Development HW 1

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Question 1. Inequality in consumption, income and wealth (CIW).

Question 1.1 Report average CIW per household separately for rural and urban areas.

Table 1.1 Average CIW per Household: Urban v.s. Rural (US $)

	Consumption	Income	Wealth	Obs.
Rural	1364.182	1391.767	2056.462	2253
Urban	2662.346	3413.421	6856.576	798

Question 1.2 CIW inequality: (1) Show histogram for CIW separately for rural and urban areas; (2) Report the variance of logs for CIW separately for rural and urban areas.
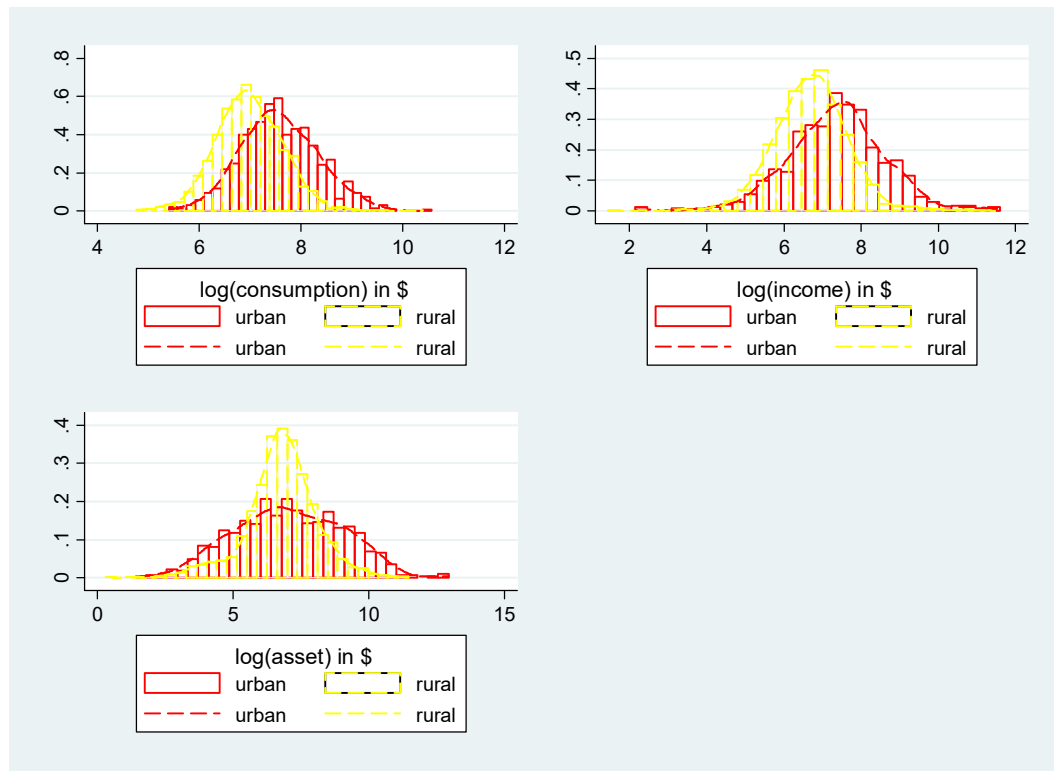

Figure 1.2 Distribution of CIW: Urban v.s. Rural (US $)

Table 1.2 Variance of log CIW per Household: Urban v.s. Rural

	Consumption	Income	Wealth	Obs.
Rural	0.443	0.953	1.744	2253
Urban	0.614	1.623	4.034	798

Question 1.3 Describe the joint cross-sectional behavior of CIW

Table 1.3-1 Correlation among CIW: Rural

Rural	Consumption	Income	Wealth
Consumption	1		
Income	0.6968	1	
Wealth	0.5358	0.4509	1

Table 1.3-2 Correlation among CIW: Rural

Rural	Consumption	Income	Wealth
Consumption	1		
Income	0.6609	1	
Wealth	0.5211	0.4003	1

Table 1.3-3 Correlation among CIW: Urban

Urban	Consumption	Income	Wealth
Consumption	1		
Income	0.6822	1	
Wealth	0.5936	0.5192	1

Question 1.4 Describe the CIW level, inequality, and covariances over the lifecycle.
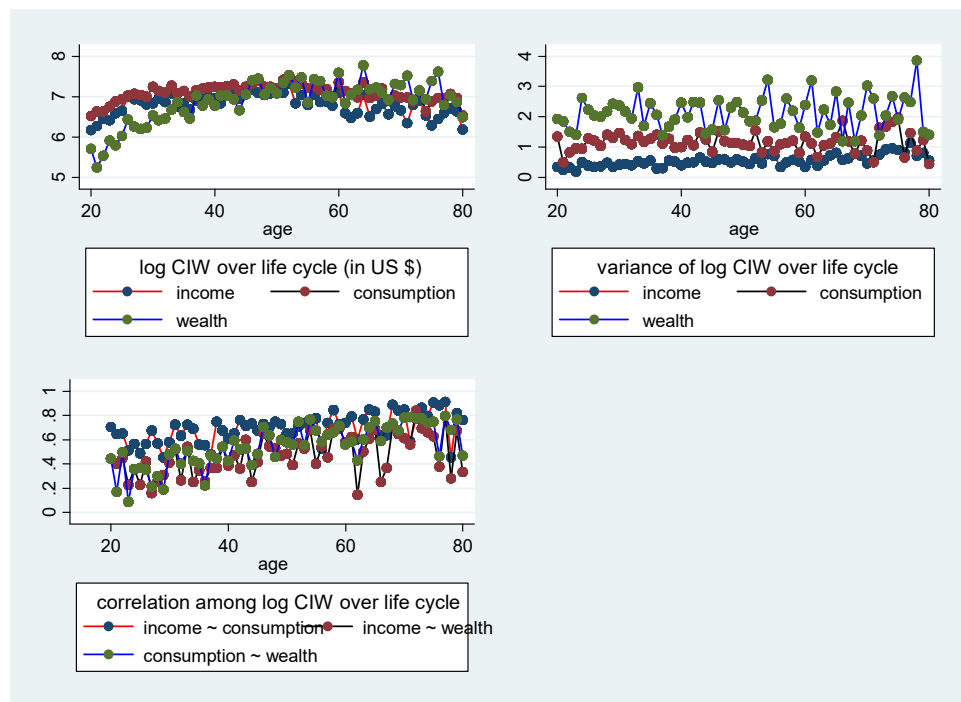

