

Optimal Pricing and Informal Sharing: Evidence from Piped Water in Manila

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Abstract

Public utilities subsidize fixed connection fees with high marginal prices to provide access especially for the poor, but this policy can have the opposite effect when many households share connections. Using data on 1.5 million water connections in Manila, I establish that informal sharing networks provide 26% of total access. I structurally estimate household water demand across three sources: purchasing directly from the provider, sharing with a neighbor's tap, or buying from a small-scale vendor. The model predicts that low fixed fees and high marginal prices decrease access by weakening incentives to share water. In contrast, the optimal pricing policy features high fixed fees and low marginal prices, increases shared connections, and ensures nearly universal access to piped water compared to current prices in Manila. This policy improves welfare by up to 84% of consumer surplus or 1.0% of household income.

JEL-Classification: H23, L95, L98, O13, O17, O18

Keywords: Water demand, non-linear pricing, informal sector, developing countries.

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1 Introduction

Despite large investments in piped water throughout the developing world, the share of urban households without piped water has remained stable at 5% for middle income countries and at 20% for low income countries for at least the past decade (World Bank [2015]). Given health, time-savings, and other benefits from piped water, how can water utilities set prices in order to close gaps in access while still covering costs?¹ A popular approach particularly in developing cities is to subsidize upfront connection fees with high marginal prices to extend access especially for the poor.² In a similar spirit, over 70% of developing cities increase marginal prices with monthly usage so that large users cross-subsidize access and usage for smaller, poorer users.³ Recent empirical papers in South Africa and Côte d’Ivoire support this intuition, predicting gains in both access to piped water and total welfare from increasing marginal prices (Szabó [2015], Diakité et al. [2009]).

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¹Gamper-Rabindran et al. [2010], Cutler and Miller [2005], and Galiani et al. [2005] find health improvements in both developed and developing settings while Devoto et al. [2012] find time savings and other utility benefits.

²McIntosh [2003] and Komives et al. [2006] from the World Bank and Asian Development Bank argue for low connection fees. Using a randomized controlled trial from Morocco, Devoto et al. [2012] confirm that modest assistance with connection fees can lead to increases in new water connections.

³This strategy is also commonly referred to as “Increasing Block Tariffs” or “Convex Pricing” (Borenstein [2012]). Hoque and Wichelns [2013] and Boland and Whittington [2000] provide overviews of the use of increasing marginal prices in the water sector in developing countries.

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