

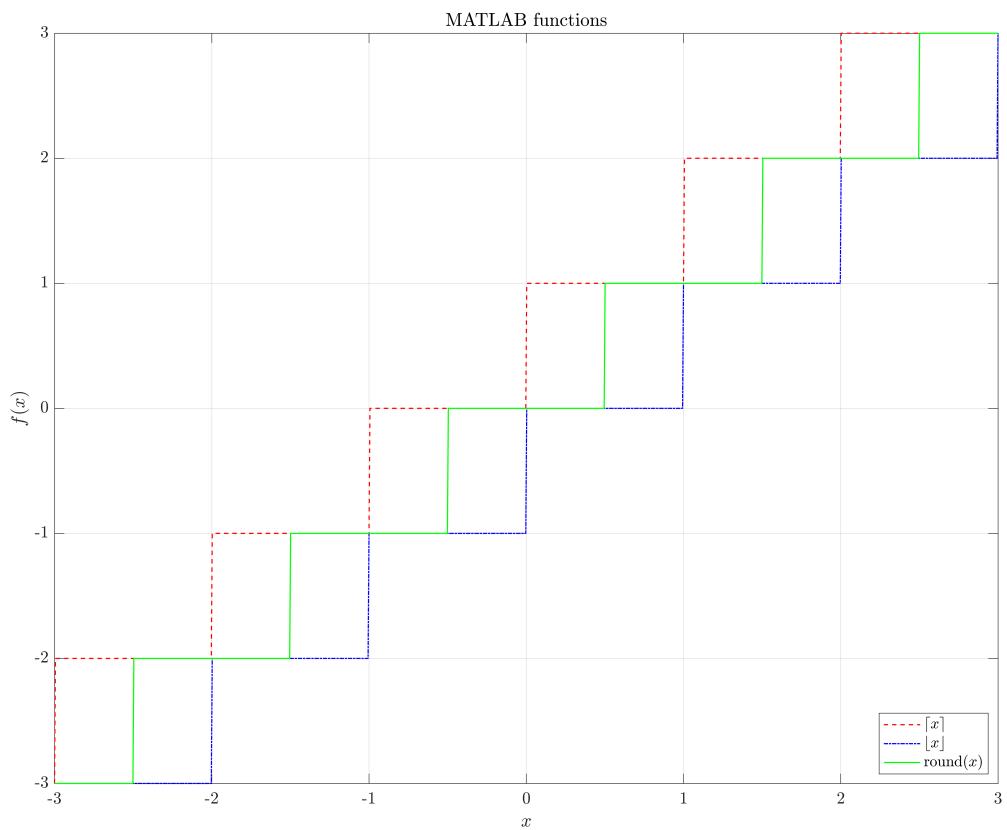
1st problem set

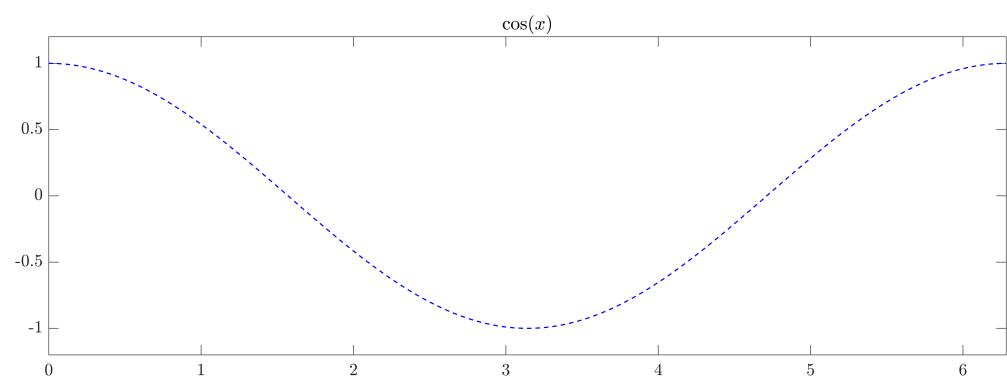
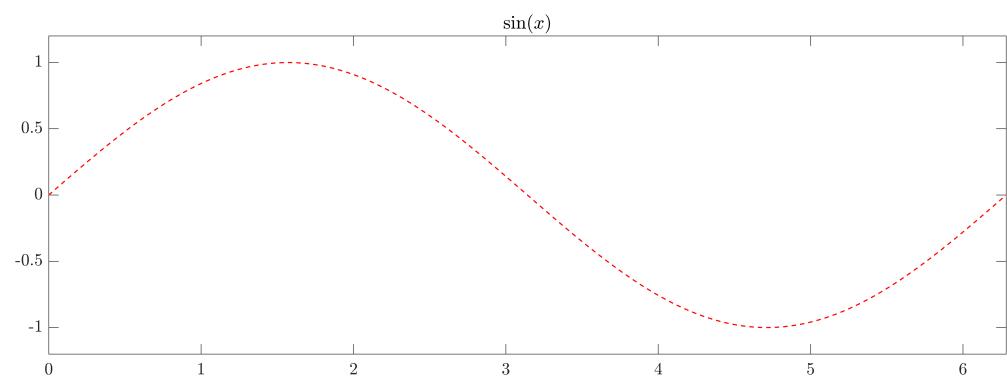
Dynamic macroeconomics 1

