer to US, and value zero when they refer to other countries	126
<i>Service</i>	Dummy variable that takes value one when multiple services are considered, and value zero when just one sector is considered	126
<i>Method</i>	Dummy variable that takes value one when a discrete choice method is used, and value zero when Ordinary Least Squares is used	126
<i>PopSize</i>	Dummy variable that takes value one when the considered sample includes municipalities with a population lower than 5,000 inhabitants	126

Note: Difference between number of observations of dependent and independent variables is due to the fact that the variables we take as dependent are not always present in all studies and estimations.

4. Results

We regress the dependent variables against the independent (moderator) variables by means of probit estimation. We estimate the following set of relationships:

$$COOPERATION = F(FC, SE, CW, OF, SF), \quad (2)$$

$$Fiscal\ constraints = F(Year, sample, continent, multi-service, method, method, popsize), \quad (3)$$

$$Community\ Wealth = F(Year, sample, continent, multi-service, method, method, popsize), \quad (4)$$

$$Economies\ of\ Scale = F(Year, sample, continent, multi-service, method, method, popsize), \quad (5)$$

$$Spatial\ Factors = F(Year, sample, continent, multi-service, method, method, popsize), \quad (6)$$

$$Organizational\ Factors = F(Year, sample, continent, multi-service, method, method, popsize), \quad (7)$$

Results from the five meta-regressions are provided in table 4. Recall that each observation is a study analyzing factors explaining inter-municipal contracting. The dependent variables are dummy variables that take a value of one when a study finds a significant relationship between inter-municipal contracting and that variable (except for community wealth and economies of scale which are coded 0= negative relationship). Positive coefficients of the moderator variables indicate that studies with that characteristic tend to provide a significant relationship between the corresponding dependent variable and inter-municipal contracting. A negative sign implies that the associated characteristic of the study tends to return a negative relationship between the two, and finally, a non-significant coefficient implies that the characteristic of the study does not influence the relationship.

The hypothesis that fiscal constraints would trigger more cooperation is well established in the literature. Results show that more recent studies (year) are less likely to find an effect of fiscal constraints. Also, studies with large samples and those done for the US are less likely to find fiscal constraints. Thus more recent studies, those with larger samples, and those made for the US are less likely to find fiscal constraints as a positive driver of cooperation.

By contrast, studies that include smaller places (< 5000 population) in the sample are more likely to find a positive effect of fiscal constraints, as small places are more likely to benefit from cooperation. The same is true of multi-service studies, as cooperation in these studies is measured on an organization-wide level, not just in a single service, so the potential for fiscal impact is greater. Furthermore, studies using logistic regression also tend to find a significant positive influence of fiscal constraints. Recall that logistic regression models are more robust than OLS when the dependent variable is bounded between 0 and 1.⁸

The surprising result in the fiscal constraint model is the lower likelihood of finding fiscal constraints as a driver in the US models. Prior meta-regression analysis on local government privatization found US studies were more likely to find fiscal constraints as a driver (Bel and Fageda 2009). What explains the divergent results between privatization and cooperation as regards fiscal constraints? Local government fragmentation in the US is high and the motivations for cooperation extend beyond fiscal constraints to concerns regarding service coordination across the region and

⁸ Because the dependent variable has values bounded between 0 and 1, the error term in the general linear regression estimate is not homoscedastic. Therefore, the coefficients obtained with ordinary least squares estimation are less robust than with logistic estimation (McGuire, Ohsfeldt and van Cott, 1987).

service quality improvements (Holzer and Fry 2011). While privatization is driven heavily by cost and fiscal constraints, cooperation is used for a broader range of purposes in the US, namely service quality and service coordination, but these variables are not captured well in the regression model literature. Our regressions cannot capture other motivators (as shown in our other models) because our N gets too small. Furthermore, in Europe, small places often receive more service for the same price under cooperative agreements. A primary type of cooperation outside the US is joint governance of services, but US studies primarily measure inter-local contracting. This type of contracting is much less prone to cross subsidies among the partner municipalities.

Table 4 Meta-regression estimates

Moderator variables	Dependent variable		
	Fiscal constraints	Community Wealth	Economies of Scale
<i>Year</i>	-0.10 (0.04)***	-0.00 (0.03)	-0.03 (0.03)
<i>Sample</i>	-2.7E-05 (1.6E-05)*	+4.3E-05 (2.5E-05)*	+2.4E-05 (1.3E-05)*
<i>Continent (US=1)</i>	-1.30 (0.41)***	-0.62 (0.64)	+1.39 (0.67)**
<i>Service (multi=1)</i>	+0.34 (0.33)	0.38 (0.37)	-1.33 (0.43)***
<i>Method</i>	+0.89 (0.40) **	-0.82 (0.57)	-1.03(0.49)**
<i>PopSize (small inc. =1)</i>	+1.31 (0.77) *	0.17 (0.57)	+0.34 (0.43)
<i>Intercept</i>	+204.31 (74.65)***	-4.03 (66.88)	-64.53 (51.02)
Pseudo R ²	0.185	0.082	0.144
χ^2 (joint sig.)	16.71**	9.54	15.59**
Log pseudolikelihood	-46.06	-29.00	-48.06
N	92	77	83

