WESS ECONOMETRICS

Exercise Sheet 3

Again we are looking at the data file ***qlfs14q1.dta***, and we will be adding to the Stata DO file that we created for Exercise Sheet 1 and then extended in Exercise Sheet 2.

1. Consider the model estimated in the last exercise sheet

$$\ln(HOURPAY_i) = \alpha + \beta_1 EDAGE_i + \beta_2 AGE + \beta_3 \left[AGE\right]^2 + \beta_4 F + \varepsilon_i \qquad (1)$$

(a) Using equation in (1) test, using Stata, the hypothesis $H_0 : \beta_4 = 0$. Is there any evidence of gender pay differential?

(b) What will happen to the coefficient estimates in (1) if you used *M*=1 if male and 0 if female, instead of the variable *F*?

(c) In this model we assume that an additional year of schooling (*EDAGE*) adds a constant proportion to an individual's earnings, irrespective of whether one gets an actual qualification. Re-estimate equation (1), including dummy variables for each individual's highest qualification (based on the variable *HIQUL11D*, using "no qualification" as the default qualification).

(d) Interpret the coefficient on the first degree dummy.

(e) Use Stata to test the hypothesis that the coefficients on the highest qualification dummies are jointly equal to zero.

(f) Re-estimate the equation in (c) using "GCE, A-level or equivalent" as the default (omitted) qualification. Interpret the coefficient on the first degree dummy. Account for the difference in this coefficient estimate compared to that reported in (c).

(g) Compare the coefficient estimate on EDAGE for the model estimated (c) with that in (f). Account for the difference in the two coefficient estimates.

(h) Generalise the model in (c) by adding interaction terms between *F* and the variables $EDAGE$, AGE and $[AGE]^2$, that is estimate the model:

$$\ln(HOURPAY_i) = \alpha + \beta_1 EDAGE_i + \beta_2 AGE + \beta_3 AGE^2 + \beta_4 FEMALE$$
$$+ \sum_{j=1, j\neq 7}^{8} \delta_j (QUAL\_j_i) + \gamma_1 FEMALE \times EDAGE + \gamma_2 FEMALE \times AGE$$
$$+ \gamma_3 FEMALE \times [AGE]^2 + \varepsilon_i$$

(i) Interpret the coefficient on γ_1 .

(j) Using equation in (f) test, using Stata, the hypothesis $H_0 : \gamma_1 = \gamma_2 = \gamma_3 = 0$. Is there any evidence of gender pay differential according to education and/or age?

(k) Estimate the model:

$$\ln(HOURPAY_i) = \alpha + \beta_1 EDAGE_i + \beta_2 AGE + \beta_3 AGE^2 + \beta_4 F + \sum_{j=1, j\neq 7}^{8} \delta_j (QUAL\_j_i) + \gamma_1 W + \varepsilon_i$$

where, *W*=1 if *ETHUKEUL*=1 and 0 otherwise. Interpret the coefficient on *W* and test the hypothesis of no ethnic discrimination.

(l) Estimate the model:

$$\ln(HOURPAY_i) = \alpha + \beta_1 W + \beta_2 F + \beta_3 F \times W + \varepsilon_i$$

Interpret the coefficients $\alpha, \beta_1, \beta_2, \beta_3$ and reconcile these with the results reported in Exercise Sheet 2 (question 10)