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Public - private interdependence: An effective tool in water supply services

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Abstract. The paper aims to study the impact of certain determinants on the choice of local authorities to use public - private interdependence for the provision of water supply services, based on the Spanish and Romanian local experiences. Being aware of their impact, the authorities could place a particular focus on the determinants that lead to local development. Several studies reveal that public – private interdependence is a powerful tool for building local development (Melo & do Carmo, 2008; Dessi & Floris, 2009) and states are interested in finding out ways to obtain it. The complex methodology of the paper was designed in accordance with the particularities of each country studied. Gathering the data for Romania implied conducting several interviews, and for Spain survey, exploratory analysis and semi-structured interviews were applied. The determinants' influence was tested through logit or linear probability model. The analysis validates that population, density of population, indirect taxes, affiliation of the city representative to a certain political party is influencing the option of local public authorities. The paper brings recommendations on promoting public - private interdependence in water supply services. The paper is mainly valuable for the parallel that is made between Spain and Romania in water supply services and it brings progress in comparative country cases.

Keywords: partnership, concession, Spain, Romania, econometric model

1 Introduction

Several studies have discussed the low capacity of the public sector to handle on its own the provision of quality services of general interest (Pessoa, 2008; Stolt, Blomqvist, & Winblad, 2011), despite there are cases when corporate public sector organizations are considered a feasible alternative (Silvestre, 2012). In these times of economic crisis it is becoming increasingly difficult to ignore the need for private providers of services of general interest who could diminish the pressure on the public sector. The public sector could overcome several constrains and deliver efficient and effective public services by applying private sector principles, as stated in the New Public Management (NPM) theory (Hall, Holt, & Purchase, 2003; Zhonghua & Ye, 2012; Aykac & Metin, 2012). Burger and Stare (2010, p. 481) point out that trends in public management focus on "the involvement of private sector in the provision of public services and the proliferation of public private partnerships in service provision".

States that realize the importance of the collaboration with the private sector, by combining the expertise of both sectors, could succeed in building a sustainable society (Department for International Development [DID], 2008). Developing states interested in progressing towards accomplished societies are recommended to adopt a medium and long term strategy based on public – private alliances (Devlin & Moguillansky, 2009). Such alliances constitute forms of public – private interaction between the extremes of public sector as the sole provider of services of general interest and privatization. According to Melo and do Carmo (2008, p. 4) public – private interdependence

generates "sufficiently lasting and consistent synergy forms to promote the necessary conditions for development". This paper adopts a similar view, whereby public – private interdependence could be considered a catalyst in achieving local development (Dessi & Floris, 2009). Local development seen as a deliberately induced process of improving the welfare of local communities should constitute the main purpose of the public sector in order to create competitive local economies, stimulate economic growth and ensure better living conditions for the inhabitants (Tăchiciu, Yankov, & Balalia, 2010). So far, however, there has been little discussion about using public - private interdependence in providing services of general interest as a tool for local development. The case of two countries with different levels of development is discussed in this study.

Based on recent evidence putting forward the idea that the quality of life is increasing when the water supply services are externalized or provided by mixed companies (Cuadrado-Ballesteros, Garcia-Sanchez, & Prado-Lorenzo, 2012), this paper will examine the particular case of water supply services at local level in Spain, as an example of a developed country, and Romania, as an emerging country (International Monetary Fund [IMF], 2009).

Several benefits of promoting public – private interdependence at local level can be mentioned, such as savings in public expenditure, high quality and efficiency of services of general interest and more effective programs (Bob & Balalia, 2010; Xie & Stough, 2012). Conversely, there are cases when the involvement of the private sector in the water supply is not the best solution because of the concession contract failure (Shwartz, 2008). But as Ancarani (2009, p. 3) stated, the success or failure of an arrangement for service delivery highly "depends on how well governments can manage the entire contract process". Along these lines, the study will focus on testing determinants that have impact on local authorities" choices of collaborating with the private sector for the provision of water supply services. A similar research question was explored in a study by Levin and Tadelis (2010) about the determinants that make the government take privatization decisions in practice. As a state interest is to promote local development and the public – private interdependence proves to be an effective tool for it, the identification of such determinants can facilitate the formulation of valuable public policies.