Figure 1.4 CIW Level, Inequality, and Covariances over the Lifecycle

Question 1.5 Rank your households by income, and discuss the behavior of the top and bottom of the consumption and wealth distributions conditional on income.

Table 1.5 Consumption and Wealth Distribution conditional on Income

	Bottom (%)			Quintiles					Top (%)		
Income	0-1	1-5	5-10	Q1	Q2	Q3	Q4	Q5	10-5	5-1	1
Consumption	1.6	2.4	2.1	10.6	11.7	15.4	21.0	41.2	9.8	12.1	4.1
Wealth	2.1	1.6	1.6	7.9	8.3	9.6	20.0	54.2	10.3	24.0	5.7

Discussion:
(1) From Table 1.1, one can see CIW in rural regions are lower than in urban regions, which can also be found from Figure 1.2.
(2) From Table 1.2, CIW are more equalized in rural regions than in urban regions.
(3) From Table 1.3-1, there is strong correlation between consumption and income (0.6968, higher than in US and Malawi), between consumption and wealth (0.5358 higher than in US and Malawi) and between income and wealth (0.4509, lower than in US but higher than in Malawi). Comparing Table 1.3-2 and 1.3-3, CIW are more correlated in urban regions than in rural regions. The same pattern is observed in Malawi.
(4) From Figure 1.4, it can be seen that over the lifecycle, level of CIW is hump-shaped, inequality of CIW keeps constant, but correlation of CIW increases.
(5) From Table 1.5, comparing the consumption and wealth distribution, it could be found that consumption and wealth are more equally distributed in Uganda than in US, but a little more unequally distributed than in Malawi.

Question 2 Inequality in Labor Supply
Question 2.1 Redo Question 1 for intensive and extensive margins of labor supply.2.1

Table 2.1-1 Employment and Average Weekly Working Hours

	Employment Rate	Weekly Working Hours
Rural	99.8	33.09
Urban	99.8	48.03

Table 2.1-2 Variance of Log Weekly Working Hours

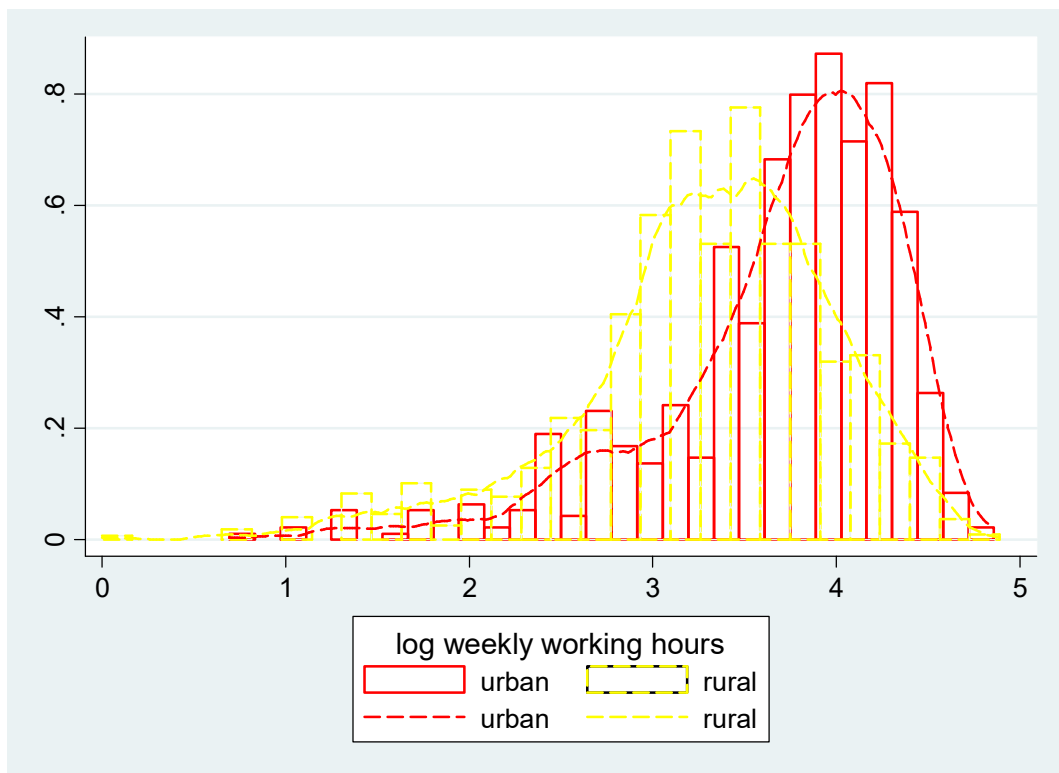|	Var. of Log	Obs.
Rural	0.4772	2253
Urban	0.4155	798

