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Has efficiency improved after the decentralization in the water industry in Venezuela?

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ABSTRACT

The importance of water in life and health of population, especially in developing countries, justifies the comparative study of the performance of undertakings providing potable water and waste water collection. The main objective of this research is to investigate if the decentralization process has led to an improvement of the efficiency in the water industry. Using a stochastic frontier analysis, we show that technical efficiency of Venezuelan water companies remained around 84% and that decentralized companies were more efficient than the centralized ones. The main policy recommendation is that the process of decentralization in the water services should continue.

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1. Introduction

Access to potable water and sanitation is recognized by the United Nations as an essential right for the full enjoyment of life. Each person needs around twenty to 50 L a day free of harmful contaminants, whilst wastewater collection services contribute to improving the health of a population, often preventing the spread of disease.

Companies that supply water services have to provide for all the population for which it is responsible and, furthermore, must

guarantee that the supply of potable water is undertaken in accordance with the guidelines for quality required by the relevant agencies. Likewise, it is essential that effluent is collected and treated before being discharged into rivers, lakes, seas etc.

As is the case in many developing countries, in Latin America a large percentage of the population has no access to drinking water supply and wastewater collection; this problematic is even worse in rural areas. This creates significant health, social, economic and environmental problems that many agencies (United Nations, World Bank, Inter-American Development Bank, Organization of American States) have tried to mitigate through studies, counseling and investments to improve these services.

In the 70s the potable water supply service in Venezuela was characterized by low quality of water delivered, by a level of coverage about 76%, and a much lower coverage for sewerage. In

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1985 steps were taken to increase the level of coverage and in 1989 started a restructuring of the sector with the creation of the public company Hidroven, whose responsibility is to establish guidelines for the management, operation, maintenance and expansion of water systems and develop policies and programs on water supply, collection and treatment of wastewater. At the same time, 10 subsidiary companies of Hidroven were created, with the Venezuelan government as the main shareholder. Later, in a gradual process of transferring management of the sector to states and municipalities that lasted 20 years, nine decentralized companies were created; in this case the main shareholders are the state governments and the municipalities. Decentralization seeks to provide companies more flexibility and autonomy, both financially and in its management.

Moreover, with the aim to contribute to the improvement in the provision of services, committees called “technical water organizations” were established. They are permanent organizations that promote community participation for achieve, improve and monitor the quality in water and sanitation services and to promote a culture that values and preserve water resource and environment (Lacabana et al., 2008). In these organizations users participate in monitoring the quality, tariffs, coverage rates, investments and services.

In accordance with current regulations, the management of water supply services must be based on criteria of quality, company efficiency, reliability, equity, non-discrimination and profitability. The efficient management of companies secures return on capital and improves the price and quality of the product. However, water supply services have the characteristics of a natural monopoly. As such, the scarcity of competition provides few incentives to encourage efficient behaviour. One way of introducing competition between companies is to compare the performance between them, and determine in that way the degree of efficiency of one company's management in a fixed period in relation to the others.

Index number techniques are among the most commonly used in the measurement of the operation of companies. In Venezuela the parent company of the water sector, Hidroven, sets out indicators partial of management which provide comparative information on hydrological companies. Those indicators allow a simple way to describe the sector. However, to evaluate firms that produce more than one output using several factors, it is necessary to conduct a more comprehensive analysis in order to take into account the overall contribution of all production factors to the production.

In this context this study is of particular interest, as it applies an approach that establish comprehensive comparisons between companies; namely, it takes into consideration all the products and factors of production that effect the delivery of the service. In this way, we calculate the technical efficiency of the companies that deliver services for provision of potable water and collection of wastewater in Venezuela.

Efficiency can be assessed by employing econometric or frontier techniques. The latter can be calculated using parametric methodologies (Corton, 2003, 2011; Lin, 2005 for Peru; da Silva e Souza et al., 2007; Sabbioni, 2008 for Brazil) or non-parametric (Anwandter and Ozuna, 2002 for Mexico; Estache and Trujillo, 2003 for Argentina; Tupper and Resende, 2004 y Seroa da Motta and Moreira, 2006 for Brazil; Escalona, 2008 for Venezuela and Lin and Berg, 2008 for Peru). Some scholars have used both methodologies. These include, among others, Berg and Lin (2008) for Peru, Corton and Berg (2009) and Ferro and Romero (2011), who have compared companies in a number of Latin American countries.

The research undertaken in this study is original in various ways. Firstly, it applies a stochastic distance function for the first time to the calculation of efficiency of the water industry in

Venezuela. Use of this methodology, despite its many advantages, is still not very extensive; in fact, in it has only been applied two times in this sector. Secondly, we attempt to improve the characterization of the water industry. Thus we include variables to represent the two main services in this industry (supply of potable water and collection of wastewater), as well as considering all the productive factors (many studies suffer from one of these because of lack of data). Variables have also been incorporated to take into account the operating environment in which companies work. In doing so we ensure that measures of efficiency are not affected by the omission of variables. We also inquire into the factors that influence levels of efficiency in order to determine if the decentralized process has been successful in promoting efficiency in this industry.

The paper proceeds as follows: firstly, it describes the Venezuelan water industry. Section 3 presents the methodology applied to estimate technical efficiency using a distance function. In section 4 the data used are laid out. The results derived from the empirical application are presented in section 5. Finally, section 6 shows the conclusions of our research.

2. The Venezuelan water industry

In Venezuela the governing body for potable water supply, collection and treatment of wastewater and urban drainage is a government company: Compañía Anónima Hidrológica de Venezuela (Hidroven). At present, services for potable water supply and collection of wastewater are supplied by 9 centralized companies (which are accountable to the Central Government and are coordinated by Hidroven) and 8 decentralized companies, accountable to state governments and/or municipalities. Table 1 shows the characteristics of these companies.

In line with current regulations, the use of water is under the jurisdiction of the national executive authorities (through the Ministry of popular power for the Environment), while the

Table 1
Hydrological organizations in Venezuela.

Company	Area of operation	Length (Km ²)
Centralized		
HAndes	Barinas	35,200
	Trujillo	7,400
HCapital	Distrito Capital	1,930
	Vargas	1,172
	Miranda	7,950
HCaribe	Anzoátegui	43,300
	Nueva Esparta	1,150
	Sucre	11,800
HCentro	Aragua	7,014
	Carabobo	4,650
	Cojedes	14,800
	Falcón	24,800
HLago	Zulia	63,100
HLlanos	Apure	76,500
HPáez	Guárico	64,986
HSuroeste	Táchira	11,100
Decentralized		
CVG-GOSH	Amazonas	177,617
	Delta Amacuro	40,200
AMerida	Mérida	10,691
AMonagas	Monagas	28,900
APortuguesa	Portuguesa	15,200
AYaracuy	Yaracuy	7,100
HLara	Lara	19,800
AEjido	Mérida, municipality Campo Elías	609
HBolívar	Bolívar	240,528

Source: Hidroven. Authors.

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