	Spatial Factors (city+suburb)	Organizational Factors (Manager)	Factors
<i>Year</i>	-0.02 (0.03)	-0.03 (0.03)	
<i>Sample</i>	-9.0E-06(1.4E-05)	-9.5E-0.6 (1.3E-05)	
<i>Continent</i>	-0.55 (0.70)	&	
<i>Service</i>	-1.04 (0.81)	-0.62 (0.89)	
<i>Method</i>	-0.25 (0.43)	+0.52 (0.45)	
<i>PopSize</i>	+0.32 (0.52)	+1.09 (0.45)**	
<i>Intercept</i>	-29.86 (54.36)	+64.72 (59.37)	
Pseudo R ²	0.062	0.080	
χ^2 (joint sig.)	4.97	7.55	
Log pseudolikelihood	-37.96	-38.52	
N	59	61	

Note 1: Standard errors in parentheses (robust to heteroskedasticity)

Note 2: &: Omitted because of collinearity.

Note 3: Significance at the 1% (***), 5% (**), 10% (*)

Turning now to community wealth, the meta-regression had only one significant moderator variable, which is sample size. The larger the sample the less likely to find a negative relationship between community wealth and cooperation. Recall that the majority of studies found no effect and those that did were almost evenly split between positive and negative effect. Although community wealth has been described in the literature as an important factor, our meta-regression provides limited insights into why we find such divergent results across studies, and a large majority of non significant results overall. Indeed, it might well be that community wealth by itself is not a relevant driver of cooperation.

Regarding economies of scale, the main operational expectation is that as population increases, cooperation would decrease. Recall that economies of scale exist when population has a

negative and significant relationship with cooperation. We expected that studies containing more small places (<5000) would be more likely to find a scale effect. However, that moderator variable was not significant, so it does not influence the regression results on scale. However, studies with large samples and studies for the US are less likely to find effects of economies of scale, than studies in regions other than the US. By contrast, multiservice studies are more likely to find scale economies as a significant driver. Studies using logistic regression methods are also more likely to find scale economies. This is important because logistic regression models are more robust than OLS when the dependent variable is bounded between 0 and 1.

Regarding our meta-regression on spatial effects, we found no significant moderator variables and the equation itself did a poor job of explaining differences in results across studies. This result is interesting. A majority of estimations show that cities in metropolitan areas have higher rates of cooperation, and only a small minority of studies find cities with lower levels of cooperation. These results are not driven by any moderator variable. Therefore, theoretical expectations are met by empirical results, and this is not explained by the intrinsic characteristics of the estimations. This allows us to confidently say that city status in a metropolitan region, where proximity helps create a market for cooperation, is a relevant driver of inter-municipal cooperation.

The meta-regression on organizational factors (manager-type government) dropped the continent moderator variable as all the studies measuring this effect are in the US. One variable shows a positive relationship with manager influence: population size. Thus, studies that include smaller places (<5000 population) were more likely to find a positive manager effect, suggesting the greater importance of professional management in promoting cooperation among smaller governments.

Results of the meta-regression tests

Publication bias is an important limitation of meta-regression analysis (Stanley 2001, 2005b). We deal with issue following methodological guidelines pointed out in Bel, Fageda and Warner (2010). When the estimations find significant relations between variables of interest, papers are more likely to be published. Publication bias in meta-regression may be examined by means of funnel asymmetry tests -FAT- (Stanley, 2005b, 2008). FAT tests are based on the estimation of the reported effect of a study and its standard errors. Therefore, we estimate the following equation: $T_i = \beta_0 + \beta_1(1/SE_i) + \varepsilon_i$, where the dependent variable $-T-$ is a study's reported t -statistic and the explanatory variable $-1/SE-$ is the inverse of the standard error. The intercept's statistical significance, β_0 , is a test for publication bias and its sign indicates the direction of this bias (Stanley, 2005, 2008). Evidence of publication bias will be found when β_0 is different from 0. Furthermore, the statistical significance of β_1 provides an estimate of the genuine empirical effect.

Because the independent variable $1/SE$ might have some measurement errors that influence the econometric estimates, the square root of the sample size $-\sqrt{\text{sample size}}-$ can be used as an instrument for the standard error. We estimate the following equation $T_i = \beta_0 + \beta_1(1/\sqrt{t_i}) + \varepsilon_i$. As in the former case, the test using $1/SE$ as the independent variable, evidence of publication bias will be found when β_0 is different from 0, and the statistical significance of β_1 provides an estimate of the genuine empirical effect.