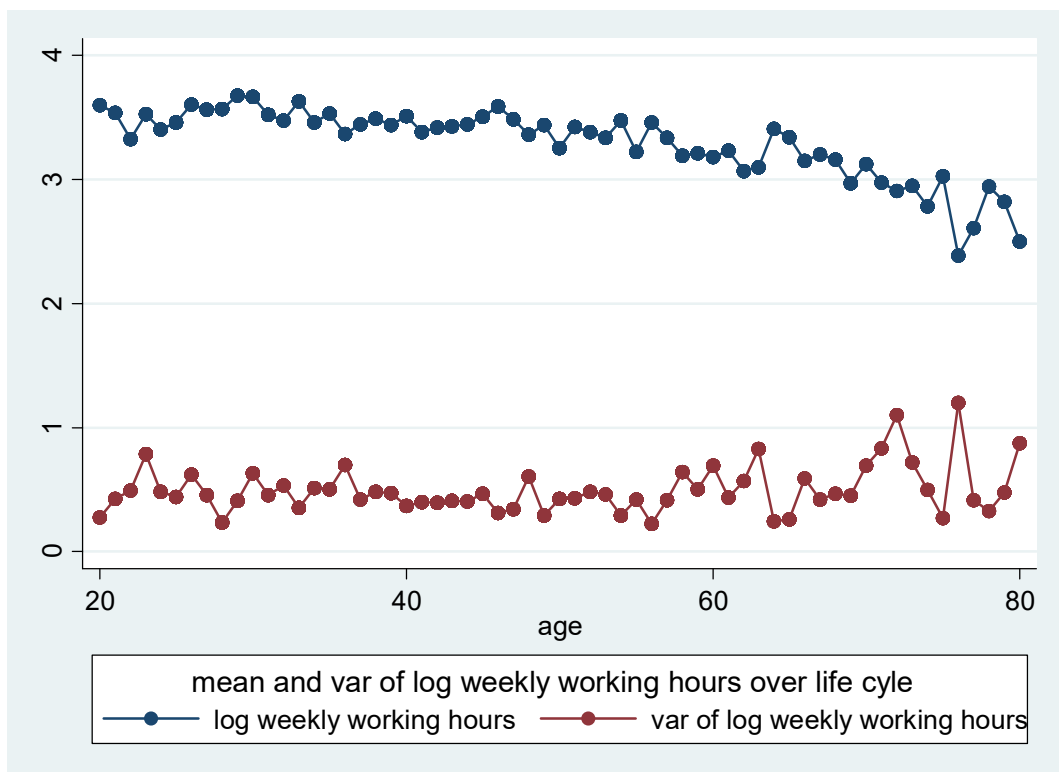Figure 2.1-1 Distribution of Working Hours: Urban v.s. Rural

Figure 2.1-2 Working Hours Level and Inequality over the Lifecycle

Discussion:

(1) From Table 2.1-1, people in urban regions work more hour than in rural regions, but the employment rate is almost the same. (Note: One is counted as employed if she/he worked in the market / household/ self-owned business in last week, or she/she would return to a job. So the employment rate approximated 100%. In the following, I will focus on working hours.)

(2) From Figure 2.1-1, people in urban regions work more hour than in rural regions. This is in general consistent with the evidence in the literature that working hours in high-income regions/countries is higher.

(3) From Table 2.1-2, working hours in rural regions is more equalized than in urban regions.

(4) From Figure 2.1-2, Over the lifecycle, working hours is (kind of) hump-shaped. The inequality of working hours is (kind of) increasing.

