Coding Assignment 3

Deema N. Azzam
Consumption & Investment

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1 The Method of Endogenous Gridpoints

(a) **Solve for the consumption policy function using the method of endogenous gridpoints.**

Found in coded3.m

(b) **Graph the consumption policy function on the cash-on-hand grid based on the assets and income states grid, for each income state.**

Found in coded3.m

(c) **Use the xcorr function to calculate a correlogram between the simulated income and consumption series to 4 lags.**

Found in coded3.m

(d) **Use the corrplot function to plot your correlogram.**

Found in coded3.m

(e) **Explain why a negative natural borrowing limit results in linear consumption functions with this utility function while the VFI consumption functions had curvature at the low end of assets.**

With a negative natural borrowing limit, households are not able to borrow to smooth consumption in a bad state. The budget constraint is binding in that households must consume all cash on hand at low asset states. As such, when we set w = a + exp(y) and c = w, the consumption functions will be a linear upwards sloping line. Meanwhile, VFI searches over the whole "a" grid to evaluate the bellman. The borrowing limit is not as constricting so the budget constraint is not always binding at low asset states. As such, the Euler equation chooses c consumption. With the CRRA utility function, the policy rule in convex and more curved towards low asset states. As such, the VFI consumption functions will be curves near zero.

(f) **Explain why having the unemployment state induces curvature at the low end of cash on-hand for this utility function.**

The unemployment states means that households may at time receive zero income next period, increasing uncertainty. When consumers are highly risk averse, marginal utility rises more quickly with low cash-on-hand. Precautionary savings will then be higher towards the low end, inducing curvature at low states.