# HWK 01

**Luis Hefang Deng (CEMFI)**

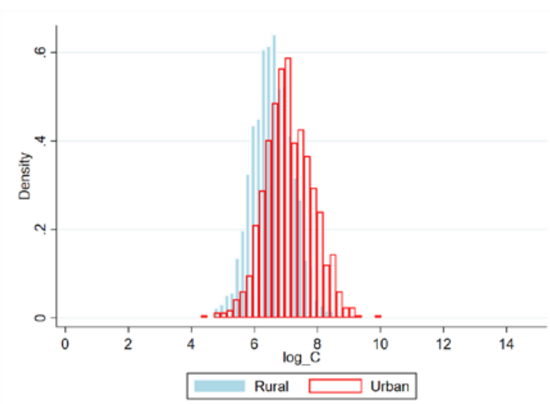
**Question 1**

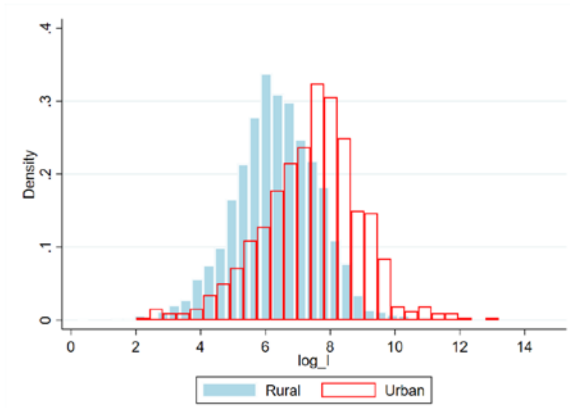
(1).

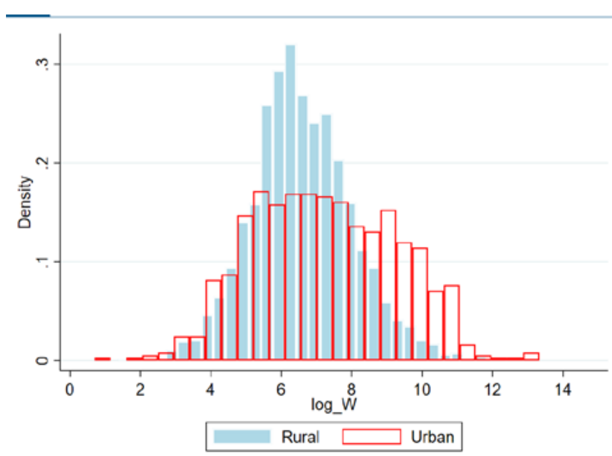
| | mean(C) | mean(I) | mean(W) |
|---|---|---|---|
| **Rural** | 921 | 1403 | 2326 |
| **Urban** | 1752 | 5291 | 9964 |
| **Total** | 1108 | 2535 | 4323 |

**In all 3 dimensions, the Urban is higher than Rural**

(2). As we can see, they are quite similar as the slides



| | var(log_C) | var(log_I) | var(log_W) |
|---|---|---|---|
| Rural | .4267483 | 1.728914 | 2.082228 |
| Urban | .576165 | 2.326532 | 4.234638 |
| Total | .519699 | 2.114658 | 2.733036 |

This is the table of variance

(3)

For total

| | log_C | log_I | log_W |
|---|---|---|---|
| log_C | 1.0000 | | |
| log_I | 0.6166 | 1.0000 | |
| log_W | 0.6366 | 0.4422 | 1.0000 |