There is another way to identify a genuine empirical effect: the relationship between a study's t -statistic and its degrees of freedom (df) using the logarithmic form can serve as a meta-significance test (MST). We estimate the following equation $\text{Log} | T_i | = \beta_0 + \beta_1 \log(\text{df}) + \varepsilon_i$. If there is an overall genuine empirical effect, the magnitude of the t -statistic will vary systematically with the degrees of freedom. Therefore, if β_0 is equal to 0 and β_1 differs from zero the magnitude of the t -statistic will vary with its degrees of freedom, and this would provide evidence of a systematic effect.

The studies included in our meta-regression analyses use different variables to test the relationship between cooperation and each set of factors. Because of this, we can implement our tests for publication bias only for the most common variables for each group of hypotheses, which reduces the samples available for the publication bias test.⁹ Furthermore, some studies report the coefficient and statistical significance, but not standard errors or t -statistics, so we can not include these studies in the tests. All this forces us to be cautious when interpreting results of the FAT, because of the low number of observations that can be used.

Table 5 shows results of the funnel asymmetry tests for each of the four sets of hypotheses. With respect to publication bias, FAT (1) and FAT (2) show that we find evidence of publication bias for fiscal constraints and spatial factors, because in both cases the intercept significantly differs from zero, and this happens for both the estimations using $1/SE$ and $\sqrt{\text{sample size}}$. If there is publication bias, the direction is positive, which means that the studies are obtaining overly large effect of fiscal constraints and of city in metropolitan areas. We find very weak evidence of publication bias in relation to community wealth and organizational factors. However, in the case of community wealth the intercept is significant only for the estimation with $1/SE$ and the significance is low. Likewise, in the case of organizational factors, the intercept is significant only for the estimation with $\sqrt{\text{sample size}}$, and the significance is low. Therefore, we do not believe publication bias is an important problem for community wealth and organization factors.

Furthermore, we find some evidence of genuine empirical effects for the estimations of economies of scale and organizational factors. But this evidence is weak because we only find it in the estimation with $1/SE$, but we do not find it in the estimation with $\sqrt{\text{sample size}}$. Moreover, MST estimations for these two variables do not find genuine empirical effects, given that in both cases the intercept is significant, but variable $\log(\text{df})$ is not.

Publication bias may be filtered by means of estimating a multivariate FAT meta-regression model (Stanley 2005). This will imply re-estimating equations for fiscal constraints (equation 3) and for spatial factors (equation 6), including alternatively $1/SE$ and $\sqrt{\text{sample size}}$, and excluding sample size. Table 6 shows the results for these multivariate FAT meta-regressions. Our previous results with respect to moderator variables in equation for spatial factors (6) are confirmed, because the sign and explanatory significance of each independent variable do not change. With respect to the equation for Fiscal constraints (3), the estimation including $1/SE$ shows a few changes: *Year* loses significance, and *popsize* changes sign. However, when we include $\sqrt{\text{sample}}$ instead of $1/SE$, the results for signs and significance are coincident with those obtained above for equation (3), with the only exception of changing sign for year. All in all, if we take into account that variables $1/SE$ might have measurement errors, and that the estimation with $\sqrt{\text{sample size}}$ has a much larger sample, we can conclude that publication bias does not provoke significant problems, either for spatial factors or fiscal constraints. Thus the results from our original equations are robust.

⁹ Our tests are based on the most commonly used variables. With respect to the relationship between cooperation and fiscal constraints, we conduct estimates for the dummy variable when it was measured as limits imposed on local taxation, local debt and debt burden. Fiscal constraints is the case where the largest number of observations are lost, because of the wide diversity in the way fiscal constraints were measured in the studies. In the case of the community wealth hypothesis, we conduct the test for studies that measured wealth as per capita income. For the economies of scale hypothesis, we conduct the test for the population variable. For the spatial factors test we used the variable ‘city in metropolitan area’. Finally, in the case of the organizational factors hypothesis, we conduct the test for the council-manager variable.

Table 5 Meta-regression tests (OLS)

