

Quantitative Macroeconomics

Unemployment due to COVID-19

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The current COVID-19 pandemic is bringing out structural flaws that are presented especially in third world economies, combining three different crises: health, economic, and social. Long-standing economic weaknesses, such as unemployment, are diminishing the way out of this crisis and are beginning to erode all the advances made in the last decades. Since the beginning of the pandemic and posterior quarantine period the levels of unemployment sky rocket to values even greater than 20%, that is why the present document tries to address this problematic and replicate how could affect a specific policy for unemployment reduction. Additionally studying how would this shock in unemployment reduction could affect the individual distribution and wealth distribution.

Subsequently, for the following model I based the estimation in the code¹ for the solution of the Krusell and Smith (1998), including heterogeneity across wealth by introducing idiosyncratic employment shocks. Given the lack of full insurance, the model generates an endogenous distribution of wealth. Then, the following results used an improvement of code used for solving the case of unemployment.

This project would be the first step of a more complete model, in which, I would like to implement more realistic parameter and considerations (other variables) to fully characterize an open economy.

I divided the analysis in two periods:

1. Period from $t=1$ to $t=50$. Time characterized by having a variation in unemployment from 10% for good times to 20% for bad times.
2. Period from $t=1$ to $t=50$. Time characterized by having a variation in unemployment from 5% for good times to 10% for bad times.

¹The code is based in the Matlab solution of the KS model, it isn't completely optimal, takes a lot of time to run

Obtaining the following differences among policy functions:

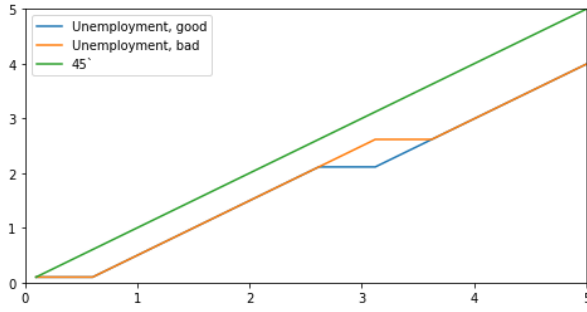


Figure 1: Policy Function - First period

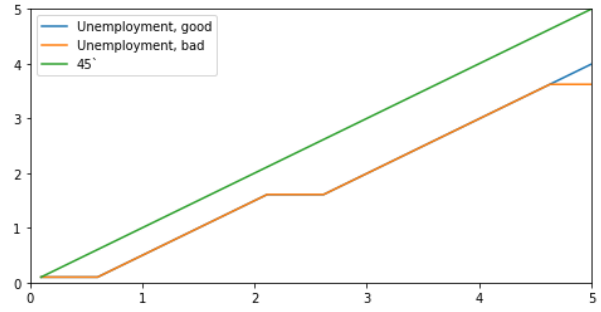


Figure 2: Policy Function - Second period

Firstly, we can observe the difference among both of the periods, for whose we have the estimation of unemployment in good and bad time. The graphs show the decision of the individual in the next period (y-axis) over the individual capital (x-axis). We can observe that in both cases (good and bad times) the decision over the next period is smaller for the second period 2. Individuals could be saving less than before.

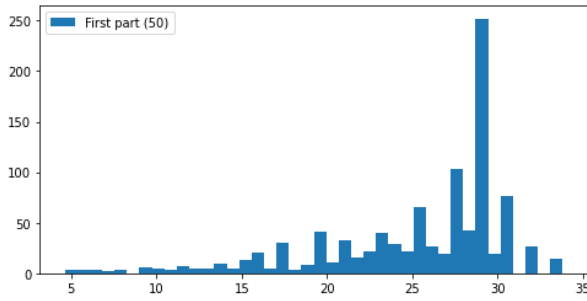


Figure 3: Wealth distribution - First period

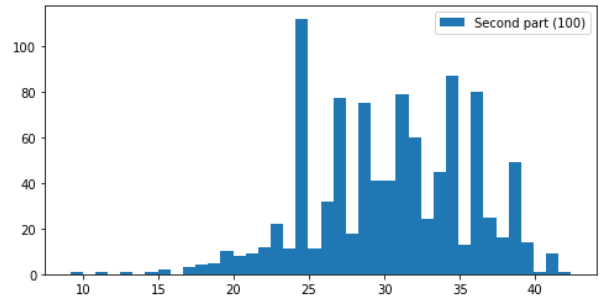


Figure 4: Wealth distribution - Second period

Secondly, we can observe the wealth distribution for a determined time corresponding to each period. Like we can observe the main characteristic is that for the second period there is a wealth distribution with less inequality, figure 4. Maybe this is due to the reduction in poor individuals.

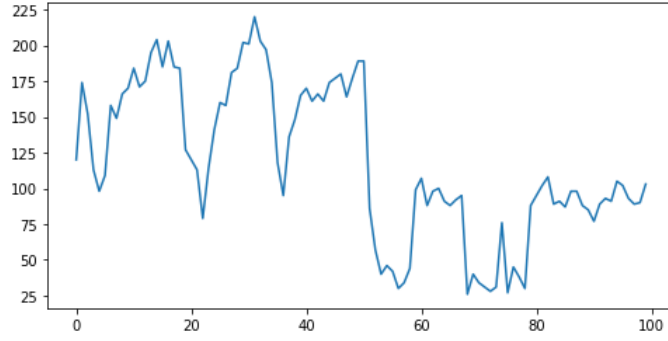


Figure 5: Unemployment rate

Thirdly, we can observe the total unemployment ratio estimation after the policy shock to improve unemployment. Like we can observe even after the first big reduction in $t=50$, the ratio never recuperate similar values as in the first part.

From these result we can conclude that the implementation of a government policy for recuperation of the Covid crisis, could be focused in a unemployment reduction. Because by supporting the employment, this ratio would permanently reduce and support the improvement of the economy into a lower inequality system.