Impact of return on capital on inequality and social mobility

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## Goals

Wealth inequality is a major modern day problem. One of its causes is argued to be return on capital being greater than growth due to income[1], allowing wealth to snowball for the already wealthy. This report investigates the relationship between wealth inequality and social mobility as affected by the rate of return on capital.

## Methodology

This report is based on a modified version of the Value Transfer Model, a simple time-discrete economic model[2]. At the beginning every population member is assigned a random income and the economy is given a wealth growth factor (representing the rate of return on capital), after every exchange, each population members’ wealth is then multiplied by the wealth growth factor and income is added, finally the populations wealth is normalised to preserve numerical stability[3]. By running this model at different wealth growth factors we expect to see different levels of inequality and social mobility, which will be measured by calculating the Gini coefficient[2] at the end of the simulation, and the mobility after a set additional number of simulation timesteps (where mobility is defined as the percentage of population members moving more than one quintile in wealth within the economy; a perfect mobility value is 48%), having a high mobility can justify lower Gini values, as population members can fairly climb up the wealth ladder.

The simulation was run on a population size of 100,000, with a time period simulation of 3000 steps to allow for the wealth of the population members to stabilise. 15 simulations per wealth growth factor were run to measure mean values and variability. Social mobility was measured after an additional 100 time steps after the end of the simulation as to allow the mobility value to stabilise.

## Results

A graph of a graph

Description automatically generatedThe plot below displays the results of the simulation running on 12 different rates of return on capital. Standard errors are shown in red. A positive correlation can be seen between the rate of return on capital, mobility and Gini coefficient.

## Conclusion

The results present interesting findings; as expected as the rate of return on capital increases, so does the wealth inequality (as it grows closer to 1) as wealth of the already wealthy grows exponentially, but what is unexpected is that social mobility is increased too, over doubling between the lower rates of 1 - 1.15 and rate of 2.0. Concluding, this report shows that larger rates of return on capital increase wealth inequality but on the other hand improve social mobility, meaning a more equal ability for poorer population members to grow their wealth and climb the wealth ladder.

**References**

[1] <https://en.wikipedia.org/wiki/Capital_in_the_Twenty-First_Century>

[2] <https://www.cl.cam.ac.uk/teaching/2324/SciComp/repo/ex_scicomp/tick1.html>

[3] <https://github.com/Kacper-M-Michalik/Scientific-Computing-Coursework/tree/main/Tick%204>