

estimation technique that will deliver consistent estimates in the absence of normality and homoskedasticity. There are a number of these in the literature, all more or less experimental. One that is relatively straightforward to compute is Powell's (1984) censored least absolute deviations estimator, which can be implemented given a program (such as STATA) that allows quantile regression.

Powell's estimator rests on the previously noted fact that medians are preserved by monotone functions. Hence, if $q_{50}(y_i|x_i)$ is the median of the conditional distribution of y_i , then from (25)

$$q_{50}(y_i|x_i) = \max[0, 450(x_i - u)] = \max(0, x_i - f) \quad (27)$$

since $\max(0, z)$ is monotone in z , and where the last equality rests on the assumption that the median of u , is zero. Given (27), consistent estimates of the parameters can be obtained by running a nonlinear median (50th percentile) regression, or equivalently by minimizing

$$E \sum y_i - \max(0, \beta) \quad (28)$$

Buchinsky (1994) suggests a simple — if not necessarily efficient — computational strategy is to run a median regression of y on x , to calculate predicted values and discard any that are negative before rerunning the regression. Repetition of this procedure, if it converges, will lead to the parameters that minimize (28). In my own — admittedly limited experience, this works quite satisfactorily even if terminated after five cycles. As is to be expected from a robust procedure, the estimates are a good deal less efficient than Tobit when Tobit's assumptions are correct, and the technique is probably not suitable for a small number of observations. Nevertheless, it is certainly worth trying on survey data, and given large enough samples is likely to be safer than either OLS or Tobit.

2.1.5. Regression bias

Censoring is only one of many cases where the model of interest does not coincide with the regression function, the conditional expectation of y on x . There are a wide range of circumstances where the explanatory variables are correlated with the disturbance, so that least squares regression does not yield consistent estimates of the structural parameters. Omitted variables, simultaneity, heterogeneity, measurement error, and sample selection are all capable of rendering OLS inconsistent, and a great deal of effort in the development literature has gone towards developing techniques that will