Instituto Tecnológico Autónomo de México

Carlos Lezama

Plots





Nonlinear equations / systems

Given the following function

$$f(x) = \frac{5x - 4}{x - 1},$$

such that, coding

```
f = @(x) ((5 * x - 4) / (x - 1));  
x = [0.75 0.87 1.02];  
y = [];  
  
for i = 1:length(x)  
    y(i) = fsolve(f, x(i));  
end  
  
[x; y]'
```

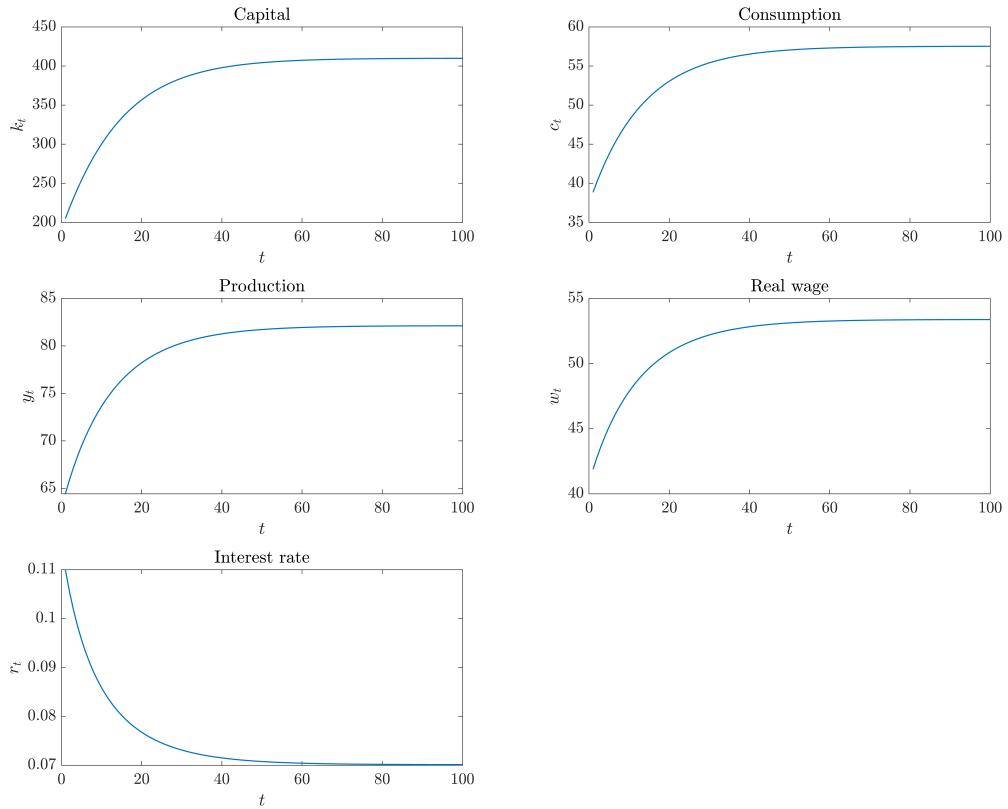
our output is

```
ans =  
  
1.0e+03 *  
  
0.0008    0.0008  
0.0009    0.0008  
0.0010    2.4431
```

