

Economics 671: Econometrics
 Department of Economics, Finance and Legal Studies
 University of Alabama
 Fall 2013

Midterm Answers

1. (a) Single index model
 (b) Scalar
 (c) $g'(x_i\beta) \beta$
 (d) $\exp(x_i\beta)$
 (e) $-\exp(x_i\beta)$
 (f) $\frac{1}{n} \sum_{i=1}^n \exp(x_i\beta) \beta$
 (g) $-\exp(\bar{x}\beta) \beta$
 (h) $g(x_i\beta) = x_i\beta$ (linear function - all marginal effects equal to β)

2. (a) $Q_n(\theta) = u'zW_nz'u$
 (b) $d'zW_nz'u = 0$, where $d = \partial g(x_i, \beta) / \partial \beta$
 (c) $V(\beta_{GMM}) = (d'zW_nz'd)^{-1} (d'zW_n\widehat{S}W_nz'd) (d'zW_nz'd)^{-1}$
 (d) $Q_n(\theta) = u'z\widehat{S}^{-1}z'u$
 (e) $Q_n(\theta) = u'z(z'z)^{-1}z'u$
 (f) NLIV, solves $z'u = 0$
 (g) NL2SLS FOC is $x'z(z'z)^{-1}(y - x\beta) \Rightarrow \beta = [x'z(z'z)^{-1}z'x]^{-1}x'(z'z)^{-1}z'y$, when $r = k$ (just-identified) $[x'z(z'z)^{-1}z'x]^{-1} = (z'x)^{-1}(z'z)(x'z)^{-1}$ and multiplication with the second part of the equation simplifies to $(z'x)^{-1}z'y$.

3. (a) Unless the unobserved heterogeneity is additively separable from the regressors (x), then standard IV estimation will not produce consistent estimates of the parameter vector.
 (b) Cigarettes smoked per day; birthweight
 (c) Habit stock; cigarettes smoked per day