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Transparency and prices with imperfect substitutes

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Abstract

We show that an increase in consumer transparency may increase prices if goods are imperfect substitutes. If the consumers have more information about the goods that are available and about corresponding prices they will increase their demand. The effect of this on prices may override the competition enhancing effect of transparency. © 2006 Elsevier B.V. All rights reserved.

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1. Introduction

It is often suggested that transparency will increase competition, reduce prices, and increase consumer surplus. In this paper we illustrate a potential caveat to this argument. A rise in transparency increases consumer awareness about the different products available and about their prices. If goods are imperfect substitutes this may increase total demand and lead to higher prices.[2] Of course, this demand effect

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[2] Others have studied the potential impact of transparency on tacit collusion (e.g., Schultz, 2005, Møllgaard and Overgaard, 2000, Nilsson, 1999). Our analysis is purely based on a static analysis, a feature it shares with Janssen and Moraga (2000) and Schultz (2004). In the latter paper transparency covers not only awareness about prices but also about the exact product characteristics.

disappears if goods are perfect substitutes. In this case we are left with the competition effect of transparency: competition intensifies and prices decrease when buyers become better informed.

We employ a static model in which there are two types of buyers. One type of buyer is perfectly informed about all products and prices offered by different sellers; the other type is only informed about the product and price of one seller and is restricted to buy from this particular seller.[3] The fraction of buyers that is perfectly informed is an exogenous parameter which we take as a measure for the level of transparency in the market.

2. Model

Consider a market with n producers and continuum of consumers of size 1. Consumers' utility functions are of the form

$$u(x_1,\ldots,x_n,M) = \sum_{i=1}^{n} \left\{ x_i - x_i^2 - 2\sigma \sum_{j>i} x_i x_j \right\} + M \tag{1}$$

where x_i is the amount of good i $(=1,\ldots, n)$, M is a composite good of all the other products in the economy, and σ indicates the degree to which goods from different producers are substitutes. Let a fraction τ of consumers be aware of all the n products in this market. They maximize the utility function above subject to a budget constraint. It is routine to verify that the inverse demand functions of these informed customers are of the form

$$p_k^I(x_k, x_{-k}) = 1 - 2x_k - 2\sigma \sum_{l \neq k} x_l$$

Of the $(1-\tau)$ other consumers, a fraction $\frac{1}{n}$ knows only of product i and is not aware of any other product. Their utility function is $u(x_i, M) = x_i - x_i^2 + M$. The inverse demand function of an uninformed consumer equals

$$p_i^U(x_i) = 1 - 2x_i$$

We say that transparency increases in this market as the fraction of people τ who are aware of all products increases.

Now we analyze the equilibrium, that is, the prices that clear the market. Let x_j denote total output of firm j. Further, let $x_j^U(x_j^I)$ denote firm j's output per head of uninformed (informed) customer. Although there are asymmetric equilibria in which some firms only produce for their "own" captive consumers,[4] we focus here on equilibria in which all firms produce for both informed and uninformed consumers, i.e., $x_j^U > 0$ and $x_j^I > 0$. Since there are τ informed customers and $\frac{1-\tau}{n}$ uninformed customers who only know

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[3] This is similar to, though not the same as Varian's (1980) assumption that the uninformed are randomly allocated to one of the sellers.

[4] See the working paper version of this paper (at http://greywww.kub.nl:2080/grey.les/ center/2002/7.html) for a characterization of these equilibria.