Project 1 FYS-STK4155: Applied data analysis and machine learning

REGRESSION AND RESAMPLING

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Abstract.

Contents

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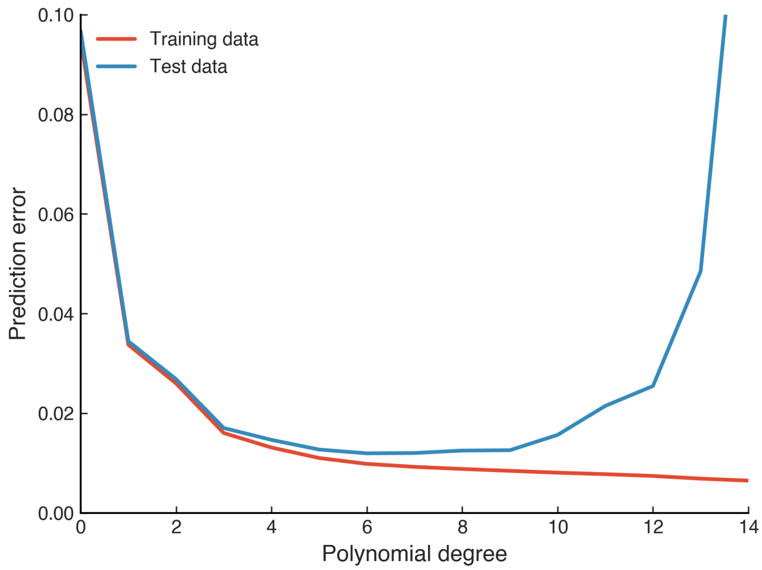

FIGURE 1. Stuff

1. Theoretical Background

2. Results

Figure 1 shows plot of different wealth distributions after 1000 simulations for $N = 500$ agents. We see that that without savings, the distribution shows a decreasing number of agents as wealth increases. As the savings rate λ is allowed to increase, the distribution moves to the right and eventually peaks at the initial wealth $m_0 = 100$ when $\lambda = 0.9$. This plot, were it not for the colors, could be an exact copy of figure 1 in Patriarca et al.[1]. Without savings the distribution appears as a inverse exponential function which is the same class of function as the Gibbs distribution (equation **??**), and the Pareto distribution (equation **??**). However, these traits disappear from the wealth distributions once savings are allowed.

3. Discussion

4. Summary Remarks

References

[1] Patriarca, M., Chakraborti, A., & Kaski, K. (2004). Gibbs versus non-Gibbs distributions in money dynamics. *Physica A: Statistical Mechanics and its Applications*, 340(1), pp. 334-339.

Appendices

A. Parametrization from Patriarca et al.

A corresponding exact solution of an income distributions for a generic value of λ with $0 < \lambda < 1$ is provided in Patriarca et al.[1]. Fir one employs the reduced variable

$$x = \frac{m}{\langle m \rangle} \tag{1}$$

the agent money in units of average money $\langle m \rangle$ and the parameter

$$n(\lambda) = 1 + \frac{3\lambda}{1-\lambda}. \tag{2}$$

The money distributions, for arbitrary values of λ, are well fitted by the function

$$P_n(x) = a_n x^{n-1} e^{-nx} \tag{3}$$

where a_n is a normalization factor shown to be

$$a_n = \frac{n^n}{\Gamma(n)} \tag{4}$$