FISCAL CONSTRAINTS	FAT (1)	FAT (2)	MST Dep. Variable log (t-Statistic in Absolute Values)
Explanatory variables	Dep. Variable t-Statistic	Dep. Variable t-Statistic	
Intercept	1.702 (0.346)***	2.131 (0.445)***	0.234 (0.279)
1/SE	0.0005 (0.0016)	-	
Sqrt (sample size)	-	-0.0059 (0.0042)	
Log (df)	-	-	-0.02567 (0.0721)
N	29	29	29
R ²	0.0006	0.0616	0.0027
COMMUNITY WEALTH	FAT (1)	FAT (2)	MST Dep. Variable log (t-Statistic in Absolute Values)
Explanatory variables	Dep. Variable t-Statistic	Dep. Variable t-Statistic	
Intercept	2.766 (1.474)*	3.906 (2.462)	-0.395 (0.406)
1/SE	0.0006 (0.0005)	-	
Sqrt (sample size)	-	-0.0125 (0.0174)	
Log (df)	-	-	0.1283 (0.1328)
N	40	40	40
R ²	0.0232	0.0026	0.0208
ECONOMIES OF SCALE	FAT (1)	FAT (2)	MST Dep. Variable log (t-Statistic in Absolute Values)
Explanatory variables	Dep. Variable t-Statistic	Dep. Variable t-Statistic	
Intercept	-1.0156 (0.881)	-1.358 (1.214)	0.736 (0.392)*
1/SE	2.8e-04 (8.51e-06)***	-	
Sqrt (sample size)	-	-0.0258 (0.0155)	
Log (df)	-	-	-0.1459 (0.1290)
N	41	41	41
R ²	0.3841	0.0639	0.0326
SPATIAL FACTORS	FAT (1)	FAT (2)	MST Dep. Variable log (t-Statistic in Absolute Values)
Explanatory variables	Dep. Variable t-Statistic	Dep. Variable t-Statistic	
Intercept	3.399 (1.047)***	4.800 (1.439)***	0.407 (0.432)
1/SE	0.0203737 (0.0149)	-	
Sqrt (sample size)	-	-0.0147 (0.0126)	
Log (df)	-	-	-0.01425 (0.1388)
N	35	35	35
R ²	0.0358	0.0149	0.0004
ORGANIZ. FACTORS	FAT (1)	FAT (2)	MST Dep. Variable log (t-Statistic in Absolute Values)
Explanatory variables	Dep. Variable t-Statistic	Dep. Variable t-Statistic	
<i>Intercept</i>	-0.378 (0.709)	1.923 (0.948)*	0.357 (0.209)*
<i>1/SE</i>	0.1627 (0.0880)*	-	
<i>Sqrt (sample size)</i>	-	-0.0017 (0.0058)	
<i>Log (df)</i>	-	-	-0.0391 (0.0688)
N	37	37	37
R ²	0.0748	0.0007	0.0061

Note 1: Standard errors (robust) in parentheses

Note 2: Significance at the 1% (***), 5% (**), 10(***)

Table 6. Multivariate FAT metaregressions for Fiscal Constraints and Spatial Factors

Moderator variables	Dependent variable	
	Fiscal constraints	
<i>1/SE</i>	+0.001(0.004)	-
<i>Sqrt (sample size)</i>	-	-0.0055 (0.0033)*
<i>Year</i>	-0.04 (0.11)	+0.10 (0.04)***
<i>Continent (US=1)</i>	-5.99 (0.92)***	-1.31 (0.41)***
<i>Service (multi=1)</i>	+5.46 (0.81)***	+0.37(0.33)
<i>Method</i>	+6.05 (0.77) ***	+0.91(0.40)**
<i>PopSize (small inc. =1)</i>	-5.07 (1.78) ***	+1.37 (0.82)*
<i>Intercept</i>	+83.39 (217.87)	-204.02 (79.31)***
Pseudo R ²	0.493	0.182
χ^2 (joint sig.)	2451.44**	16.60**
Log pseudolikelihood	-10.104	-46.22
N	29	92
	Spatial Factors	
<i>1/SE</i>	+0.007 (0.005)	-
<i>Sqrt (sample size)</i>	-	-0.03 (0.003)
<i>Year</i>	-0.03 (0.04)	+0.02 (0.03)
<i>Continent</i>	&	-0.50 (0.70)
<i>Service</i>	-0.63 (0.87)	-1.05 (0.81)
<i>Method</i>	-0.87 (0.56)	-0.20 (0.43)
<i>PopSize</i>	+0.35 (0.52)	+0.36 (0.52)
<i>Intercept</i>	51.48 (78.68)	-31.36 (54.50)
Pseudo R ²	0.127	0.069
χ^2 (joint sig.)	8.59	5.69
Log pseudolikelihood	-17.32	-37.68
N	31	59

Note 1: Standard errors in parentheses (robust to heteroskedasticity)

Note 2: &: Omitted because of collinearity.

Note 3: Significance at the 1% (***), 5% (**), 10% (*)

5. Conclusion

In this paper we have undertaken a meta-regression of factors explaining differences in results of motivators for inter-municipal cooperation in service delivery. Theoretical expectations are that significant drivers motivating more cooperation would be fiscal constraints, economies of scale, professional manager and suburban metropolitan location; and that significant barriers to cooperation would be transaction costs, racial heterogeneity, community wealth and politics. We analyzed all published multivariate studies we could find on factors driving cooperation. There was insufficient commonality in the measures of barriers to cooperation to enable a meta-regression analysis. More consistent, multivariate research is needed on barriers to cooperation to enable robust comparative analysis of transaction costs, racial and class heterogeneity and politics.

