

COMPLEXITY IN ECONOMIC NETWORKS: FROM TOPOLOGY TO DYNAMICS

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Abstract. Studying complicated economic systems in the literature of complex network theory is very important to understand the complexity of the macroeconomic collective behaviors. In this paper, several typical economic networks have been surveyed on their complex networking topologies, whose dominant effects have also been investigated in the synchronization behaviors and chaotic dynamics in these complex economic networks.

Keywords. Complex Networks, World Trade Web, World Exchange Arrangements Web, economic-cycle synchronization, competition, chaos

1 Introduction

The economic globalization has promoted different countries' economies to be integrated together in terms of trade and capital flow [1]. The countries' economic activities are considered as being organized within a network structure. In this kind of macroeconomic networks, for example, every country is a node, and the economic interactions between two countries are the edges (links) between two networking nodes in the economic system. In fact, any economic system can be described in the language of network, and any entity in the system is a node, and economic communications between any two entities are the edges in the network. It is therefore foreseeable that the understanding of complex network theories will shed light on the emergent phenomena of macroeconomic systems from the network topological complexity [2].

The latest discoveries of small-world and scale-free features in many real world complex networks [3,11] have also been found in networks of economic systems, which have a significant influence on the observed economic collective behaviors [4-7, 9, and references therein]. Therefore, in this paper, we will synthetically survey the latest understanding of economical dynamical networks concerning the trading and exchange strategies.