Texas Tech University

ECO 6353—Consumption & Investment Dynamics

Ongoing Coding Problems—Part 1

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Part (a)

The eight bugs are identified and corrected as shown below. Brief explanations for each bug are given.

Bug 1: Incorrect Income Grid Generation Function

Issue: Placeholder `xxxxxxx` is used instead of a valid MATLAB function.
Correction: Replace `xxxxxxx` with **linspace** to generate a linearly spaced vector. This is a direct correction as per the instruction to only change `xxxxxxx` to `linspace` and keep the parameters as is. Again the linspace function must have three parameters.

Bug 2: Incorrect Access to the Last Element of Y

Issue: `Y(Y_n)` attempts to access the `Y_n`-th element of Y, which is incorrect syntax in MATLAB.
Correction: Change `Y(Y_n)` to `Y(end)` to correctly access the last element of Y.

Bug 3: Undefined Variable rho

Issue: `rho` is used in the income grid setup and the main question but is not defined in the code.
Correction: Define `rho = 0.9` before its use.

Bug 4: Incompatible Dimensions in Consumption Calculation

Issue: The use of `repmat` within the consumption (`c`) calculation loop does not correctly account for the dimensions needed for the operation.
Correction: Ensure that the dimensions in `repmat` usage match the required dimensions for matrix operations.

Bug 5: Inappropriate Initialization of Value Function V0

Issue: Initializing V0 with NaN*repmat(...) can lead to NaN values in calculations.
Correction: Initialize V0 with zeros or another appropriate value to avoid NaN propagation.

Bug 6: Incorrect Update of Value Function V0 in the Main Loop

Issue: V0 is updated with V_candidate instead of V1.
Correction: Update V0 with V1 at the end of each iteration in the loop.

Bug 7: Undefined Transition Probability Matrix P

Issue: The transition probability matrix P is used but not defined in the VFI loop.
Correction: Define P or provide a mechanism to generate it. For simplicity, you might use an identity matrix if P is not specified.

Bug 8: Incorrect Preallocation of Policy Functions c and a$_prime$

Issue: Preallocating c and a' using V1 can lead to confusion and potential errors, as these variables serve different purposes.
Correction: Preallocate c and a' separately with appropriate dimensions.

Part (b)

Setting the borrowing constraint to 0 would qualitatively affect the simulated results (consumption c and asset a') by preventing households from having negative assets. This means that the household cannot borrow and must adjust their consumption accordingly.

Part (c)

Doubling the relative risk aversion parameter would make the household more averse to consumption fluctuations, leading to more savings as a buffer against income uncertainty and a smoother consumption path over time.

Part (d) and (e)

Below plots represent Part (d) and (e).

