Solving Heterogeneous Agent Models and Transitions

Computations and Quantitative Models in Macro

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Some details on the computation

- I chose $n_{aa} = 1000$ grid points for the assets. Moreover $a \in [0, 50]$.
- The tolerance criterion was chosen as $1e^{-6}$. The criterion was reduced to $1e^{-4}$ for solving Aiyagari's model with VFI. This was useful when the number of grid points was lower than the actual chosen.
- The number of grid points for interpolation (for instance, for obtaining the Euler equation errors) was $n_{aa} \times 5 = 5000$.
- I decided to work with linearly spaced instead of log-spaced assets grids.

You can download the codes in this link

Assets policy function, $a'(z, a)$

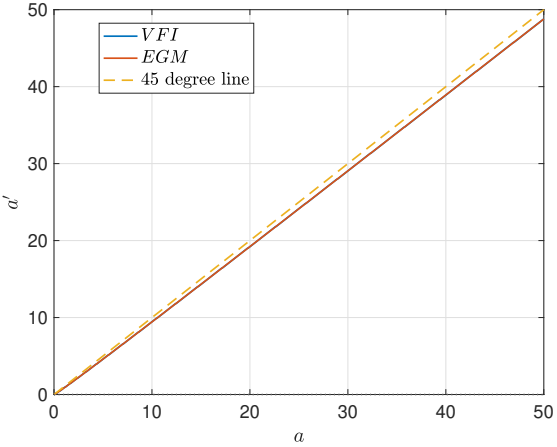


Figure low productivity shock