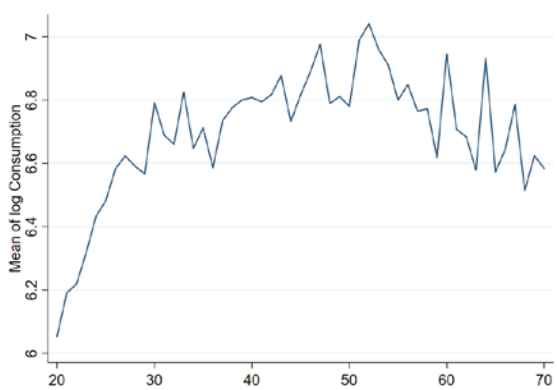
For Rural

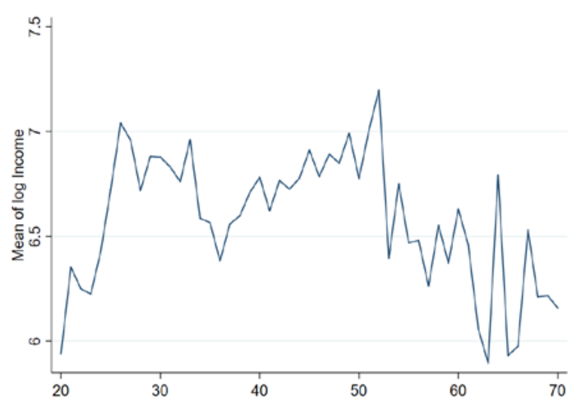
| | log_C | log_I | log_W |
|---|---|---|---|
| log_C | 1.0000 | | |
| log_I | 0.5319 | 1.0000 | |
| log_W | 0.5964 | 0.3837 | 1.0000 |

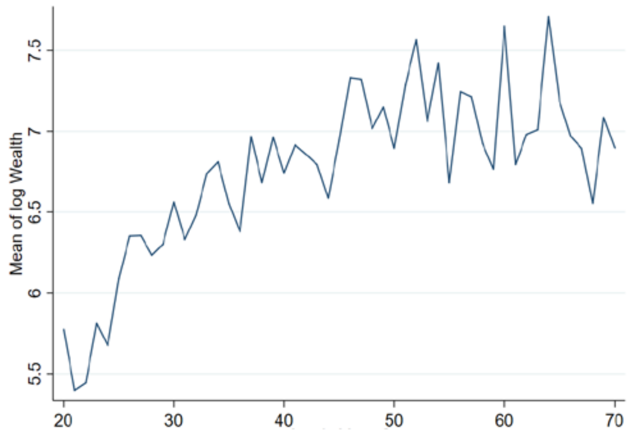
For Urban

| | log_C | log_I | log_W |
|---|---|---|---|
| log_C | 1.0000 | | |
| log_I | 0.6514 | 1.0000 | |
| log_W | 0.6701 | 0.4655 | 1.0000 |

(4)






(5)

Question 2

(1).

**Intensive Mean**

```
Summary statistics: mean
     for variables: LS LSFamily Total_LS
  by categories of: urban

       urban |     e(LS)  e(LSFam~)  e(Total~)
-------------+---------------------------------
       Rural |  639.0838   1986.935   2591.908
       Urban |  1464.303   1516.406   2719.536
-------------+---------------------------------
       Total |  854.8534   1920.351   2609.969
```

**Intensive Variance**

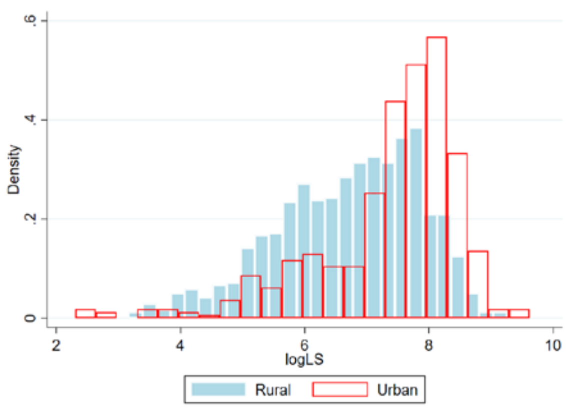
```
Summary statistics: variance
     for variables: logLS logLSFamily logTotal_LS
  by categories of: urban

       urban |  e(logLS)  e(logLS~)  e(logTo~)
-------------+---------------------------------
       Rural |   1.39385    .940929   .8735892
       Urban |  1.377697   1.196387   1.125171
-------------+---------------------------------
       Total |  1.488303   .9875084   .9087133
```