Question 2.2 Redo separately for women and men, and by education groups (less than primary school completed, primary school completed, and secondary school completed or higher).
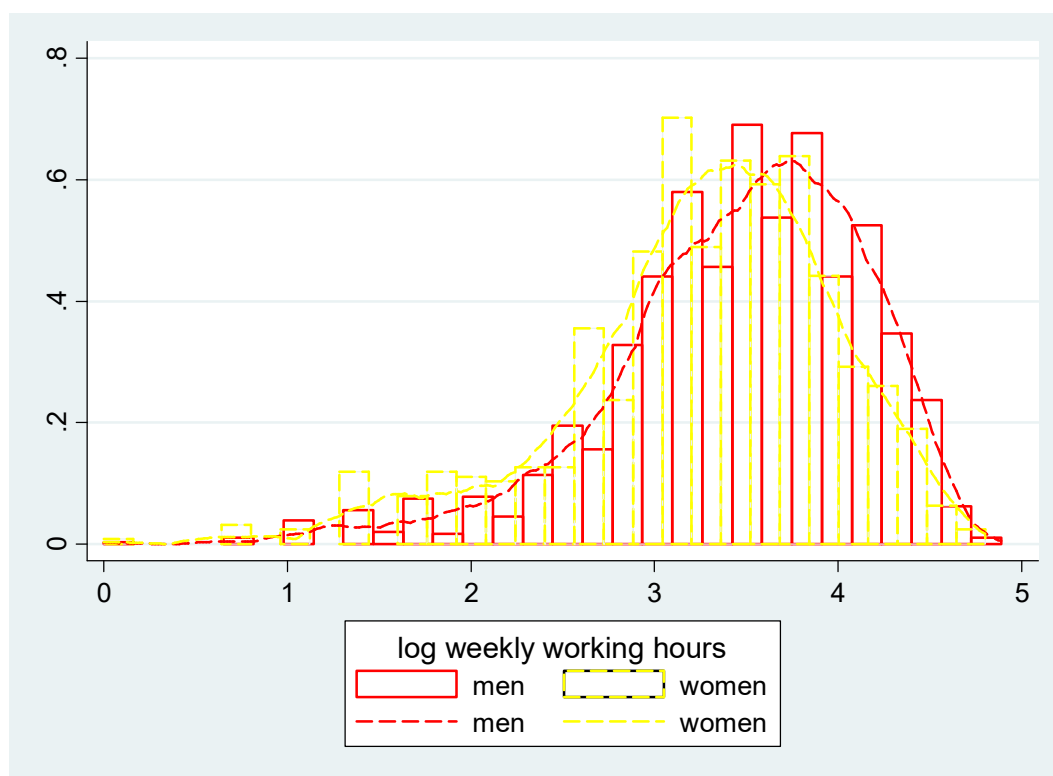

Figure 2.2-1 Distribution of Working Hours: Men v.s. Women

Table 2.1-1 Level and Inequality of Weekly Working Hours

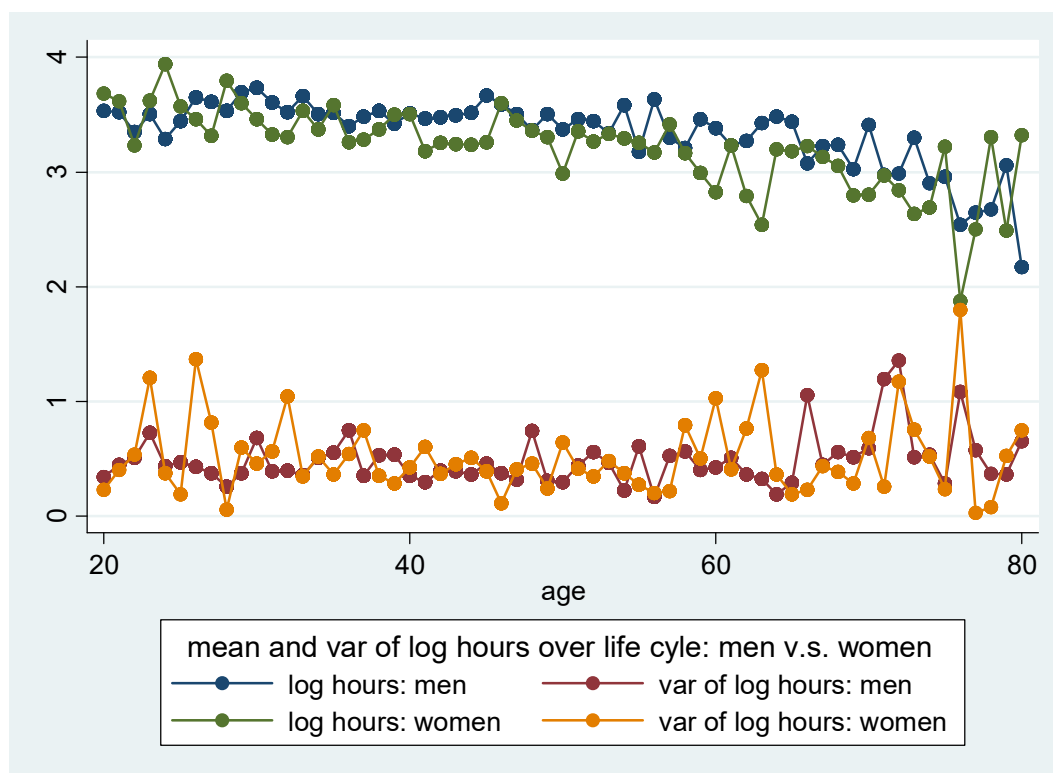|	Weekly Working Hours	Var. of Log
Men	38.72	0.4678
Women	32.56	0.5278

Figure 2.2-2 Working Hours Level and Inequality over the Lifecycle:

Men v.s. Women

Discussion:

(1) From Table 2.2-1, men work more hour than women and men's working hours are less dispersed than women, which can also been seen in Figure 2.1-1. This is consistent with the fact that women's labor supply is more flexible and elastic.

(2) From Figure 2.2-2, over the lifecycle, women's working hours in early ages and old ages are more dispersed, but equalized in middle ages.

