SOME ALTERNATIVE METHODS FOR MODELING THE STABILITY OF ATTUTUDE FOR A DICHTOMOUS DEPENDENT VARIABLE

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ABSTRACT

A conventional method for a panel data to assess the stability in Y, when Y is a dichotomous dependent variable, is to introduce Y(t-1) as a covariate in predicting P(t) where P(t) = Prob(Y(t)=1). Hence, a conventional method of assessing observable heterogeneity in the stability of Y among different states of X is to introduce an interaction term Y(t-1)X in the equation for predicting P(t).

I this paper, I consider two alternative methods based on latent-class models for (1) a possible better fit of the model with data and (2) for a possible provision of better insights into the data. I also discuss as the third alternative that a regression extension for the conventional latent-class model is possible but is not very suitable for the purpose of measuring observable heterogeneity in the stability in Y.

One of the models I advocate, which I call the white-gray model, or the mover-random model, is the model that assumes two latent classes, for one of which Y(t) is assumed to depend on Y(t-1), while for the other Y(t) is assumed to be independent of Y(t-1). I show that the model is a special case of the switching regression model with certain parameter constraints. In addition to regression equations for predicting P(t) for latent classes, the model includes an additional regression equation for predicting Q, the probability of being in latent class 1 with state dependence rather than latent class 2 without state dependence, and this equation identifies the covariates of stability in Y. I discuss the advantages and limitations of this model.

The other model, which I call the black-gray model, or the mover-stayer model, is a model that assumes three-latent classes, the class of stayers of a positive attitude, the class of stayers of a negative attitude, and the class of movers. Its special case, which I call the black-white model, or the stayer-random model, is a regression extension for the loglinear quasi-independence model for the three-wave panel data of dichotomous variables. The model assumes a pair of individual probabilities, the probability of being a stayer versus a mover of one's Y(1) state and the probability of making a positive versus a negative response if one is a mover, and identify, by a pair of regressions, the predictors of probability P(t) of making a positive versus a negative response among movers, and the predictors of the probability Q of being a stayer versus a mover. While the assumption of being a stayer is a strong one, a major advantage of this over the conventional regression model or the switching regression model is that we can assess the content dependence of stability, such that whether the predictors of stability in Y(t) differ between those for stable positive responses and those for stable negative responses.

An application of the four kinds of models (conventional logistic regression models, regression extensions of the conventional latent-class model, switching regression models,

and mover-stayer models) to the three-wave panel data for an analysis of stability in the support for the first Bush administration around the period of Persian Gulf War will be presented.