**Panel Econometrics**

Assignment #4

By Chuxin Liu

**Question 1: Compute and report the descriptive statistics (means and standard deviations) for the twelve variables.**

Table 1: Summary Statistics

|  |  |  |
| --- | --- | --- |
|  | (1) |  |
|  | Total sample |  |
|  | mean | sd |
| exp | 19.85378 | 10.96637 |
| wks | 46.81152 | 5.129098 |
| occ | .5111645 | .4999354 |
| ind | .3954382 | .4890033 |
| south | .2902761 | .4539442 |
| smsa | .6537815 | .475821 |
| ms | .8144058 | .3888256 |
| fem | .112605 | .3161473 |
| union | .3639856 | .4812023 |
| ed | 12.84538 | 2.787995 |
| blk | .0722689 | .2589637 |
| lwage | 6.676346 | .4615122 |
| *N* | 4165 |  |

**Question 2: Replicate the results of Table 7.4 (you may use Stata’s built-in commands: xtreg and xthtaylor)**

Table 7.4 on Baltagi’s book:

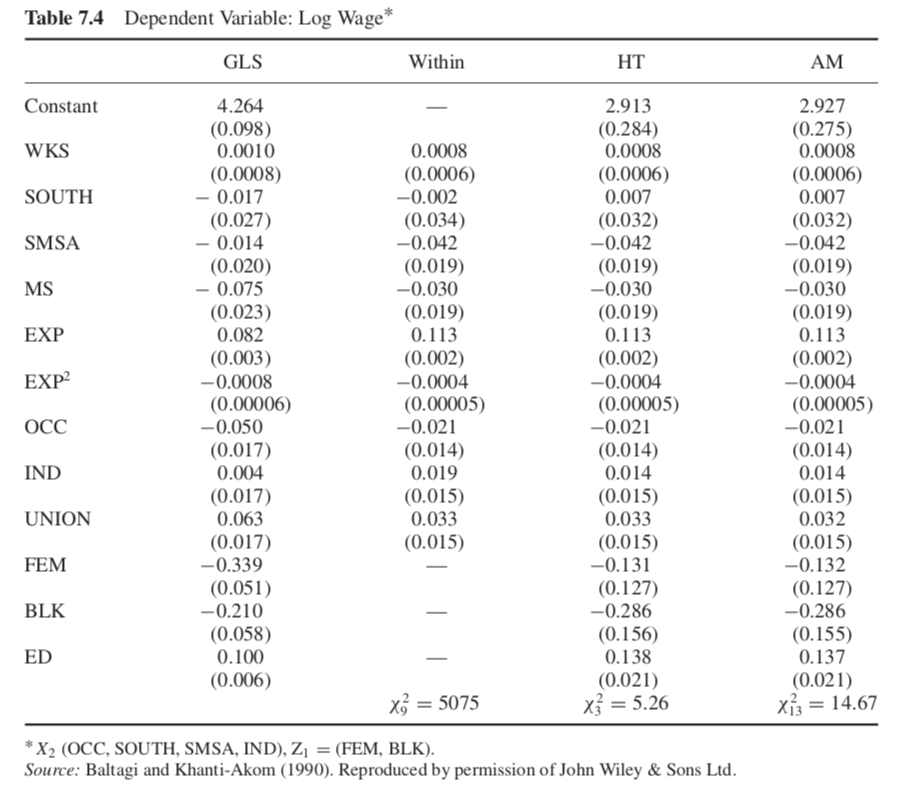
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Table 2: Replication of Table 7.4

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
|  | GLS | Within | HT | AM |
| Constant | 4.264\*\*\* | 4.649\*\*\* | 2.913\*\*\* | 2.927\*\*\* |
|  | (0.0977) | (0.0460) | (0.284) | (0.275) |
| WKS | 0.00103 | 0.000836 | 0.000837 | 0.000838 |
|  | (0.000773) | (0.000600) | (0.000600) | (0.000599) |
| SOUTH | -0.0166 | -0.00186 | 0.00744 | 0.00728 |
|  | (0.0265) | (0.0343) | (0.0320) | (0.0319) |
| SMSA | -0.0138 | -0.0425\* | -0.0418\* | -0.0420\* |
|  | (0.0200) | (0.0194) | (0.0190) | (0.0189) |
| MS | -0.0746\*\* | -0.0297 | -0.0299 | -0.0301 |
|  | (0.0230) | (0.0190) | (0.0190) | (0.0190) |
| EXP | 0.0821\*\*\* | 0.113\*\*\* | 0.113\*\*\* | 0.113\*\*\* |
|  | (0.00285) | (0.00247) | (0.00247) | (0.00247) |
| exp2 | -0.000808\*\*\* | -0.000418\*\*\* | -0.000419\*\*\* | -0.000421\*\*\* |
|  | (0.0000628) | (0.0000546) | (0.0000546) | (0.0000546) |
| OCC | -0.0501\*\* | -0.0215 | -0.0207 | -0.0208 |
|  | (0.0166) | (0.0138) | (0.0138) | (0.0138) |
| IND | 0.00374 | 0.0192 | 0.0136 | 0.0136 |
|  | (0.0173) | (0.0154) | (0.0152) | (0.0152) |
| UNION | 0.0632\*\*\* | 0.0328\* | 0.0328\* | 0.0325\* |
|  | (0.0171) | (0.0149) | (0.0149) | (0.0149) |
| FEM | -0.339\*\*\* | 0 | -0.131 | -0.132 |
|  | (0.0513) | (.) | (0.127) | (0.127) |
| BLK | -0.210\*\*\* | 0 | -0.286 | -0.286 |
|  | (0.0580) | (.) | (0.156) | (0.155) |
| ED | 0.0997\*\*\* | 0 | 0.138\*\*\* | 0.137\*\*\* |
|  | (0.00575) | (.) | (0.0212) | (0.0206) |
| Hausman |  | chi2(9)=5075 | chi2(3)=5.26 | chi2(13)=14.67 |

