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# A Control Function Approach to Estimating Switching Regression Models with Endogenous Explanatory Variables and Endogenous Switching

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**Abstract**

We derive simple, multi-step estimation methods for a linear model with heterogeneous coefficients when there are both continuous and discrete endogenous explanatory variables. We consider both cross-sectional and panel data settings. When we extend our model to panel data, we use the Chamberlain-Mundlak device to allow heterogeneity to be correlated with time-varying explanatory variables. We apply the panel data methods we propose to estimation of a housing budget share equation where a homeownership dummy variable plays the role of the endogenous regime, and total expenditure plays the role of a continuous endogenous explanatory variable. We find that the constant coefficient model seems sufficient, and that the estimation methods we propose produce rather plausible estimates of the model parameters.

*JEL-code:* C23

*Keywords:* Random Coefficient Model; Average Treatment Effect; Control Function Approach



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