Public Choice (2009) 139: 105–119
DOI 10.1007/s11127-008-9381-z

Factors explaining local privatization: a meta-regression analysis

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Received: 18 June 2007 / Accepted: 24 October 2008 / Published online: 8 November 2008

Abstract This paper aims at explaining the differences in the results of empirical studies of motivations for local privatization by undertaking a meta-regression. Our results suggest that fiscal constraints and interest groups were especially relevant in the early studies of the US, which considered several services. Further, studies that focus on one service capture the influence of scale economies more accurately. Finally, our results show that small towns are more affected by fiscal and political factors, while ideology plays a major role for European and large cities. Thus, no clear conclusions emerge from this literature because the findings of each study are sensitive to its characteristics.

Keywords Meta-regression analysis · Privatization · Contracting-out · Local governments

JEL Classification L33 · R51 · H72 · C25

1 Introduction

Local public services in many different countries have been privatized in recent decades. Early academic analyses of the effect of privatization on costs usually found a positive relation between privatization and savings, and similar outcomes were stressed in early reviews such as Domberger and Jensen (1997).[1] Given this broad agreement, it may come as a surprise that many governments remain reluctant to privatize and continue to prefer public

[1] However, more recent work (e.g. Hodge 2000; Bel and Warner 2008) emphasizes that the evidence is mixed and cost savings vary from one service area to another.

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production. Consequently, over the last twenty years many empirical studies have tried to identify the factors that explain privatization. Many variables have been tested, but they can be readily grouped into one of four families: (1) fiscal restrictions, (2) economic efficiency, (3) political processes, and (4) ideological attitudes.

The empirical results obtained by these studies vary widely. Indeed, there seems to be only one consistent result: that is, that the overall explanatory power of the estimated equations is quite low. To investigate this conundrum, we present here a meta-regression analysis of the factors examined in the many studies that have set out to explain the decision to privatize local services.

Our work follows on from previous studies using meta-regression analysis, a method that has been widely used in the economic literature since its introduction in the late 1980s. Stanley and Jarrell (1989) provide an extensive list of possible reasons for the large variations between the results of empirical studies that focus on a single topic. Generally speaking, the reasons they cite fall into one of three categories: (a) idiosyncratic statistical methods; (b) biases induced by model misspecification; or (c) the unique character of the data sets of particular studies.

Recent studies using meta-regression have covered a wide variety of issues: the effects of public subsidies on business $R + D$ (García-Quevedo 2004), the β convergence hypothesis (Abreu et al. 2005), the effect of immigration on wages (Longhi et al. 2005), the effects of common currency on international trade (Rose and Stanley 2005), the natural rate hypothesis (Stanley 2005a) and voter turnout (Geys 2006).

To our knowledge, meta-regression analysis has not so far been applied to the study of privatization decisions and, more specifically, of privatization decisions in the local sphere. This paper intends to fill this gap. We should stress at this point that our analysis aims solely to explain the pattern and diversity of findings in empirical studies. Our results indicate that, overall, significant relationships depend heavily on the individual characteristics of each study. Many factors condition the analysis of any particular set of cases, and prevent one from drawing any conclusions of general validity from the results of any one study. The period and region analyzed, the nature of the service and the size of the municipalities included in a sample are all important factors. In the end, the main contribution of our paper is to show that any finding of significance for a particular relationship is quite sensitive to the characteristics of the particular study.

The rest of the paper is organized as follows. Section 2 describes the relationships most commonly analyzed in the literature. Section 3 explains the variables used in the meta-regression equation. Section 4 presents our own empirical analysis and results, and is followed by a summary of our main conclusions.

