AN ORDERED LOGIT MODEL FOR THE EVALUATION OF DUTCH NON-LIFE INSURANCE COMPANIES**

BY

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1 INTRODUCTION

The insurance industry is subject to government regulation to safeguard the interests of the policyholders. There are a number of reasons for this regulation (Finsinger, Hammond and Tapp, 1985, p. 11–13). First, the imbalance of information between buyers and sellers. In insurance markets there is a reciprocal asymmetry: the insurer has better information on its solidity and solvency than the insured, while the insured typically has better information about the nature of the risk than the insurer. Second, the problem of insolvency. Insurer insolvency can lead to very serious problems for the policyholders. For instance, the policyholder may be faced with a large liability claim and may be personally bankrupted if the insurance company fails, because (s)he remains personally liable. Furthermore, the confidence in the insurance business will be undermined when too many insolvencies occur. Confidence is necessary to effect an insurance policy and it is therefore necessary for the insurance business as a whole that all insurance companies are sufficiently solvent.

In order to protect the interests of the policyholders, the Dutch government has established the insurance supervisory board (ISB, in Dutch: Verzekeringkamer). The primary goal of the ISB is to protect the policyholders against failures of insurance companies to meet their obligations. To reach this goal, the ISB assesses the solvency of the companies (Verzekeringkamer, 1992, p. 28).

The evaluation of insurance companies is primarily based on annual reports which all Dutch insurance companies are obliged to hand in. These reports include a number of prescribed financial statements. The evaluation is done in three rounds. The verification round consists of a consistency check of the financial statements, and of a solvency check. With the solvency check, the solvency mar-

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gin is compared with the statutory required margin. In the assessment round the financial statements are thoroughly analyzed by a (senior) employee. The final evaluation is performed by the account manager. The findings from the different rounds are written down in the assessment text. If the evaluation of a company leads to any doubt about the solidity of that company, then the account manager can decide to request more information or to visit the company for a more thorough examination.

An on-site inspection can give a better idea of the solidity of a company than a sole analysis of the financial statements. On-site inspections enable the ISB to make sure that the documents submitted reflect the actual situation, on the one hand, and to obtain additional prospective information about the business practices of the insurance company, on the other (Angerer, 1993, p. 42). However, given the large number of companies which have to be evaluated (in 1992, 97 life and 391 non-life insurers) and the limited number of employees (20), there is not enough time left for an annual on-site inspection of each company. Normally, if no problems are visible, a non-life company is visited once in five to ten years.

A computer-based system that can identify insurers with financial difficulties can be a useful tool for scheduling the timing, intensity, and extent of a particular insurer’s examination. A system which evaluates the financial solidity of insurance companies can be used to classify these insurers according to their degree of risk exposure. Given this exposure an examination schedule can be established. Such a system could take over the solvency check in the verification round and part of the assessment round. Moreover, such a system might be able to locate problem companies quicker enabling the ISB to react faster.

In this paper, we describe an ordered logit model which determines the financial solidity of Dutch non-life insurers. This model can be used to classify insurers according to their degree of risk exposure. The (standard) distinction between bankrupt and non-bankrupt companies will not be made here since bankruptcies of Dutch non-life insurance companies are very rare. The classification criterion will be described in the next section. A consequence of the classification criterion is, that the dependent variable of the model is ternary (1, 2, 3). Therefore, instead of the usual discriminant or logit model, an ordered logit model is used. A general description of ordered logit models will be given in section 3. The resulting model will be described in section 4, and the results of some tests are given in section 5. The conclusions are given in section 6.

1 Of which 243 non-life insurance companies are seated in The Netherlands.