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Supply-side and demand-side cost sharing in deregulated social health insurance: Which is more effective?☆

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ABSTRACT

Microeconomic theory predicts that if patients are fully insured and providers are paid fee-for-service, utilization of medical services exceeds the efficient level ('moral hazard effect'). In Switzerland, both demand-side and supply-side cost sharing have been introduced to mitigate this problem. Analyzing a panel dataset of about 160,000 adults, we find both types of cost sharing to be effective in curtailing the use of medical services. However, when moral hazard mitigation is traded off against risk selection, the minimum-deductible, supply-side cost sharing option ranks first, followed by the medium-deductible demand-side alternative, making the supply-side option somewhat more effective.

1. Introduction

One of the main goals of health care financing systems is to promote efficient levels and types of care (Ellis and McGuire, 1993). If patients are fully insured and providers are paid fee-for-service, they desire larger than optimal quantities of health care services, connoted 'moral hazard'. Zeckhauser (1970) and Zweifel and Manning (2000) have analyzed how demand-side cost sharing (in the guise of deductibles or co-payments) can be used as a corrective. However, demand-side cost sharing exposes consumers to financial risk, contradicting the very objective of insurance. Unless limited by a stop-loss, it also makes beneficial procedures unaffordable to some patients (Nyman, 1999). In addition, it might be considered unfair towards the chronically ill.

These considerations have created interest in the alternative of supply-side cost sharing (in the guise of capitation or prospective payment). Because of their information advantage, providers of medical care can influence the demand for their services to a greater extent than other professionals (Arrow, 1963). Moreover, providers are less vulnerable to risk than patients because they can pool treatment cases. However, supply-side cost sharing might also promote a reduction in quality or the denial of beneficial but costly services, a phenomenon commonly termed stinting (Newhouse, 2002).

Both demand-side and supply-side cost sharing have been empirically examined in terms of their effectiveness. The novelty of this paper is that it directly compares the expenditure effects of demand-side and supply-side cost sharing (and combinations thereof), using contract variants offered by the same health insurer. This has the advantage that many side conditions (underwriting policy, billing procedure) are kept constant. Moreover, the paper complements Lehmann and Zweifel (2004), who construct a proxy for unobserved health status from prior health care expenditure (HCE), by the two-stage residual inclusion estimator (2SRI, Terza et al., 2008). In this way, risk-selection effects are more fully controlled for. Finally, it extends the set of instruments influencing choice of plan but not HCE by including the premium for the baseline contract, the potential premium reduction for a restricted plan, the individual's credit record, and years of membership with the

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same fund. For the capitated plan, an additional instrument is a dummy indicating whether or not an Independent Practice Association (IPA) was operative in the individual's county of residence.

The data come from Switzerland, a country where consumers have annual free choice of plan with no employer involvement. The chronically ill are not precluded from switching due to open enrollment. Low-income individuals (about 30 percent of the population) are eligible for premium subsidies. Receiving the subsidy, they are less likely to choose high-deductible plans, because a reduction in the income transfer to the sick state is particularly disadvantageous if the income effect on medical consumption is strong (Nyman, 1999). On the other hand, managed-care type plans that are too restrictive compared to premium charged will not be chosen.

The remainder of this article is structured as follows. Section 2 contains an overview of the empirical literature. The policy setting is described in Section 3, while Section 4 is devoted to a description of the data base. In Section 5, we explain the econometric methods used to separate moral hazard from risk-selection effects and to deal with the very skewed distribution of the HCE data. The estimation results are presented in Section 6. Section 7 discusses policy implications in view of related literature, while the final Section 8 contains a summary and conclusions.

2. Literature review

In order to keep this review concise, we focus on empirical papers that measure moral hazard in health insurance. When individuals have a choice of plan, risk-selection effects need to be accounted for because those who expect high future HCE are more likely to opt for more comprehensive insurance. A small number of researchers have avoided this selection problem by benefiting from randomized experiments (the famous RAND study; Manning et al., 1987) or natural experiments (Chiappori et al., 1998; Eichner, 1998; Winkelmann, 2004). Other papers have used econometric techniques to address endogenous plan choice. Many econometric approaches require for identification the availability of at least one variable that influences contract choice but not utilization (an 'identifying instrument'). Pertinent studies from Switzerland are Schellhorn (2001), Gerfin and Schellhorn (2006) and Gardiol et al. (2006). The former two rely on premium level and supplementary hospital insurance as identifying instruments, while the latter uses death as an indicator of morbidity which is unaffected by insurance. Using Australian data, Cameron et al. (1988) advocate income as determinant of insurance coverage but not utilization. In the United States, employers play a strong role in determining the individual's choice of plan, making their characteristics potential identifying instruments. For example, Dowd et al. (1991) and Cardon and Hendel (2001) exploit the fact that different employers offer different premiums and copayment levels, while Deb and Trivedi (2009) use the employer's type (public or private), the size of the firm, and whether or not it offers both HMO and non-HMO options.