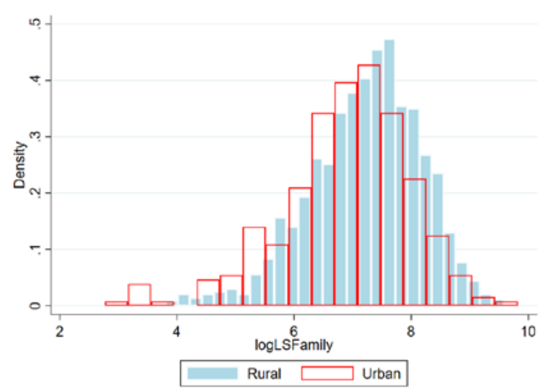
**Extensive Mean**

```
Summary statistics: mean
     for variables: LS_Extensive LSFamily_Extensive Total_LS_Extensive
  by categories of: urban

       urban | e(LS_Ex~)  e(LSFam~)  e(Total~)
-------------+---------------------------------
       Rural |  46.00348   99.21807   99.52215
       Urban |   59.7546   97.91411    99.6319
-------------+---------------------------------
       Total |  49.59897   98.87713   99.55085
```

**Extensive Variance**

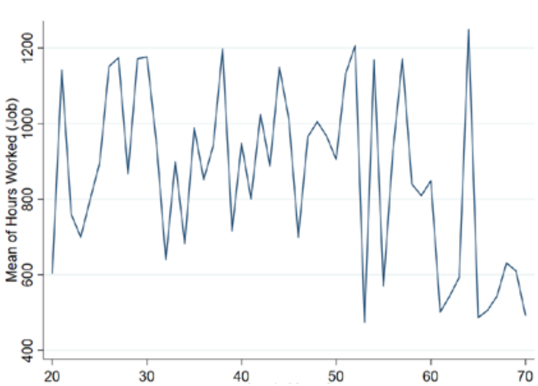
```
Summary statistics: variance
     for variables: LS_Extensive LSFamily_Extensive Total_LS_Extensive
  by categories of: urban

       urban | e(LS_Ex~)  e(LSFam~)  e(Total~)
-------------+---------------------------------
       Rural |  2485.107   77.61518   47.57687
       Urban |  2407.802   204.4889   36.71937
-------------+---------------------------------
       Total |  2500.641   111.0622    44.7276
```

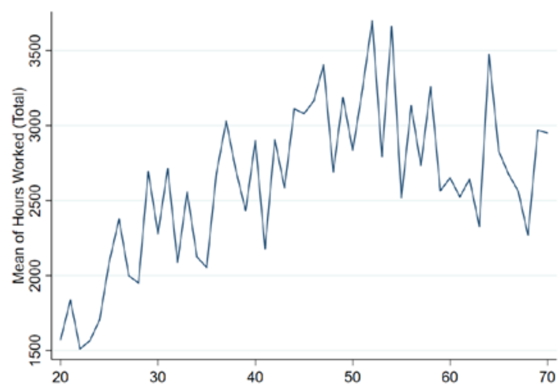



**Interpretation :** Maybe in rural there're more Children than in Urban.

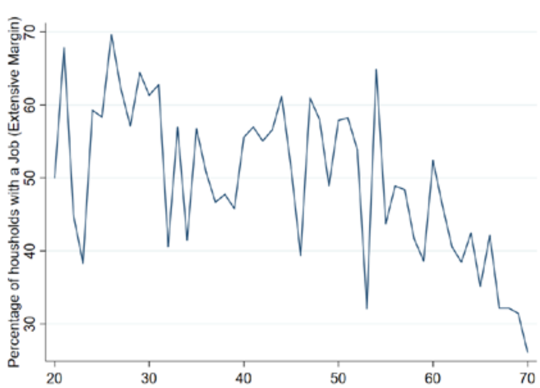
## Lifecyle Labor Surply (Intensive)

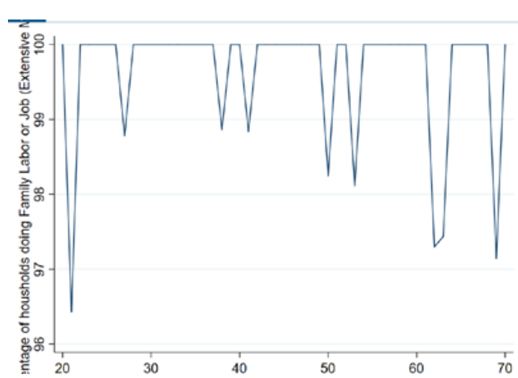



The rght hand side is the total labor surply .

