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The role of water tariffs as a determinant of water saving innovations in the hotel sector

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ABSTRACT

The hotel sector is one of the biggest consumers of fresh water within the tourist economy.

However, the implementation of policies to increase water efficiency in this sector is still an ongoing process. Specifically, the research on the market-based motivational tools is limited. This study attempts to provide an insight to the role of water tariffs in the implementation of water saving innovations in Majorcan hotels. Using the framework of the Porter hypothesis, a model predicting the probability to implement this type of innovation is elaborated. The results show that hotels in the areas with the highest water tariffs are more likely to implement water-saving innovations than hotels in other locations. The paper discusses the challenges faced in order to achieve an efficient water tariff design for hotels, emphasizing the need for development of water consumption benchmarks and measuring of price elasticity as main directions for future research.

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1. Introduction

Tourism presents serious challenges for the management of water supplies. Though it is not considered an enormous problem on a global level (direct tourism-related water use is considerably less than 1% of global consumption), the situation differs at the regional level (Gössling et al., 2012). The most popular destinations are located in regions with warmer climates and low rainfall especially during the peak tourism seasons (Essex et al., 2004; Rico-Amoros et al., 2009). The deterioration of the water systems can have a significant negative effect on local residents' welfare and also on the destination's tourism life cycle. Water problems can disturb the progression of the destination and dislocate the trajectories of rejuvenation or sustainable growth into renewed decline by environmental crises (Essex et al., 2004).

Within the tourism industry, the hotel sector is recognized as a key water consumer and sewage producer (Chan et al., 2009). It has been established that people in hotels tend to use the pleasure behavior approach (Eurostat, 2009). Water consumption per person staying at hotels can exceed three times the average consumption of people living at home (Ministerio de Medio Ambiente, 2007). Responding to the need to increase water efficiency, a number of studies have been made analyzing most used water saving measures in the hotels, their efficiencies (Barberían et al., 2013; Chan et al., 2009; Charara et al., 2011; González and León, 2001; Wyngaard and de Lange, 2013), as well as examples of the inefficient practices in water management (Trung and Kumar, 2005). However, the development of policies for tourism in general and for hotels in particular to promote the implementation of such measures is a relatively new and ongoing process. Thus far, many of the existing water policy proposals have focused on voluntary approaches to promote water saving, such as fiscal incentives, awareness campaigns or voluntary certification schemes. Nonetheless, the effectiveness of these approaches has shown to be uncertain (Cashman and Moore, 2012).

One of the possible reasons for the low efficiency of the voluntary approaches is that water tariffs are subsidized by many governments (OECD, 2009). Though the guarantee of moderate prices for individuals and the competitiveness of the local businesses (Cashman, 2012), the subsidized tariffs present a considerable disincentive for water saving. Thus, Gössling et al. (2012) state that in order to raise awareness and to engage stakeholders proactively in water saving measures, considerable increases in water prices may be demanded. Kasim et al. (2014) elaborate a voluntary water management framework for hotels but also admit that generally low water tariffs are one of the most important challenges to the implementation of such frameworks in practice. Charara et al. (2011) suggest that in Barbados, a lack of success in reducing hotels' water consumption is linked to the fact that water bills represent less than 5% of their annual expenses. Recognizing this problem the European Water Framework Directive (European

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Commission, 2000) has established 2015 as a deadline for European Union countries to reform water price policies to provide adequate incentives for water saving. It recommends the use of economic instruments and pricing schemes that encourage a more efficient use of the resource.

Despite the numerous calls for research, to date, the role of water pricing as a driver of water efficiency in hotels has received a very limited attention from the academics. A recent work of Cashman and Moore (2012) makes a valuable contribution to the issue by analyzing the potential of the tradable permits system for water in the hotel sector of Barbados. The authors conclude that such a scheme would, in theory, motivate hotels to adopt water saving measures. Yet there are a number of important technical, administrative and social considerations that would need to be addressed. The present work aims to further contribute to the under researched topic of water pricing focusing on water tariffs as a possible tool to trigger the implementation of water saving innovations in hotels. Under the terms of water saving innovations we considered the implementation of both technical devices and water efficient processes in the hotels.

The empirical model to test the role of the water tariffs steams from the framework of the so-called Porter Hypothesis (Porter and van der Linde, 1995). The PH claims that firms may fail to reveal profitable environmental innovations due to the internal constraints. Efficient and stringent environmental regulation has a potential to overcome such constraints and trigger innovative response. The water tariffs are potentially a regulatory tool that the PH refers to. The OECD report "Managing Water for All" (2009) stresses the vital role of tariffs as a "core instruments of water policies" (OECD, 2009:74). Specifically, it argues that "well-designed tariffs are crucial for sustainable cost recovery and provide incentives to use water efficiently" (OECD, 2009:73).