2 Main hypotheses in the empirical literature on factors explaining local privatization

Our goal is to explain variations in the results of empirical studies of factors influencing local service privatization. While there is no absolute agreement on what factors might influence privatization, the hypotheses in the literature may be conveniently grouped into two economic and two political sets of variables. Thus, we analyze results obtained in multivariate regressions that test the following relationships:

$$PRIVATIZATION = F(FC, EE, PC, ID, Z), \tag{1}$$

where the dependent variable refers to a local government decision to supply a service either internally or through external providers. The explanatory variables are fiscal constraints (FC), economic efficiency (EE), political processes (PC) and ideological attitudes

(*ID*). *Z* refers to other explanatory variables that cannot be included in our meta-regression analysis. Usually, these variables concern city-specific characteristics.[2]

2.1 Fiscal constraints

In the 1970s, tax revolts and state legislation limiting increases in local taxation put an end to the growth of taxation in municipalities in the US. Local restrictions reduced the ability of cities to raise revenues, and transfers from federal and regional governments also decreased in response to the economic crisis of the period. Other countries experienced similar fiscal restrictions in later years. Most studies of privatization at the time included fiscal variables designed to measure the effects of such restrictions. The conventional hypothesis proposed a positive relation between fiscal constraints and privatization.

2.2 Economic efficiency

According to public choice theory, overproduction and inefficiency will result when politicians and bureaucrats monopolize public service delivery (Niskanen 1971). Breaking that monopoly by contracting out is expected to reduce costs and oversupply by introducing competition in the markets for public services. The hypothesis suggests that large cities will privatize more often, since they can take advantage of competition from a larger number of service providers.

Outside the public choice model, some authors have suggested exploiting economies of scale as a rationale for privatization (Donahue 1989). When a public service is delivered in a suboptimal jurisdiction, the exploitation of scale economies requires the aggregation of jurisdictions for the satisfactory delivery of the service. Since the same firm can deliver services in several municipalities, privatization can be a useful tool for aggregating operations into a more efficient size. The population of municipalities is the variable normally used to test whether exploiting scale economies induces privatization of local services.[3] The specific hypothesis is that small municipalities will use contracting out more frequently, because they can take more advantage of the scale economies provided by either private firms or public agencies operating across several jurisdictions.

2.3 Political processes and ideological attitudes

Political processes and ideological attitudes have also been analyzed as possible explanatory factors in local service delivery choices. Within the domain of political interests, the decision to privatize may be influenced by pressure groups with particular interests in extracting rents derived from a given form of service delivery. The variables more usually chosen to capture the influence of interest groups are the degree of unionization of public employees (assumed to be opposed to privatization) and the income level of households (assumed to favor privatization more as income rises).[4]

[2]Some additional aspects have recently been considered as possible relevant explanatory factors of local privatization, such as political patronage or transaction costs. However, the low number of studies of these aspects does not allow us to use the meta-regression technique to assess in which scenarios they should be relevant.

[3]The variable for demand, which is the most appropriate for testing the scale economies hypothesis, is not usually available.

[4]Several studies use the variable for the weight of public employees as a possible explanatory factor of local service delivery choices. However, results for this variable may be statistically biased since there is a simultaneous determination of service delivery choices and the percentage of public employees. Indeed, a more intense use of external suppliers implies *per se* a reduction in the number of public employees.

Ideological attitudes also have a part to play. Left-wing parties are usually associated with public values, whereas right-wing parties are usually linked to pro-private business values. It follows that positive associations are likely between right-wing governments and privatization, and between left-wing governments and more public production.

3 The empirical strategy: Data and methods

To date, more than thirty studies have studied local privatization decisions using multivariate methods. As far as we know, the sample used here includes all studies, both published and unpublished, that use multivariate regression techniques to examine the factors explaining the privatization of local services. Our meta-regression analysis includes articles published in academic journals in the fields of Economics, Political Science, and Public Policy and Public Administration. Additionally, it includes some recent unpublished manuscripts presented at International Academic Meetings specializing in public policy and, particularly, local government reform, or published in related Working Paper Series (such as the Social Science Research Network–SSRN). Table A1 in Appendix displays general information on all the studies consulted (note that a high proportion of studies refer to US cases from the 1980s).

Individual studies may involve several observations since they contain several estimations with different data sets, different variables or different services analyzed. Most of the studies that account for several observations in our sample have produced estimations based on different sets of services. Table 1 shows the dependent variables and the moderator variables used in the meta-regression analysis.

