ECON 810: Homework 2

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1 Part 1: Data

1.1 Earnings gains while employed

- I used PSID data with the following filters:

  - Main sample. No SEO oversample.
  - Years 1978-1997 inclusive.
  - Ages 25 to 60 inclusive.
  - Annual hours worked `e11101` of at least 1800 ($=$ 52 weeks per year minus two weeks for vacation times 36 hours).
  - I use variable `i11103` (description "HH Labor Income") as my income variable, Y_{it}. I drop observations with zero income and over $e^{12} \approx 163000$.
  - I limit the growth in earnings to doubling or less (i.e. a hundred percent increase in earnings).

- I compute an annual change in earnings of 7.35%.

- See `part_1_1.R` for implementation.

1.2 Earnings losses while unemployed

- I use the iid normal shocks to individuals income over time $\varepsilon \sim_{iid} N(0, 1000)$.

- See `part_1_2.jl` for the implementation.

- $\beta_k \approx 0$ for $k \in \{-4, ..., -1\}$ and $\beta_k \approx -9000$ for $k \in \{0, ..., 5\}$. This makes sense because the income shock from job loss is permanent.

- γ_t start at around -5000 and increase by 1000 each period. This makes sense because it captures the incremental increase in income.

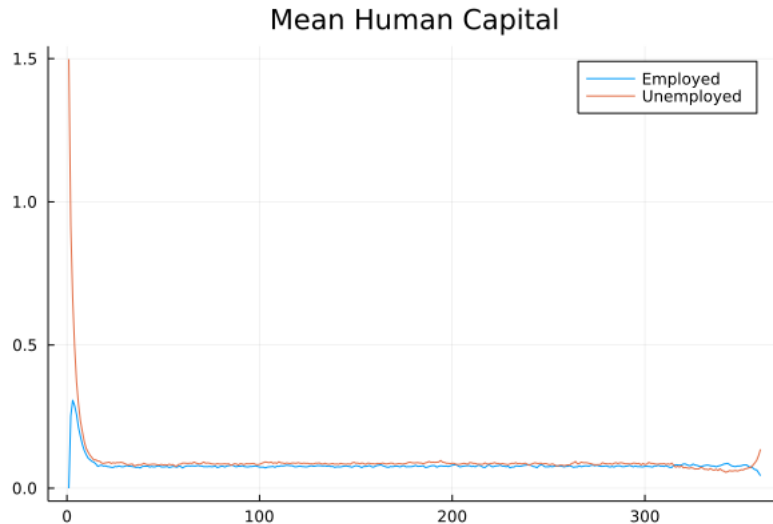|	earnings
	(1)
dm4	113.728
	(87.470)
dm3	122.149
	(87.470)
dm2	7.981
	(87.470)
dm1	80.500
	(87.470)
d0	-8842.457***
	(87.470)
dp1	-8895.236***
	(87.470)
dp2	-8969.840***
	(87.470)
dp3	-8885.697***
	(87.470)
dp4	-8891.502***
	(87.470)
dp5	-8935.596***
	(87.470)
Estimator	OLS
N	11,000
R^2	0.941

β_k

γ_t
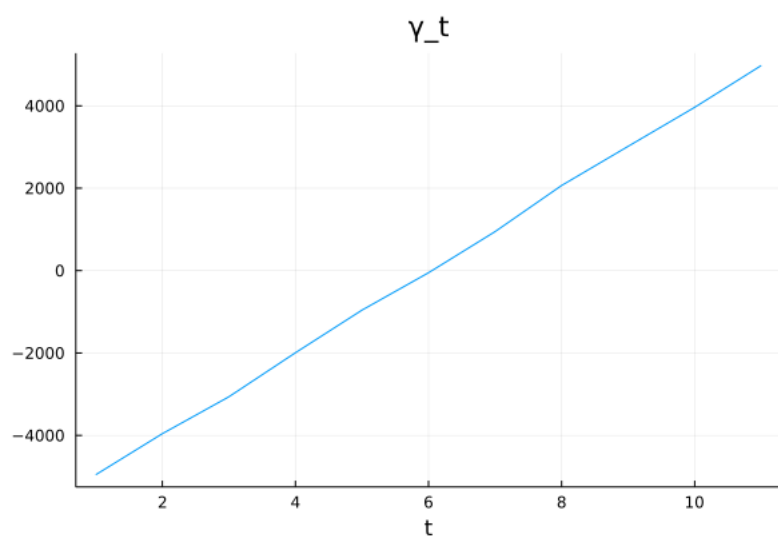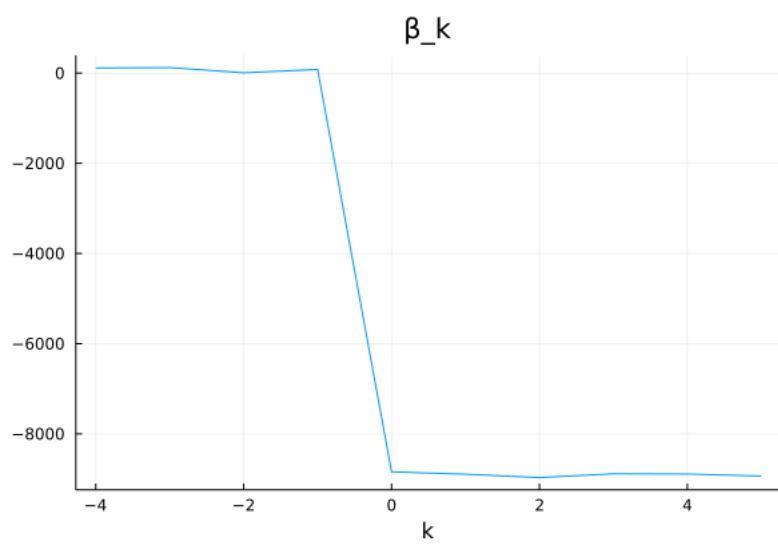
2 Part 2: Model

- I use $\psi_e = 0.5$ and $\psi_u = 0.2$.