This paper starts by giving a brief overview of the Spanish and Romanian territorial administrative structure and the legislation that supports the provision of water supply services at local level. The second part of the paper deals with formulating the hypotheses that are econometrically tested. In the third part, based on the collected data, the emphasis will be placed on the relevant elements that differentiate the Spanish and Romanian experience on water supply services. Econometric models are formulated and commented on in order to identify the impact of determinants on using the public – private interdependence for water supply services. Finally, based on the comparison between the Spanish and Romanian local authorities" contracting choices, policy recommendations on promoting public – private interdependence for the provision of water supply service are made.

2 Territorial administrative structure and regulations on water supply services

Services that should be provided within the municipalities ("municipalidades" in Spanish) in relation to the population hierarchy are specified in the Spanish legislation. As Chirleşan (2007) stated water supply, waste collection, street cleaning and public transport are among the main services that need to be offered by the local public administration authorities to their citizens. Regarding Romania, the provision of the mentioned above services is also assumed by the local public administration authorities.

Terminologically, the Spanish term "municipalidad" is used with the same general meaning as "city" in Romania. The territorial administrative structure indicates that Romania is formed of 42 counties, each of them having at least one city named municipality with more than 40,000 inhabitants with impact on the development of the country. There are 104 municipalities in Romania out of which 42 represent the county capitals. The province capitals of Spain are placed at the same level with the county capitals of Romania. While Romania has 42 counties, Spain is composed of 50 provinces and two autonomous cities. In this context, the focus is placed on the water supply analysis at the local level, namely the county capitals of Romania and province capitals of Spain. The Local Council and the mayor of each county or province capital are associated with the local public administration authorities. A feature that differentiates Spain and Romania worth mentioning because of its potential influence on the research reported here refers to the mayor's election. In the case of Spain, the mayor is chosen from among local councilors and by them, which induces a political orientation of the Spanish executive power (Bel, Dijkgraaf, Fageda, & Gradus, 2010). In contrast to Spanish practice, the local elections in Romania imply the vote of citizens for the mayor candidates. The legal framework for water supply services in Spain and Romania constitutes the starting point in finding out the modalities (mode of provision and contractual form) under which the service is provided to its final users. The Spanish basic law that regulates the provision of services of general interest is constituted by Law 48/1998 that establishes procedures regarding the contracting process in the water, energy, transport and telecommunications sector. In brief, the forms of direct management means providing services of general interest by the local management entity itself through a publicly owned company differ from the indirect forms of management that are mainly represented by concession, interested management, "concierto", lease and joint venture (Law 30/2007 on public services contracts (article 253); Wagner, 2008).

According to a study conducted by Spanish Water Supply Company in 1999, the mode of providing water supply services is directly related to the number of inhabitants within a city, as follows: in cities with fewer than 10,000 inhabitants the water provision is mainly ensured by the Local Corporation while in those with up to 20,000 inhabitants the tendency is in favor of concession. The study by Ordonez de Haro and Martinez (2003) reinforced that within the cities with more than 20,000 inhabitants the participation of private enterprises that offer the water supply services under the legal status of concession or lease is extensive. Practice has revealed that municipalities in Spain are associating for the provision of services of general interest under the name of "Mancomunidades" that have legal personality and capacity. Similarly, water supply operators in Romania are forming Intercommunity Development Associations (IDA)[1]. In the case of Romania, there is a general law that stipulates the regulation of public utilities services, ie Law 51/2006, and a particular law dedicated to water supply services and sanitation, ie Law 241/2006. According to Law 241/2006, water supply services are including "all activities of public utility and general economic and social interest" in order to capture, treat, transport, store and distribute drinking or industrial water to the users of a certain locality (article 3 (A) (b)). Within the content of these laws it is stipulated that both direct and indirect modes of public utility services management can be used in Romania. Direct management is achieved by local authorities through their own structures. In contrast, the delegated management of public utility services can be put into practice by operators as companies with public, private or mixed capital. According to article 30 paragraph 5 (Law 51/2006) management delegation agreements may

[1] IDAs are defined in the Law 51/2006 (article 2 (a)) as a "cross-community association between two or more administrative territorial units, represented by local authorities, for the establishment, development, management and / or common exploitation of public utilities systems and supply / provision of public utilities services to the users situated on the jurisdiction of the associated administrative - territorial units".

take the form of concession contract and public - private partnership contract. For signing these contractual forms, the local public administration authorities should ensure that the best value for the ratio money - quality and the satisfaction in the best conditions of the general public interest of local communities are obtained (Law 51/2006, article 22 paragraph (4)).