Table 2.2-2 Level and Inequality of Weekly Working Hours for Diff. Edu. Groups

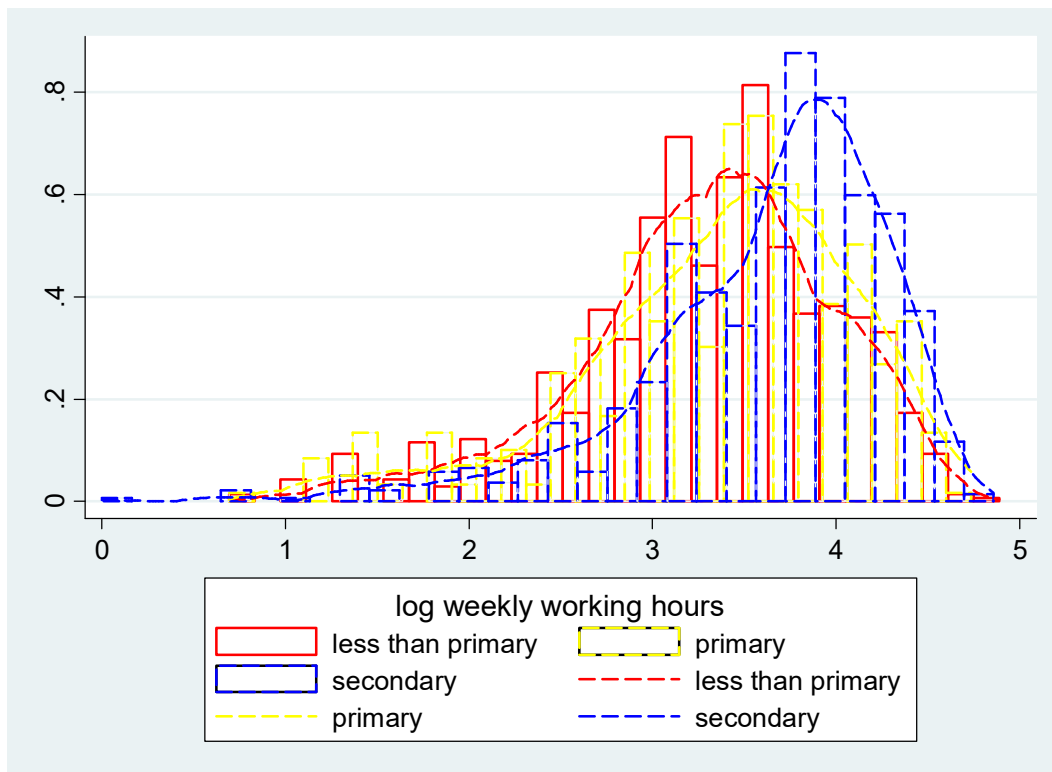|	Weekly Working Hours	Var. of Log
< Primary	33.24	0.4684
Primary	36.26	0.5339
>= Secondary	44.70	0.4452

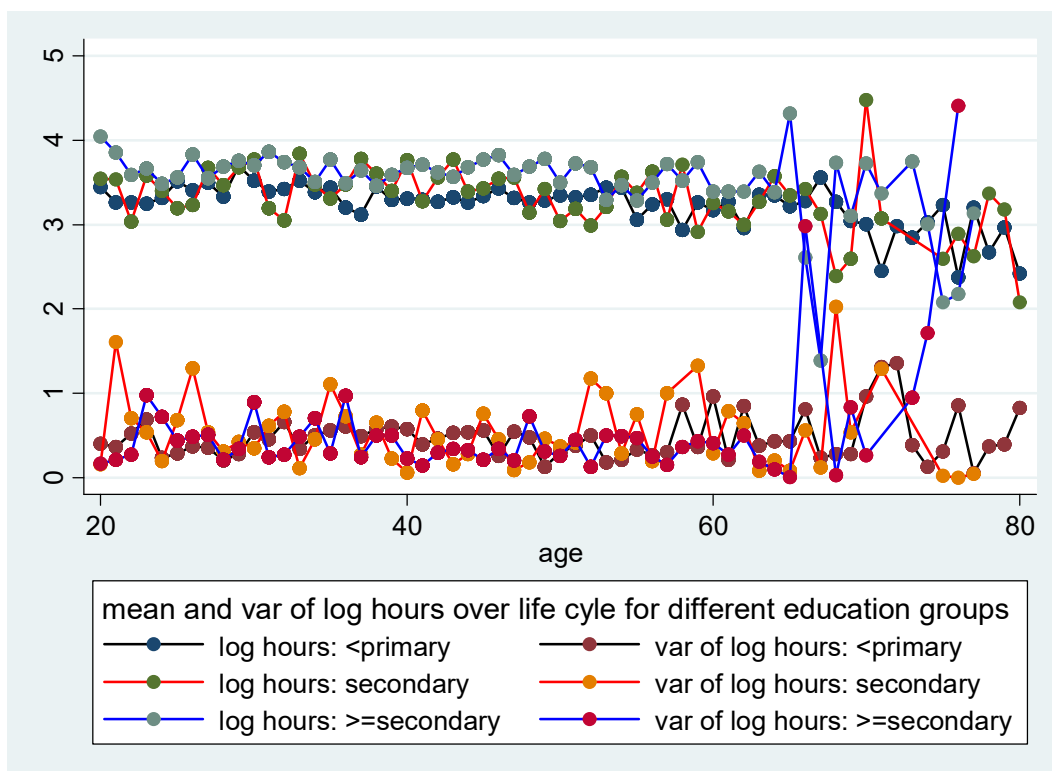Figure 2.2-3 Distribution of Working Hours for Diff. Edu. Groups

Figure 2.2-4 Working Hours Level and Inequality over the Lifecycle

Discussion:

(1) From Table 2.2-2, more educated people work more hours. This is consistent with the general evidence in the literature that high-income or more educated people work more. In addition, working hours is more dispersed for those who have completed primary school. Such information can also be obtained from Figure 2.2-3.