One empirical strategy for performing a meta-analysis of the relationship between two variables is to use the coefficients or t-statistic values estimated in a study as a dependent variable in the meta-regression (Stanley and Jarrell 1989). Since several variables have been used in the literature to test the relationship between privatization and each set of economic and political factors, we are only able to identify comparable coefficients or t-values for a small number of studies.

As in García-Quevedo (2004), our strategy of comparing results across studies relies on identifying whether the relationship of interest is significant. To this end, we construct a set of dependent variables as dummy variables that take a value of one if a study finds a significant relationship between production choices of local governments and the corresponding set of explanatory variables (fiscal, economic, politic and ideology aspects):[5]

- We find a significant relationship between privatization and fiscal constraints when any variable that captures this effect has a positive influence on privatization. The variables most commonly used are tax burden, taxes per capita, and limits imposed by supra-municipal governments on local taxation and local debt.
- The relationship between privatization and economic efficiency is considered significant when: (a) the coefficient of the variable for population (or demand) is both statistically significant and carries a negative sign, and (b) variables for the alternative hypothesis (large cities have more external providers available) are not significant.[6] The variables most commonly used are population, log (population), and urban density.

[5] Political processes and ideological attitudes were introduced together in the previous section. Nonetheless, the very different nature of the variables used to check these hypotheses makes it advisable to analyze the results for political processes and ideological attitudes separately.

[6] It is worth noting that the effect related to the availability of external providers is analyzed in a few studies.

Table 1 Variables used in meta-regression analysis

Dependent variable	Description	Number of observations
Fiscal constraints (*FC*)	Dummy variable that takes value one if a study finds a significant relationship between any variable for fiscal constraints and privatization	60
Economic efficiency (*EE*)	Dummy variable that takes value one if a study finds a significant relationship between the size of the municipality and privatization	56
Political considerations (*PC*)	Dummy variable that takes value one if a study finds a significant relationship between the relative strength of interest groups and privatization	54
Ideology (*ID*)	Dummy variable that takes value one if a study finds a significant relationship between the ideological orientation of the incumbent party and privatization	31
Moderator variables	**Description**	**Number of observations**
Sample	Number of municipalities included in the considered sample	66
Year	Year of collection of data for dependent variables	66
Region	Dummy variable that takes value one when studies refer to US, and value zero when they refer to other countries	66
Service	Dummy variable that takes value one when different services are considered, and value zero when just one sector is considered	66
Method	Dummy variable that takes value one when a discrete choice method is used, and value zero when Ordinary Least Squares is used	66
Size	Dummy variable that takes value one when the considered sample includes municipalities with a population lower than 5,000 inhabitants	66

- Political considerations are usually approached through variables for the relative strength of interest groups in favor of (or against) privatization. Thus, we assign a value of one to the dummy variable for political considerations when any of the variables for the relative strength of interest groups are statistically significant with the expected sign. In the majority of cases, this relative strength refers to the degree of unionization in the public sector and/or the percentage of high-income (low-income) households, unemployed citizens, and industrial interests.
- Finally, the value of the ideology variable depends on the statistical significance of the ideological orientation of the incumbent party or elected officials. In this regard, conservative parties are usually considered more prone to privatization than progressive ones. The variables most commonly used to test this hypothesis are the percentage of votes for

conservative (or alternatively progressive) parties, and a dummy variable for the mayor being from a conservative or progressive government.

The independent variables, usually called moderator variables, concern particular characteristics of the empirical studies. The number of observations, the year of data collection, geographical area and method of estimation are variables that are often used in meta-regression analyses. In this regard, differences in the results across studies for the period and region of the study may be a result of the effects of managerial learning or the specific institutional frameworks of the countries under study. The quality of the data set and the technique used may also affect the estimation.

In our context, two additional characteristics of the studies should be included. First, the range and type of services considered may go a long way toward explaining the differences in results across studies. Therefore, we differentiate between studies that examine the delivery choices of local governments for a broad range of services and studies that address just one service.