The legislation of both countries notifies the existence of several categories of operators, which according to their legal status, are divided into: local administrations, autonomous, publicly owned companies, privately owned companies, mixed capital companies, and even joint ventures resulting from the association of different operators (Romania) or interest management (Spain). Even though there are several options, the responsibility for providing services of general interest in the case of both countries is taken on by the local public administration authorities. Additionally, the authorities have the option to provide the services through their own structures or participation in inter - municipal cooperation (Spain)/ intercommunity development associations (Romania). On the opposite side, there is privatization that implies delivering water supply services by privately owned companies. Between these two modalities, various modes of public – private interdependence are developed. The interdependence is manifested through mutual actions and reactions between public and private sector with the purpose of providing water supply services to the citizens. In the particular case of Spain and Romania, concession and Public – Private Partnership are the main contractual forms undertaken by public - private interdependence. The relevance of partnerships between public and private sector for water supply services is also highlighted by experts in water governance (Tortajada, 2010).

3 Methodology

The main objectives of the analysis conducted in Spain and Romania are set as follows:

O1: Identification of the options adopted by local public administration authorities (county or province capitals, depending on the case) for the provision of water supply services in Spain and Romania.

O2: Identification of the influence of certain determinants on the options adopted by local public administration authorities for the provision of water supply services through public – private interdependence, in the case of Spain and Romania.

Bel and Fageda (2008) emphasize the positive impact of private actors' involvement in providing services of general interest often observed in the technical efficiency obtained with lower costs compared to the provision of services strictly by the public sector. The same authors (2008) highlighted the presence of the interest groups that influence the option of local factors of political decision concerning the public services' provision. They have also demonstrated that the decision to privatize is conditional on the existence of pressure groups that have a certain interest in achieving a service in one form or another. Additionally, their research confirmed that those who have won the elections in a democratic system and are in charge put their mark on the society through their ideological visions. Moreover, another determinant represented by fiscal constraints may prove its positive influence on the option for privatization of a public service (Bel & Fageda, 2008).

Bel (2009) argues that privatization is also affected by the decisions made by elected persons when applying certain policies. For example, between 1996 – 2003, the upward trend of PPP development in Spain was supported by the political implication of the People's Party in power. Positive results were obtained by providing quality public services at low cost through more effective involvement of the private partner (Allard & Trabant, 2008). However, there are analyses carried out in the municipalities

of Catalonia (Bel, 2006; Bel & Costas, 2006) and Aragon (Bel & Mur, 2009) that illustrate that differences in costs between provision of services by public or private entity are not significant. The arguments underpinning this situation focus on the business concentration issues and limited competition in the area of services provided to citizens. Therefore, Bel (2009) suggests applying domestic alternative reforms by encouraging intermunicipal cooperation and creation of public and mixed enterprises. Intermunicipal cooperation refers to the participation of authorities in multigovernmental associations (Bel, Dijkgraaf, Fageda, & Gradus, 2010).

A recent study by Benito, Bastida and Garcia (2010) involved testing the efficiency rate of services in Murcia, a region of Spain, by taking into consideration the economic level, municipality dimensions, decentralization, political apparel and financial situation. The results of the study indicated that public management, through a publicly owned company, is by far a more efficient option compared to private management. Nevertheless, the studies made by Martinez-Espineira and Garcia-Valinas (2009) on 53 main municipalities in Spain revealed that a significant positive effect on the price of water supply services is obtained by privatization.

Summing up, Ruiz-Villaverde, Garcia-Rubio and Gonzalez-Gomez (2010) propose in the case of water supply services the use of a cyclical trend as an alternation of periods between public and private management.

Providing services of general interest in Romania, compared to Spain, is a less discussed topic within scientific papers. Radu (2009) argues that in the 1990s water supply services and sanitation in Romania were dominated by public sector, but beginning with 2000, changes through privatization and decentralization have been implemented. These solutions have been adopted because of the need to improve the old infrastructure of utilities and develop new networks. The current trend is moving towards public - private partnerships, because of the local public administration authorities' purpose to diminish the pressure on the limited financial resources available to the public sector by sharing responsibilities and risks with private actors.

The discussion so far has pointed out the role of several determining factors that will be further investigated in this study. Those determinants are: the membership of elected mayor to a certain party, economic issues (ie indirect taxes) and municipality dimensions (ie population size, density of population).

Based on the literature review mainly related to water supply services in Spain, the hypotheses that are tested in this paper are formulated (Table 1). The main content of the hypotheses is similar for Spain and Romania, but some adjustments were made because of the scarce presence of evidence in the international literature regarding Romanian water supply services. The econometric models that are to be constructed include the determinants identified in the literature as affecting the option of local authorities to provide water supply services through public – private interdependence.

