Temple University

Department of Economics

Economics 8190

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1. The REM model is $y\_{it}=β\_{0}+β\_{1}x\_{it}+a\_{i}+u\_{it}$for a panel data set with i = 1,…,n and t = 1,…,T. The equation used to obtain the between estimator is $\overbar{y}\_{i}=β\_{0}+β\_{1}\overbar{x}\_{i}+a\_{i}+\overbar{u}\_{i}$ where the overbar represents the average over time. We can assume that E(ai) = 0 because we have included an intercept in the model. Suppose that $\overbar{u}\_{i}$ is uncorrelated with $\overbar{x}\_{i}$ but $cov\left(x\_{it}, a\_{i}\right)= σ\_{xa}$ for all i,t.
2. Let $\tilde{β}\_{1}$ be the between estimator. Show that $plim \tilde{β}\_{1}=β\_{1}+^{σ\_{xa}}/\_{Var(\overbar{x}\_{i})}$.
3. Assume further that the $x\_{it}$ for t = 1,2,…,T are uncorrelated and with constant variance $σ\_{x}^{2}$. Show that $plim \tilde{β}\_{1}=β\_{1}+T^{σ\_{xa}}/\_{σ\_{x}^{2}}$.
4. In this exercise you will estimate a wage equation for men using the dataset wagepan.raw, the description of which is in wagepan.des. The basic model has as its dependent variable log(wage). The independent variables are educ, black, hispan, exper, exper2, married, and union.
	1. Which independent variables are time varying and which are not?
	2. Use OLS to estimate a model with all of the independent variables and report your results.
	3. Estimate the coefficients of a REM equation with all of the independent variables and report your results.
	4. Estimate the coefficients of an LSDV model that has just exper2, married and union on the RHS.
		1. Why have some independent variables been dropped from the specification? Make sure you understand why exper is not included.
		2. Report your results.
	5. Use the appropriate statistical tests to decide which is the preferred specification.