THE COMPLEX NETWORK ANALYSIS ON SERVICE CHANNELS OF A BANK AND ITS MANAGEMENT UTILITY

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Abstract. Due to the difficulty in analyzing giant amount of data, usually, the study of banking service channels focuses on the attribute variables of customers and of channels respectively, but few on relational variables between them. The development of complex networks approach provides a simple and effective framework for the analysis of tremendous relational variables. Based on the transaction journal of a branch office of a bank, several complex network models are constructed in this paper. Through exploring the distributions of the important relational variables (the node degree, the node strength and the edge weight) and the topological properties of the networks, we discuss the features of the transaction relationships of service channels of the bank; suggest a complex network approach for analyzing banking service channels. On the other hand, this paper use power law exponent to explore the management utility of some important relational variables. It is also argued that, in the study of real problems presenting power-law network properties, besides using power-law exponent, mean, variance, and range of relational variables should also be taken into account in analyzing the properties of a network. Finally, the necessity of further exploring the implication of the robust-yet-fragile property of bipartite networks is emphasized.

Keywords. Power-law distribution, bipartite network, weighted network, banking service channels, management utility

1　Introduction

Banking service channels are the access for customers to use the products and services of banks. With the development of information technologies, banking service channels have been changing from the traditional counter service into diversified service channels, including ATM, telephone banking and self-service terminals. Service channels are currently the main field of competition between banks.

In banking industry, the researches on service channels mainly focus on the attribute variables of customers and channels: statistical analysis on the