Table 1. Variables, hypotheses, variable's code and source.

Variable	Description of the variable	Hypotheses associated with the variable	Code of the variable within the model	Source of the variable
Option of the local public administration authorities for	Dummy variable with two variants: - public - private interdependence: private,	-	Interc (endogenous variable)	Own research

Variable	Description of the variable	Hypotheses associated with the variable	Code of the variable within the model	Source of the variable
providing the water supply services to citizens	mixed company - lack of public – private interdependence: local entity, public company			
Population	The total number of inhabitants within a country, region, city etc. (province capital of Spain or county capital of Romania)	H1: the population size has a positive influence on public – private interdependence.	pop (exogenous variable)	www.ine.es www.insse.ro
Density of population	Number of inhabitants per km^2 within the province capital (Spain)/ county capital (Romania)	H2: the density of population has a negative influence (mix between H1 and H2) on public – private interdependence.	dens (exogenous variable)	Calculated as pop/ sup
Indirect taxes	Fiscal incomes gathered at the state budget; excise tax, border tax, value added tax and other indirect taxes	H3: indirect taxes have a negative influence on public – private interdependence.*	ind_tx (exogenous variable)	www.ine.es
Party	*Spain:* Party 1: Partido Socialista Obrero Espanol (PSOE) Party 2: Partido Popular (PP) Party 3: Other parties *Romania:* Party 1: Partidul Democrat Liberal (PDL) Party 2: Partidul Naţional Liberal (PNL) Party 3: Partidul Social Democrat (PSD) Party 4: Other parties	H4: the membership of public administration representative (mayor) to a certain party** has a positive impact on public – private interdependence.	part1, part2, part3, part4 (exogenous variable)	www.mir.es (Ministerio del Interior in Spain) *www.beclocale2008.ro (Biroul Electoral Central in Romania)*

Table 1 includes both exogenous and endogenous variables. Data for the first type of variables are to be found at the sources indicated in the last column of the table. Regarding the endogenous variable, a piece of research was undertaken in order to mark the presence or lack of public – private interdependence for providing water supply services in the province or county capitals of Spain, respectively Romania.

In accordance with the particular situation of each country, distinct methods for Spain and Romania have been used in order to achieve full observation of the options available to local public administration authorities for providing water supply services in the province or county capitals, as appropriate. More precisely, the particularity of each situation is given by the presence or absence of a national authority that regulates and monitors the market of services of general interest within the country. The existence of the National Authority for Regulating Community Services on Public Utilities (NARCS), which is in charge with services of general interest is Romania, brings a solid base for research compared to Spain where a similar authority is missing.

In the case of Romania, the informal conversation interview proved to be one of the most practical ways of interaction with a representative of NARSC in order to obtain a clear picture of the current providers of water supply services within the county capitals. This type of interview requires that "questions emerge from the present situation and are naturally addressed" (Cohen, Manion & Morrison, 2006, p. 271). During several interviews, the NARSC representative answered open questions on how the water supply services in Romania are provided and on the contractual terms. As a result of the informal conversation interviews and requests for information, a list with the name of water supply services providers in the county capitals of Romania was obtained. Related to this, the following step involved running an exploratory analysis of the providers' web sites. During the exploratory analysis, open conversations with the NARSC representative were conducted in order to clarify the providers' type and conclude on the adopted contractual forms. The entire process of data collection started in December 2010 and was conducted until April 2011 when the information on 41 out of 42 county capitals of Romania was complete.

In the case of Spain, a series of steps were designed in order to obtain, with the appropriate methods, as much observations as possible on water supply providers in the province capitals. The process started with a survey based on a questionnaire, continued with an exploratory analysis of the web sites of each provider and ended up by carrying out semi-structured interviews with officials of the Local Councils.

Respondents to the questionnaire were officials of the Local Council, represented by the mayor or his/her councilors. The brief questionnaire was designed as follows: firstly, the identification question that refers to the name of the province capital, followed by a closed question on the provision mode of the water supply services, the third question referring to the used contractual form and the last question invited indication of the name of the water supply services operator. The response rate of this questionnaire was of 10%, and more actions were necessary in order to reach fuller data. Therefore, the exploratory analysis of the Local Council web sites was the second step that generated a considerable amount of information. In order to complete the database, semi-structured interviews were carried out over the phone with officials in charge with water supply service within the Local Council. The information was obtained on the spot or by using electronic correspondence. The process of gathering information in Spain lasted from November 2010 to January 2011 and a full database was obtained.