However, we were able to find sufficient numbers of studies with consistent (sufficiently homogeneous) measures of motivators: fiscal constraints, economies of scale, professional management and suburban metropolitan location to conduct robust meta-regression analyses. Fiscal constraints are more likely to be a significant driver of cooperation in studies that include small municipalities, and that use logistic regressions. This was expected. The surprise was that studies that were more recent or studies from the US were less likely to find fiscal constraints as a driver, but this may be explained by the fragmented nature of US local government. Cooperation in the US may be driven by the policy goal of service coordination across municipalities, not just efficiency concerns. Technological improvements in service quality and the need to coordinate services across

the metropolitan region are increasingly being referenced in the qualitative literature on cooperation as important drivers. Future quantitative research should develop measures for service quality and coordination to explore these effects.

Motivators for cooperation are not simply fiscal constraints. Economies of scale, suburban metropolitan location and professional management are also important drivers. Studies including small municipalities are more likely to find positive impacts of professional management. Logistic regression models are more likely to capture fiscal constraints and economies of scale. Our meta-regression analysis provides confidence in the results of these factors as drivers of cooperation.

Cooperation is a long-standing reform that has gained increased interest among local governments. However, our meta-regression analysis of factors explaining cooperation suggests that it may be driven by more nuanced goals regarding service effectiveness rather than efficiency. If so, future scholarship needs to develop robust and consistent empirical measures for service quality, coordination and political concerns.

References

- Agranoff, Robert and Michael McGuire. 2003. *Collaborative Public Management. New Strategies for Local Governments*. Georgetown University Press, Washington DC.
- Andrew, Simon A. 2009 Regional integration through contracting networks: An empirical analysis of institutional collection action framework. *Urban Affairs Review*, 44 (3), 378-402
- Aulich, Chris, Melissa Gibbs, Alex Gooding, Peter McKinlay, Stefanie Pillora, and Graham Sansom. 2011. *Consolidation in Local Government: A Fresh Look*. Australia Center of Excellence for Local Government, Local Government Association of South Australia and Local Government of New Zealand, Broadway (NSW).
- Bae, Jungah. 2009. Institutional choices for local service contracting and collaboration. *International Review of Public Administration*, 14(1), 27-42.
- Bel, Germà and Xavier Fageda. 2009. Factors explaining local privatization: a meta-regression analysis. *Public Choice*, 139(1/2), 105-119.
- Bel, Germà, Xavier Fageda and Melania Mur. 2013. Why do municipalities cooperate to provide local public services? An empirical analysis. *Local Government Studies*, 39(2), 435-454..
- Bel, Germà, Xavier Fageda and Melania Mur. (forthcoming). Does Cooperation Reduce Service Delivery Costs? Evidence from Residential Solid Waste Services. *Journal of Public Administration Research and Theory*, forthcoming.
- Bel, Germà, Xavier Fageda and Mildred Warner. 2010. Is Private Production of Public Services Cheaper than Public Production? A meta-regression analysis of solid waste and water services. *Journal of Policy Analysis and Management*, 29 (3): 553-577.
- Berardo, Ramiro, and John T. Scholz. 2010. Self-organizing policy networks: Risk, partner selection, and cooperation in estuaries. *American Journal of Political Science* 54(3), 632–649.
- Bickers, Kenneth N., Stephanie Post and Robert M. Stein. 2009. *The partisan dimensions of intergovernmental cooperation*. Paper presented at the 2009 Annual Meeting of the American Political Science Association, September 3, 2009, Toronto, Canada.
- Bish, Robert L. and Eric G. Clemens. 2008. *Local Government in British Columbia (Fourth Edition)*. Union of British Columbia Municipalities, Richmond (BC)
- Brown, Trevor L. and Matthew Potoski. 2003. Transaction costs and institutional explanations for government service production decisions. *Journal of Public Administration Research and Theory* 13(4): 441-468.
- Brown, Trevor L., Matthew Potoski, and David M. Van Slyke. 2008. Changing modes of service delivery: How past choices structure future choices. *Environment & Planning C: Government & Policy* 26(1): 127-43.