The island of Majorca (Spain) was selected for this study for being a representative Mediterranean mass tourism destination characterized by the typical arid climate, highly seasonal tourism pattern and scarce water resources (Deyà and Tirado, 2011). Water consumption in Majorcan hotels in many cases exceeds the available industry benchmarks for the Mediterranean hotels (Table 1) making it essential to understand the driving forces behind water saving activities to be able to design effective water management policies on the island and in the similar destinations. For the empirical test we have used micro-data from 188 hotels operating in Majorca and the data on the water consumption tariffs and sewage fees applied to them. The tariffs design varies between local Majorcan council jurisdictions, thus making it possible to compare their effect on the water saving innovations and shed some light on the potential of tariffs as a water management policy tool.

The paper is structured as follows. It begins with the specification of the model estimating the effect of the water tariffs on the implementation of the water saving practices in hotels. Then, the data used, measurement of variables, in particular the relative stringency of the water tariffs, and the econometric analysis are explained. The paper follows with a discussion of the main results, conclusions and directions for future research.

2. The model

To elaborate the empirical model for testing of the water tariffs as a driving force in water saving innovations we use the framework of the Porter Hypothesis (Porter and van der Linde, 1995). The central idea of the PH is that pollution is generally a sign of an inefficient use of resources: "Pollution is a manifestation of economic waste and involves unnecessary or incomplete utilization of resources... Reducing pollution is often coincident with improving productivity with which resources are used" (Porter and van der Linde, 1995, p. 98, 105). The main assumptions of the PH why firms fail to improve their productivity is that the present business environment is characterized by the dynamic competition and rapid technological advances. The firms' organizational ineffectiveness and lack of experience addressing environmental issues make them overlook some profitable (cost-saving) environmental innovations. Therefore, Porter argues that "properly designed environmental regulations can trigger innovation" (Porter and van der Linde, 1995, p. 98).

Water saving measures seem to be a priori a type of innovation the PH refers to: they are cost-saving innovations. Importantly, there is ample evidence that hotels realize the potential of such practices. The studies of Ayuso (2007), Barberían et al. (2013), Bohdanowicz (2005), Bohdanowicz (2006), and Chan et al. (2009) show that the prospect of reduced operational costs from decreased consumption of water can be a major motive or the number one motive for innovations in the hotels due to their important economic potential. A study of the Hotel Technologic Institute estimates that the installation of the full range of low cost water-saving devices in a hotel would cost about 23€ per room and that the investment could be recovered in less than six months (ITH, 2014). Moreover, hotels are aware that water saving measures not only reduce costs but also affect demand. Adopting a strategy of environmental responsibility not only improves hotels' competitive advantage in terms of differentiation as tourists increasingly value environmental variables when choosing destinations and accommodation but also eventually increases a hotel's profitability (Molina-Azorín et al., 2015; Tarí et al., 2010). So, if the water saving has so many advantages for the hotels, why is the consumption of this resource in many of them still higher than good practice benchmarks? (Table 1). To shed light on this question, the empirical model to test the effect of firm's internal characteristics and water consumption tariffs on water saving innovations has been designed. The choice of variables and their measurement are explained in Sections 2.1 and 2.2.

2.1. Firm's internal variables related to environmental innovations

Firm's internal variables in the model stem from the main constraints to innovations mentioned by the PH: organizational inefficiency and the lack of experience addressing environmental issues. Porter and van der Linde (1995) mention three types of organizational ineffectiveness that impede firms aiming to find all profitable innovations: organizational inertia, the principal-agent problem and incomplete information. Organizational inertia is associated with the routines and procedures used in the firms. In the short run, such routines and procedures may improve a firm's efficiency, but in the long run, they may reduce the firm capacity to adapt to changing circumstances (Gabel and Sinclair-Desgagné, 2001). The principal-agent problem represents the situations when there are discrepancies between the objectives of a principal and an agent hired by the principal. In the case of environmental innovations, such discrepancies may appear if the manager lacks his or her own environmental values and his or her remuneration is not related specifically to the environmental performance of a hotel. Linking a manager's bonus to the achievement of environmental goals (Bonilla-Priego et al., 2011) and providing a monetary reward for employees for bringing "green" ideas seem to be possible mechanisms to engage staff in environmental innovations (El Dief and Font, 2012; Govindarajulu and Daily, 2004). Finally, the problem of incomplete information for the possibility for environmental improvements is particularly relevant to tourism firms. A recent OECD survey on green business model innovation in the tourism sector (OECD, 2012) reveals that the information gaps were the barriers most often mentioned by firms.

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