The research describes the situation on the provision of water supply services at the local level in Romania and Spain and has hopefully captured a complex reality.

4 Results and discussion

4.1. Descriptive analysis

Starting with descriptive analysis, the most common mode of providing water supply services in Spain is constituted by indirect management through private and mixed companies, covering 61% of the total cases. This result illustrates the interest of local public administration authorities to allocate the provision of water supply service to the private sector, while maintaining the responsibility for the service. Aquagest, part of the Grupo Fomento Construcciones y Contratas, and Aqualia, part of the Grupo Agbar, are two of the main companies that provide this service in Spain. In contrast, the direct mode of providing the service to the citizens by the local entity is positioned. As regards the direct management by a publicly owned company, it occupies a noticeable share out of the provision modes of water supply services in province capitals and autonomous cities of Spain, especially where large public companies have strengthened their position over time.

If in Spain direct management through a publicly owned company is noticeably present on the market, in Romania this variant has even a more dominant position. 95% of the modes of providing water supply services in Romania are represented by the intercommunity development associations that have the status of public companies with mixed capital between Local Councils and County Councils. The diversity of the percentages allocated between the councils involved in IDA generates difficulties in the distribution of power between authorities and as a result, the division of responsibilities is hard to be achieved. In brief, the water supply services in Romania are preponderantly under the administration of companies with public capital through the intercommunity development associations, with Apa Nova as the only company with public - private capital that operates within two out of the 41 analyzed county capitals in Romania. The strategy of the Municipality of Bucharest, drafted in 1993, and revised in 1997, regarding the development of the water supply and sewage services was the starting point in the process of signing a Public - Private Partnership, under concession (Radu, Lefter, Şendroiu, Ursăcescu, & Cioc, 2008, p. 132). Further on, the company managed to penetrate the market in year 2000 due to "the incapacity of the local and central public administration authorities to ensure by their own funds the rehabilitation and the development of the water supply and sewage services" (Radu et al., 2008, p. 123) according to indicators of quality of the service focused on consumer satisfaction and environmental protection.

As regards the contractual form used for the provision of water supply services, the result of this study indicates that concession and Public – Private Partnership contracts are the two main types that are present in the majority of cases of indirect management in both Spain and Romania. These contracts are applicable also in the case of management through a publicly owned company in Romania, which is considered, according to the law, an indirect mode of providing services. In the case of direct management by the local entity or a publicly owned company, the contractual type is included in the "other options" variant, because concession or public - private partnership contracts are not applicable to this context.

It is interesting to note that the management of water supply services through a company with mixed capital may cover two contractual situations encountered under the form of Public - Private Partnership or public distribution of shares. "Public - Private Partnership" is recorded when the company was formed through the contribution of both the Local Council of municipality and a private actor. "Other options" is a reliable variant for the management of mixed capital companies when the

company is basically publicly owned and at a certain moment the option for selling shares to private actors is expressed.

The current study found that in Spain the water supply services are equally provided by concession contract as "other options", with 44% for each of the two variants. The cases in which the service is supplied through a company with mixed capital by using Public - Private Partnership contracts represent 12% of all variants. Based on the results of the undertaken research, it has been observed that in most Romanian county capitals the most widely encountered type of contract between local authorities and the intercommunity development associations takes the form of concession, associated to indirect management. The dominance of this type of contract is explained by the Romanian legislative framework that requires public utilities to be provided only by concession or Public - Private Partnership contract, and as the legislation for the latter type of contract was repealed for a period of time, the concession contract remained the only option for the local public administration authorities. In consequence, both indirect management modes encountered for water supply services in Romania involve only the use of the concession contract.

4.2. Econometric model

Turning now to the econometric model, the appropriate method is chosen in accordance with the established hypotheses, available data and the type of variables. A dummy variable as dependent variable (Y_i), which captures the modes of providing water supply services, and an explanatory variable (X_i), also a dummy variable, namely the "party" that takes value 0 or 1, indicate that the probability model is the most appropriate one to be used in this context. Maddala (2008) and Gujarati (2003) argue that a probability model can be addressed by three different ways represented by the linear probability model (LPM), logit model or probit model.