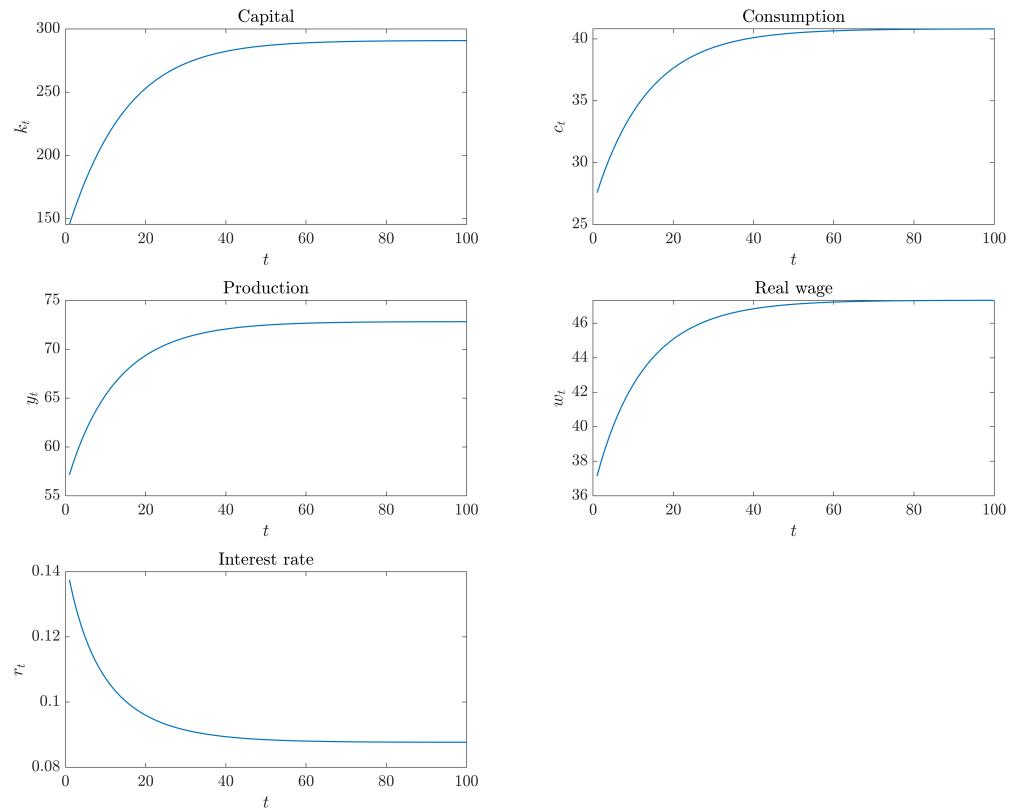
Clearly, there is a vertical asymptote in $x = 1$. This is why, for our last guess $x_0 = 1.02$, the method cannot compute a Newton–Raphson solution.

