Health insurance: Medical treatment *vs* disability payment[☆]

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ABSTRACT

We present arguments for treating health insurance and disability insurance in an integrated manner in economic analysis, based on a model where each individual's utility depends on both consumption and health and her income depends on her earning ability. When purchasing insurance, she may choose a contract that offers less than full medical treatment. We find that high-ability individuals demand full recovery and equalize utility across states, while low-ability individuals demand partial treatment and cash compensation and suffer a loss in utility if ill. Our results carry over to the case where health states are not observable.

1. Introduction

Random changes in health, *e.g.* due to illness, affect a person's well-being in several ways. One way is the direct effect of health on well-being. But there are also some indirect effects. First, reduced health may affect the person's utility from consumption. Secondly, medical expenses necessary to recover from illness reduce affordable consumption. Finally, illness may affect the ability to generate income. In this paper, we argue that a proper treatment of health risk and health insurance should take all these effects of an illness into account, and we offer a theoretical model in which to do this. In this model, an individual's utility depends on both consumption and health and her income depends on her earning ability. When purchasing health insurance, she may choose to receive less than full medical treatment when ill, and support consumption from a combination of cash compensation and her remaining earning ability.

While health insurance and disability insurance are in fact integrated in a number of European countries with public tax-financed (social) insurance systems, the economics literature has treated the two risks as separate problems, with the risk of medical expenditures to be covered by health insurance and the risk of losses in labour market productivity to be covered by disability insurance. The present work is an attempt at correcting this, putting a coordinating perspective on health and disability insurance. In particular, we expand the concept of health insurance to include not only coverage against medical costs but also against permanent loss in earning ability, arguing that these are two types of consequences of the same risk, *i.e.* the risk of suffering a loss in health.

Whereas health and disability insurance in most European countries is heavily subsidized – in effect, a cross-subsidization takes place from individuals with high earning abilities to those with low abilities – our analysis addresses the question of

what the outcome would be without any transfers. We find that individuals with low earning abilities indeed trade off health for consumption. Letting insurance contracts offer individuals various combinations of medical treatment and cash compensation of income loss if they become ill, we find, in particular, that high-productivity individuals choose contracts providing full medical treatment while low-productivity individuals choose contracts offering partial medical treatment and partial compensation for loss in earnings. Low-productivity individuals consequently choose *not* to fully recuperate from an illness but rather receive cash payment that partly offsets the income loss due to partial impairment.[1] Moreover, even in this setting where there is symmetric information about health risks and health states, such low-productivity individuals end up being less than fully insured, in the sense that they have lower utility when ill than when healthy.

These results have interesting policy implications. Whereas there is much focus among many policy makers on the issue of providing health insurance that covers all individuals in a fair and uniform manner, our analysis points to reasons for offering a menu of health insurance contracts, where cash compensation may substitute for the right to full recovery.[2] In the case where health insurance schemes are also used as a means of redistributing income, our analysis indicates that this issue is related to redistribution in cash, *i.e.*, through the tax system: a low-productivity individual may actually prefer to receive support from government in the form of cash rather than in the form of improved health, since better health has a smaller effect on consumption for low-skilled people than for high-skilled ones.[3]

Like the traditional literature on health insurance, we focus on illnesses for which a treatment is available that fully restores pre-illness health and ability. However, in other work, individuals' desire to restore health is taken for granted.[4] In Marchand and Schroyen (2005), for example, there is no loss of health for an individual who falls ill, only a loss of time caused by illness. In their model, high-productivity individuals get well immediately at a private practice, while low-productivity ones suffer a time loss while waiting in the public health-care system. This time loss constitutes an inefficiency, whereas the outcome in our model is efficient, with low-productivity individuals getting compensation in cash instead of full treatment.

In other work where non-monetary consequences of illness are taken into account, it is assumed that utility is state dependent and that health is either irreplaceable or not restorable.[5] In this paper, we allow for both monetary and non-monetary consequences of illness without imposing assumptions either that health will always be fully restored or that it is irreplaceable. Thus, we provide a bridge between the health-insurance literature, which typically takes only monetary consequences of illness into account, and the disability-insurance literature postulating that health is irreplaceable or non-restorable.

Our model has the following crucial features. First, we make the reasonable assumption that an individual's productivity is affected by her health: If she suffers an illness and health is not fully restored, then her productivity will be negatively affected by the illness. The effect is that individuals with low full productivity have lower incentives for restoring health and therefore will tend to prefer contracts with cash compensation for illness.[6] Second, we use a bivariate formulation of utility that allows for interactions between consumption and health. In particular, we make the assumption that the two are complements, *i.e.*, that an individual's marginal utility of consumption is increasing in health.[7]

Our main analysis takes place in a world of symmetric information about health risks and health states, while the individuals' ability may be private information. However, we show that our findings hold also in a situation where an individual's health is non-verifiable, *i.e.*, when insurers face problems of *ex-post* moral hazard. In fact, if *ex-post* moral hazard is a problem, then integrating medical insurance (with in-kind provision of medical treatment) and disability insurance (with cash compensation) reduces the insured individual's incentive to falsely claim to be ill when in good health; in other words, integration induces self-selection.[8]

The outline of this paper is as follows. The model is presented in Section 2 while our main findings are derived in Section 3. We discuss the case of *ex-post* moral hazard in Section 4. Our results are discussed in a concluding Section 5. Proofs are relegated to an Appendix.

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[1] Our findings are in accordance with the empirical observation that individuals with less schooling are more likely to be disabled than those with more schooling [*e.g.*, Haveman and Wolfe (2000)] and may provide an explanation for this correlation in addition to those traditionally put forward.

[2] Of course, there are normative arguments for giving all individuals the right to full recovery whenever feasible; such issues are not discussed here.

[3] This theme has been picked up by Fleurbaey (2006), who notes its consequences for discussions of health and equity: the poor being less healthy than the rich may in part be a result of individual preferences.

[4] One exception is Byrne and Thompson (2000), who argue that, when the probability of successful treatment is small, the insured may be better off with cash compensation if ill, rather than going through the treatment. We shall assume that full treatment, if chosen, provides full restoration of health with certainty.

[5] Analyses based on health being non-restorable include Zeckhauser (1970), Arrow (1974), Viscusi and Evans (1990), Evans and Viscusi (1991), and Frech (1994). Health is irreplaceable if individuals value restored health lower than pre-illness health; see Cook and Graham (1977) and Schlesinger (1984).

[6] In related work by Jack and Sheiner (1997) and Koç (2004), the demand for health insurance is discussed in a situation where, like in our model, the consumption of health care is endogenous. An important difference, however, is that these authors disregard the effect of illness on an individual's earning ability.

[7] Such interaction is standard in analyses of disability insurance where it is called state-dependent utility; see references in footnote 5. Our assumption of complementarity between consumption and health is in line with the results from the empirical study by Finkelstein et al. (2008).

[8] Asheim et al. (2003) analyze a version of our model with asymmetric information about an individual's probability of illness, *i.e.*, a situation where insurers face problems of adverse selection.