The first model refers to the least squares method, while logit and probit models imply the use of maximum likelihood method (Gujarati, 2003). In brief, the LMP is a linear regression model where the dependent variable Y_i is dichotomous and indicates the occurrence of an event or not. In LMP, probabilities increase linearly with X_i, and the model has the form as in equation (1).

Equation 1. Model of LMP

$$Y_i = \beta_1 + \beta_2 X_i + u_i$$

with Y_i= 1 if the event happens
0, if the event does not happen.
Logit and probit models are differently formulated, as in equation (2).

Equation 2. Model of logit and probit

$$y_i^* = \beta_0 + \sum \beta j x_{ij} + u_i$$

with y_i^*, defined as the latent variable which is not observable.
with Y_i= 1 if $y^* > 0$
0, if $y^* \leq 0$
Overall, it is recommended to use a logit or probit model prior to LMP due to its heteroscedasticity problems that may appear. The models indicate the probability that the public local administration authorities choose the provision of water supply services through public – private interdependence in relation with the exogenous variables.

Y_i from the formula is the variable corresponding to the choice of local public administration authorities for providing water supply service through public – private interdependence, noted as INTERC, and has the following options:
1: there is public – private interdependence for the provision of water supply services;
0: there is not public – private interdependence for the provision of water supply services.

The first option is assimilated with the provision of service by indirect management through a private company or a company with mixed capital. In contrast is positioned the second option that can be found in the cases of direct management by the local entity or a publicly owned company.

The analysis in the case of Spain includes 47 province capitals out of 52, because of the lack of data regarding indirect taxes. Before constructing the model, the multicolinearity of the variables was tested through the results registered in the correlation matrix presented (Table 2).

Table 2. Correlation matrix in the case of Spain.

	POP	DENS	IND_TX	PART1	PART2	PART3
POP	1.000000	0.415839	0.741545	-0.094922	0.074143	0.036068
DENS	0.415839	1.000000	0.325241	-0.145078	-0.065866	0.284832
IND_TX	0.741545	0.325241	1.000000	-0.157767	0.230575	-0.088782
PART1	-0.094922	-0.145078	-0.157767	1.000000	-0.642262	-0.333196
PART2	0.074143	-0.065866	0.230575	-0.642262	1.000000	-0.456532
PART3	0.036068	0.284832	-0.088782	-0.333196	-0.456532	1.000000

As shown in table 2, there is no multicolinearity between the group variables, because the values registered by the correlation coefficient are not next to the -1 or 1 extreme value. Further on, the equation (3) stands as logit model in the case of Spain.

Equation 3. Logit model for the case of Spain

$$INTERC = C(2)*POP + C(3)*DENS + C(4)*IND\_TX + C(5)*PART2 + C(6)*PART3$$

In addition, the results obtained by using the Eviews programme are presented (Table 3).

Table 3. Logit model estimation results of parameters in the case of Spain.

Dependent Variable: INTERC

Method: ML - Binary Logit (Quadratic hill climbing)

Sample: 1 47

Included observations: 47

Convergence achieved after 12 iterations

Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.244032	0.612476	0.398435	0.6903
POP	9.09E-06	4.53E-06	2.005230	0.0449
DENS	-0.000348	0.000170	-2.049491	0.0404
IND_TX	-1.93E-07	9.80E-08	-1.967554	0.0491
PART2	2.236811	0.911261	2.454633	0.0141
PART3	1.275449	1.048627	1.216304	0.2239
Mean dependent var	0.617021	S.D. dependent var		0.491369
S.E. of regression	0.408734	Akaike info criterion		1.179882
Sum squared resid	6.849597	Schwarz criterion		1.416071
Log likelihood	-21.72723	Hannan-Quinn criter.		1.268762
Restr. log likelihood	-31.27867	Avg. log likelihood		-0.462282
LR statistic (5 df)	19.10287	McFadden R-squared		0.305366
Probability(LR stat)	0.001839			
Obs with Dep=0	18	Total obs		47
Obs with Dep=1	29			

As Table 3 shows, there are several variables that are validated at the p=0.05 level. The results of this study indicate that the population of municipality, density of population, indirect taxes and party 2 has influence on the options adopted by local public administration authorities for the provision of water supply services through public – private interdependence. The correlation between the dependent variable and the exogenous variables is supported by the medium level of pseudo-determinative coefficient, which recorded a value of 30%.