## Lifecyle Labor Surply (Extensive)



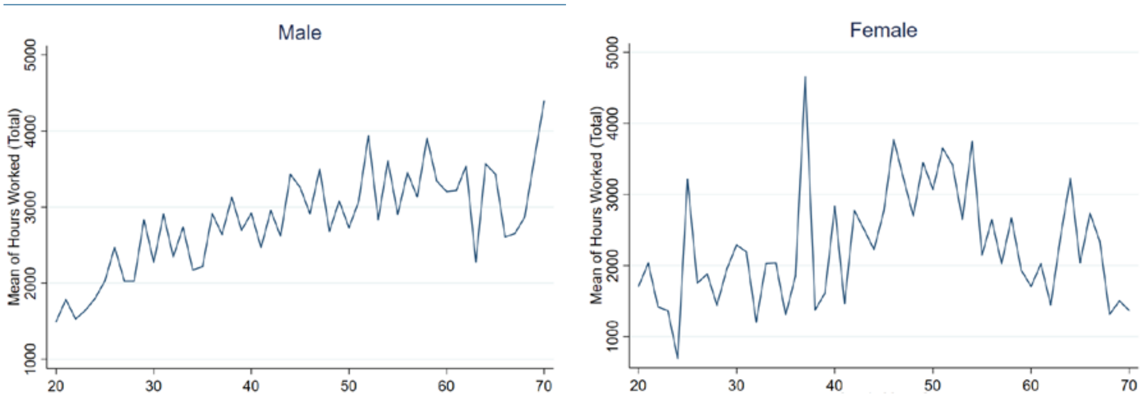



## 2.2

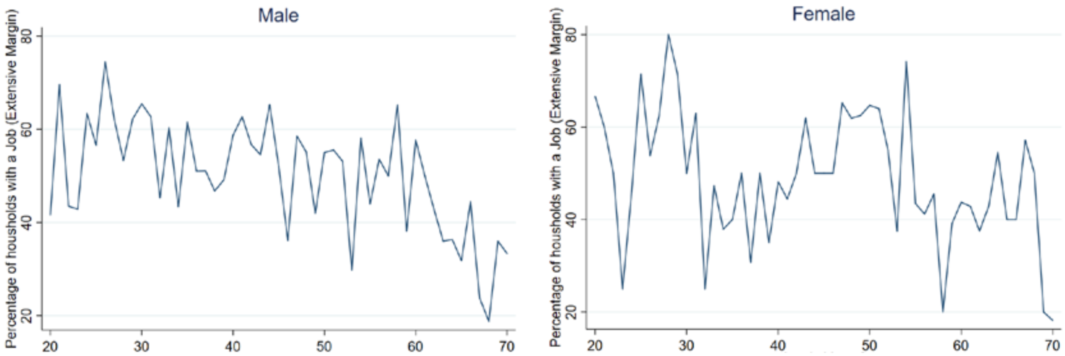
## By Women and Men

```
. estpost tabstat LS LSFamily Total_LS, by(sex) statistics(mean)

Summary statistics: mean
     for variables: LS LSFamily Total_LS
  by categories of: sex

         sex |     e(LS)  e(LSFam~)  e(Total~)
-------------+---------------------------------
        Male |  891.1402   2024.738   2746.729
      Female |   777.122   1693.795   2313.151
-------------+---------------------------------
       Total |  854.8534   1920.351   2609.969


Summary statistics: mean
     for variables: LS_Extensive LSFamily_Extensive Total_LS_Extensive
  by categories of: sex

         sex | e(LS_Ex~)  e(LSFam~)  e(Total~)
-------------+---------------------------------
        Male |  51.38824   98.91765   99.67059
      Female |  45.76613   98.79032   99.29435
-------------+---------------------------------
       Total |  49.59897   98.87713   99.55085


Summary statistics: variance
     for variables: logLS logLSFamily logTotal_LS
  by categories of: sex

         sex |  e(logLS)  e(logLS~)  e(logTo~)
-------------+---------------------------------
        Male |  1.510737    .905207   .8157396
      Female |  1.435515   1.126088   1.068565
-------------+---------------------------------
       Total |  1.488303   .9875084   .9087133
```

