Available online at www.sciencedirect.com
SCIENCE DIRECT
International Journal of Industrial Organization
23 (2005) 451–466
International Journal of Industrial Organization
www.elsevier.com/locate/econbase

Truly costly sequential search and oligopolistic pricing

Maarten C.W. Janssen[a,b], José Luis Moraga-González[a,b,c,*], Matthijs R. Wildenbeest[a,b]

[a]*Erasmus University Rotterdam, The Netherlands*
[b]*Tinbergen Institute, The Netherlands*
[c]*CESifo, Germany*

Received 10 June 2004; received in revised form 19 October 2004; accepted 29 January 2005
Available online 26 April 2005

Abstract

We modify the paper of Stahl (1989) [Stahl, D.O., 1989. Oligopolistic pricing with sequential consumer search. American Economic Review 79, 700–12] by relaxing the assumption that consumers obtain the first price quotation for free. When all price quotations are costly to obtain, the unique symmetric equilibrium need not involve full consumer participation. The region of parameters for which non-shoppers do not fully participate in the market becomes larger as the number of shoppers decreases and/or the number of firms increases. The comparative statics properties of this new type of equilibrium are interesting. In particular, expected price increases as search cost decreases and is constant in the number of shoppers and in the number of firms. Welfare falls as firms enter the market. We show that monopoly pricing never obtains with truly costly search.

JEL classification: C13; D40; D83; L13

Keywords: Sequential consumer search; Oligopoly; Price dispersion

* Corresponding author. Erasmus University Rotterdam, Rotterdam School of Economics, Office H07-26, Postbox 1738, 3000 DR Rotterdam, The Netherlands. Fax: +31 10 4089149.
E-mail addresses: janssen@few.eur.nl (M.C.W. Janssen), moraga@few.eur.nl (J.L. Moraga-González), wildenbeest@few.eur.nl (M.R. Wildenbeest).

0167-7187/$ - see front matter © 2005 Elsevier B.V. All rights reserved.
doi:10.1016/j.ijindorg.2005.01.013

1. Introduction

A celebrated article by Stahl (1989) studies oligopolistic pricing in the presence of consumer search. There are two types of consumers in the market. Fully informed consumers (referred to as shoppers in his article) have no opportunity cost of time and thus search for all prices at no cost; non-shoppers search sequentially, i.e., they first observe one price and then decide whether or not to observe a second price, and so on.[1] Stahl (1989) assumes that consumers observe the first price quotation for free, as do many other papers in the search literature, which implies that every buyer makes at least one search. In this paper, we study the implications of relaxing this assumption.

The optimal sequential search rule implies that a consumer with a price at hand continues searching if, and only if, the observed price is higher than a certain reservation price. Knowing this, no firm will charge prices above consumers' reservation price. Therefore, under the assumption that obtaining the first price observation is costless, buyers 'search' exactly once in equilibrium and buy at the observed price. In this paper, we refer to this type of equilibrium as one with *full consumer participation*. This equilibrium is one of the two possible equilibrium configurations when the first price quotation is not for free. The new type of equilibrium that arises with truly costly search is one with *partial consumer participation*, where some buyers decide not to search at all as they rationally expect prices to be so high that they are indifferent between searching and not searching. The existence and characterization of this new type of equilibrium is one of the two main contributions of this paper.

The other main contribution is to provide the comparative statics properties of the equilibrium with partial consumer participation. These comparative statics effects differ from those under full consumer participation in interesting ways. First, the equilibrium distribution of prices with a given search cost dominates in a first-order stochastic sense the price distribution with a lower search cost; as a result expected price increases as search cost decreases. This is due to the fact that a decrease in search cost raises participation of non-shoppers, who happen to search only once in equilibrium. As firms have monopoly power over these consumers, they raise their prices. A second result is that an increase in the number of shoppers does not influence the equilibrium price distribution. This is because more shoppers foster the participation of non-shoppers in such a way that prices remain the same. Finally, we find that firm entry results in a mean-preserving spread of prices and in a decrease in welfare because the market participation rate of non-shoppers falls. The last two results imply that, unlike in Stahl's model, expected price does not tend to the monopoly price when the number of shoppers converges to zero, nor when the number of firms goes to infinity. This is because when the fraction of shoppers becomes very small, or the number of firms very large, the economy turns into an equilibrium with partial consumer participation and in such an equilibrium expected price is insensitive to changes in those parameters.

[1] The functioning of markets in the presence of sequential consumer search is also examined in Anderson and Renault (1999), Reinganum (1979), Rob (1985), Stahl (1996) and Stiglitz (1987).