(2) From Figure 2.2-4, working hours in old ages is more dispersed for more educated people (most dispersed for those who completed secondary education, and least dispersed for those who did not complete primary school).

Question 3 Inequality Across Space
Question 3.1 Plot the level of CIW and labor supply by zone (or district) against the level of household income by zone.
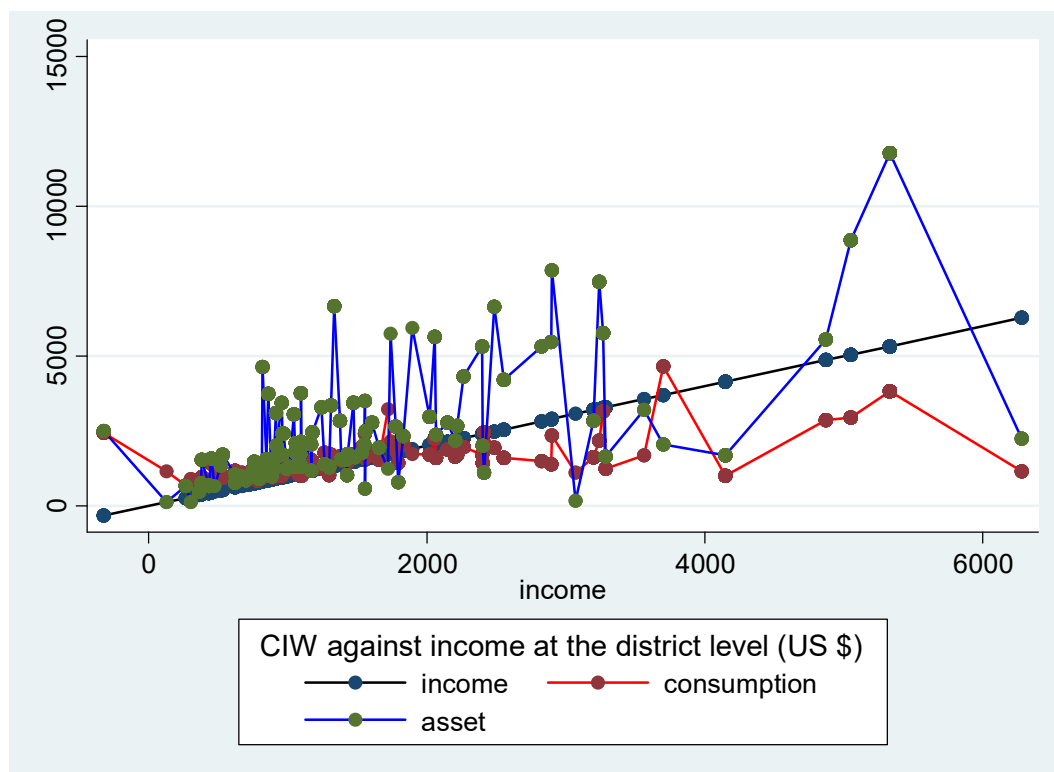

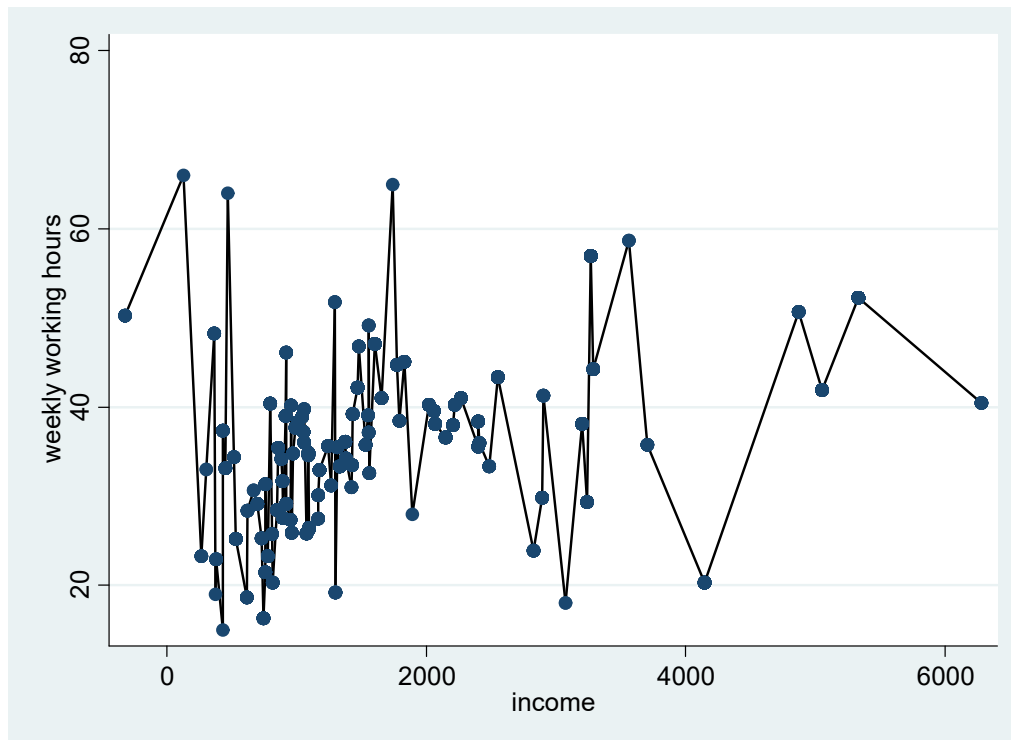Figure 3.1-1 Level of CIW against Household Income by District

