



PAPER

A tale of two (and more) altruists

B De Bruyne¹, J Randon-Furling^{2,3} and S Redner^{5,4}

Published 19 October 2021 • © 2021 IOP Publishing Ltd and SISSA Medialab srl

[Journal of Statistical Mechanics: Theory and Experiment](#), Volume 2021, October 2021 Citation B De Bruyne *et al* *J. Stat. Mech.* (2021) 103405

This article is corrected by [J. Stat. Mech. \(2022\) 019901](#)

[Hide article information](#)

Author e-mails

redner@santafe.edu

Author affiliations

¹ LPTMS, CNRS, Univ. Paris-Sud, Université Paris-Saclay, 91405 Orsay, France

² SAMM, Université Paris 1 – FP2M (FR2036), CNRS, 75013 Paris, France

³ MSDA, Mohammed VI Polytechnic University, Ben Guerir 43150, Morocco

⁴ Santa Fe Institute, 1399 Hyde Park Rd., Santa Fe, New Mexico 87501, United States of America

Author notes

⁵ Author to whom any correspondence should be addressed.

Dates

Received 14 September 2021

Accepted 20 September 2021

Published 19 October 2021

DOI

<https://doi.org/10.1088/1742-5468/ac2906>

[Buy this article in print](#)

[Journal RSS](#)

[Sign up for new issue notifications](#)

[Create citation alert](#)

Abstract

We introduce a minimalist dynamical model of wealth evolution and wealth sharing among N agents as a platform to compare the relative merits of altruism and individualism. In our model, the wealth of each agent independently evolves by diffusion. For a population of altruists, whenever any agent reaches zero wealth (that is, the agent goes bankrupt), the remaining wealth of the other $N - 1$ agents is equally shared among all. The population is collectively defined to be bankrupt when its total wealth falls below a specified small threshold value. For individualists, each time an agent goes bankrupt (s)he is considered to be 'dead' and no wealth redistribution occurs. We determine the evolution of wealth in these two societies. Altruism leads to more global median wealth at early times; eventually, however, the longest-lived individualists accumulate most of the wealth and are richer and more long lived than the altruists.