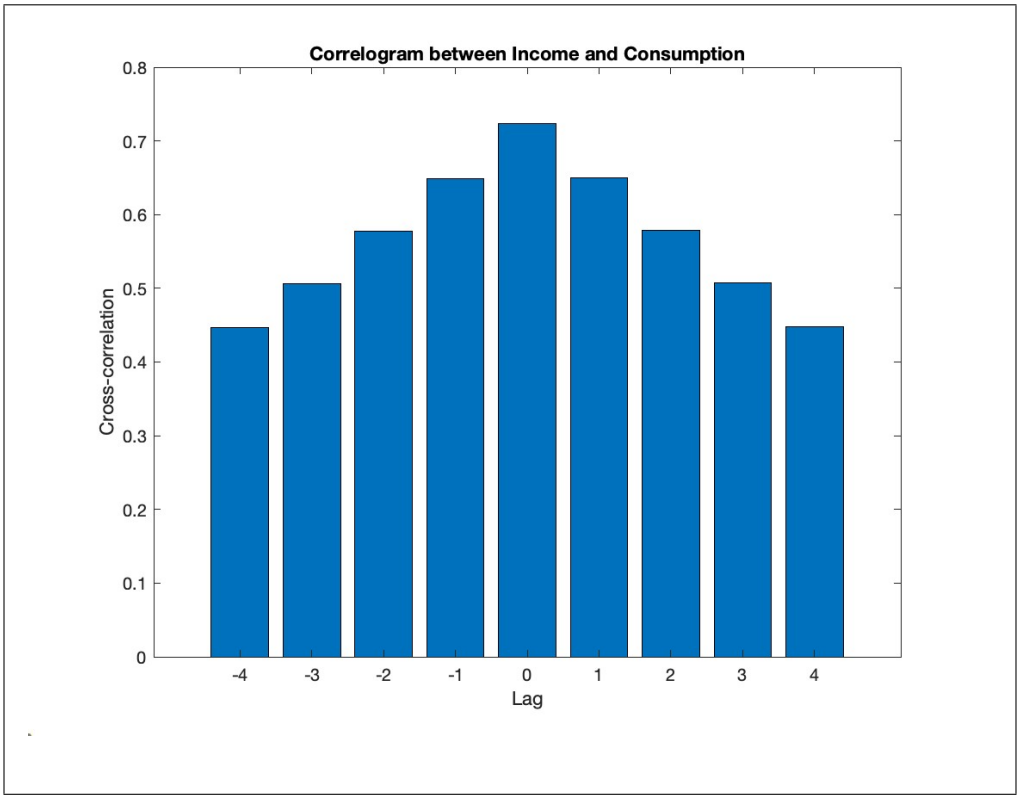
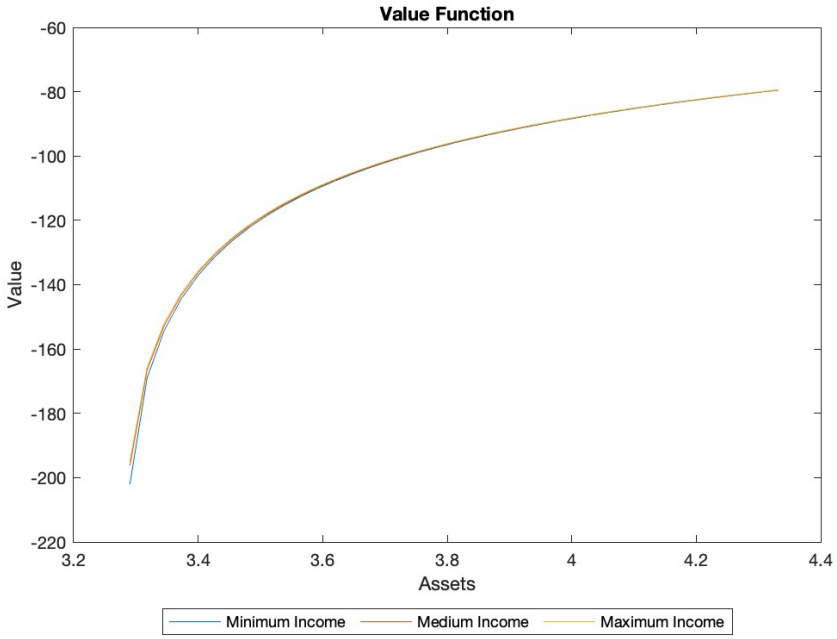
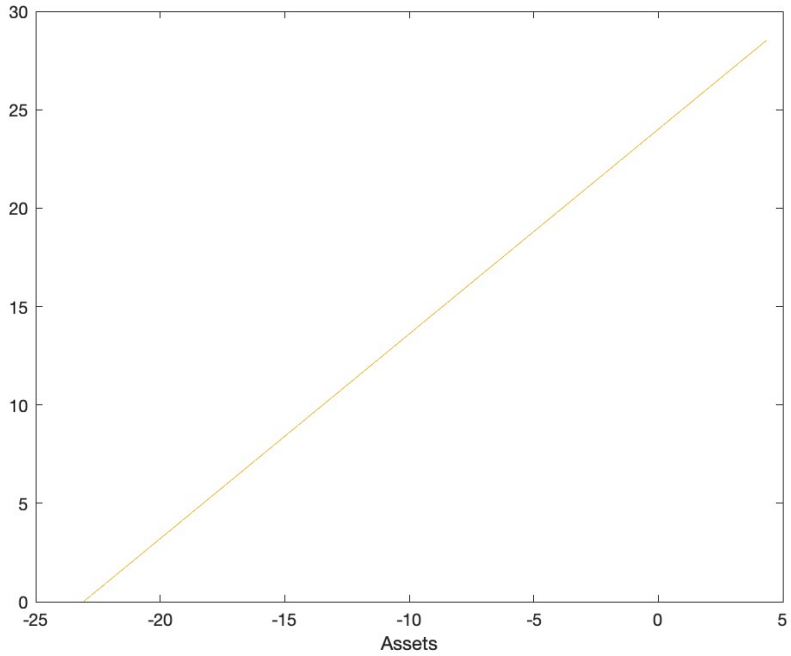


Figure 1: Correlation between Income and Consumption for part (d)



(a) Corrplot function to plot correlogram 1 for part (e)



(b) Corrplot function to plot correlogram 2 for part (e)

Figure 2: Corrplot function to plot correlogram