Problem Set #4

Econ 899, Fall 2021

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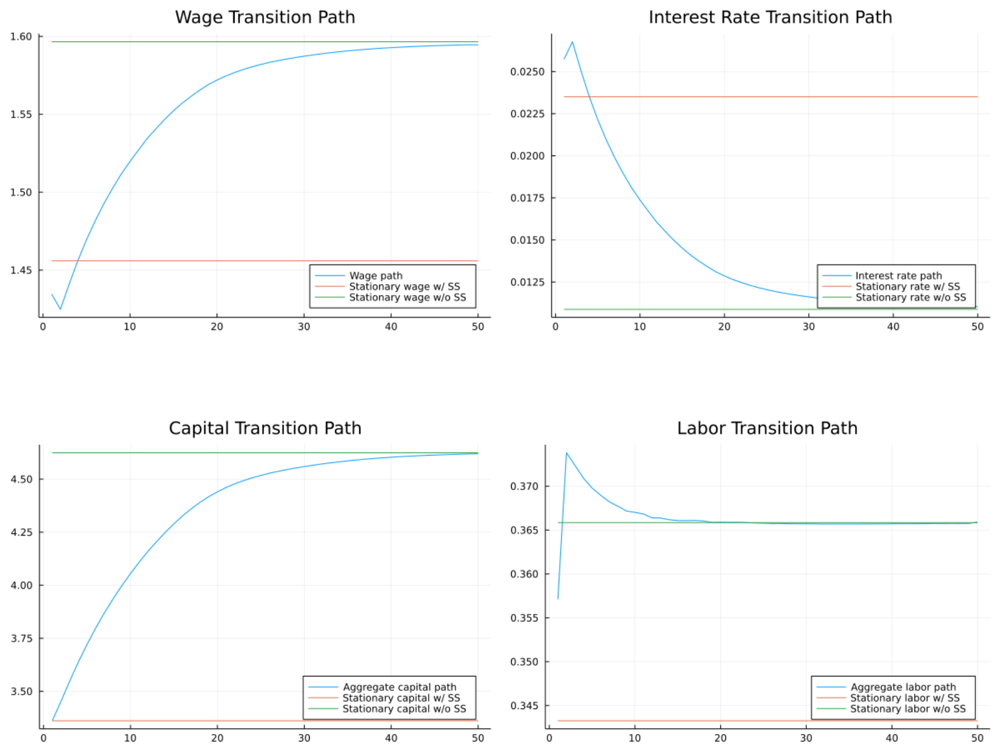
Exercise 1

1. Stationary equilibrium results with social security ($\theta_0^{SS} = 0.11$) and without it ($\theta_N^{SS} = 0$) are presented below.

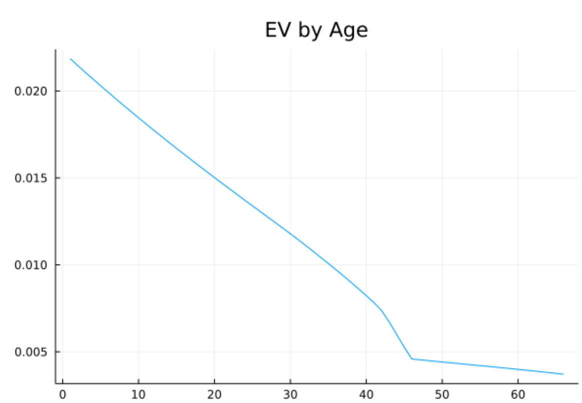
	With Social Security	Without Social Security
K	3.361	4.624
L	0.343	0.366
w	1.456	1.600
r	0.023	0.011
b	0.226	0.000
W	-35.8	-37.3
CV	0.598	0.673

2. Transition paths of interest rate, wage, capital, and effective labor are plotted in the following four figures. Since social security benefit is removed, the interest rate will instantly surge as the money need will increase from those who were previously able to receive social security benefits. Also, people will work more to insure their future lives by themselves, and a higher labor supply will immediately cut the wage level. Then as time passes by, a higher interest rate will gradually increase aggregate capital stock, and an increase in capital supply will reduce the interest rate. Also, lowered wages will make people gradually work less, and decreasing labor supply will make wages go up further. Overall, interest rate, wage, capital, and labor will converge into the new steady-state level.



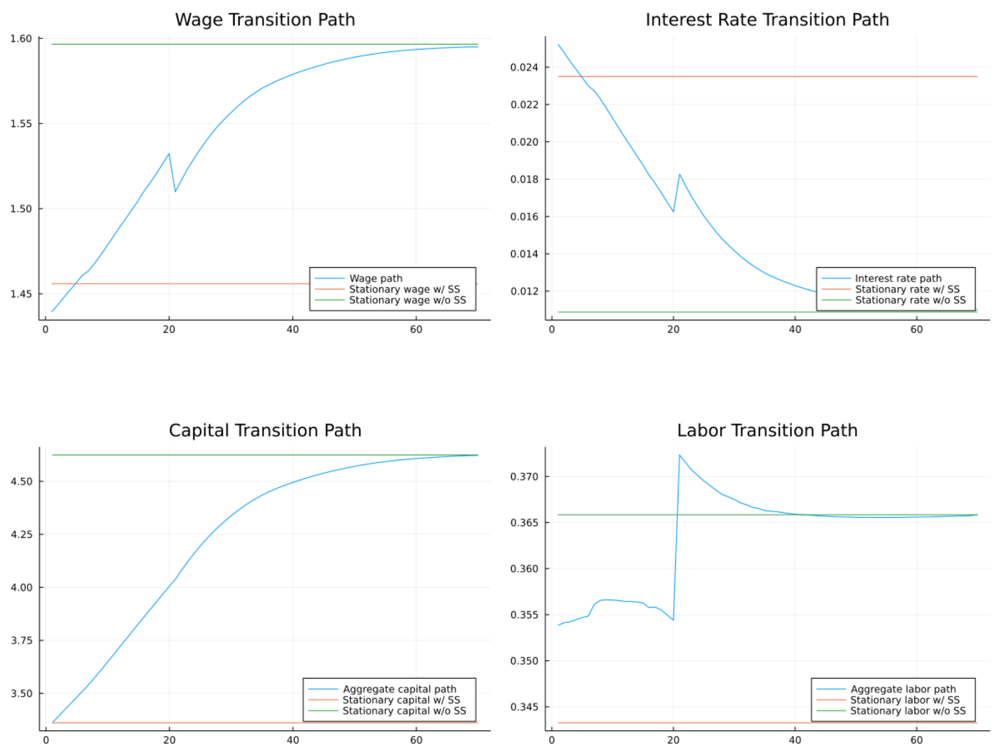
3. By calculating the consumption equivalent variation (EV) for each age, asset, and productivity shock grid and by summing up the measure of people whose EV is greater or equal to 1, we can see that 11.4% of population will be better off by the reform. Thus, these people will support this change.

   The values of EVs by ages are plotted below. EV decreases in age, as the elder have not accumulated enough funds for their life after the retirement.



Exercise 2

1. We can repeat the same analyses as Exercise 1, only making a change on the policy implementation time to $t = 21$. Instant shocks to all the variables (interest rate, wage, capital, and labor) have the same directions but the sizes of impacts are a little moderate than the previous case. Then, the remaining shocks are coming at the time of policy implementation, in which we can find kinks in the figures.



The proportion of people who support the reform will substantially increase to 22.3%. Still, the majority of population will be against the reform.