Response

The income transfer effect, the access value of insurance and the Rand health insurance experiment

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Åke Blomqvist (2001) raises the issue of relevance in his review of my two papers (Nyman, 1999a,b). He agrees that because of the skewed distribution in health expenditures (which concentrates most of income transfers from health insurance in the hands of those few who become ill), income transfers explain a large portion of the additional consumption due to becoming insured. Nevertheless, he argues that income transfer effects are largely irrelevant in explaining the marginal health expenditure differences between different health plans because of the stop-loss provisions typically incorporated into them. For example, in the Rand health insurance experiment (HIE) the stop-loss provision in the 95% coinsurance plan converted this plan into a 0% coinsurance plan as soon as US$ 1000 in out-of-pocket spending was generated. This reduces the difference between the income transfers in the 95%/0% plan and the transfers in the 0% plan. If income transfer differences between the two insurance plans are small, then the portion of the difference in spending that can be explained by income transfers — the income transfer effect — is also small.

Blomqvist uses the Slutsky approximation to make his point, but with the detailed information from the Rand experiment, his point can be made more directly using:

$$\% \Delta M = \varepsilon (\% \Delta Y)$$

where $\% \Delta M$ is the percentage increase in medical spending due to income transfers, $\varepsilon$ the appropriate income elasticity of demand and $\% \Delta Y$ is the percentage increase in income due

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to income transfers. In private insurance that pays off by reducing price, the $ΔY$ is calculated by finding the difference in medical spending in the two plans, net of any differences in out-of-pocket copayments and premiums. That is, $ΔY$ is the income transferred from those who remain healthy to the consumer who becomes ill. It is determined by the portion of medical care expenditures that the ill person does not pay for himself in premiums or out-of-pocket spending.

Blomqvist’s example is based on average spending in the two Rand plans, but average spending does not capture the skewness in the health care spending distribution due to the uncertainty of illness. This skewness is perhaps best illustrated by inpatient expenditures. Inpatient spending per participant was US$ 315 in the 95%/0% plan and US$ 409 in the 0% plan (Manning et al., 1987, Table 2) but because only 7.9% of participants in the 95%/0% plan and 10.3% in the 0% plan had any inpatient spending at all, the inpatient spending per participant who becomes ill enough to be hospitalized was (US$ 315/0.079 =) US$ 3987 in the 95%/0% plan and (US$ 409/0.103 =) US$ 3971 in the 0% plan. If these plans were conventional privately-funded insurance policies covering inpatient services-only and charging actuarially fair premiums of about US$ 315 and US$ 409, respectively, income transfers would pay for about (US$ 3987 in spending − US$ 315 premium − US$ 1000 out-of-pocket =) US$ 2672 of hospital expenditures in the 95%/0% plan and (US$ 3971 − US$ 409 − US$ 0 =) US$ 3562 in the 0% plan. Although, the US$ 3562 in income transfers in the 0% plan would represent a 40% increase in income compared with income without insurance (US$ 8912, per Blomqvist’s assumption that US$ 713 in spending is 8% of income), the marginal gain in income transfers would only be (US$ 3562 − US$ 2672 =) US$ 890 and would represent about an 8% increase in income, using income under the 95%/0% plan (US$ 8912 + US$ 2672 = US$ 11 584) as the base. Using Eq. (1) and the appropriate estimate of the income elasticity of demand, the marginal income transfer effect of the 0% plan would be only about 1/5 as large as the total income transfer effect.

Although Blomqvist is correct that the presence of a stop-loss reduces the difference in income transfers in two plans that are ostensively distinguished by coinsurance rates alone, his original premise — that my revision of moral hazard analysis is irrelevant because economists have concentrated on evaluating marginal changes in coverage — is not correct. Economists have also evaluated policies which extend insurance to the uninsured, such as, extensions of Medicare eligibility and coverage, and national health insurance. For important policy issues like these, the total gain and loss from insurance to the individual is central to the evaluation. The total gain and loss is also central to the evaluation of policies which encourage the purchase of insurance where none would have otherwise been purchased, such as, the tax subsidy of employee premiums and subsidies for certain types of insurance.