Figure 3.1-2 Level of Working Hours against Household Income by District

Question 3.2 Plot the inequality of CIW and labor supply by zone (or district) against the level of household income by zone.
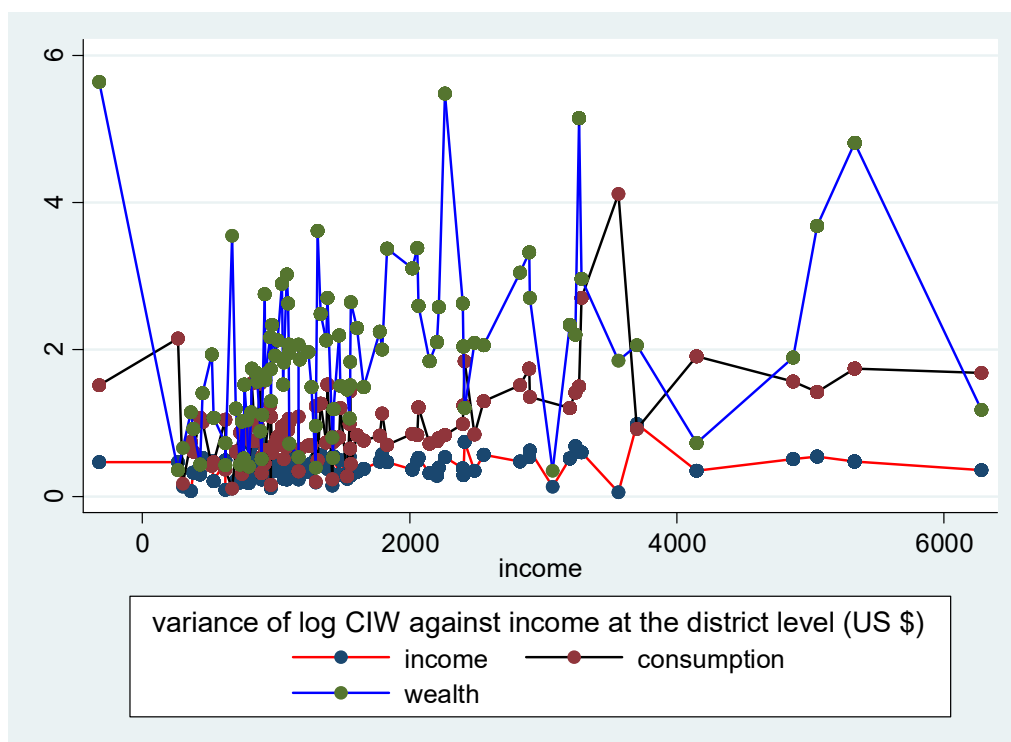

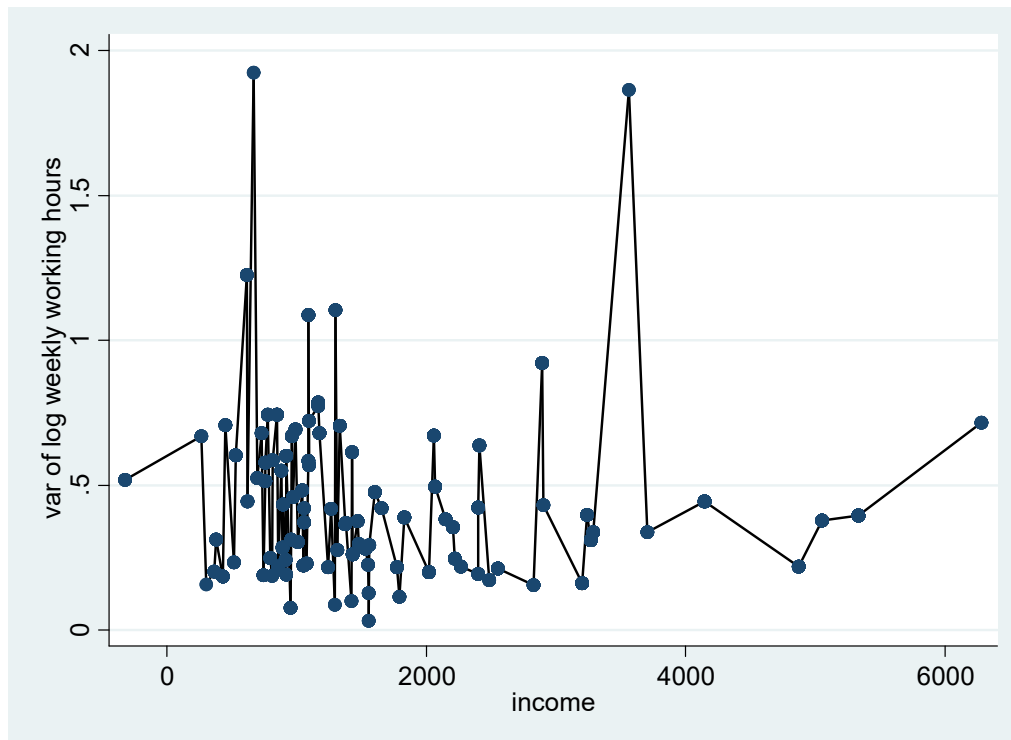Figure 3.2-1 Inequality of CIW against Household Income by District

