Competition among differentiated health plans under adverse selection

Pau Olivella [a,*], Marcos Vera-Hernández [b]

[a] *Department of Economics and CODE, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain*
[b] *University College London and Institute for Fiscal Studies, United Kingdom*

Abstract

Market power and adverse selection are prevalent features of the market for pre-paid health plans. However, most of the literature on adverse selection considers extreme cases: either perfect competition or monopoly. If instead health plans are horizontally differentiated, then (i) profits derived from each low risk are higher than from each high risk and (ii) when the profits derived from each high risk are negative (cross-subsidization), a health authority as informed as the health plans can implement a Pareto-improvement. Both local and global deviations from cross-subsidization are addressed within a Nash equilibrium framework.
© 2006 Elsevier B.V. All rights reserved.

1. Introduction

We explore the effect of horizontal differentiation in a model of competition among pre-paid health care plans in the presence of adverse selection, i.e., when consumers possess privileged information about their true health risks. Pre-paid health care plans, or Health Maintenance Organizations (HMOs) in the US, directly offer medical treatment in several services in exchange for a fee (or capitation rate) per affiliated agent, usually paid by a third party. This way of obtaining health care has gained much popularity in the US and it has been extended to public programs such as Medicaid and Medicare, which provide health care for the poor and elderly respectively.

---

* Corresponding author.
  E-mail addresses: pau.olivella@uab.es (P. Olivella), m.vera@ucl.ac.uk (M. Vera-Hernández).

HMOs are also important in Europe. After the Dekker reform, health organizations in Holland receive a premium for providing health care to their insurees. In Spain, civil servants can obtain health insurance from health plans that work very much as HMOs.

Market power is an important feature in the market for pre-paid health care plans.[1] We introduce market power in our model by considering horizontal differentiation. We interpret horizontal differentiation as geographical differentiation, which we take as exogenous. Thus, hospitals are located at different points in a straight line. Attending a hospital implies some transportation cost that increases with distance. This assumption is well justified in the HMO market.[2] However, as in Ellis (1998), the model does not preclude interpreting distance as a consumer's disutility from seeking a certain style of health care.

Apart from being realistic, the interaction of adverse selection and differentiation brings about several results that are new and relevant from both the theoretical and the empirical point of view. The first one deals with the profits that plans obtain from each type of consumer. The literature on risk selection in health insurance points out that insurance companies have incentives to attract low risks while deterring high risks.[3] While this is intuitive, it is at odds with the standard model of adverse selection with homogenous product, which predicts zero expected profits per consumer regardless of his type. In contrast, we prove that under differentiation insurance companies obtain more profits from low risks than from high risks in equilibrium. This result is important, reconciling as it does the literature on risk selection with the literature on adverse selection. Perhaps more interestingly, we show that equilibrium exhibits cross-subsidization for some parameter values. That is, firms derive positive profits from the low risks and negative profits from the high risks for these parameter values.[4] This is important because risk selection incentives are present in this case even in the absence of fixed contracting costs. It is important to note here that, as in the classical analysis of Rothschild and Stiglitz (1976), we find that the proportion of low risks plays a fundamental role. Namely, on the one hand this proportion cannot be too high, since in this case our symmetric separating equilibrium candidate is not robust to non-local deviations. On the other hand, this same proportion cannot be too low since in this case the equilibrium ceases to present cross-subsidization.

Our second contribution regards the welfare properties resulting from imperfect competition. They also differ from the perfectly competitive model. In the latter, the equilibrium menu of contracts is always second-best if firms are allowed to offer menus. In other words, a health authority that is as informed as the firms cannot implement a Pareto-improvement.[5] In contrast, our equilibria are not always second-best. Our main contribution here is to show that it is precisely

---

[1] According to Feldman et al. (1999), the US 10 firm concentration ratio for HMOs increased from 58% in 1994 to 67% in 1997. For the Medicare + Choice program, Town and Liu (2003) finds that an increase in payments by \$1 to the HMOs by the administration results in ninety cents increase in profits and only six cents increase in consumer surplus.

[2] Travel distance is an important variable when choosing health care provider (see Kessler and McClellan, 2000; Burgess et al., 2003; Shortell and Hughes, 1988; Buchmueller et al., 2004). Given that HMO patients will generally visit the providers that their HMO has contracted with, travel distance must be an important variable when choosing among HMOs. Given the above evidence, we are quite comfortable with the geographical interpretation of distance.

[3] See for instance Newhouse (1996), Jack (2001), and Frank et al. (2000).

[4] In the homogeneous product case, several authors (Miyazaki, 1977; Spence, 1978 among others) have used Wilson's (1977) equilibrium notion to sustain cross subsidization in equilibrium. Riley (2001) and Crocker and Snow (1985) criticize these non-Nash behavioral assumptions. We obtain cross-subsidization while sticking to the standard Nash equilibrium concept.

[5] As shown by Rothschild and Stiglitz (1976), if firms are constrained to offer single contracts there exist competitive equilibria that are not second-best.