**We find that the Labor Supply of Men is higher than Women on average in both intensive and extensive margin.**




**Intensive Margin**




**Extensive Margin**

**As we can see, the female fluctuates more than the Male and both go down when they becoming old**

# By Education

Summary statistics: mean
for variables: LS LSFamily Total_LS
by categories of: education

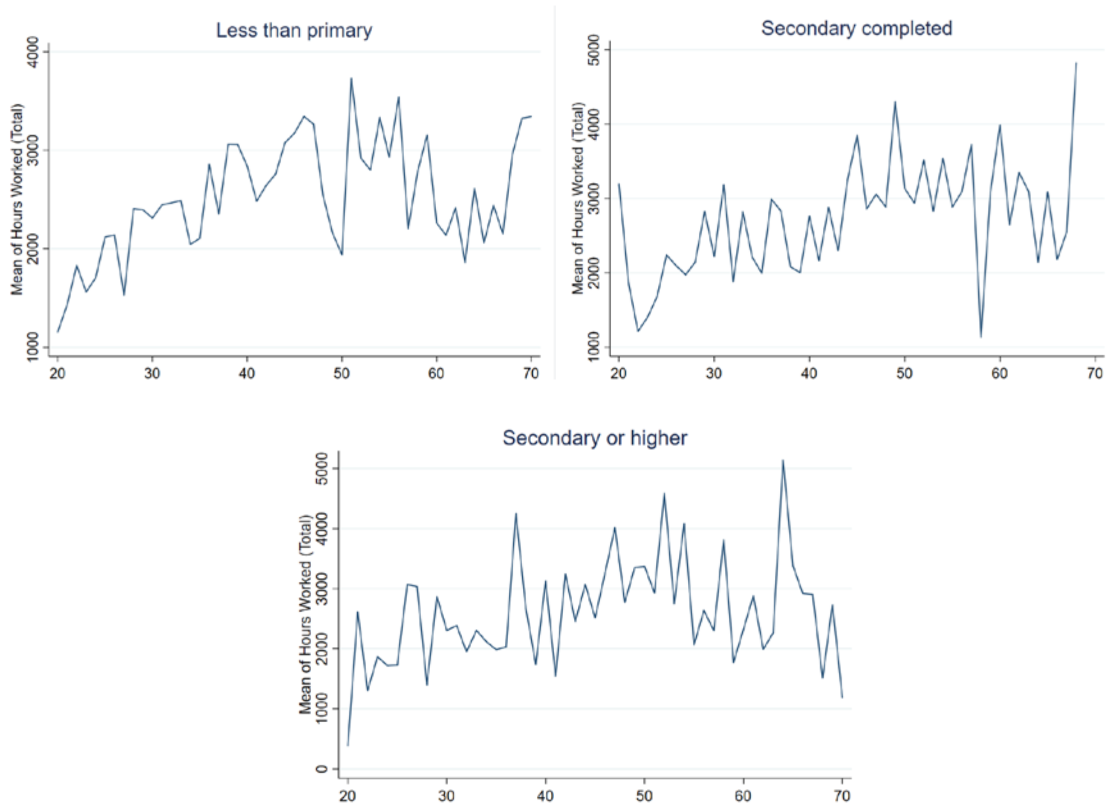
| education | e(LS) | e(LSFam~) | e(Total~) |
|---|---|---|---|
| 1 | 645.2544 | 2018.525 | 2562.887 |
| 2 | 825.6283 | 2042.342 | 2708.682 |
| 3 | 1076.051 | 1712.587 | 2591.363 |
| Total | 854.8534 | 1920.351 | 2609.969 |

Summary statistics: mean
for variables: LS_Extensive LSFamily_Extensive Total_LS_Extensive
by categories of: education