These results regarding Spain need to be interpreted with caution, because in the case of logit or probit models the sign is taken into account, rather than the number itself[2]. Thus, a positive relationship between the population of municipality and mayor affiliation to party 2 and the probability of providing water supply services by public – private interdependence is recorded. Additionally, the results emphasize an indirect relationship between the density and indirect taxes and the probability of providing water supply services by public – private interdependence. Therefore, hypotheses H1, H2, H3 and H4 for the particular case of party 2 are confirmed. Similar to the research conducted for Spain[3], data from Romania refers to 41 county capitals out of 42. Before applying the appropriate

[2] There is not a marginal value, as in the case of LMP when applying the least squares method.
[3] Variables included in the model of Romania are mainly based on the literature associated to the Spanish experience than on Romanian facts, because of the lack of appropriate literature on the particular case of Romania. Data regarding indirect taxes in county capitals of Romania are not available.

method, the multicolinearity of the variables included into the model has to be checked. In this sense, the correlation matrix is shown (Table 4).

Table 4. Correlation matrix in the case of Romania.

	POP	DENS	PART1	PART2	PART3	OTHER_PART
POP	1.000000	0.427838	-0.065760	-0.115301	-0.069985	0.303596
DENS	0.427838	1.000000	-0.077496	-0.112693	0.113460	0.080870
PART1	-0.065760	-0.077496	1.000000	-0.362994	-0.514614	-0.331231
PART2	-0.115301	-0.112693	0.300520	1.000000	-0.291878	-0.187867
PART3	-0.069985	0.113460	-0.514614	-0.291878	1.000000	-0.266338
OTHER_PART	0.303596	0.080870	-0.331231	-0.187867	-0.266338	1.000000

As it can be noticed, there is no multicolinearity between the group variables, because the values registered by the correlation coefficient are far from the -1 or 1 extreme value. Based on this, the projection of the model could continue, but not before selecting the most appropriate method.

The dominance of the 0 variant for the endogenous dummy variable, marking the lack of public – private interdependence for the provision of water supply services in Romania, is generating errors within the programme when applying the logit model. The small variability in the sample allows only the use of linear probability model and makes it difficult to obtain robust results. In order to go further with the investigation in the case of Romania, the LPM is applied. The LPM hides enough problems, but the most important is heteroscedasticity, involving the presence of unequal variances (Asteriou & Hall, 2007). A favorable situation is encountered when there is no autocorrelation between the residuals, meaning that the model is homoscedastic. The model for Romania has the equation (4).

Equation 4. The LPM for the case of Romania

$$INTERC = C(1)+ C(2)*POP + C(3)*DENS + C(4)*PART2 + C(5)*PART3 + C(6)*OTHER\_PART$$

In addition, by applying the White test with cross terms, the following results are obtained (Table 5).

Table 5. White test results for the LPM in the case of Romania.

White Heteroskedasticity Test:			
F-statistic	0.587095	Probability	0.850798
Obs*R-squared	9.848018	Probability	0.773209

The corresponding value of Durbin - Watson is around 2 and LM (9.848) < $\chi^2_{0,05;6}$ (12. 591), therefore the conditions for homoscedasticity are accomplished and the results of the model can be interpreted (Table 6).

Table 6. LPM estimation results of parameters in the case of Romania.

Dependent Variable: INTERC
Method: Least Squares

Sample: 1 41

Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.039820	0.050309	-0.791523	0.4340
POP	4.85E-07	1.02E-07	4.762264	0.0000
DENS	9.37E-06	1.30E-05	0.718888	0.4770
PART2	-0.035220	0.073915	-0.476500	0.6367
PART3	-0.064357	0.062673	-1.026865	0.3115
OTHER_PART	-0.016499	0.080912	-0.203909	0.8396
R-squared	0.512854	Mean dependent var		0.048780
Adjusted R-squared	0.443262	S.D. dependent var		0.218085
S.E. of regression	0.162724	Akaike info criterion		-0.659067
Sum squared resid	0.926765	Schwarz criterion		-0.408301
Log likelihood	19.51088	F-statistic		7.369419
Durbin-Watson stat	2.063243	Prob(F-statistic)		0.000083

The value of the "population" parameter suggests that reported to p=0.05 level only H1 can be validated in the case of Romania. Thus, the population has a positive influence on the option of local public administration authorities to provide water supply services through public – private interdependence. The coefficient of determination indicates a well-defined model, because of the high recorded value of 0.51.

