Journal of Economic Behavior & Organization 88 (2013) 133–139

Contents lists available at SciVerse ScienceDirect

Journal of Economic Behavior & Organization

journal homepage: www.elsevier.com/locate/jebo

Information and subsidies: Complements or substitutes?

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ARTICLE INFO

Article history:
Received 20 August 2012
Received in revised form
21 December 2012
Accepted 24 December 2012
Available online 29 January 2013

JEL classification:
D83
H23
I18
O12

Keywords:
Subsidies
Information
Health

ABSTRACT

Does providing information about a product influence the impact of price subsidies on purchases? This question is particularly relevant for health products in developing countries where both informational campaigns and price subsidies are common policy instruments. We conduct a field experiment in Zambia and find that providing information about a new version of a product significantly increases the impact of price subsidies on take-up. Taken alone, the information manipulation has no significant impact on demand while the price subsidy substantially increases demand. However, the evaluation of either intervention in isolation fails to capture the significant complementarity between the two.

1. Introduction

Governments and NGOs commonly use both informational campaigns and price subsidies in attempts to increase the use of health products and other socially beneficial technologies in developing countries (Hecht and Shah, 2006; Nugent and Knaul, 2006). The optimal deployment of these policy instruments depends on the way they interact in the policy maker's production function; if providing households with information about a product changes the demand function, it may also affect the policy maker's optimal level of a price subsidy.

Information about a product can impact demand in two broad ways. First, providing information can affect the overall level of demand. For instance, information can increase demand by allowing consumers to purchase more appropriate products (Tadelis and Zettelmeyer, 2011). Or, if the quality of the product does not match consumers' ex ante expectations, providing information can change the average perception of quality (Caswell and Mojduszka, 1996). Second, and more important for our purposes, providing information can change the elasticity of demand (and thus the impact of price subsidies). For example, information can increase the dispersion of consumers' valuation, which rotates the demand curve clockwise, making demand less sensitive to price (Johnson and Myatt, 2006). But, if consumers' initial beliefs are more heterogeneous than their valuations, information will have the exact opposite effect. Moreover, information can reduce the extent of

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http://dx.doi.org/10.1016/j.jebo.2012.12.031

consumers' price-based inference, thus making demand more sensitive to price (Judd and Riordan, 1994).[1] Hence, the impact of information on the level and the slope of the demand curve is fundamentally an empirical question.

In this paper, we estimate the causal impact of information about an unfamiliar health product on the effectiveness of price subsidies. Using door-to-door marketing in Lusaka, Zambia, we offered a new, unfamiliar water purification product for sale to 487 households, randomly varying both the price subsidy and the information about the product. We offered this unfamiliar *target product* alongside a familiar *substitute product* (Clorin), which we sold at its regular market price of 800 Zambian Kwacha (around 0.20 USD).[2] We varied the price of the target product from zero (full subsidy) to 1200 Kwacha (no subsidy).[3] This variation allows us to estimate the quantity demanded across the full range of relevant subsidy levels. We varied the information through a simple manipulation that involved telling some subjects that the target product is "an alternative water purification solution that is not available for purchase in Zambia but that we are offering this month only for sale to randomly selected households in your area." Other subjects were told on addition that "the solution contains the same ingredients as regular Clorin but the strength or concentration of the ingredient is higher" and were given the opportunity to inspect the product.[4] We refer to these two groups of households as uninformed and informed, respectively.[5]

Our main specification compares the impact of the price subsidy on purchase behavior across uninformed and informed households. Overall, 34% of households purchase the target product. The probability that an uninformed household purchases the product increases by 3.4 percentage points for every 100 Kwacha increase in the price subsidy. Among the informed households, this effect is 5.4 percentage points. In other words, information and subsidies are complements: providing consumers with additional information about the product increases the effectiveness of price subsidies by about 60%. Our result is driven by consumers' shift from the familiar product toward the target one, not by an overall increase in the demand for water purification.

While our data do not pin down a specific mechanism behind the observed complementarity, one straightforward way to interpret our results is through price signaling. In the absence of information, people tend to take a price of the unfamiliar product as a signal of its quality, so high prices do not diminish the quantity demanded very much. When information is provided, the signaling content of the price diminishes. As a result, demand becomes more elastic.[6] In particular, informed consumers see no reason to pay more for the new product given that it has the same ingredients as the familiar one. The effect of the information is thus to encourage more people to switch from the substitute product to the target one at low prices, and vice versa at high prices.

As in many other field experiments, our ability to generalize beyond the specific product, context, and intervention is limited. In particular, one could certainly imagine circumstances where price signaling is unlikely to be important. Despite the limited generalizability, however, our paper makes two substantive contributions.

First, we find that the complementarity between two commonly used policy instruments, subsidies and information, can be quite large; in our setting, the impact of price subsidies is 60% greater among the informed households. The magnitude of this point estimate highlights the potential importance of taking complementarities into account when designing policy interventions. Second, previous work on pricing of health products in developing countries (Dupas, 2009; Ashraf et al., 2010; Cohen and Dupas, 2010) has focused almost exclusively on products that are familiar. Our study reveals that optimal pricing may be different for products that are new or unfamiliar.

The paper proceeds as follows. The next section relates our result to the existing literature. The following describes the design and the implementation of the field experiment. Section 4 presents the empirical results. Section 5 concludes.

2. Existing literature

Our paper primarily relates to two strands of existing literature. Numerous studies have estimated the impact of information programs (Jalan and Somanathan, 2008; Luoto et al., 2012) and price subsidies (Kremer and Miguel, 2007; Ashraf et al., 2010; Cohen and Dupas, 2010) in isolation. Our paper is more closely related to the small literature that examines interactions between the two policies.[7] Dupas (2009) compares purchase decisions at various levels of subsidies for insecticide treated

[1] Wedig and Tai-Seale (2002) show that giving consumers a report card with detailed information about the quality and coverage of health insurance plans increases the elasticity of demand with respect to price.

[2] In 2004, the average monthly income for a household in a low income urban neighborhood in Zambia was 645,000 Kwacha (Central Statistics Office, 2005).

[3] The unfamiliar product is not available for sale in Zambia, but based on estimated costs of production and distribution, its market price under perfect competition would be around 1200 Kwacha.

[4] The English language script is in Appendix. Scripts were administered in Nyanja.

[5] Our information manipulation relies on the presence of the familiar substitute product to convey quality information. In this way, it is most similar to information campaigns that offer explicit product comparisons or demonstrates the mechanisms through which a product works. In our sample, over 90% of respondents report having used Clorin in the past.

[6] Judd and Riordan (1994) present a model that formalizes this idea.

[7] Some work also examines potential complementarities between other interventions. Cole et al. (2011) find no complementarity between financial literacy training and subsidies in their impact on the demand for credit. Gine and Mansuri (2011) show that business training is no more effective when coupled with access to credit. Groh et al. (2012) find that employability skills training does not increase the impact of a wage subsidy program. Doi et al. (2012) document that financial literacy training has a much greater impact on saving when provided both to the migrant worker and to their family in the home country.