Quantitative Macroeconomics - Problem Set IV

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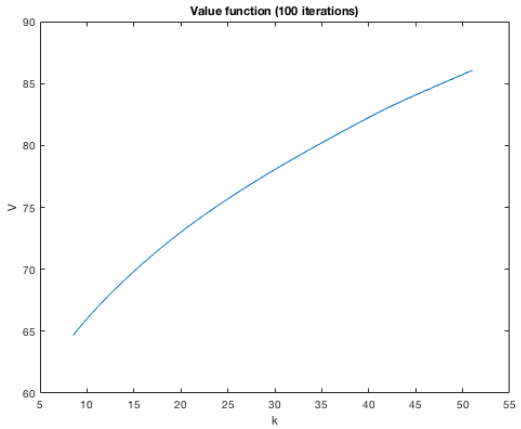
Question I - Value Function Iteration

In this section, I report the number of iterations and time to get a solution for the model using variants of Value Function Iteration (VFI) methods[1]

Table 1: VFI Methods

Method	Nº iterations	Time
Brute force	295	.0731
Monotonicty	295	0.2074
Concavity	-	-
Concav+Mont	-	-
Local Search	-	-
Howard	16	.0565
Chebyshev	14	20.508

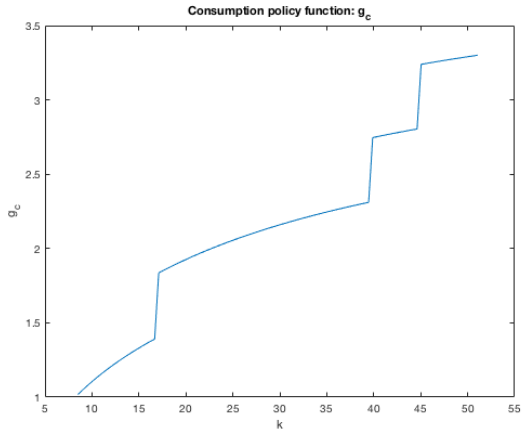
The graphical results for my codes are exhibit below. I report here the Value Function and Policy Functions for capital and consumption.

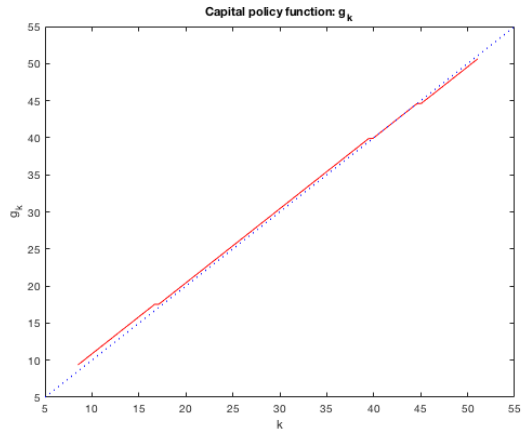


Even though not all my codes (each one for a method of VFI) ran, I attemped to do all. One of my biggest problem was that iteration stopped after the first one.

I am still working on my codes and I intent to fix them all. Due to lack of time, I report this incomplete version.

[1]Matlab codes: vfi.m , cheb.m , conc_monot.m , concavity.m , howard.m , local_search.m , monot.m , interpolation_cheb.m





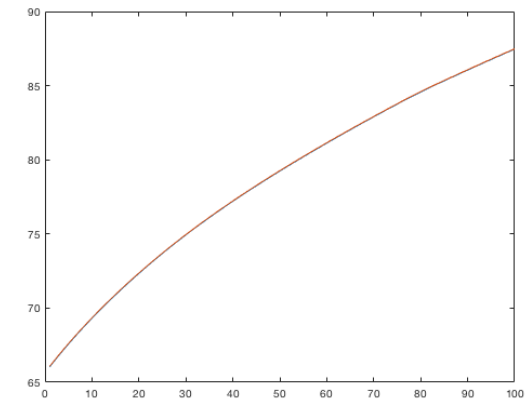
Also, I found that not all the speeding up algorithms did their purpose. My thought is that I used different methods for the loop-iteration in each (for example, matrices vs long loops) and so this interfeers on the running time.

Finally, I was not able to redo the exercise with labor (due to lack of time, I apologize). I will update this version later.

Question II - Business Cycle Fluctuations

In this section I introduced productivity shocks[2].

Value Function graphcial result is depicted below:



When simulating the economy, I found some weird results, which I believe it's due to some mistake of my code.

[2]Matlab codes: q2.m, simulate_markov.m

I coded the entire question but the results are not reliable and I am still working to find their mistakes. Please refer to my code for all the details of my solution.