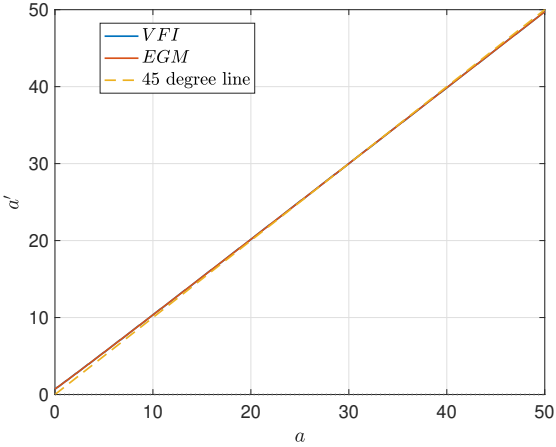


Figure high productivity shock

Consumption policy function, $c(z, a)$

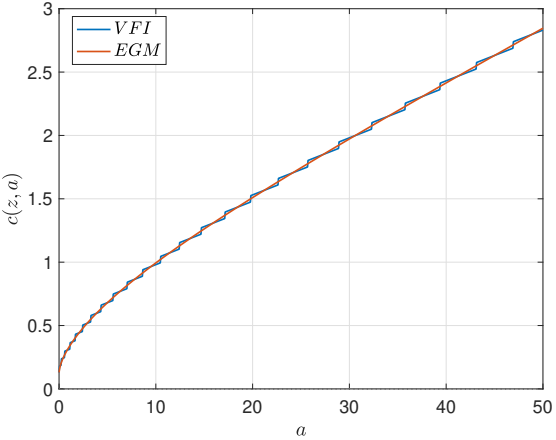


Figure low productivity shock

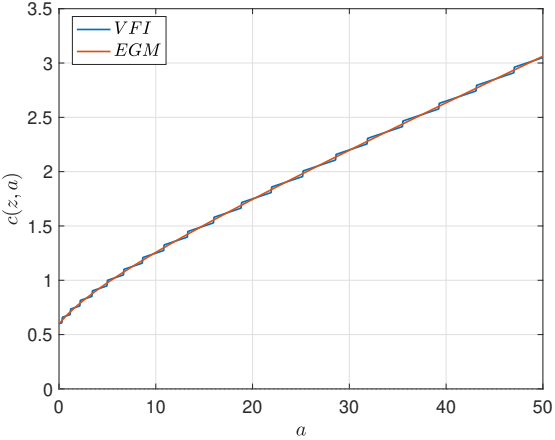


Figure high productivity shock

Value functions, $V(z, a)$

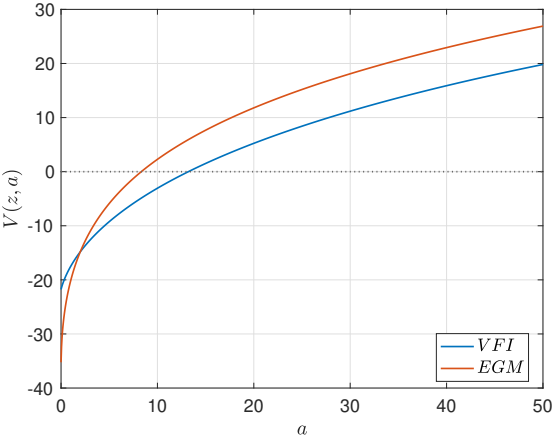


Figure low productivity shock

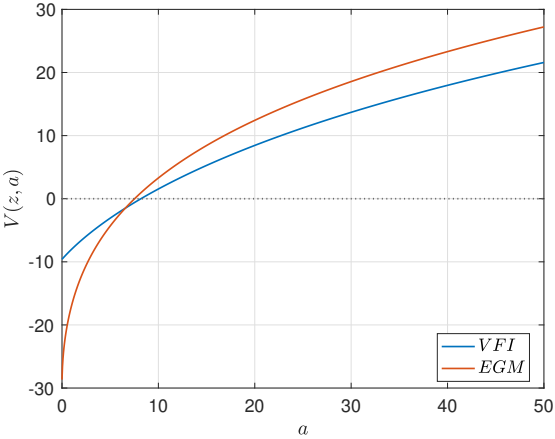


Figure high productivity shock

Euler equation errors, $\log(|EE|)$

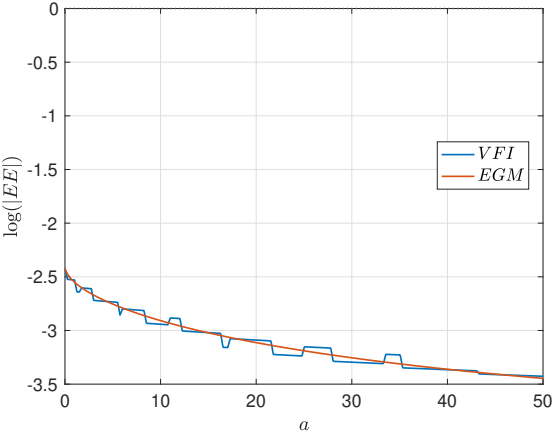


Figure low productivity shock

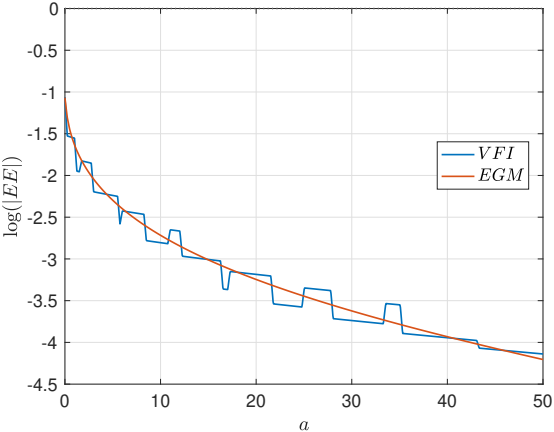


Figure high productivity shock

abs(EE)	Max	Mean
VFI	0.08863	0.02685
EGM	0.08855	0.02690

abs(EE)	Max	Mean
VFI	0.34576	0.01244
EGM	0.34405	0.01260

Equilibrium values

Method	r	w	L	K	Y
VFI	0.0218	1.4202	0.55	5.3597	1.1659
EGM	0.0220	1.4182	0.55	5.3367	1.1642