Sequential Neoclassical growth model

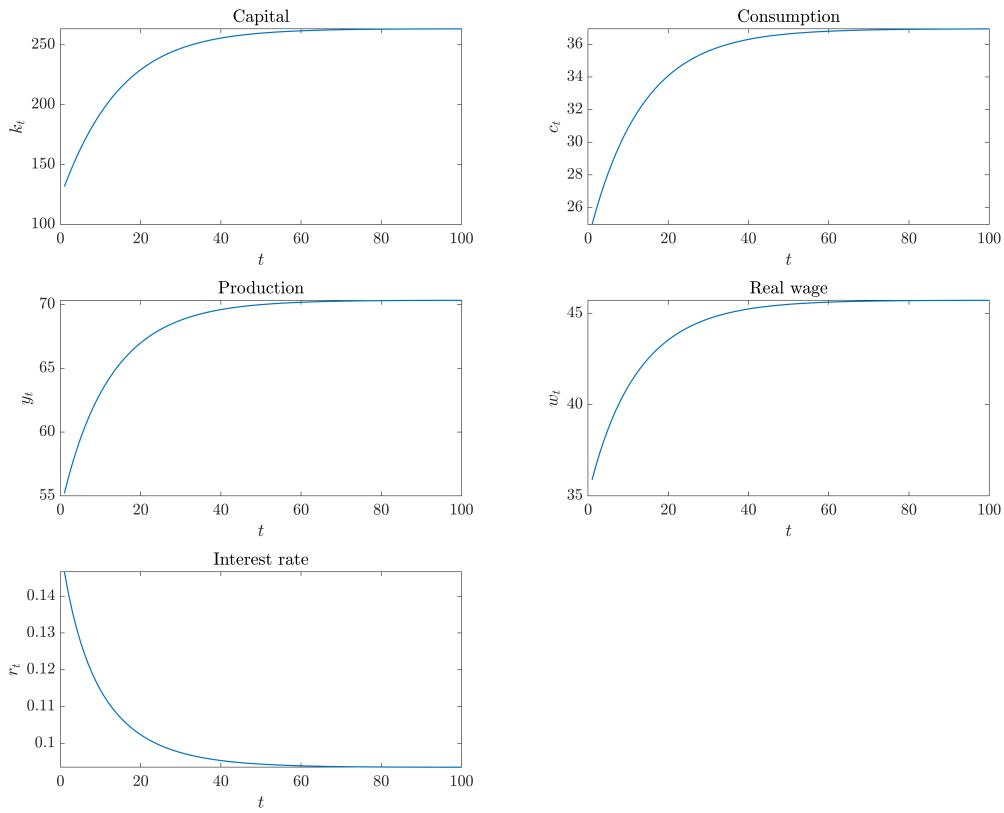
No distortions



Income taxation ($\tau = 0.2$)