\*X2(exp exp2 wks ms union), Z1(fem blk)

Source: Baltagi and Khanti-Akom (1990)

**There is slight difference between replication and original table:**

1. My replication FE model estimates constant term while the original FE model doesn’t;
2. In terms of Hausman test for (FE vs HT) and (HT vs. AM): my replication is able to match the statistics but cannot match the degree of freedom. Meng-Ting later taught me to add an option to change the degree of freedom, which helps solve this problem.

**Question 3: How many instruments does each of the two HT regressions use, and thus what are the degrees of freedom of the test for overidentification?**

Exogenous time-varying variables:

Endogenous time-varying variables:

Exogenous time-invariant variables:

Endogenous time-invariant variables:

HT uses instruments:

# of instruments: 4+5+4+2=15

# of degree of freedom of the test for overidentification: 4-1=3

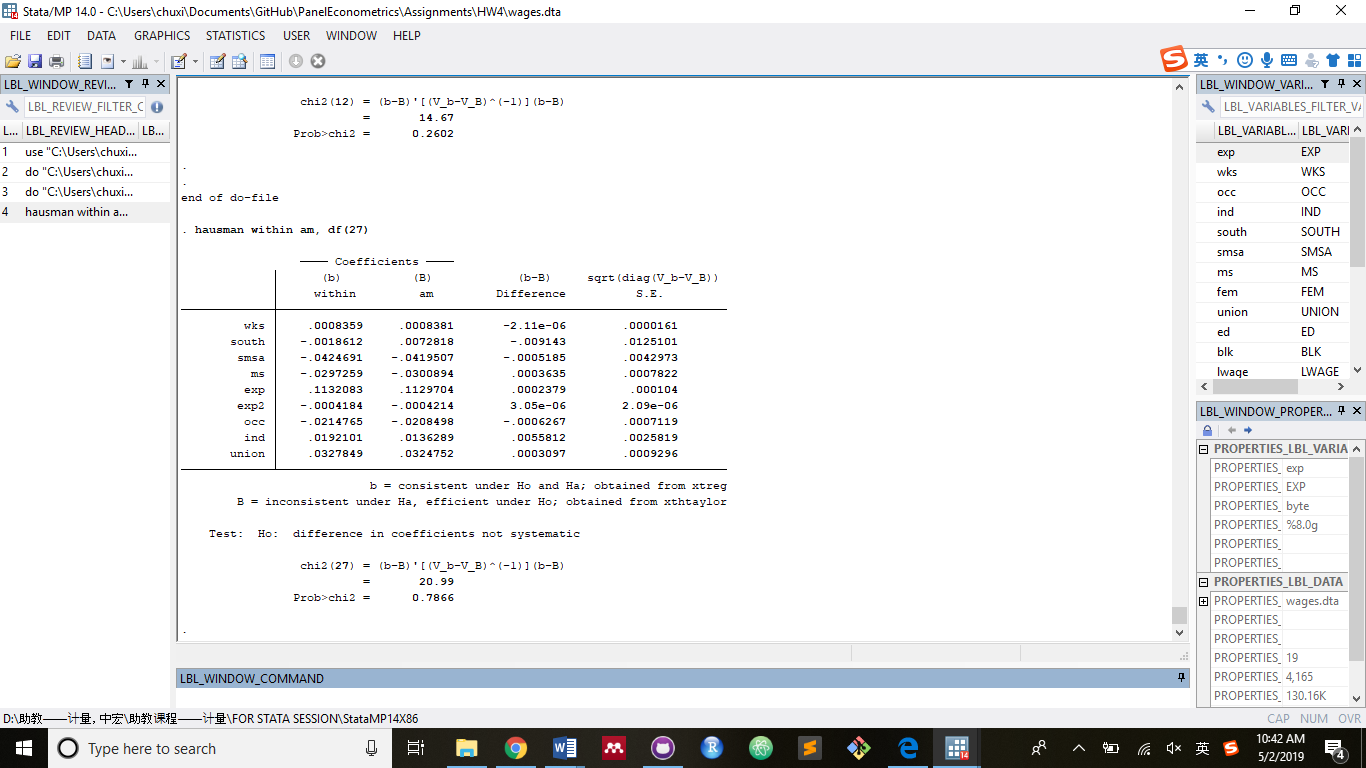
AM uses instruments: where

# of instruments: 4+5+4\*7+2=39

# of degree of freedom of the test for overidentification: 4\*7-1=27

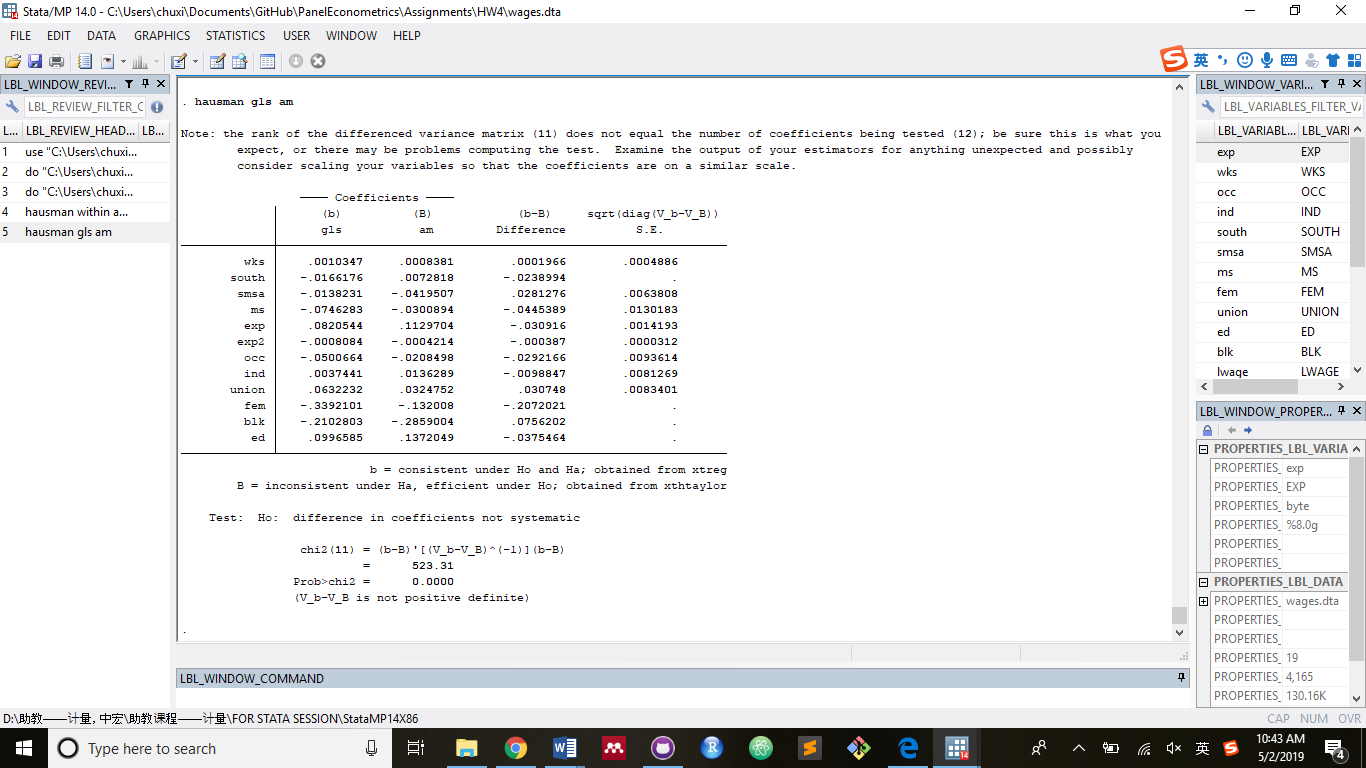
**Question 4: Compare the RE (or GLS), FE (or WE), and AM estimators: do the proper HT and Hausman tests to figure out your recommended estimator.**

1. FE vs. AM with df=27 (insignificant)



Insignificant test result suggests that AM or GLS will be more efficient than FE.

1. RE vs. AM (significant)



Significant result suggests that AM is more consistent than GLS.

**Appendix: STATA Codes**

