

Project 4: Financial Engineering from a Statistical Physics Approach

Michael Saybolt

5/7/2017

Contents

1	Introduction	2
2	technical intro	2
2.1	implementation sepcifics	2
3	Results	3
3.1	Default	3
3.2	Savings	3
3.3	Similar Wealth	3
3.4	Previous Interactions	3

Abstract

This project explores the generation and simulation of an economic system. Financial transactions among agents are simulated using Monte Carlo methods. The resulting distribution of wealth is then studied. Various parameters can be tuned to create a system that accurately models real wealth distributions from various countries.

1 Introduction

The end goal is to analyze the distribution of wealth as a function of agents' money/income, m . The result should follow a Pareto distribution. moar details, section layouts, how rng assigned, what effects examined

2 technical intro

- some maths copy from paper - initial conditions, unlike papers, all have same money, cant get debtjj -termination conditions random, some variancec, also see nate parameter selection - good results, need sufficient start money I think

2.1 implementation sepcifics

- mention quikplot, big MC, necessity of ldr/str

3 Results

3.1 Default

3.2 Savings

3.3 Similar Wealth

3.4 Previous Interactions

References

- [1] V. Pareto, Cours d'economie politique, Lausanne, 1897.
- [2] M. Patriarca, A. Chakraborti, K. Kaski, Physica A **340**, 334 (2004).
- [3] S. Goswami and P. Sen, Physica A **415**, 514 (2014).