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Optimal risk adjustment with adverse selection and spatial competition

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Abstract

Paying insurers risk-adjusted prices for covering different individuals can correct selection incentives and induce the market to provide optimal insurance policies. To calculate the optimal risk-adjusted prices we need to know (a) what the optimal policies are; (b) how much they cost; and (c) how competitive the market is. We examine these issues in a model with spatial heterogeneity and adverse selection. Market equilibrium is characterized, and delivery of the socially optimal insurance policies is possible, as long as providers are paid risk-adjusted fees for each individual they serve. When the payment can be made on the basis of an individual's risk, it should be sufficient to cover the expected cost of the socially optimal policy for that person, plus a mark-up. If payments can be made only on the basis of a partially informative signal, the optimal risk-based payments should be adjusted according to a simple linear transformation, identified by Glazer and McGuire [Glazer, J., McGuire, T., 2000. Optimal risk adjustment of health insurance premiums: an application to managed care. American Economic Review 90 (4), 1055–1071].

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1. Introduction

In the hope of providing stronger efficiency incentives and ensuring greater responsiveness to demand, many public services have recently been contracted out to private providers. For example, by July 2005, 12% of Medicare enrollees in the US obtained health insurance coverage

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through private sector Health Maintenance Organizations (HMOs),[1] while a number of states have implemented school voucher schemes and other means of increasing school choice. In these kinds of markets, private providers are paid by an intermediary purchaser (the government) for each individual they serve. Alternatively, individuals may be allocated a voucher with a specified face value, that can be used to purchase services offered by a provider. A problem that many health economists have identified, and in recent years begun to model, arises when individuals are heterogeneous. If a uniform price is paid to providers on behalf of individuals they serve, or if vouchers have a uniform face value, incentives may arise for providers to restrict access of certain (high cost) individuals to services. If providers are required to offer a single standardized bundle of services, then non-discrimination and open enrollment regulations might mitigate against such actions.[2] On the other hand, individual heterogeneity typically means provision of a single bundle of services for all types of individuals is inefficient. Individuals at risk of heart disease need cardiovascular surgeons in their health plan, and parents of children with learning disabilities want special education services (Biglaiser and Ma, 2003). There is then a concern that if providers are afforded the flexibility of offering different bundles of services, they might strategically alter the mix not so much to efficiently match consumer preferences, but to induce unprofitable individuals to seek services elsewhere, while attracting more profitable clients.

Such selection-induced marketing policies could result in costly distortions to equilibrium service bundles. One response is for the purchaser to alter the prices paid on behalf of different consumers, in the hope of reducing the variation in profitability across individuals. This is referred to as risk adjustment in the health economics literature (e.g., Newhouse, 1996). Much of the risk adjustment literature has been empirical in nature, searching for good predictors of individual health care spending.[3] But if different individuals would optimally consume different bundles of services, then predicting the cost of providing a given bundle to individuals with different characteristics is not necessarily enough information for the purchaser to optimally set prices.

This paper contributes to a growing literature on "optimal" risk adjustment mechanisms. We approach the question of how to optimally differentiate prices paid to providers on behalf of heterogeneous consumers in four steps. First, we ask what bundles of goods a social planner would directly allocate to the different consumers in maximizing social welfare. This optimization is performed under the incentive compatibility constraints imposed by the requirement that consumers can freely choose between the bundles that are provided. The second step is to model the equilibrium behavior of providers when they are paid a fixed uniform price for all individuals. In the recent literature on managed care behavior (Frank et al., 2000, hereafter FGM, Glazer and McGuire, 2002, hereafter GM02) providers are assumed to allocate resources by choosing good-specific shadow prices when competing. We show that this neither is consistent with profit maximization (Ma, 2003 also makes this point), nor does it necessarily respect incentive compatibility constraints imposed by open enrollment rules.[4]

[1] http://www.kff.org/medicare/upload/Medicare-Advantage-April-20050Fact-Sheet.pdf, although this percentage is expected to risk in 2006 due to changes in reimbursement rules. Murgolo (2002), reported that the proportion was 17% in 2000, and that in fact, conditional on having (geographic) access to an HMO, 25% of eligible individuals got insurance coverage through such an organization at that time.

[2] Shen and Ellis (2002) present a model in which health plans can perfectly cream skim—that is, they can identify costly patients and deny them coverage.

[3] See Newhouse (2002, chapter 6) and Van de Ven and Ellis (2000) for a review of this literature.

[4] Of course, some providers are non-profit, but this in itself should not imply that they offer allocatively inefficient plans.