Second, the size of municipalities can lead to different conclusions about the factors leading to privatization. Therefore, we distinguish between studies that include or exclude small towns in their samples. We consider municipalities with fewer than 5,000 inhabitants to be small towns. It is sensible to argue that policy-makers in small towns react differently to the factors commonly considered in explaining the privatization choices of large cities. Note that those studies that include small towns have a sample with higher variance in terms of size of municipalities; but in no case is the sample limited to small towns.

Overall, our sample includes 32 studies that account for 66 observations. However, most of studies are concerned with just some of the hypotheses associated with the dependent variables. Hence, the total number of observations for each dependent variable ranges from 31 to 60.[7] Indeed, our meta-regression has limitations from a statistical point of view, given the scarcity of observations in the empirical literature concerning some motivations for local privatization. This is particularly the case for the relationship between ideology and privatization, and this limitation must be kept in mind when interpreting the results of estimates in the following section.

4 Estimation and results

In this section, we present the meta-regression estimation for each set of dependent variables. We regress the set of dependent variables against the moderator variables using the Probit model, since each dependent variable is discrete choice in nature. In particular, we estimate the following set of relationships:

$$Fiscal\ constraints = F(Sample,\ Year,\ Region,\ Service,\ Method,\ Size), \quad (2)$$

$$Economic\ efficiency = F(Sample,\ Year,\ Region,\ Service,\ Method,\ Size), \quad (3)$$

$$Political\ considerations = F(Sample,\ Year,\ Region,\ Service,\ Method,\ Size), \quad (4)$$

$$Ideology = F(Sample,\ Year,\ Region,\ Service,\ Method,\ Size). \quad (5)$$

[7] The dependent dummy variable takes value zero when a study does not find a significant relationship between privatization and the corresponding set of variables. Where a study does not analyze a relationship, it is not counted as an observation for the meta-regression analysis.

Table 2 Meta-regression estimates (probit). $N = 60$

Moderator variables	Dependent variable: Influence of fiscal constraints on privatization
Sample	0.0001 (0.0004)
Year	−0.08 (0.04)*
Region	0.37 (0.66)
Service	1.29 (0.48)***
Method	−0.88 (0.76)
Size	0.86 (0.49)*
Intercept	157.26 (89.42)*
Pseudo R^2	0.25
χ^2 (joint sig.)	13.09**
Log pseudolikelihood	−31.23

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

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

Recall that each observation is a study analyzing motivations for local privatization. As we mention above, the dependent variables are dummy variables that take a value of one when a study finds a significant relationship between privatization and the corresponding set of factors—that is, fiscal constraints, economic efficiency, political considerations, and ideology. The independent variables (moderator variables) are the number of municipalities included in the sample (*Sample*), the year of data collection (*Year*), the geographical area of the study (*Region*), the range of services considered (*Service*), the method of estimation (*Method*) and the inclusion or not of small municipalities in the empirical analysis (*Size*).

Positive coefficients of the moderator variables indicate that the characteristic of the study tends to provide a significant relationship between the corresponding dependent variable and privatization. A negative sign implies that the associated characteristic of the study tends to return a non-significant relationship between the two, and finally, a non-significant coefficient implies that the characteristic of the study does not influence the relationship.

Table 2 shows the results of the meta-regression estimates for the influence of fiscal constraints on privatization.

The variables for sample size, method of estimation and geographical area are not significant. So it seems that these characteristics have no significant effect on the relationship the studies included find or do not find. In contrast, the variables for the year of data collection, the plurality of services studied, and the inclusion of municipalities with fewer than 5,000 inhabitants imply that those moderator variables do affect the empirical analysis of the influence of fiscal constraints on privatization.

Indeed, modern studies tend to invalidate the hypothesis that fiscal constraints are a major explanatory factor of privatization. One possible explanation is that the European studies, none of which find a relationship, were all undertaken in recent years. Additionally, fiscal constraints in the US may have been more intense in the 1980s, the period analyzed in many of the studies that do not reject the hypothesis. Indeed, after Proposition 13 was passed in California in 1978 many states passed legislation that restricted the freedom of local governments to manage their budgets.

Studies that analyze several services, rather than just one, tend to validate the hypothesis that fiscal constraints are a major explanatory factor of privatization. This result can be easily explained by the fact that the internal or external production of just one service should not affect the overall financial situation of local governments. Fiscal considerations will loom larger when local governments are considering a broader range of services.