Overall in Romania, the provision of services of general interest is poorly represented by modalities that imply interdependence between public authorities and private actors. In this respect, some considerations are given as justification:

- Water supply services involve high levels of investment and private actors are not always willing to commit themselves;
- Public - private interdependence implies transaction costs that both the public and private sectors may be reluctant to accept;
- Local public administration authorities creating Intercommunity Development Associations are keen on generating economies of scale;
- The legal framework needs improvement in order to allow private actors to be involved in providing services of general interest. The Law of Public Private Partnership in Romania was drafted with this purpose in view

- Reluctance of local authorities' leaders to develop interdependence with private sector for various reasons related to political orientations;
- Provision of services of general interest can be an unprofitable business for private actors, given the lack of subsidies which are no longer granted by the public sector starting with the concession or public - private partnership contract.

The only similarity between Spain and Romania regarding the determinants which influence the option of local public administration authorities for the provision of water supply services is represented by the positive impact of "population" on the probability of delivering water supply services through public - private interdependence in Spain and on the option itself in Romania.

5 Concluding remarks

The paper starts by presenting the trends in public management regarding the involvement of private actors in the provision of services of general interest (Burger & Stare, 2010). Moreover, the paper focuses on public – private interdependence as an effective tool for water supply services at local level. The present study sustains that public – private interdependence in the case of water supply services have a positive impact on life of citizens (Cuadrado-Ballesteros et al., 2012), and implicitly contributes to local development. The study investigates the modes used by the local public authorities for offering water supply services in Spain and Romania and evaluates the determinants with impact on the choice of those modes. By way of conclusions some mutual recommendations between Spain and Romania can be drawn from this study. Similar countries to Spain, respectively Romania, could follow the recommendations formulated in this paper.

The results indicate that the private actors' presence is noticeable in the area of water supply services in Spain compared to Romania, which is at an incipient stage. A measure that can be implemented for the progress of private involvement in providing water supply services lies in the power of local authorities to initiate, stimulate and sustain competition among private actors, starting with the requested taxes and selection criteria made public for auctions.

The findings of this study suggest that ideological vision of elected community officials put their mark on society and validate the positive impact of parties regarding the development of PPP in Spain. There is, therefore, a definite need for people with vision towards public - private interdependence, as part of the local public administration authorities.

A problem that both countries have to face is the power distribution between public entities, because of the blurry delineation of duties between the City Council and County (Romania) or Provincial Diputacion of a certain province and Local Council of a municipality (Spain). Thus, a clear delimitation between the duties that are assumed by each of the administrative level is recommended. While this problem has to be solved, IDAs in Romania are bringing advantages in what concerns the potential gain represented by economies of scale.

A major difference between the two countries' experience starts with the distinct view on economies of scale. In the case of Romania economies of scale are a benefit for the society as a whole, because of the public entities involved; as for Spain, these are attributed to private operators that are part of groups of companies motivated mainly by their own interest. The latter situation may have double impact: negative by the presence of a limited competition on the market, due to the dominance of certain groups that "impose the rhythm", and positive by access to innovation, investment support, and

other elements that have impact on service quality. An implication of these findings is that both Spain and Romania should take into account the mix between companies in order to create strong groups that can take charge of large programs of investment, but under the strict supervision of public administration authorities that have to ensure the competitiveness among operators of services of general interest.

A final mutual suggestion applicable to similar countries refers to the construction of reforms for public – private interdependence that ensure the competition between private actors at the time of their selection by public authorities.

The current findings will serve as a basis for future studies that generally imply comparison between Spain and Romania regarding services of general interest, and particularly refer to water supply services in Romania. Moreover, this study has an important implication for future practice, because the local public authorities that are aware of the relevant determinants have the opportunity to develop or diminish their impact in favor of public – private interdependence.

However, with a small sample size, caution must be applied, as the findings might not be transferable to all the localities from Spain or Romania. Additionally, due to the lack of variance among the options of providing water supply services in Romania, the econometrical model hardly allowed testing the influence of the determinants on the dependent variable.

Further research might explore the extension of econometric models by including other or more variables that are less visible in the international literature, but tend to be relevant in practice, such as the geographical region where the city is included. Adding variables to a model implies also recording additional observations, so that the models could be designed to extended variants for all municipalities in Romania or for all cities with over 35,000 inhabitants, as is the population of Teruel- the smallest province capital in Spain. Further work needs to be done to establish whether the included determinants have similar influence on public – private interdependence for another type of service of general interest.

Finally, the public – private interdependence could be tested as a solution to several problems that González-Gómez, GarcíA-Rubio and Guardiola (2012) have spotted in urban water services in Spain

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