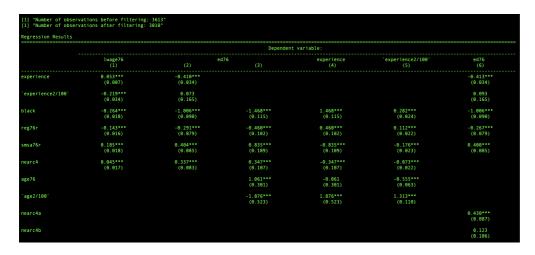
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Homework: 2024/11/20

1-1. Reduced-form regressions

Reproduce Table 12.2



1-2. IV & 2SLS wage regressions

Reproduce Table 12.1

Regression Results						
	Dependent variable:					
	0LS	lwage76 OLS instrumental variable				
	OLS	IV(a)	IV(b)	2SLS(a)	2SLS(b)	
	(1)	(2)	(3)	(4)	(5)	
ed76	0.074*** (0.004)	0.132*** (0.049)	0.133*** (0.051)	0.161*** (0.041)	0.160*** (0.041)	
experience	0.084***	0.107***	0.056**	0.119***	0.047*	
	(0.007)	(0.021)	(0.026)	(0.018)	(0.025)	
`experience2/100`	-0.224***	-0.228***	-0.080	-0.231***	-0.032	
	(0.032)	(0.033)	(0.134)	(0.035)	(0.128)	
black	-0.190***	-0.131**	-0.103	-0.102**	-0.064	
	(0.018)	(0.053)	(0.077)	(0.045)	(0.063)	
reg76r	-0.125***	-0.105***	-0.098***	-0.095***	-0.086***	
	(0.015)	(0.023)	(0.029)	(0.022)	(0.026)	
smsa76r	0.161*** (0.016)	0.131*** (0.030)	0.108** (0.050)	0.116*** (0.027)	0.083** (0.041)	

Sargan's over-identification test

Sargan Test Results:
25L5(a) Model:
Sargan statistic: 0.821
p-value: 0.365

25L5(b) Model:
Sargan statistic: 0.524
p-value: 0.469

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2.

Since
$$S \xrightarrow{} Z'(I_{\ell} - \mathcal{Q}(Q'Q)^{\dagger}Q') Z$$
, and $Z \sim N(0, I_{\ell})$
The olegies of freedom depends on rank $(I_{\ell} - \mathcal{Q}(Q'Q)^{\dagger}Q')$
 $\operatorname{rank}(I_{\ell} - \mathcal{Q}(Q'Q)^{\dagger}Q') = \operatorname{trace}(I_{\ell} - \mathcal{Q}(Q'Q)^{\dagger}Q')$
 $= \ell - k$
As we know that for any idempotent matrix A , we have $Z'AZ \longrightarrow \chi^{2}(\operatorname{rank}(A))$
 \therefore Under H_{0} , we have $S \xrightarrow{d} \chi^{2}(\ell - k)$, $Q \in D$.

3. Source Code

Source Code