1 Data Construction

- we sum consumption taxes (variable imtxpc) at the HH level as split in function of income in BDSPS
- we keep in the BDSPS all those who are either the HH head or the spouse of the HH head (variable idefrh equal to 0 or 1)

2 Variables

2.1 Consumption

2.1.1 Simfin input

- defined as household consumption in BDSPS divided by number of adults (i.e. "individual consumption");
- we then have $c_{edu,age,mar,mal}$ is average per-adult consumption for the household of an individual with characteristics $\{edu, age, mar, mal\}$;

2.1.2 Aggregate

- based on $N_{edu,age,mar,mal}$ the number of adult individuals (excluding ghosts) with $\{edu, age, mar, mal\}$ we can compute (non-rescaled) aggregate consumption as:

$$C_{agg} = \sum_{edu} \sum_{age} \sum_{mar} \sum_{mal} N_{edu,age,mar,mal} c_{edu,age,mar,mal}$$

- we can also compute the adjustment factor based on aggregate consumption in the base year as $\chi_c = C_{base}/C_{agg}$

2.2 Consumption Tax

2.2.1 Simfin input

- defined as household consumption tax divided by household consumption divided
- we then have $\tau^c_{edu,age,mar,mal}$ is average per-adult consumption for the household of an individual with characteristics $\{edu, age, mar, mal\}$;

2.2.2 Aggregate

- (non-rescaled) aggregate consumption taxes can then be computed as:

$$\tau^c_{agg} = \chi_c \sum_{edu} \sum_{age} \sum_{mar} \sum_{mal} N_{edu,age,mar,mal} c_{edu,age,mar,mal} \tau^c_{edu,age,mar,mal}$$

- we can also compute the adjustment factor based on aggregate consumption taxes in the base year as $\chi_{\tau^c} = \tau^c_{base}/\tau^c_{agg}$

2.3 Employment

2.3.1 Simfin input

- defined as individual employment status
- $emp_{edu,age,mar,mal}$ is then employment probability of an individual with characteristics $\{edu, age, mar, mal\}$;

2.3.2 Aggregate

- (non-rescaled) employment:

$$emp^{agg} = \sum_{edu} \sum_{age} \sum_{mar} \sum_{mal} N_{edu,age,mar,mal} emp_{edu,age,mar,mal}$$

2.4 Conditional earnings

2.4.1 Simfin input

- defined as individual earnings conditional on being employed
- $earn\_c_{edu,age,mar,mal}$ is then earnings conditional on being employed of an individual with characteristics $\{edu, age, mar, mal\}$;

2.4.2 Aggregate

- (non-rescaled) aggregate earnings are then:

$$earn^{agg} = \sum_{edu}\sum_{age}\sum_{mar}\sum_{mal} N_{edu,age,mar,mal}\, emp_{edu,age,mar,mal}\, earn\_c_{edu,age,mar,mal}$$

2.5 Conditional hours

2.5.1 Simfin input

- defined as individual hours conditional on being employed
- $hours\_c_{edu,age,mar,mal}$ is then hours conditional on being employed of an individual with characteristics $\{edu, age, mar, mal\}$;

2.5.2 Aggregate

- (non-rescaled) aggregate hours are then:

$$hours^{agg} = \sum_{edu}\sum_{age}\sum_{mar}\sum_{mal} N_{edu,age,mar,mal}\, emp_{edu,age,mar,mal}\, hours\_c_{edu,age,mar,mal}$$

2.6 (Residual) Taxable income

2.6.1 Simfin input

- defined as individual taxable income minus individual labor earnings
- ${tax\_inc^{residual}}_{edu,age,mar,mal}$ is then taxable income minus to labor earning of an individual with characteristics $\{edu, age, mar, ma$

2.6.2 Aggregate

- (non-rescaled) taxable income is then:

$$tax\_inc^{agg} = \sum_{edu}\sum_{age}\sum_{mar}\sum_{mal} N_{edu,age,mar,mal} \left({tax\_inc^{residual}}_{edu,age,mar,mal} + emp_{edu,age,mar,mal}\, earn\_c_{edu,age,mar,mal} \right)$$

2.7 Personal taxes

2.7.1 Simfin input

- defined as personal taxes divided by taxable income
- ${\tau^{inc}}_{edu,age,mar,mal}$ is then personal taxes divided by taxable income of an individual with characteristics $\{edu, age, mar, mal\}$;

2.7.2 Aggregate

- (non-rescaled) aggregate personal taxes is then:

$$\tau^{agg}_{inc} = \sum_{edu}\sum_{age}\sum_{mar}\sum_{mal} N_{edu,age,mar,mal}\, {\tau^{inc}}_{edu,age,mar,mal} \left({tax\_inc^{residual}}_{edu,age,mar,mal} + emp_{edu,age,mar,mal}\, earn\_c_{edu,age,mar,ma}\right.$$

- $Y_t = A_t K_t^{\alpha} L_t^{1-\alpha} = A_t \left(\frac{r_t+\delta}{A_t\alpha}\right)^{\alpha/(\alpha-1)} L_t = A_t^{1/(1-\alpha)} \left(r_t+\delta\right)^{\alpha/(\alpha-1)} L_t$

2.8 Employment

$$r_t + \delta = A_t \alpha \left(\frac{K_t}{L_t}\right)^{\alpha-1} \Rightarrow \frac{K_t}{L_t} = \left(\frac{r_t+\delta}{A_t\alpha}\right)^{1/(\alpha-1)}$$

$$w_t = A_t\left(1-\alpha\right)\left(\frac{K_t}{L_t}\right)^{\alpha} = A_t\left(1-\alpha\right)\left(\frac{r_t+\delta}{A_t\alpha}\right)^{\alpha/(\alpha-1)} = A_t^{1/(1-\alpha)}\left(1-\alpha\right)\alpha^{\alpha/(1-\alpha)}\left(r_t+\delta\right)^{\alpha/(\alpha-1)}$$

=

$$\log w_t = \frac{1}{1-\alpha}\log A_t + \log\left(1-\alpha\right) + \log\left(\alpha^{\alpha/(1-\alpha)}\right) + \frac{\alpha}{\alpha-1}\log\left(r_t+\delta\right)$$

$$\frac{dw_t}{w_t} = \frac{1}{1-\alpha}\frac{dA_t}{A_t} - \frac{\alpha}{1-\alpha}\frac{d\left(r_t+\delta\right)}{r_t+\delta}$$