- Campbell, Richard W. and Patty Glynn. 1990. Intergovernmental cooperation: an analysis of cities and counties in Georgia. *Public Administration Quarterly*, 14(2): 119-141.
- Carr, Jered B. and Richard Feiock, eds. *City-county consolidation and its alternatives. Reshaping the local government landscape*. M.E.Sharpe, New York.
- Carr, Jered B., Kelly Leroux and Manoj K. Shrestha. 2009. Institutional Ties, Transaction Costs, and External Service Production. *Urban Affairs Review* 44(3): 403–27.
- Carvalho, Pedro, Rui C. Marques and Sanford Berg, 2012. A meta-regression analysis of benchmarking studies on water utilities market structure. *Utilities Policy*, 21, 40-49.
- Chen, Yu-Chen and Kurt Thurmaier. 2009. Interlocal agreements as collaborations: an empirical investigation of impetuses, norms, and success. *American Review of Public Administration*, 39(5): 536-552
- Connor, John and Yuliya Bolotova. 2006. Cartel overcharges: Survey and meta-analysis. *International Journal of Industrial Organization*, 24(6), 1109–1137.
- De Mello, Luiz and Santiago Lago-Peñas. 2013. Local government cooperation for joint provision: The experiences of Brazil and Spain with inter-municipal consortia. In Santiago Lago-Peñas and Jorge Martinez-Vazquez, eds. *The challenge of local government size. theoretical perspectives, international experience, and policy reform*. Edward Elgar, Cheltenham, pp. 221-241.
- Deller, Steven C. 1992. Production efficiency in local government: a parametric approach”, *Public Finance* 47(1): 32-44.
- Deller, Steven C. and Edward Rudnicki. 1992. Managerial efficiency in local government: Implications on jurisdictional consolidation, *Public Choice*, 74(2): 221-231.
- Dijkgraaf, E., R.H.J.M. Gradus & B. Melenberg, 2003. Contracting out refuse collection. *Empirical Economics*, 28(3), 553-570
- Dixit, Avinash 1973. The optimum factory town. *Bell Journal of Economics and Management Science* 4(2): 637-651.
- Dollery, Brian, Alexandr Akimov & Joel Byrnes. 2009. Shared services in Australian local government: rationale, alternative models and empirical evidence. *Australian Journal of Public Administration* 68(2): 208–219.
- Feiock, Richard C. 2007. Rational choice and regional governance, *Journal of Urban Affairs* 29(1): 47-63.
- Feiock, Richard C., 2013. The institutional collective action framework. *Policy Studies Journal*, 41(3): 397-425.
- Feiock, Richard C. and John T. Scholz. eds. 2010, *Self-organizing federalism: Collaborative mechanisms to mitigate institutional collective action*. Cambridge University Press, Cambridge.
- Feiock, Richard C., Annette Steinacker and Hyung-Jun Park 2009. Institutional collective action and economic development joint ventures. *Public Administration Review* 69 (2), 256-270.
- Ferris, James M., and Elizabeth Graddy. 1991. Production costs, transaction costs, and local-government contractor choice. *Economic Inquiry* 29(3): 541–554.
- Ferris, James M., and Elizabeth Graddy. 1994. Organizational choices for public service supply. *Journal of Law, Economics & Organization* 10(1): 126–141.
- García-Quevedo, Jose. 2004. Do public subsidies complement business R&D?: a meta-analysis of the econometric evidence. *Kyklos*, 57(1), 87–102.
- Girard, Peter, Robert D. Mohr, Steven C. Deller and & John M. Halstead. 2009. Public-private partnerships and cooperative agreements in municipal service delivery. *International Journal of Public Administration* 32(5): 370-392
- Girth, Amanda, Amir Hefetz, Jocelyn Johnston and Mildred E. Warner 2012. Outsourcing public service delivery: management responses in noncompetitive markets. *Public Administration Review*, 72(6): 889-900.

- Gómez-Reino, Juan Luis and Jorge Martínez-Vazquez 2013. An international perspective on the determinants of local government fragmentation in Lago-Peñas, Santiago and Jorge Martínez-Vazquez, ed. *The challenge of local government size. theoretical perspectives, international experience, and policy reform*. Edward Elgar, Cheltenham.
- Hawkins, Christopher V. 2010. Competition and cooperation: local government joint ventures for economic development. *Journal of Urban Affairs*, 32(2), 253-275.
- Hawkins, Christopher V. and Richard Feiock. 2011. Joint ventures, economic development policy, and the role of local governing institutions. *American Review of Public Administration*, 41(3): 329–347
- Hefetz, Amir and Mildred E. Warner. 2012. Contracting or public delivery? The importance of service, market and management characteristics. *Journal of Public Administration Research and Theory* 22(2): 289-317.
- Hefetz, Amir, Mildred E. Warner and Eran Vigoda-Gadot. 2012. Privatization and inter-municipal contracting: The US local government experience 1992-2007. *Environment and Planning C: Government and Policy* 30(4): 675-692.
- Hefetz, Amir, Mildred E. Warner and Eran Vigoda-Gadot. 2012A. Concurrent Sourcing in the Public Sector: Contract and Agent Strategies to Manage Risk. Presented in International Workshop, Neither Public nor Private, Barcelona, May 2012.
- Hefetz, Amir, Mildred E. Warner and Eran Vigoda-Gadot. 2012B. Professional management and local government service delivery: Strategic decisions across alternative markets. Presented in International Research Society for Public Management Conference, Rome April, 2012.
- Hirsch, Werner Z. 1995. Contracting out by urban governments: A review. *Urban Affairs Review* 30 (3), 458–472.
- Hoene, Christopher. 2004. Fiscal structure and the post-proposition 13 fiscal regime in California's cities, *Public Budgeting and Finance*, 24(4): 51–72.
- Holzer, Marc and John Fry. 2011. *Shared services and municipal consolidation. A critical analysis*. Public Technology Institute, Alexandria (VA).
- Hulst, Rudie and André van Montfort, eds. 2007a. *Inter-Municipal cooperation in Europe*. Springer, Dordrecht.
- Joassart-Marcelli, Pascale, and Juliet Musso. 2005. Municipal service provision choices within a metropolitan area. *Urban Affairs Review* 40(4):492-519.
- Jung, Changhoon and Juchan Kim. 2009. Patterns and the determinants of interlocal cooperation in American cities and counties. *International Review of Public Administration* 14(1):11-25.
- Jung, Changhoon and Seong-Ho Jeong. 2013. Effects of service characteristics on interlocal cooperation in U.S. cities: A pooled regression analysis. *International Journal of Public Administration* 36(5), 367-380
- Krueger, Skip and Michael McGuire. 2005. *A Transaction costs explanation of interlocal Government Collaboration*. Paper presented at the Either National Public Management Research Conference, Los Angeles, CA, Sept 29-Oct 1.
- Krueger, Skip, and Ethan Bernick. 2010. State rules and local governance choices. *Publius: The Journal of Federalism* 40 (4): 697–718.
- Krueger, Skip, Robert W. Walker and Ethan Bernickz. 2011. The intergovernmental context of alternative service delivery choices. *Publius: The Journal of Federalism* 41 (4): 686-708.
- Kwon, Sung-Wook, and Richard C. Feiock. 2010. Overcoming the barriers to cooperation: Intergovernmental service agreements. *Public Administration Review* 70(6): 876-84.
- Ladd, Helen F. 1992. Population growth, density and the costs of providing public services. *Urban Studies* 29 (2): 273-295.

