

Post-Randomization Under Test: Estimation of the Probit Model

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Summary

The paper analyzes effects of randomized response with respect to some binary dependent variable on the estimation of the probit model. This approach is used in interviews when asking sensitive questions or if a respondent erroneously chooses the wrong category in an interview leading to ‘misclassification’. Alternatively, randomization can be used for statistical disclosure control and then is called ‘post randomization method’ (PRAM). We consider two variants which are termed ‘ordinary’ and ‘invariant’ PRAM the latter being of importance mainly in descriptive analysis. Maximum likelihood estimation of the corrected likelihood results in consistent estimates although variances increase considerably for ‘strong’ randomization. Moreover a finite sample bias has been observed in the simulation study, but it is much less pronounced than the bias implied from use of the ‘naive’ probit estimator when the binary dependent variable has been randomized. Effects of randomization on the probit estimates are also illustrated by an empirical study using cross-section data from the German ‘IAB establishment panel’ (IAB Betriebspanel). The decision of firms to accept a collective bargaining agreement (‘Tarifvertrag’) is analyzed in a binary probit model using both original data and data masked by ordinary and invariant PRAM. Here, too, a remarkable bias is observed in case of ‘strong’ randomization.

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¹ See, for example, *Ronning* (1991).