In a separate paper, Will Manning and Susan Marquis (2001) argue that their model “...Implicitly accomplishes all of the shifts in constraints and associated changes in individual welfare that Nyman (1999a) requires, except for the incorporation of gains from extended life expectancy resulting from medical purchases not affordable under the uninsured budget constraint (this issue).”

This exception is the point of the paper on the access value of insurance (Nyman, 1999a): a major source of value has been overlooked. Manning and Marquis (1996) estimate the demand for insurance with information from a survey that asks Rand participants whether or not they would pay a certain specified amount in order to reduce their stop-loss from the
existing level of no more than US$ 1000 to a specified lower level. Because the demand for insurance coverage for unaffordable expenditures would be reflected in reductions from a much higher stop-loss, the survey does not capture the information necessary to estimate the access value of insurance. As a result, it can be questioned whether the form of the indirect utility function that they estimate holds outside the range of their data, which they implicitly assume to be true when they extrapolate to the infinite stop-loss case. Thus, of the coinsurance rate/stop-loss combinations they consider, Manning and Marquis (1996, Table 6) conclude that optimal insurance would have about a 50% coinsurance rate and an infinite stop-loss level, that is, no stop-loss at all. Had the access value of insurance been included in their analysis, their prescriptions for an optimal stop-loss would likely have been more consistent with the low stop-loss levels employed in the Rand experiment and found in most insurance policies actually bought and sold on the market.

The focus on the Rand HIE, however, raises a different kind of relevance issue. The Rand HIE is based on theory that becoming insured represents a price change, just as if an exogenous price reduction had occurred in the market (Newhouse, 1978). Historically, this theory was perhaps appropriate because the debate at the time revolved around the various proposals for national health insurance (Newhouse, 1993). Under many of these proposals, taxpayers would be compelled to provide health insurance for the uninsured. Health insurance would be conferred upon beneficiaries and it would appear as if an exogenous drop in the price of health care had occurred. This debate and the need for information on the relationship between insurance and demand provided the impetus for a social experiment. An ideal experiment to obtain this information would be to randomize consumers into health plans which were distinguished primarily by coinsurance rates — just as if consumers had been placed at random into markets with different health care prices — and observe the differences in spending behavior.

The private purchase of health insurance, however, has a different theoretical origin. It originates in a voluntary quid pro quo exchange where many consumers pay a premium in exchange for a claim on the pooled premiums, contingent on becoming ill. The smaller the probability of illness, the smaller is the premium that each purchaser must pay for a given payoff if ill. The difference between the payoff and the premium is a transfer of income from those who remain healthy to the person who becomes ill. Health insurance is purchased to obtain this income transfer when ill.

Because of this income transfer, those who become ill purchase more health care (and other commodities) than they would without insurance. For example, they may purchase an extra day in the hospital to recuperate or a life-saving procedure that would otherwise be unaffordable. This is the income transfer effect, estimated by Eq. (1). But because of the problems with verifying illness, fraud, and the complexity of writing contingent claims contracts, the payoffs in actual private health insurance contracts occur through a reduction in the price of health care. Thus, a portion of the additional health care purchased is an

1 Newhouse writes, “for the purpose of studying the relationship between health insurance and demand, the important point is that insurance is like a subsidy to purchase medical care, that is, it lowers the per-unit price of care. Although, there is an income effect caused by premiums or taxes paid to finance the insurance benefits, these income effects can be shown to be empirically negligible in their effect on the demand for care…” (Newhouse, 1978, p. 9).
opportunistic response to the reduced price, but a portion is still the original intended response to the income transfer. The ideal social experiment to determine the price and income transfer effects of private insurance would be to identify voluntary purchasers of a price-payoff contract (say, a 0% coinsurance plan with an actuarially fair premium), to develop a contingent claims plan with contingent payoffs equal to the various expenditures under the 0% plan, and then to randomize purchasers among the two plans and no insurance. The observed difference in health care spending between the two plans is the pure price effect of insurance, and the difference between spending with the contingent claim plan and spending with no insurance is the income transfer effect.

References