Table 3 Meta-regression estimates (probit). $N = 56$

Moderator variables	Dependent variable: Influence of economic efficiency on privatization
Sample	−0.0007 (0.0006)
Year	0.03 (0.04)
Region	1.35 (0.72)*
Service	−1.52 (0.69)**
Method	−1.41 (0.75)*
Size	0.71 (0.76)
Intercept	−49.98 (80.08)
Pseudo R^2	0.11
χ^2 (joint sig.)	7.67
Log pseudolikelihood	−31.16

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

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

Finally, it seems that studies that use a sample that includes municipalities of fewer than 5,000 inhabitants are more likely to find a positive relationship between fiscal constraints and privatization. Small municipalities have more difficulty generating the revenues needed to justify expenditures associated with the internal production of services. Privatization can be used both to increase payments by users and to reduce funding from the general budget (Bel and Miralles 2006).

Table 3 shows the results of the meta-regression estimates of the influence of scale economies on privatization. The variables for sample size, year of the data collection, and the inclusion of small municipalities play no role in explaining differences across the studies. On the other hand, the variables for the range of services analyzed, the method of estimation and the geographical area are significant, although in the case of the latter two moderator variables only at the 10% level.

Studies that analyze just one service find more evidence that scale economies are a major determinant of privatization. Indeed, the influence of scale economies varies with the size of fixed costs involved in the production of services. Therefore, an analysis of just one service will better capture the economic efficiency effect. Studies that consider several services can include services with low fixed costs, while many of the one-service studies focus on solid waste collection. Several studies show the relevance of scale economies for this sector (Stevens 1978; Bel and Costas 2006).

Studies that use Ordinary Least Squares (OLS) for estimation are more likely to validate the scale economies argument. In these studies, the dependent variable is usually the percentage of services privatized rather than the decision of whether to privatize or not. The use of the percentage seems to capture the effect better. However, not many studies use the OLS technique, and we must be cautious regarding the interpretation of this variable.

Finally, studies for the US are more likely to find a positive relationship between scale economies and privatization. The average municipality size (population) in the US is smaller than in most countries in the European Union. This suggests that there is more room for the realization of scale economies through privatization in the US. We must also recall that small municipalities can use inter-municipal cooperation as an alternative to privatization, in order to exploit scale economies. The fact is that small municipalities in many European countries use inter-municipal cooperation more frequently than small towns do in the US (Bel and Fageda 2008; Dijkgraaf and Gradus 2007; Warner and Bel 2008). Therefore, realizing scale

Table 4 Meta-regression estimates (probit). $N = 54$

Moderator variables	Dependent variable: Influence of political considerations on privatization
Sample	0.0001 (0.0004)
Year	−0.12 (0.06)**
Region	−0.57 (0.92)
Service	1.18 (0.60)**
Method	–
Size	1.32 (0.64)**
Intercept	246.54 (127.99)**
Pseudo R^2	0.12
χ^2 (joint sig.)	7.36
Log pseudolikelihood	−32.62

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

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

Note 3: The variable for method is excluded as predicts success perfectly

economies by means of privatization is likely to have been a more influential factor in the US, and this difference may explain our results for the region variable.

Table 4 shows the results of the meta-regression estimates of the influence of political considerations on privatization. Recall that this variable is constructed from the relationship between privatization and the relative strength of interest groups affected by it. As we have mentioned above, the variables used to capture this effect are usually the degree of unionization of public employees, the weight of high-income (or low-income) households, unemployment, and industrial interests.

The variables for the sample size and the geographical area of the study are not significant. The variable for the estimation method must be excluded as it predicts success perfectly. The variables for year of data collection, range of services considered and inclusion of small municipalities play a role in explaining differences across studies.

Early studies of US cases seem to give stronger support for the hypothesis that interest groups influence privatization. In addition, the hypothesis tends to be validated more often when a broad range of services is analyzed. This makes sense since pressure from these groups will focus on the whole activity of a local government rather than on just one service (regardless of its economic and political relevance). Finally, the influence of interest groups seems to be higher when small municipalities are included in the sample. Indeed, local governments in small municipalities are particularly vulnerable to pressure from interest groups.

