# Econ 899 Problem Set 1

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## 1 Dynamic Programming Problem

Households solve:

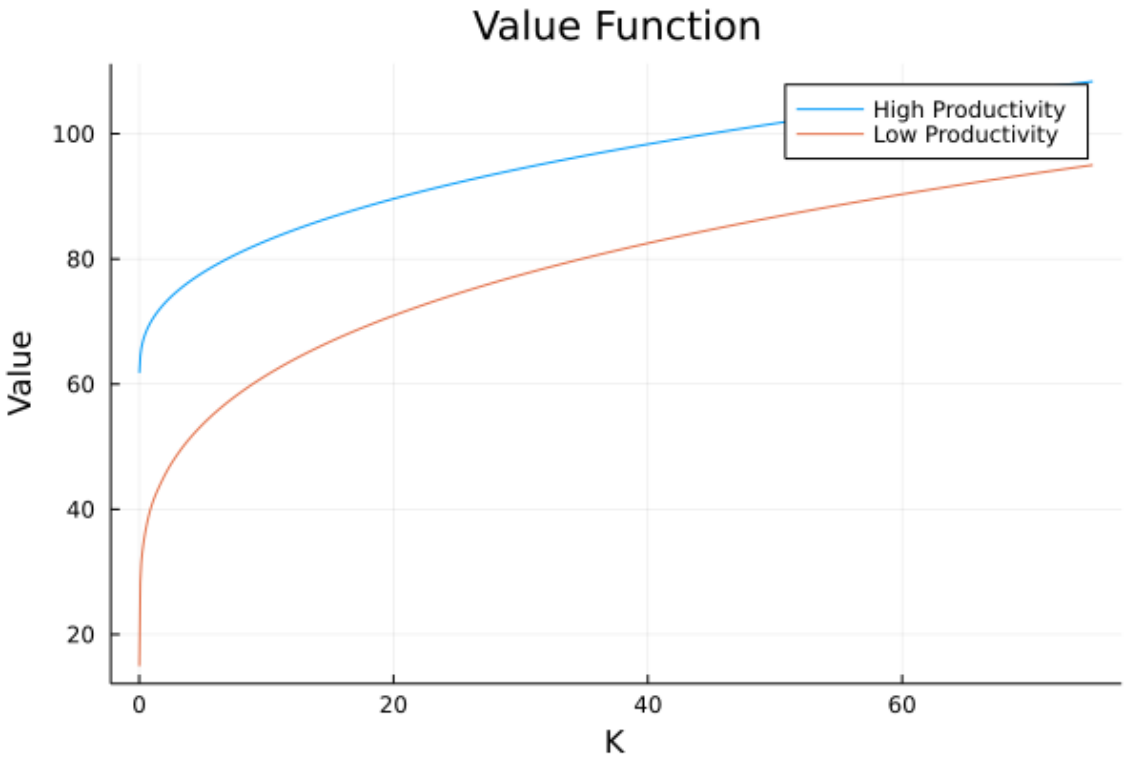
$$V(K,Z) = \max_{K'} \sum \log(C) + E[V(K',Z')]$$
$$\text{Where } C = ZK^{\alpha} + (1-\delta)K - K'$$

I have solved this problem using Julia, Fortran, and parallelized Fortran. In Julia, my code converged in 7.3 seconds. In Fortran, my code converged in 5.8 seconds.

*I have discussed this problem set with Katherine Kwok and Michael Nattinger.

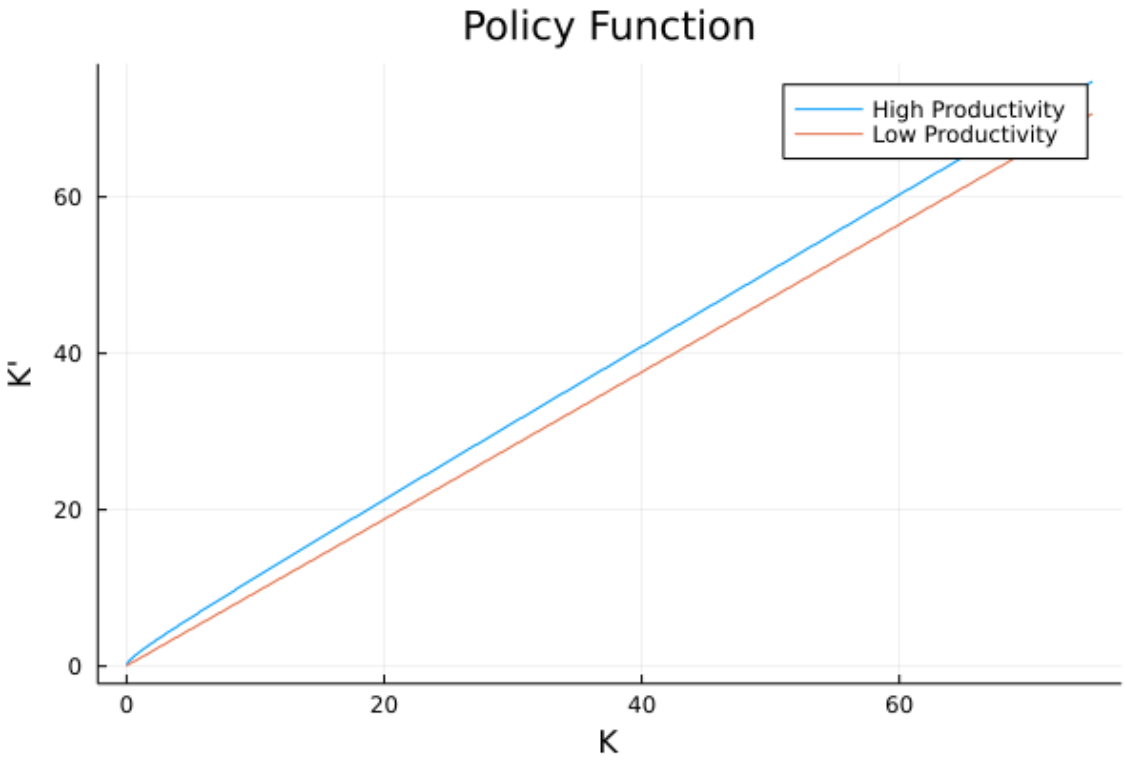
## 2 Value Function Plots

We can see that for both technology levels the value function is concave and increasing.



## 3 Policy Function Plots

We can see that for both technology levels the policy function is increasing in K and Z.




Although the policy function is increasing in K and Z, savings are not already increasing in K.

Households with higher capital levels choose not to save, so saving is not always increasing in K. However, households save less under bad technology than they do under good technology, so savings are increasing in Z.