- Lago-Peñas, Santiago and Jorge Martínez-Vázquez, 2013. *The challenge of local government size. theoretical perspectives, international experience, and policy reform*. Edward Elgar, Cheltenham.
- Lamothe, Scott, Meeyoung Lamothe and Richard C. Feiock. 2008. Examining local government service delivery arrangements over time. *Urban Affairs Review* 44(1): 27-56.
- LeRoux, Kelly, Paul W. Brandenburger and Sanjay K. Pandey. 2010. Interlocal service cooperation in us cities: a social network explanation. *Public Administration Review* 70(2): 268-278.
- LeRoux, Kelly and Jered B. Carr. 2007. Explaining local government cooperation on public works: evidence from Michigan. *Public Works Management and Policy* 12(1): 344–58.
- LeRoux, Kelly and Sanjay Pandley. 2011. City managers, career incentive and municipal services decisions: the effects of managerial progressive ambition on interlocal service delivery. *Public Administration Review* 71(4): 627-636.
- Levin, Jonathan, and Steven Tadelis. 2010. Contracting for government services: Theory and evidence from U.S. cities. *The Journal of Industrial Economics* 58(3): 507-41.
- Longhi, Simonetta, Peter Nijkamp, And jacques Poot. 2005. A meta analytic assessment of the effect of immigration on wages. *Journal of Economic Surveys*, 19(3), 451–477.
- Lowery, David. 2000. A transactions costs model of metropolitan governance: Allocation versus redistribution in urban America. *Journal of Public Administration Research and Theory* 10(1): 49-78.
- Marvel, Mary K. and Howard P. Marvel 2007. Outsourcing oversight: A comparison for in-house and contracted services. *Public Administration Review* 67(3): 521-30.
- Mazzalay, Victor. 2011. Subnational regionalisation in Argentina: The effects of subjective interdependence and the relationships between actors on intermunicipal cooperation. *Bulletin of Latin American Research*, 30(4), 453–472.
- McGuire, Robert. A., Robert L. Ohsfeldt and T. Norman Van Cott. 1987. The determinants of the choice between public and private production of publicly funded service. *Public Choice*, 54 (3): 211-230.
- Mirrless, James A. 1972. The optimum town. *Swedish Journal of Economics* 74(1): 114-135.
- Mohr, Robert, Steven C. Deller and John M. Halstead 2010. Alternative methods of service delivery in small and rural municipalities. *Public Administration Review* 70(6): 894-905.
- Morgan, David R., Michael W. Hirlinger and Robert E. England. 1988. The decision to contract out city services: a further explanation. *The Western Political Quarterly* 41(2): 363-372.
- Morgan, David R. and Michael W. Hirlinger 1991. Intergovernmental service contracts: a multivariate explanation. *Urban Affairs Quarterly* 27(1): 128-144.
- Oates, Wallace, 1972. *Fiscal federalism*. Harcourt Brace Jovanovich, New York.
- Ostrom, Vincent, Charles M. Tiebout, and Robert Warren 1961. The organization of government in metropolitan areas: A theoretical inquiry. *American Political Science Review* 55 (4): 831-842.
- Reinagel, Tyler P. and Justin M. Stritch. 2012. *Competition and professionalism: An exploratory look at municipal participation in facility sharing in Georgia*. Poster presented at 20102 Fall APPAM-Baltimore, MA.
- Ringquist, Evan J. 2005. Assessing evidence of environmental inequities: A meta-analysis. *Journal of Policy Analysis and Management*, 24 (2): 223–247.
- Rodrigues, Miguel, Antonio F. Tavares and J. Filipe Araujo. 2012. Municipal service delivery: The role of transaction costs in the choice between alternative governance mechanisms. *Local Government Studies* 38(5), 615-638.
- Rodríguez-Oreggia, Eduardo and Rodolfo Tuirán Gutiérrez. 2006. La cooperación intermunicipal en México. Barreras e incentivos en la probabilidad de cooperar. *Gestión y Política Pública*, 15(2), 393-409.
- Rose, Andrew, K. and T. D. & Stanley. 2005. A meta-analysis of the effect of common currencies on international trade. *Journal of Economic Surveys*, 19(3), 347–365.