Table 5 shows the results of the meta-regression estimates of the influence of ideology on local service privatization. The variables for the year of the data collection and range of services considered are not significant, while the variables for the geographical area, sample size and the inclusion of small municipalities seem to be relevant. The variable for estimation method must be excluded as it predicts success perfectly.

Our estimates suggest that studies of European cases are more likely to find ideological influence on the privatization of local services. Additionally, the statistical significance of the variable that captures the inclusion of small municipalities seems logical, since ideological influence is likely to be lower for smaller governments. The policies of large cities are more dependent on ideological orientation, while in small towns personal interaction between politicians and citizens is crucial. Finally, studies that use a large sample of municipalities find a more significant relationship between ideology and privatization.

Table 5 Meta-regression estimates (probit). $N = 31$

Moderator variables	Dependent variable: Influence of ideology on privatization
Sample	0.001 (0.0006)**
Year	0.03 (0.02)
Region	−2.20 (1.21)*
Service	−0.43 (0.71)
Method	–
Size	−2.88 (1.22)**
Intercept	−61.18 (57.76)
Pseudo R^2	0.30
χ^2 (joint sig.)	9.59*
Log pseudolikelihood	−14.45

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

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

Note 3: The method variable is excluded as it predicts success perfectly

In short, our meta-regression analysis finds that the likelihood that a particular relationship will be significant is quite sensitive to the characteristics of the study: geographical coverage, time period, range of services considered and size of municipalities determine the results obtained concerning the motivations for privatization. Therefore, no generalizations should be made on the basis of the results of any particular study.

It is worth noting here that publication bias is an important limitation of meta-regression analysis (Stanley 2001, 2005b). Papers are more likely to be published when significant relationships between the variables of interest are found. Stanley (2005b, 2008) indicates that funnel asymmetry tests (FAT) may be appropriate to examine publication bias in a meta-regression. These tests are based on the estimation of a study's reported effect and its standard errors. Hence, we estimate the following equation:

$$T_i = \beta_0 + \beta_1(1/SE_i) + \varepsilon_i, \tag{6}$$

where T is a study's reported t-statistic and $1/SE$ is the inverse of the standard error. Stanley (2005b, 2008) suggests that the statistical significance of the intercept in (6), β_0, is a test for publication bias and that its sign indicates the direction of this bias. Evidence of publication bias will be found when $\beta_0 \neq 0$. Additionally, the statistical significance of β_1 provides an estimate of the genuine empirical effect.

Recall that the studies included in our meta-regression use different variables to test the relationship between privatization and each set of economic and political factors. Hence, our tests for publication bias can only be implemented for the most common variables for each group of hypotheses. In addition, some studies report the coefficient and statistical significance, but not standard errors or t-statistics. We must therefore be cautious in the interpretation of results of the FAT since the number of observations that can be used is low.

As regards the relationship between privatization and fiscal constraints, we can conduct estimates of (6) for the dummy variable related to limits imposed by supra-municipal governments on local taxation and for the tax burden variable. In the case of the economic efficiency hypothesis, we can conduct the test for the population variable. Publication bias may be examined for political and ideology factors by means of the variables unionization and percentage of votes for conservative parties respectively.

Table 6 shows results of the funnel asymmetry tests for the most common variable used in each of the four sets of hypotheses. In relation to the economic efficiency, political considerations and ideology hypotheses, publication bias does not seem to be problematic. In

Table 6 Funnel asymmetry tests (OLS)

Explanatory variables	Dependent variable: t-statistic (effect of the variable on privatization)				
	(1): tax limits	(2): financial burden	(3): population	(4): unions	(5): % votes conservative parties
Intercept	0.29 (0.48)	0.80 (0.36)**	0.90 (0.94)	1.65 (1.74)	1.30 (0.79)
$1/SE$	0.01 (0.02)	0.00020 (0.00018)	2.98e−07 (1.64e−07)*	−0.004 (0.004)	−0.04 (0.04)
N	22	29	27	25	12
R^2	0.04	0.009	0.00001	0.03	0.06

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

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

the case of fiscal constraints, our evidence is mixed. We do not find evidence of publication bias for the variable related to supra-municipal restrictions on local taxation, but the intercept of (6) is significant for tax burden. Since more than one variable is frequently used to test the relationship between privatization and fiscal constraints, we do not think that publication bias seriously distorts our results for this hypothesis. In any case, the small number of observations does not allow us to estimate a multivariate FAT to correct it.