- I use $b = 0.5$.

- The search effort policy function ends up equaling one for all levels and human capital period expect for the end. Below is the search policy function for the every three months in the last two years. As an unemployed worker get closer to the end of the model, they spend less effort searching for more levels of human capital.


Search Effort Policy Function
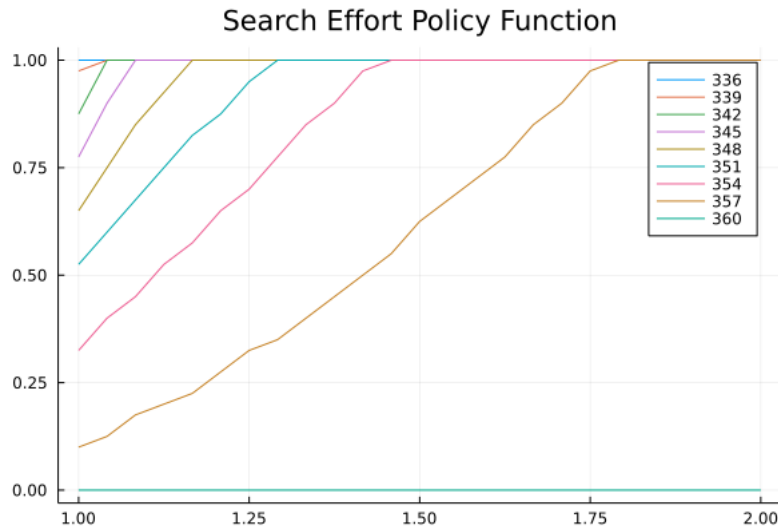
- Below is the reservation wage policy function for every five years starting at 2.5 years. It is generally increasing in human capital.
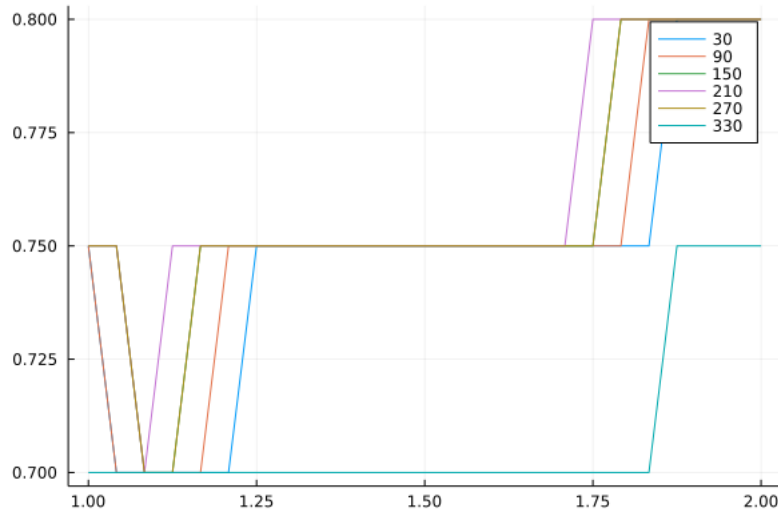
- I simulated a panel of 10000 individuals. Below is the mean level of human capital by employment status. The initial spike of high human capital in the unemployed and low human capital in the employed makes sense because everyone starts off as unemployed. I'm surprised by how constant the mean level is over time. Nearing death, the human capital level of employed starts to dip and the unemployed starts to rise.

Mean Human Capital

- I compute an average earnings growth when employed of 32.16 percent, which is substantially larger than the value I computed from the data.

- I searched through the simulations for job losses and below plot the average earnings from six months before to 2 years after job loss. We see a similar pattern to Davis and von Wachter (2011) with a drop in earnings and then a slow recovery but never reaching the same level.
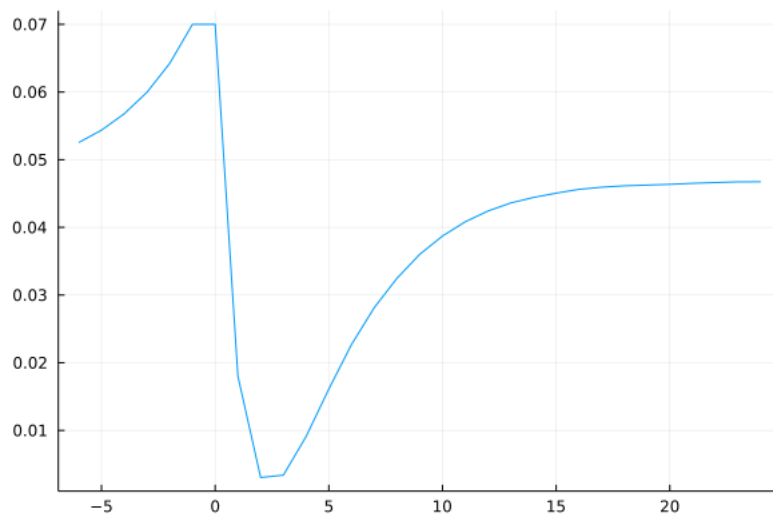
- See `part_2_XXX.jl` files for implementation.

    - See `part_2_model.jl` contains code to estimate the model.
    - See `part_2_simulation.jl` contains code to simulate the model.
    - See `part_2_run.jl` contains runs the estimate and simulation and creates charts.