- Sancton, Andrew. 2005. The governance of metropolitan areas in Canada. *Public Administration and Development* 25(4): 317-327.
- Shrestha, Manoj K. 2005. Interlocal fiscal cooperation in the provision of local public services: the case of large us cities. Paper presented at the American Society of Public Administration, Milwaukee, WI, April.
- Shrestha, Manoj K. and Richard C. Feiock. 2011. Transaction cost, exchange embeddedness, and interlocal cooperation in local public goods. *Political Research Quarterly* 64 (3): 573-587.
- Shrestha, Manoj K., and Richard C. Feiock. 2013. Institutional collective action dilemmas in service delivery: Exchange risks and contracting networks among local governments. Paper presented at 2013 PMRA, Madison (WI)
- Sonenblum, Sidney, John J. Kirlin and John C. Reis 1977. *How cities provide services*. Ballinger, Cambridge, MA.
- Stanley, T. D., & Stephen B. Jarrell 1989. Meta-regression analysis: A quantitative method of literature surveys. *Journal of Economic Surveys*, 3 (2), 54–67.
- Stanley, T. D. 2005. Beyond publication bias. *Journal of Economic Surveys*, 19 (3), 309–345.
- Stanley, T. D. 2008. Meta-regression methods for detecting and estimating empirical effects in the presence of publication selection. *Oxford Bulletin of Economics and Statistics*, 70 (1), 103–127.
- Stănuș, Cristina. 2011. Patterns of inter-municipal cooperation and local governments Characteristics in Romania. *Southeastern Europe* 35(2): 191-208.
- Stein, Robert M. 1991. *Urban alternatives: Public and private markets in the provision of local services*. Univ. of Pittsburgh Press, Pittsburgh, PA.
- Sundell; Anders, Mikael Gilljam and Victor Lapuente. 2009. Patterns of Local Public Administration Reform: Perceived Effects and Determinants of Contracting and Intermunicipal Cooperation among Local Governments in Sweden. Paper presented in APSA 2009 meeting, Toronto.
- Swianiewicz, Pawel, eds. 2011. *Working together. Inter-municipal cooperation in five central European Countries*. Open Society Institute, Budapest.
- Tavares, António F. and Pedro J. Camões. 2007. Understanding intergovernmental cooperation: An empirical study of collaboration among Portuguese municipalities. University of Minho (Portugal), WP NEAPP Série IV (6)
- Thurmaier, Kurt and Curtis Wood. 2004. Interlocal agreements as an alternative to consolidation. In Jered B. Carr and Richard Feiock, eds. *City-county consolidation and its alternatives. Reshaping the local government landscape*, pp. 113-130. M.E.Sharpe, New York.
- Tiebout, Charles. 1956. A pure theory of local expenditures. *Journal of Political Economy* 64 (5): 416–424.
- Tiller, Kelly J. and Paul M. Jakus. 2005. Applying the Miceli Model to explain cooperation in municipal solid waste management. *Agricultural and Resource Economics Review* 34(2): 217-225.
- Warner, Mildred E. 2006. Inter-municipal cooperation in the U.S.: A Regional Governance Solution? *Urban Public Economics Review*, 6: 132-151.
- Warner, Mildred E. and Amir Hefetz. 2002. Applying market solutions to public services: An assessment of efficiency, Equity and Voice. *Urban Affairs Review* 38(1):70-89.
- Wassenaar, Mattheus, Tom Groot, and Raymond Gradus. 2013. Municipalities' contracting out decisions: an empirical study on motives. *Local Government Studies*, 39(3).
- Wood, Curtis. 2006. Scope and Patterns of Metropolitan Governance in Urban America: Probing the Complexities in the Kansas City Region". *American Review of Public Administration* , 36 (3): 337-353.
- Zullo, Roland. 2009. Does fiscal stress induce privatization? Correlates of private and inter-municipal contracting 1992-2002. *Governance* 22(3): 459-481.