



Is water affordable for households? Some empirical evidence

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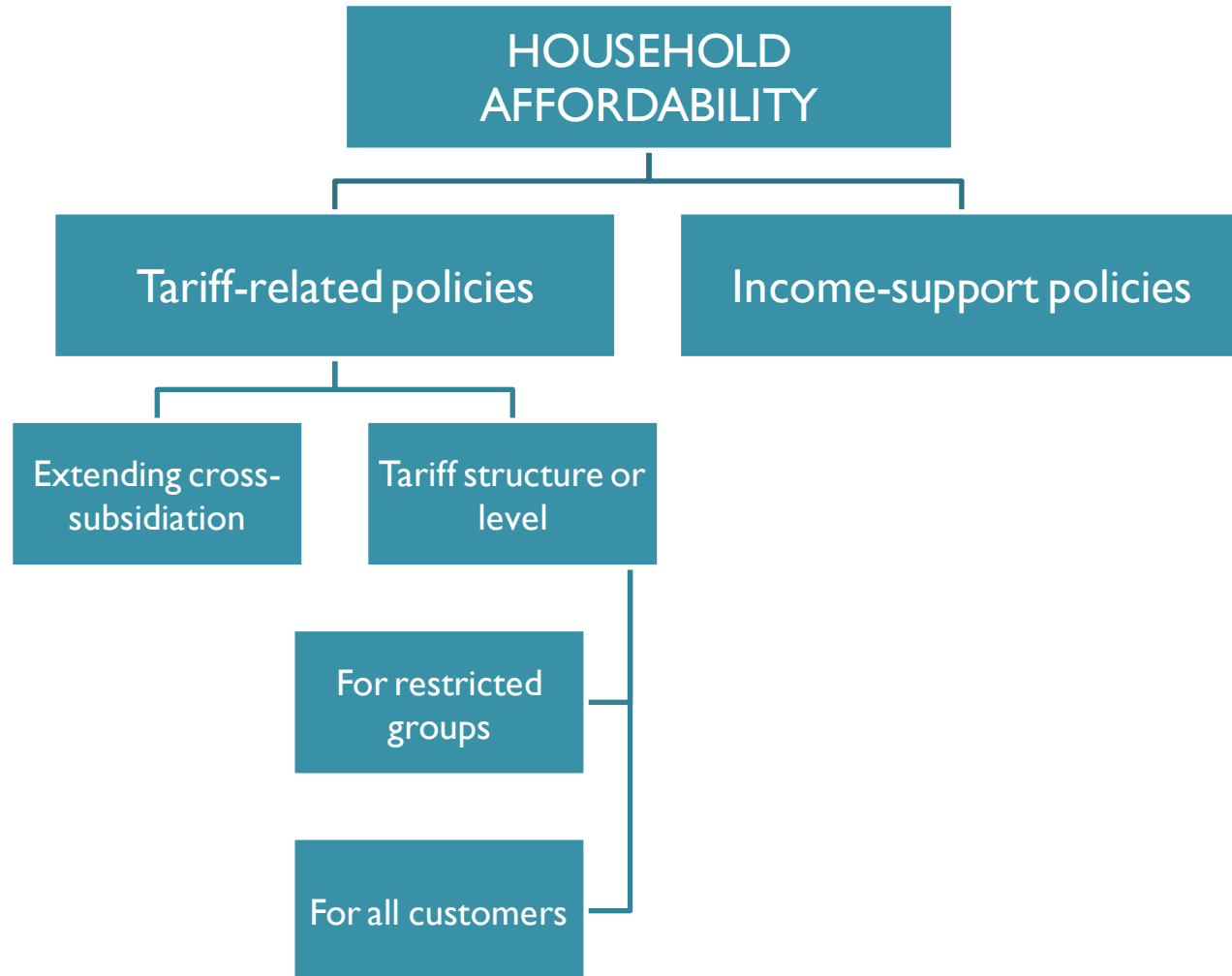
Outline

- Introduction
- Making water affordable
- Measuring affordability
- Future research

Introduction

- Is water affordable for households?
- Mechanisms and measures
- Some papers published:
 - Garcia-Valiñas, M.A., Martínez-Espiñeira, R. and González-Gómez, F.J (2010), “Affordability of residential water tariffs: Alternative measurement and explanatory factors in southern Spain”, *Journal of Environmental Management*, 91(12), 2696-2706.
 - García-Valiñas, M.A., Martínez-Espiñeira, R. and González-Gómez, F. (2010), “Measuring water affordability: a proposal for urban centers in developed countries”, *International Journal of Water Resources Development*, 26(3), 441-458.

Making water affordable



Making water affordable

Residential water tariff structures in Andalusia, 2005



Source: García-Valiñas, M.A., et al. (2010)

Measuring affordability

- Several affordability measures have been proposed → dividing water expenses by an index of purchasing power (OECD, 2003; Reynaud, 2008)

$$AI = WB/Y$$

- According to World Bank or OECD, households' water bills should not exceed 3%-5% of their income. Reynaud (2008) define "water-poor" household as *"a household spending 3% or more of its income for paying water charges"*.
- However, according to OECD (2003, p.37): *"The percentage of income spent on water for luxury purposes should be of no particular concern to those interested in social and affordability policies (...)"*
- In such a context, it becomes very important to distinguish between non- discretionary and "discretionary" water consumption.

Measuring affordability

Discretionary versus non-discretionary water uses

Residential water demand estimation derived from an Stone-Geary utility function

$$Q^w = (1 - \beta^w) \gamma^w + \beta^w (I / P^w)$$

γ^w : "minimum threshold"

- This functional form is showing strong habits
- Empirical studies: (Al-Qunaibet and Johnston 1985; Gaudin et al. 2001; Martinez-Espineira and Nauges 2004; Madhoo 2009; Meran and von Hirschhausen 2009; Nauges et al. 2009; Schleich 2009; Monteiro 2010; Garcia-Valinas et al. 2010; Dharmaratna and Harris 2012; Renzetti et al. 2015; Clarke et al. 2017; Roibás et al. 2018)

Measuring affordability

Stone-Geary utility function: some empirical results

- **Andalusia, Spain (301 municipalities; 2005)**
 - **Minimum threshold → Average household → 112 l/person/day**
- France (5,510 local communities; 1998, 2001, 2004)
 - Minimum threshold → Average household → 123 l/person/day
- Australia (2,141 households, Brisbane, 2009-2010)
 - Minimum threshold = Average household → 92-103 l/person/day

Measuring affordability

Affordability in Andalusia, 2005

Variable	Mean	Std. Dev.	Min	Max
NDWB(euros/year)	127.99	46.39	19.24	215.26
AI* (%)	1.09	0.43	0.19	2.58
AI (%)	1.63	0.90	0.26	6.95

Source: García-Valiñas, M.A., et al. (2010)

Future research

- Developing countries
- Distributive impact
- Price reforms and affordability
- Access: cutting off water supply due to non-payment