

Zipf law in a community currency system called Lets

Nozomi Kichiji⁽¹⁾ , Makoto Nishibe⁽²⁾

1. *Faculty and Graduate School of Engineering, Hokkaido University Kita 13, Nishi 8, Kita-ku, Sapporo, 060-8628, Japan*

2. *Graduate School of Economics and Business Administration, Hokkaido University Kita 9 Nishi 7, Kita-Ku, Sapporo, 060-0809, Japan*□□

Corresponding author e-mail: kichiji@topology.coe.hokudai.ac.jp

Econophysics has focused on economic phenomena at macro levels. But very few attempts to study economic phenomena at mezzo levels have been made because of difficulty of obtaining such data. Since we make use of the database of a virtual community currency system operated on the Internet, we can analyze the mezzo-level data. LETS is the kind of community currencies which is most widely used among 2000 communities all over the world. It is a multilateral settlement system, in which each participant opens his or her account and trades goods and services with other participants through changes in plus or minus on the account balance. Using data of transactions and account balances of an online LETS "Q" operated in Japan since December 2001, we discovered a Zipf law for the distribution of the account balances of 287 participants until October 2002. We show that the number of participant increases (growth) and some specified participants trade more goods and services than other participants (preferential attachment). The result shows that scale-free network model, which creates power-law distribution, is valid for the network of community currency transactions. We also show that exponent of monthly power law tends to decrease with time and reaches to 1 on March 2002 and then oscillates between 0.733-1.13 until October 2002. The result is call for further investigation.