

This Week's Citation Classic

Amemiya T. Qualitative response models: a survey. *J. Econ. Lit.* 19:1483-536, 1981.
[Stanford University, Stanford, CA]

This article surveys the literature on the applications of qualitative response models in economics, with a special emphasis on (1) how to specify a model which is consistent with economic theory and at the same time statistically manageable, (2) how to estimate and test hypotheses on the parameters of a model, and (3) what criteria to use for choosing among competing models. [The SSC[®] and the SC[®] indicate that this paper has been cited in more than 340 publications, making it the most-cited paper published in this journal.]

Writing a Survey

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The qualitative response model, or the discrete variable model, is a statistical model which specifies the distribution of a discrete random variable as a function of explanatory variables. It originated in biometric research in an attempt to explain, for example, how the rate of survival of a patient is affected by a particular treatment. In the 1970s it rapidly gained popularity in econometrics as a result of the emergence of sample surveys, which usually contain discrete data, and the development of computer technology which made the analysis of such data possible. The model has been applied to wide-ranging problems in economics such as labor force participation, choice of occupation, choice of transportation, purchase of consumer durables, schooling, and so on.

My main research interest was initially in time series analysis, but in the beginning of the 1970s it gradually shifted toward qualitative response models and other models which dealt with cross-section data. The main rea-

son for this shift was the fact that most of my colleagues at Stanford who were engaged in empirical research started working with such models.

In the early 1980s Moe Abramovitz, my colleague at Stanford, was the editor of the *Journal of Economic Literature* and was planning to initiate a series of surveys on various fields of economics to be published in his journal. One day he asked me what would be a suitable topic in econometrics to be included in the series, and I suggested qualitative response models and agreed to write a survey myself. By that time I had published several articles^{1,3} on the subject and was quite familiar with it. Nevertheless, the task was a challenge for me because my articles had been all highly technical, yet the survey was intended for empirical researchers, possibly without an extensive statistical background. I spent quite a lot of time on the preparation of the survey, and as the deadline of the submission approached, I often had to resist the pleading of our two children (then aged 10 and 7) to play with them by saying that I had to write a paper for Moe. One weekend I had to stay home to work on the survey, while my wife and the two children went skiing. In those days Moe was not a very popular man in our home. In the end, however, all was well. I was gratified by the responses I received from readers, and now I am very grateful to Moe for having given me the opportunity to write this survey.

My interest in the qualitative response model and related cross-section models has continued to this day. When I wrote an econometrics textbook⁴ in 1985,¹ included in the book more technical material which I could not include in the survey, as well as the papers which appeared after the survey was published.

1. Amemiya T. The modified second-round estimator in the general qualitative response model. *J. Econometrics* 5:295-9, 1977.

2. On a two-step estimation of a multivariate logit model. *J. Econometrics* 8:13-21, 1978.

3. The n-2-order mean squared errors of the maximum likelihood and the minimum logit chi-square estimator. *Ann. Statist.* 8:488-505, 1980.

4. *Advanced econometrics*. Cambridge, MA: Harvard University Press, 1985. 521 p. (Cited 250 times.)