a)

Dep. variable: LOGW
Sample size: 3010

	Coeff	SE	t-stat
Constant	4.611	0.0679	67.91
EDUC	0.082	0.0035	23.31
EXPER	0.084	0.0068	12.38
$EXPER^2$	-0.002	0.003	-6.80
SMSA	0.151	0.0158	9.52
SOUTH1	-0.175	0.0146	-11.96

when educ ↑ 1 year we have:

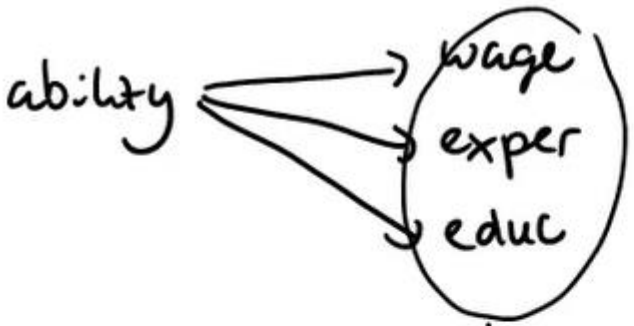
$$\log(wage^{new}) = \log(wage^{old}) + 0.08$$

$$wage^{new} = wage^{old} \exp(0.08)$$

$$wage^{new} = wage^{old} \times 1.083$$

the wage increases by about 8%.

b)



endogenous → OLS is biased & inconsistent

c) age : - related to exper (only older people can have very long experience)

- exogenous (people cannot influence their age)

d)

Depvariable: EDUC
Sample size: 3010

	Coeff	SE	t-stat
Constant	-5.652	3.976	-1.421
AGE	0.990	0.279	3.551
AGE^2	-0.017	0.005	-3.518
SMSA	0.530	0.102	5.217
SOUTH1	-0.425	0.091	-4.667
NEARC	0.265	0.099	2.670
DADED	0.190	0.016	12.199
MOMED	0.235	0.017	13.773

Condition that instruments and endogenous variable are sign. related

e) First run 1st stage regressions for EXPER and $EXPER^2$

→ store predicted series (_FIT)

perform 2nd stage

Dep. variable: LOGW
Sample size: 3010

	Coeff
C	4.417
EDUC_FIT	0.100
EXPER_FIT	0.073
$EXPER^2$_FIT	−0.002
SMSA	0.135
SOUTH	−0.159

positive effect 10%

f) 1) calculate 2SLS residuals
(! use actual X variables, not fitted)

2) regress 2SLS residuals on all instruments

f)

Dep. variable: 2SLS residuals
Sample size: 3010

	Coeff	SE	t-value
Constant	0.126	0.657	0.192
SMSA	-0.003	0.017	-0.200
SOUTH1	0.002	0.015	0.148
AGE	-0.009	0.046	-0.203
AGE^2	0.000	0.001	0.199
NEARC	0.014	0.016	0.825
MOMED	0.004	0.003	1.462
DADED	-0.004	0.003	-1.592
R^2	0.00123		

Sargan test stat = $\underset{\uparrow}{n} \times \overset{\nearrow}{R^2} = 3010 \times 0.00123 = 3.70 < 5.99$

$\chi^2(3-6) = \chi^2(2)$ dist with C.V. 5.99

↓

not reject H_0

→ instruments seem to be valid