

variables, with higher reservation wages required to bring women with children into the labor force. But this sort of clear separation appears to be rare in practice, and in cases where there are no grounds for excluding the selection variables from the structure, there is little point in pursuing the selectivity through a normality-dependent correction, as opposed to estimating the regression function without any attempt to separate structure from selection.

When the models are identified, it is still desirable to pursue estimation strategies that do not rest on normality. There exist a number of robust techniques for various special cases of the general model. For the "policy evaluation" model given by (37) and (41), the obvious technique is instrumental variables although see the earlier discussion on heterogeneity which is dealt with in the next subsection. Robust techniques for dealing with generalized Tobit are still in the experimental stage, and there is little practical experience upon which to draw. However, one straightforward method is given by Newey, Powell, and Walker (1990), who generalize the Heckit to make it robust against departures from normality. At the first stage, they estimate a non-parametric version of probit using the kernel techniques discussed in Section 2.3 below. Alternatively, if we are not too concerned with the role of normality in the probit, the first stage of Heckit can be retained to provide an estimate of the index  $z'y$ . Indeed, the linear probability model is also a competitive technique for the first stage. At the second stage, Newey, Powell and Walker suggest that the index be entered into the regression, not through the Mill's ratio, but as a polynomial that will mimic the unknown and distribution dependent A-function in (39). This procedure avoids having to specify a joint distribution for the two error terms, and will force us to confront the lack of identification where it exists. For example, the procedure will break down if the  $x$  and  $z$  variables are the same.

#### *2.1.10. Instrumental variables and natural experiments*

The "policy evaluation" model (37) and (40) is only one of the many regression models where the technique of instrumental variables can be useful. Indeed, whenever there is a correlation between an explanatory variable and the error term, whether induced by heterogeneity, simultaneity, measurement error, omitted variables, or selectivity, instrumentation can be used to generate consistent estimates provided that it is possible to find instruments that are (at least asymptotically) correlated with the explanatory variable and uncorrelated with the error terms. Of course, the variance of IV estimators will be larger than OLS, so that even when the latter is inconsistent, there is no guarantee that the IVE will be closer to the truth; as usual, the price of greater generality is decreased precision, and as usual, it is important not to interpret an insignificant estimate from IVE as evidence that the OLS estimate is spurious.