

WORKER-EMPLOYER MONEY FLOW: A MODEL FOR ECONOMIC HEALTH

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The year 2020 marked the beginning of the COVID-19 pandemic. Savings accounts and the total amount deposited increased, several stores closed. Instability causes uncertainty about the future. Economic fear makes people save more money.

However, saving money is extremely detrimental to an economy. Money flow allows people to live as they currently do. When people reduce

spending, fewer employers receive money and therefore find it difficult to pay their workers, who will then be unable to buy from other employers, creating a vicious cycle that can destabilize the economy. Econophysics is an area

interdisciplinary approach that uses Mathematical rigor and Physical investigative thinking to address Economic problems, applying especially stochastic methods. This one

work aims to describe the relationships between Workers and Employers

through complex networks. Describe the dynamics of relationships between agents of the system. And carry out simulation, analyze the results, and discuss. For the methodology, the

model starts with a complex bipartite network. There are two types of agents: Workers

and Employers. Each node represents an Employer or a Worker. After that, it is

randomly connecting each Worker with an Employer. With the network

assembled, we define two more system information: Each agent has its own

monetary reservoir, Workers start with the reservoir at zero and all

Employers start with an amount corresponding to the same fraction of total wealth

of the system. Attractiveness, each Employer has, is defined as the ratio between the

number of Workers under its management and the total number of Workers. Each cycle

simulation consists of two stages. In the first stage, Employers pay their

Workers also share what they have if they are unable to pay their salary

fully. In the second stage, each Worker chooses randomly, with the

probability to attractiveness, an Employer and decides the amount you will spend with him

based on how much money he has, the cost of living, and economic fear. After each cycle

simulation, the value and its square of Economic Health are noted, defined by the ratio

of the sum of employers' money to the total wealth of the population after the cycle. At the Finally, the temporal average of Economic Health is taken and its variance is also calculated. As results, economic health curves were obtained, presenting a phase transition of second-order observable in agreement with the variance. There is a critical temperature which separates a regime where economic health is under control from a regime where economic health is ill. Finally, this work modeled a society and its behavior observed through simulation. Dividing individuals into two types: Employers and Workers, linked by employment contracts. The monetary flow was simulated through cycles of its stages: Payment and purchase, taking into account the current economic fear. After each cycle, economic health was calculated. We calculate the temporal mean and variance. The model presents two distinct phases and a second-order transition, separating high and low health regimes economic.