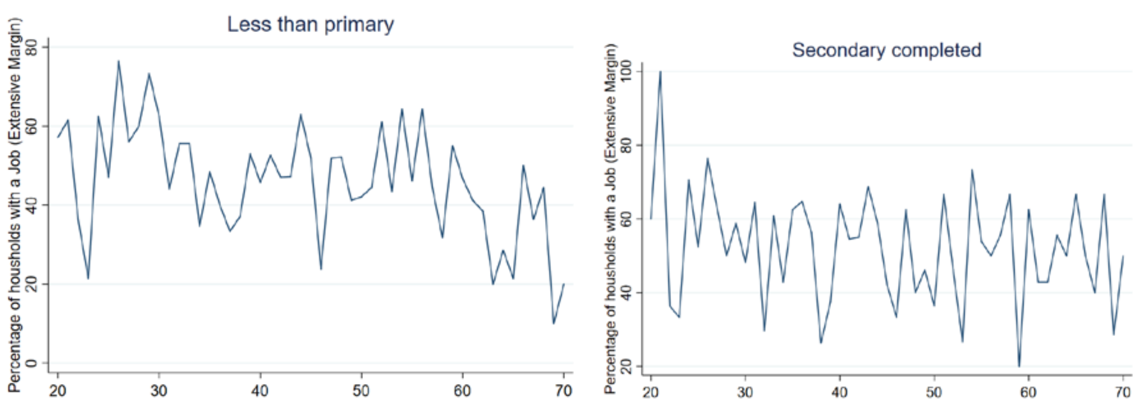
| education | e(LS_Ex~) | e(LSFam~) | e(Total~) |
|---|---|---|---|
| 1 | 45.42254 | 99.29577 | 99.3838 |
| 2 | 51.4393 | 99.1239 | 99.87484 |
| 3 | 52.36887 | 98.30795 | 99.49239 |
| Total | 49.59897 | 98.87713 | 99.55085 |

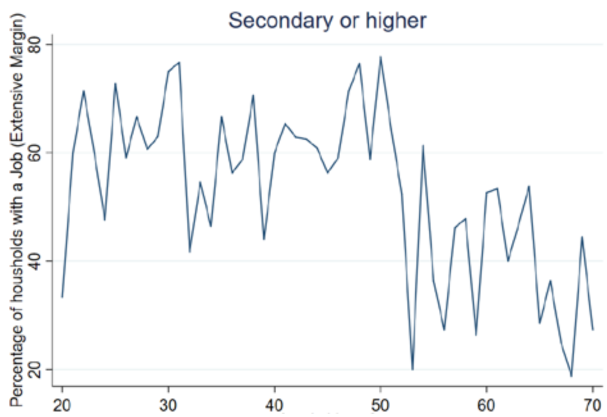
Summary statistics: variance
for variables: logLS logLSFamily logTotal_LS
by categories of: education

| education | e(logLS) | e(logLS~) | e(logTo~) |
|---|---|---|---|
| 1 | 1.619899 | .9515028 | .9086623 |
| 2 | 1.493068 | .9524317 | .7911067 |
| 3 | 1.249805 | 1.032474 | .9934147 |
| Total | 1.488303 | .9875084 | .9087133 |