We find evidence of a genuine empirical effect in the case of the relationship between privatization and economic efficiency, since $\beta_1 \neq 0$ when the population variable is considered. Recall that the literature examines two contradictory hypotheses: (1) small municipalities will privatize more often due to the exploitation of scale economies, and (2) large municipalities will privatize more often due to the higher availability of external providers. Our FAT seems to provide evidence in favor of the second hypothesis since $\beta_1 > 0$, which implies that the relationship between privatization and population of municipalities is positive. In any case, we must be cautious in the interpretation of this specific result of our FAT. For example, the meta-significance test that regresses the log (t-statistic) against the log (degrees of freedom) does not confirm this empirical effect.

FAT carried out for the rest of the hypotheses seem to provide evidence against a genuine empirical effect. This may be due to the high variance in the results reported, as we mentioned above. Indeed, several published studies have found no statistically significant impact of fiscal constraints, political considerations, or ideology on privatization. We must stress here that the main goal of our meta-regression is to explain what drives differences in the results of studies and not to identify a true empirical effect. In fact, our analysis reveals that no generalizations can be made from the estimates each particular study obtains.

It is worth recalling that the clearest pattern in these empirical studies is their low explanatory power. This may be because these empirical studies only imply a cross-sectional estimation between the form of service delivery and explanatory variables in the period analyzed. However, this type of estimation does not necessarily explain the motivations for privatization (Bel and Fageda 2007), as the decisions to privatize or not were made before the data were collected. Therefore, the dependent variable shows whether production is public or private in a particular year, but does not span the move from public to private production.

Indeed, considering the correlation between the form of service delivery and factors in period x does not indicate why the local government made the decision to privatize in period $x-n$. For example, we cannot expect fiscal restrictions in period x to explain decisions made in the period $x-n$. This is a typical shortcoming of the empirical literature about factors

explaining local privatization, with the exception of the studies by Chandler and Feuille (1994), Bel and Miralles (2003) and Miralles (2008).

The combination of this typical methodological shortcoming, the high variance in the reported estimates, and the fact that a large number of the studies refer to US cases in the eighties must prevent generalizations about factors explaining local privatization.

5 Concluding remarks

In this paper, we have undertaken a meta-regression analysis of motivations for local privatization decisions to explain the diversity of results found in the literature. Overall, the following patterns can be inferred from the results of our empirical analysis.

First, fiscal constraints and political considerations have been found to contribute to local service privatization in the studies of US cases published in the 1980s. The relationship between privatization and fiscal and political factors is less clear in more recent work, which includes studies of several European countries. US municipalities tend to privatize more often to obtain scale economies, given that their average size (population) is lower and they cooperate less frequently than do towns in many European countries. Finally, it seems that studies of US cases tend to find a lower influence of ideology on the privatization of local services.

Second, studies that consider a broad range of services capture more accurately the influence of fiscal constraints and political considerations on the privatization choices of local governments than do studies that examine just one service. On the other hand, studies that focus on one service reflect the influence of economic efficiency on privatization more accurately than do studies devoted to several services. We do not find a systematic relationship between the range of services considered and results for the ideology hypothesis.

Third, governments of small towns are more affected by fiscal constraints and political considerations than governments of large cities. In contrast, ideology seems to play a major role for large cities.

Fourth, results of the studies concerning privatization motivations are generally not related to the sample size and estimation method used. Thus, it is worth noting that all the studies considered have a rich enough sample of observations and most of the empirical analyses are made within a discrete choice framework.