Turning to estimation techniques, one notices that instrumental variable estimators are rarely applied to non-linear frameworks. An early exception is Dowd et al. (1991), who estimate a Tobit model with a correction for selectivity (Lee, 1978). In addition, Deb and Trivedi (2009) and Deb et al. (2006) specify a fully parametric model of both choice and utilization equations, which is jointly estimated by maximum simulated likelihood. However, these approaches depend upon restrictive distributional assumptions. As HCE data are very skewed and the distribution of the 'tail' is difficult to specify correctly, Terza et al. (2008) advocate the two-stage residual inclusion estimator. It yields consistent estimates over a wide range of non-linear specifications.

Studies that have addressed endogeneity in non-linear panel data models are even more rare. Non-linear fixed-effects models are plagued by the incidental parameters problem (see Lancaster (2000) for an overview, and Chamberlain (1980) for a corrective). In random effects specifications, the incidental parameters problem can be avoided by integrating out the individual-specific effects (Vella and Verbeek, 1998, 1999). However, this requires a parametric specification of their distribution.

An alternate approach of exploiting the information of panel data was pioneered by Wolfe and Godderies (1991). It uses HCE from prior years to proxy unobserved differences between individuals which become predetermined in the year when the comparison between plans is performed (Lehmann and Zweifel, 2004; Van Kleef et al., 2008). In this paper, a combination of the IV and the 'health proxy' approach will be applied.

3. Swiss health insurance

Swiss health insurance is of the 'managed competition' type (see Kreier and Zweifel (2010) for a comprehensive description). Coverage is mandatory for a rather comprehensive 'basic' basket of medical services and pharmaceuticals, written by some 80 private, not-for-profit insurers competing in a regulated market. Free consumer choice of plan is a distinctive feature of the system. There is no pre-selection of plans by employers or government agencies. Insurers are obliged to accept all applicants during annual open enrollment periods. Premium subsidies for low-income individuals are funded out of general taxation. Premiums can be differentiated by area of residence but not by health risk. Reductions are possible for young adults (19–25) and individuals who receive accident coverage through the employer.

In the baseline contract, insured individuals enjoy unlimited access to all licensed physicians and most hospitals in their region of residence. They face a minimum annual deductible of CHF 300 (some EUR 200 as of 2006) and a copayment rate of 10 percent up to a cap of CHF 700 (EUR 470) per year. Physicians in independent practice are reimbursed fee-for-service (FFS) according to an administered fee schedule that is collectively bargained between the providers' and the insurers' associations. Hospitals receive per diems for patients treated (the nation-wide introduction of a DRG system is scheduled for 2012). The cantons[1] finance hospital investment and one-half of operational cost. While this system is generally found to ensure access to comprehensive health care to all citizens, it is criticized for high and rapidly increasing HCE, lack of co-ordination between providers, and lack of information about quality and efficiency (OECD, 2006).

In response to these problems, insurers have been granted the right to offer managed-care type options (since 1994) and higher deductibles (since 1996) in return for lower premiums. However, policy makers feared that these options would attract low risks. In addition to a risk adjustment scheme based on age and sex, they imposed limits on possible premium reductions. For voluntary deductibles, these are fixed percentages of the base premium or 80 percent of the additional financial risk taken by the consumer (deductible minus 300), whichever is less. The eligible deductible levels are also regulated, as shown in Table 1. In managed-care type contracts, the insurer must prove that the reduction is justified by efficiency gains rather than risk-selection effects. Furthermore, it must not exceed 20 percent during the first five years since

[1] Switzerland is divided into 26 cantons, with population ranging from 1,307,600 (Zurich) to 15,500 (Appenzell i.R.), Source: Swiss Federal Statistical Office, http://www.bfs.admin.ch.