**As we can see, with higher education, when they are old, they also work more hours than low educated.**





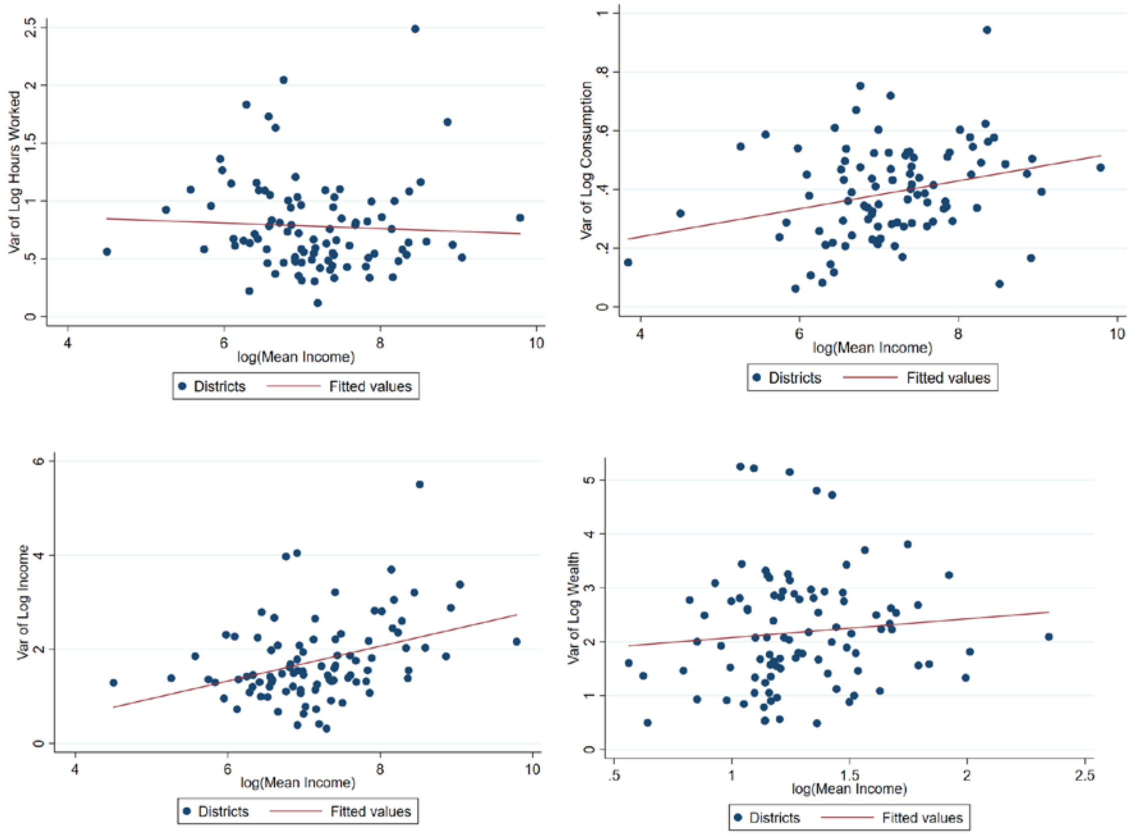

**For the extensive margin, the higher educated, they have higher extensive margin in their overall life.**

# Question 3

## (1). plot the level

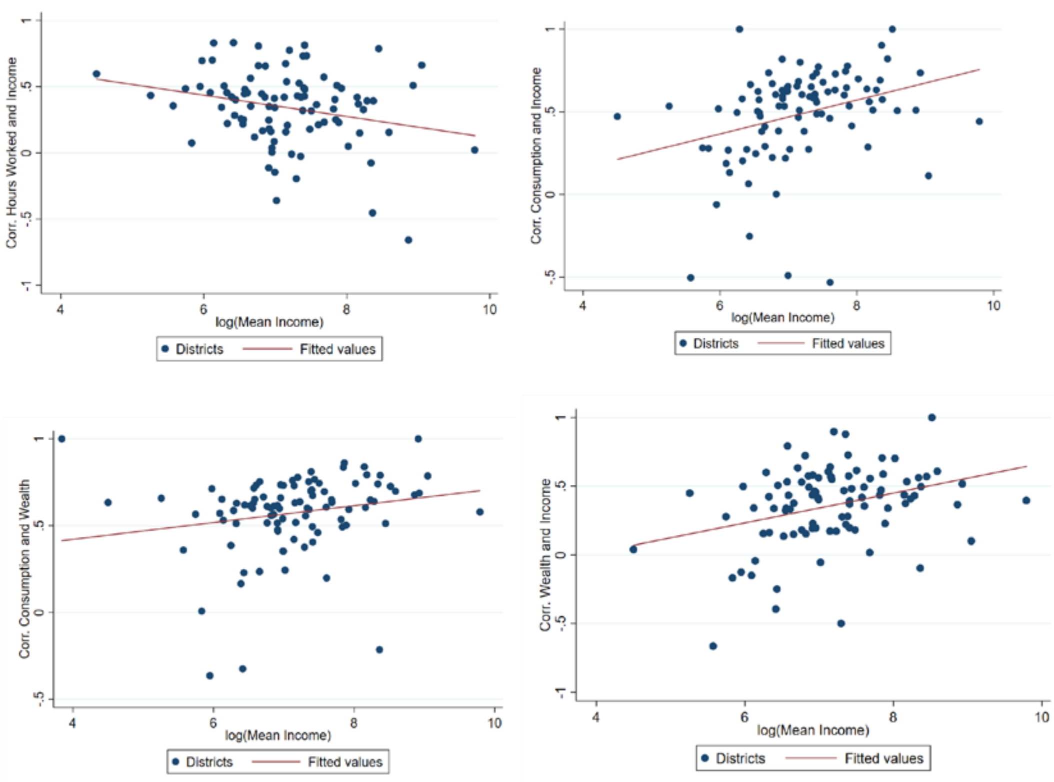


## (2). Plot the inequality




**We find some interesting facts, when income is higher the variance of labor supply reduce.**

**(3).**




**We find some interesting facts, when income is higher**

1. **the correlation between labor supply and Income becomes smaller .**
2. **the correlation between Consumption and Income increase a lot .**
3. **the correlation between Consumption and wealth are quite stable and the slop is positive but smaller .**
4. **the correlation between Wealth and Income increase a lot .**

## (4) replicate Bick et. al (2018)

```
.
. * Regressions
. xi: reg logLS log_I_Hourly age age2, vce(cluster district_code)

Linear regression                               Number of obs     =      1,542
                                                F(3, 97)          =       0.90
                                                Prob > F          =     0.4450
                                                R-squared         =     0.0024
                                                Root MSE          =     1.2203

                         (Std. Err. adjusted for 98 clusters in district_code)
```

| logLS | Coef. | Robust Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| log_I_Hourly | .0382255 | .1241564 | 0.31 | 0.759 | -.2081906 | .2846416 |
| age | .0176957 | .013441 | 1.32 | 0.191 | -.0089809 | .0443723 |
| age2 | -.0001972 | .0001385 | -1.42 | 0.157 | -.000472 | .0000775 |
| _cons | 6.515055 | .3155215 | 20.65 | 0.000 | 5.888832 | 7.141278 |

```
. xi: reg logLS Wage age age2, vce(cluster district_code)

Linear regression                               Number of obs     =      1,546
                                                F(3, 98)          =       6.82
                                                Prob > F          =     0.0003
                                                R-squared         =     0.1404
                                                Root MSE          =     1.1322