Histogram of assets

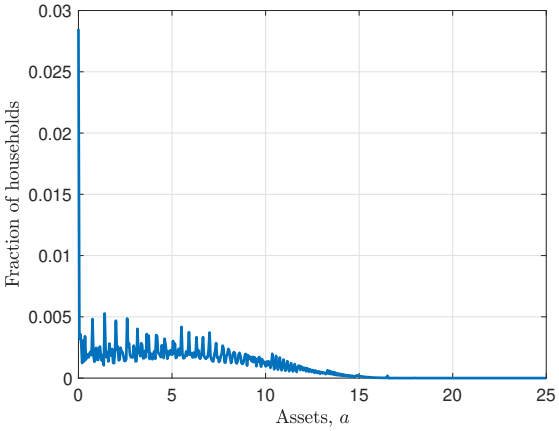


Figure Value function iteration

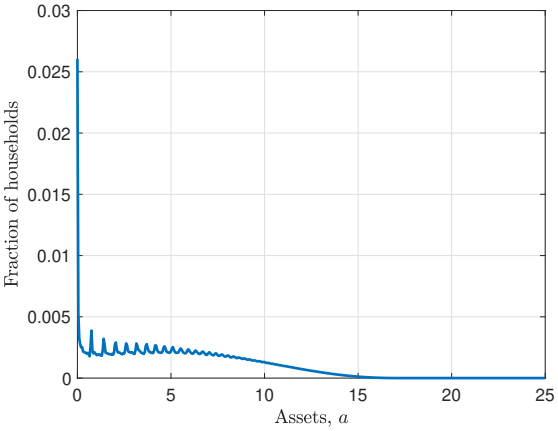
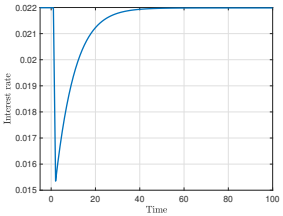
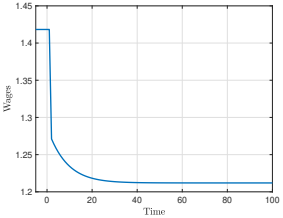


Figure Endogenous grid method

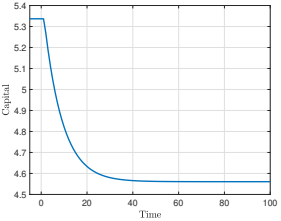
Permanent negative technology shock



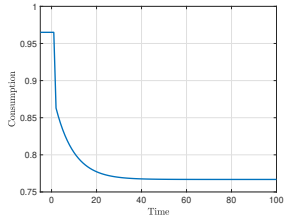
(a) Interest rate



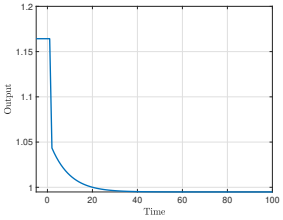
(b) Wages



(c) Capital

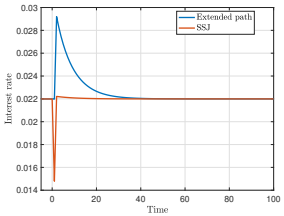


(d) Consumption

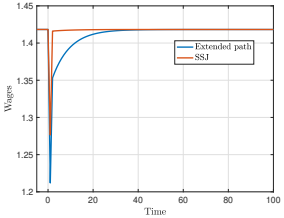


(e) Output

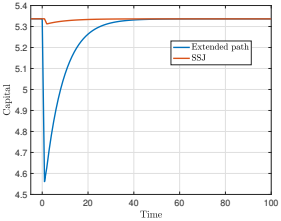
Transitory negative technology shock



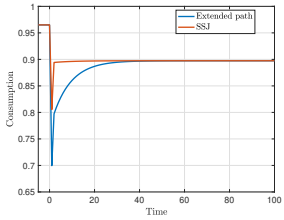
(a) Interest rate



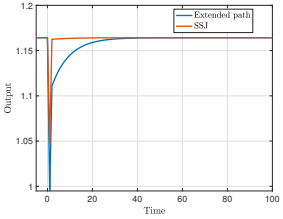
(b) Wages



(c) Capital



(d) Consumption



(e) Output