

Social anatomy of a financial bubble

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This work is about the demographic trends and social dynamics observed at the onset and during the evolution of a financial bubble. Our characterization aims to detect demographic trends in the flux of new investors buying the Nokia asset, i.e. the most representative dotcom stock of the Nordic Stock Exchange during the dotcom bubble. The data for our empirical investigation are taken from two datasets. The first one is maintained by Euroclear, and it tracks the daily ownership of financial assets owned by Finnish investors during the period 1995-2003. The second dataset has demographic information collected by the national statistics office of Finland about age categories, number of inhabitants, income levels, education and jobs per postal code of residence. We track the flux of new investors entering the market daily, and we yearly compare their demographic features with those of the whole Finnish population with a method able to detect over-expression and under-expression of attributes in a heterogeneous system [1]. As for many innovation product or services, we detect a bursty dynamics of access to the market by new investors. We investigate the attributes of age, postal code and gender, of new Nokia investors. As far as income levels and job information are concerned, these attributes are first assigned through maximum entropy methods using age levels as a conditioning variable. We also present an agent based model which is a variant of Deffuant's opinion model [2], that can qualitatively describe the bursty profile of access to the market of new investors.

[1] Tumminello, M., Miccichè, S., Lillo, F., Varho, J., Piilo, J. and Mantegna, R.N., 2011. Community characterization of heterogeneous complex systems. *Journal of Statistical Mechanics: Theory and Experiment*, 2011(01), p.P01019.

[2] Deffuant, G., Neau, D., Amblard, F. and Weisbuch, G., 2000. Mixing beliefs among interacting agents. *Advances in Complex Systems*, 3(01n04), pp.87-98.

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