Figure 3.2-2 Inequality of Working Hours against Household Income by District

Question 3.3 Plot the covariances of CIW and labor supply by zone (or district) against the level of household income by zone.
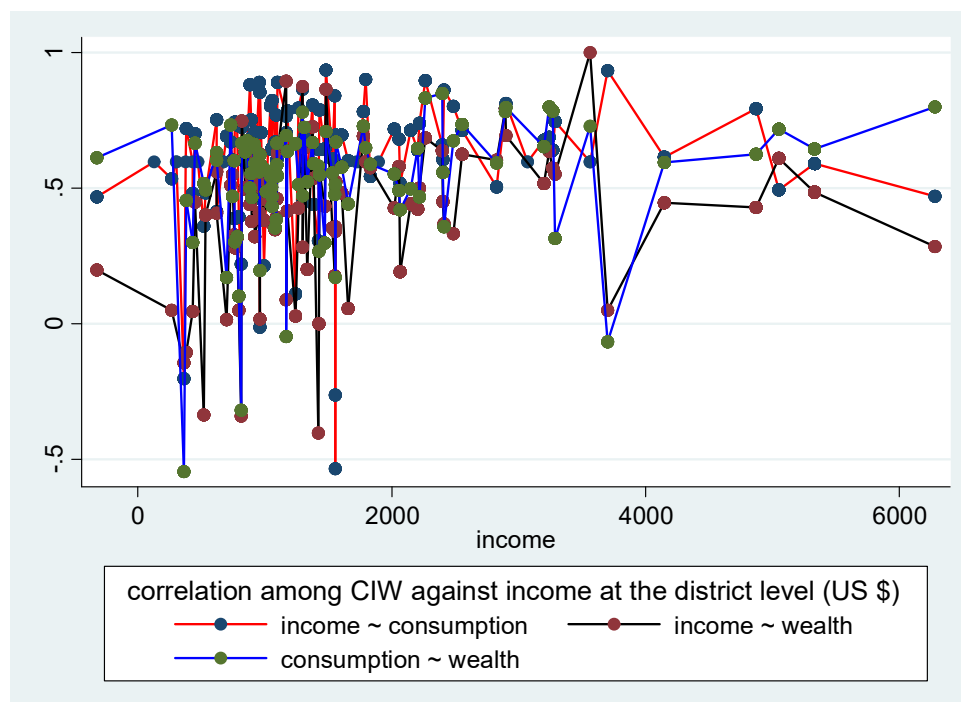

Figure 3.3-1 Correlation of CIW against Household Income by District

Discussion:

(1) From Figure 3.1-1 and 3.1-2, CIW and working hours are higher in districts with high income.

(2) From Figure 3.2-1, inequality of CIW is higher in districts with higher income. But no clear pattern could be observed for working hours from Figure 3.2-2.

(3) From Figure 3.3-1, correlations among CIW are higher in districts with higher income which means less insurance.

Question 3.4 Reproduce the Bick et. al (2018) analysis between individual vs. country income, and individual hours-wage elasticity by country in Uganda. Instead of "country" use districts/zones in Uganda.

There are several troublesome things here. Firstly, labor supply is at the individual level, but income is at the household level. When we run regressions as in the paper, we have to compute income at the individual level, which means we have to split the income at the household level, which is not easy. One possibility is to consider market working hours (working for an employer) and corresponding labor supply. But the sample size is not large, which means we cannot make precise estimation.

Since we are just doing exercise, I will not bother to adopt any of the aforementioned approaches. Instead, I simply redefine the following variables: hourly wage rate = household income/ working hours of household head; GDP per hour = sum of household income/ sum of working hours of household head.

Table 3.4 Elasticity of Hours to Aggregate and Individual Income

Panel A: Both Sexes.

	(1)	(2)	(3)	(4)
Log (GDP per hour)	0.112***		0.239***	
	(0.025)		(0.024)	
Log (wage per hour)		-0.221***	-0.249***	-0.255***
		(0.012)	(0.012)	(0.011)
District fixed effect	No	No	No	Yes
N	2673	2635	2627	2635
R^2	0.008	0.119	0.150	0.315

Panel B: Men

	(1)	(2)	(3)	(4)
Log (GDP per hour)	0.128***		0.249***	

	(0.029)		(0.028)	
Log (wage per hour)		-0.204***	-0.234***	-0.238***
		(0.014)	(0.014)	(0.013)
District fixed effect	No	No	No	Yes
N	1884	1855	1849	1855
R^2	0.011	0.108	0.144	0.316

Panel C: Women

	(1)	(2)	(3)	(4)
Log (GDP per hour)	0.052		0.192***	
	(0.048)		(0.044)	
Log (wage per hour)		-0.278***	-0.300***	-0.281***
		(0.022)	(0.022)	(0.021)
District fixed effect	No	No	No	Yes
N	789	780	778	780
R^2	0.001	0.170	0.189	0.462

Standard errors in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

Discussion:

From the table, we can see that the elasticity of hours to aggregate income is positive, but the elasticity of hours to individual income is negative. The elasticity of hours to aggregate income is higher for men, while the elasticity of hours to individual income is higher for women.