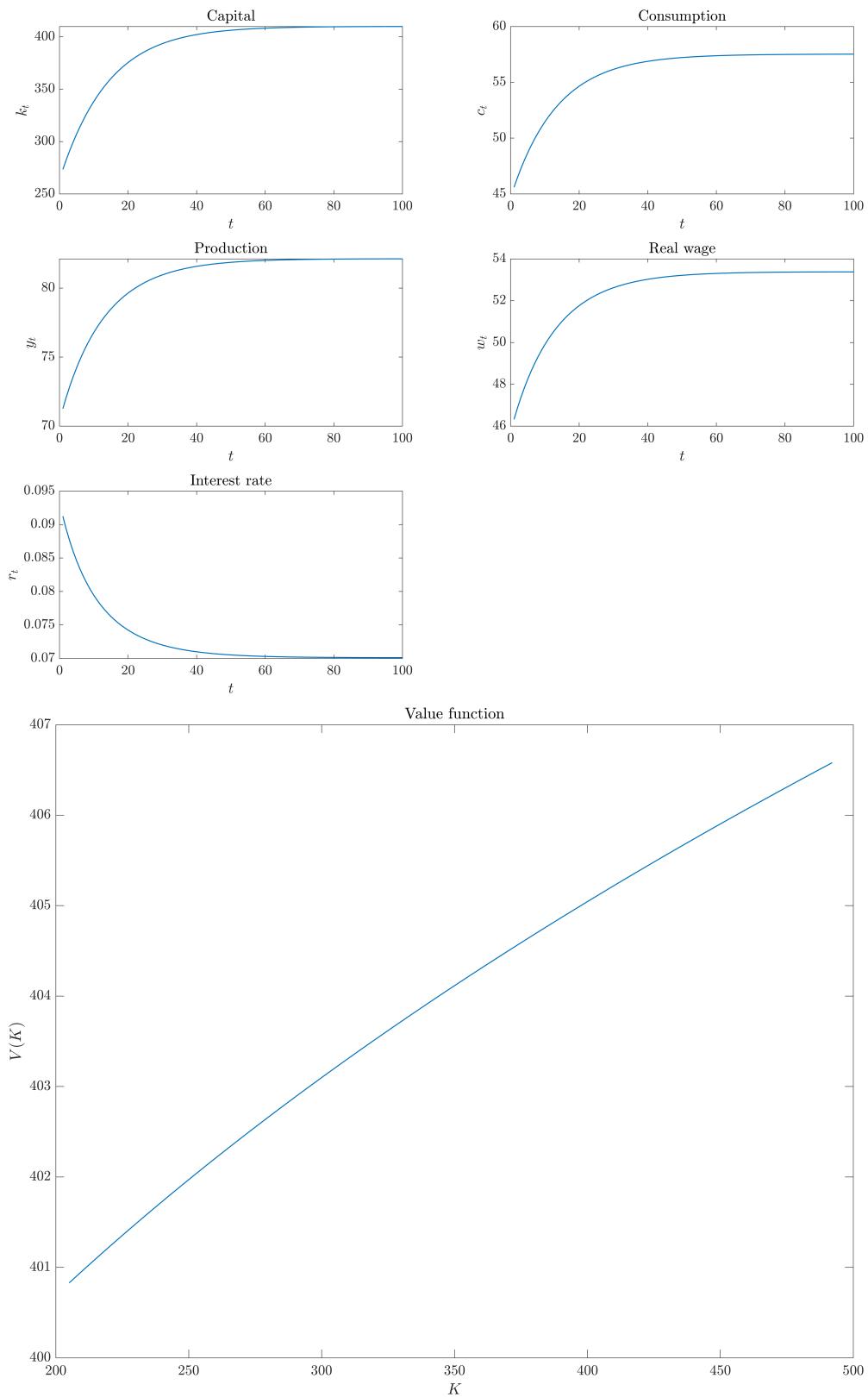


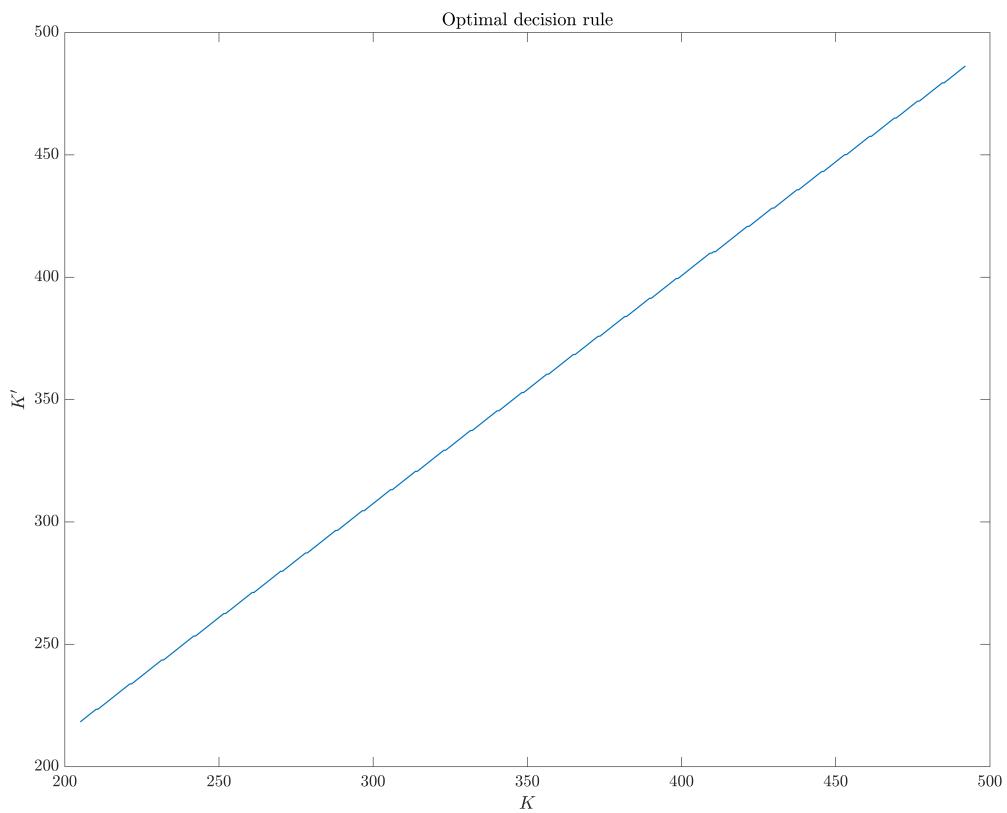
Income taxation ($\tau = 0.25$)



With a higher tax rate, capital, consumption, production, and real wages converge to lower steady states while the interest rate converges faster to a higher level.

Recursive Neoclassical growth model





All code can be found [here](#).