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Adverse selection and categorical discrimination in the health insurance markets: the effects of genetic tests

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Abstract

In this paper, the effects of new methods for risk classification, e.g., genetic tests, on health insurance markets are studied using an insurance model with state contingent utility functions. The analysis focuses on the case of treatment costs higher than the patient's willingness to pay where standard models of asymmetric information are not applicable. In this case, the benefit from signing a fair insurance contract will be positive only if illness probability is low. In contrast to the common perception, additional risk classification under symmetric information can be efficiency enhancing. Under asymmetric information about illness risks, however, there can be complete market failure.

JEL classification: D82; G22; I11
Keywords: Genetic testing; Asymmetric information; Health insurance markets

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[1] For an overview see Dionne and Doherty (1992).

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1. Introduction

Insurance market equilibria under asymmetric information [1] and welfare effects of imperfect categorical discrimination [2] have been extensively studied in rather generally designed models. In these models, utility functions are assumed to be state-independent and financial loss does not exceed wealth. Hence, a risk averse person would always choose to sign an insurance contract at a fair premium. If the population consists of two different risk types and there is asymmetric distribution of information about the insureds risk types (insureds are informed about their illness risks, while insurance companies are not informed), the market equilibrium is found to be a Nash-equilibrium providing high risk types with full insurance and low risk types with partial insurance (known as Rothschild–Stiglitz–equilibrium). [3] In case of symmetric information about risk types, insureds would prefer not to receive additional information about their illness risks because of the additional income risk caused by more risk adequate insurance premiums. [4]

For health insurance markets, however, these standard models are not generally applicable, mainly for the following reason: loss in health insurance implies non-financial loss of well-being by getting ill. If there exists a method of treatment, this loss of utility can be transformed into a financial loss by visiting a physician and undertaking the costs of the treatment. Without health insurance, a rational patient would compare expected benefits from being treated to the price he would have to pay for the treatment. He would choose to bear his sufferings and not to be treated if treatment costs were higher than his willingness to pay. [5]

The structure of possible losses of well-being (and consequently of wealth) in the health sector is quite heterogeneous. Roughly we can distinguish between acute (curable) diseases and chronic (incurable) diseases. In the latter case, treatment prevents worsening and alleviates complaints, but effectuates no cure and often there is no significant change in life expectancy. Still, costs of long-term treatment can be quite high and, hence, exceed an uninsured patient's willingness to pay (or even his wealth). Examples for this phenomenon are numerous: bypass surgery in cardiovascular diseases, disc surgery or visits to the health resorts as a treatment of a slipped disc as well as treatment of many internal diseases like rheumatism or subsequent diseases in diabetes can be named here. Since many infectious and other acute diseases are becoming less of a threat (because of new

[2] See Hoy (1982; 1984; 1989), Rea and Samuel (1992), and Crocker and Snow (1986).

[3] See Rothschild and Stiglitz (1976). Other types of market equilibria have been defined by Wilson (1976; 1977), Miyazaki (1977), and Spence (1978).

[4] See Hoy (1982), and Rea and Samuel (1992).

[5] A similar argument could be brought forward for other insurance markets, e.g., automobile insurance. However, a damaged car could be resold on a market, thus the market value of this car can be obtained. This does not apply to the health insurance market.