Finally, it is worth recalling that most studies have shortcomings when analyzing the dynamics of local privatization. This may be why the empirical analyses of factors explaining local privatization generally have low explanatory power. Additionally, as a high proportion of studies are of US cases in the 1980s, the geographical and chronological coverage is poor; as a result, no general conclusions can be made.

In short, the likelihood that a particular relationship is found to be significant is quite sensitive to the characteristics of the study. In fact, no general conclusions can be reached about the explanatory factors of local service privatization. The period and country analyzed, the nature of the service, and the size of the municipality determine the results. Thus, any empirical study of local privatization should be made conditional upon the case specifically analyzed, and researchers should be cautious in generalizing from the results of any specific analysis.

Acknowledgements Our research on local privatization has received financial support from the Spanish Ministry of Education and Science (SEJ2006-04985/ECON) and from the Fundación Rafael del Pino. We benefited from comments by Trevor Brown, Robert Hebdon, Matthew Potosky, Mildred Warner, and other participants in the International workshop on *Local Government Reform: Privatization and Public-Private Collaboration* held in Barcelona on June 12–13th 2006, where a preliminary version of this paper was presented. We also thank two anonymous referees and the editor for useful comments.

Appendix

Table A1 Main characteristics of the studies analyzed

Study	N[1]	Country	Year data	Service	Num. municipalities	Method
Ferris (1986)	1	USA	1982	43 services	447	OLS
McGuire et al. (1987)	1	USA	1979-1980	School bus	51	Logit
Feldman (1986)	1	USA	1980	Urban buses	67	Probit
Morgan et al. (1988)	1	USA	1982	56 services	447	OLS
Ferris and Graddy (1988)	8	USA	1982	Several services	178–995	Logit
Dubin and Navarro (1988)	1	USA	1974–1975	Solid waste	204	Logit
Stein (1990)	13	USA	1982	Several services	1433	Logit
Benton and Menzel (1992)	1	USA	1988–1989	76 services	57	OLS
Miranda (1994)	1	USA	1982	64 services	263	OLS
Chandler and Feuille (1994)	1	USA	1973–1988	Sanitation	740	Logit
Ferris and Graddy (1994)	1	USA	1982	Local health Services	471	Logit
Hirsch (1995)	1	USA	1980	Solid waste	93	OLS
Greene (1996)	1	USA	1988	70 services	188	OLS
Nelson (1997)	1	USA	1992	63 services	1221	Logit
López-de-Silanes et al. (1997)	6	USA	1987	12 services	3042	Probit
Kodrzycki (1998)	1	USA	1992	Several services	644	Logit
Ménard and Saussier (2000)	1	France	1993–1995	Water	2019	Logit
Warner and Hebdon (2001)	1	USA	1997	8 service areas	201	Logit
Warner and Hefetz (2002)	1	USA	1997	8 service areas	1025	Probit
Bel and Miralles (2003)	1	Spain	1979–1998	Solid waste	41–90	Probit
Dijkgraaf et al. (2003)	1	Netherla.	1998	Solid waste	540	Logit
Ohlsson (2003)	1	Sweden	1989	Several services	115	Probit
Martínez Rodríguez (2004)	7	Spain	2000	Several services	576	Logit
Walls et al. (2005)	2	USA	2001	Solid Waste (recycling, disposal)	980–912	Logit
Zullo (2005)	2	USA	2002	Several services, solid waste	1530–2183	Logit
Perard (2007)	1	USA	2002	Water	459	Logit
Bel and Fageda (2008)	2	Spain	2003	Solid waste, water	115–456	Logit
Brown et al. (2008)	1	USA	1997	Several services	625	Logit
Hebdon and Jalette (2008)	1	US-Can.	2004	Several services	1493	OLS
Levin and Tadelis (2008)	1	USA	1997	30 services	914	Logit
Miralles (2008)	1	Spain	1980–1996	Water	133	Duration
Mur (2008)	2	Spain	2003	Solid waste, water	70–74	Logit

Note 1: Number of observations obtained from the corresponding study

Note 2: The work by Christoffersen and Paldam (2003) is not included as observation in the meta-regression since it is a bivariate and not a multivariate empirical analysis of local governments' production choices

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