                         (Std. Err. adjusted for 99 clusters in district_code)
```

| logLS | Coef. | Robust Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| Wage | .4320455 | .0986551 | 4.38 | 0.000 | .2362676 | .6278234 |
| age | .0132511 | .0129123 | 1.03 | 0.307 | -.012373 | .0388751 |
| age2 | -.0001496 | .000133 | -1.12 | 0.263 | -.0004134 | .0001143 |
| _cons | 6.408197 | .3382289 | 18.95 | 0.000 | 5.736993 | 7.079402 |

```
. xi: reg logLS Wage log_I_Hourly age age2, vce(cluster district_code)

Linear regression                               Number of obs     =      1,542
                                                F(4, 97)          =       7.17
                                                Prob > F          =     0.0000
                                                R-squared         =     0.1406
                                                Root MSE          =      1.133

                         (Std. Err. adjusted for 98 clusters in district_code)
```

| logLS | Coef. | Robust Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| Wage | .4337434 | .1021008 | 4.25 | 0.000 | .2311015 | .6363853 |
| log_I_Hourly | -.0295372 | .0965627 | -0.31 | 0.760 | -.2211875 | .162113 |
| age | .0129985 | .0128522 | 1.01 | 0.314 | -.0125095 | .0385066 |
| age2 | -.0001478 | .0001328 | -1.11 | 0.269 | -.0004114 | .0001159 |
| _cons | 6.437475 | .3149621 | 20.44 | 0.000 | 5.812362 | 7.062587 |

```
Linear regression                                 Number of obs     =      1,542
                                                  F(2, 97)          =          .
                                                  Prob > F          =          .
                                                  R-squared         =     0.2908
                                                  Root MSE          =     1.0629

                             (Std. Err. adjusted for 98 clusters in district_code)
```

| logLS | Coef. | Robust Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| Wage | .3504572 | .1232288 | 2.84 | 0.005 | .1058822 | .5950322 |
| log_I_Hourly | .0729683 | .0206076 | 3.54 | 0.001 | .032068 | .1138686 |

**Interpretation:**

**What we cares is the labor surply Elasticities.**

**Let's look at the coefficient on Wage, we find in the last three regressions, the number is around 0.35. and they're quite stable.**