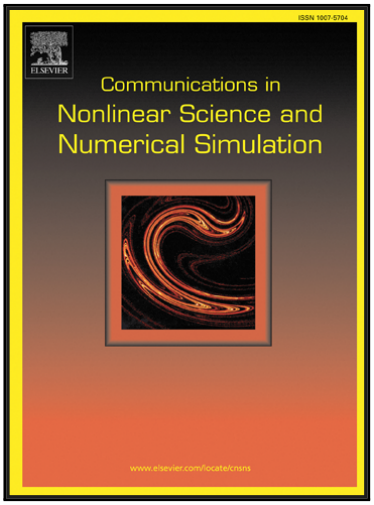

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PII: S1007-5704(17)30236-8
DOI: 10.1016/j.cnsns.2017.06.030
Reference: CNSNS 4250

To appear in: *Communications in Nonlinear Science and Numerical Simulation*

Received date: 25 February 2017
Revised date: 12 May 2017
Accepted date: 18 June 2017

Please cite this article as: Junhai Ma, Lei Xie, The impact of loss sensitivity on a mobile phone supply chain system stability based on the chaos theory, *Communications in Nonlinear Science and Numerical Simulation* (2017), doi: 10.1016/j.cnsns.2017.06.030

Article

The impact of loss sensitivity on a mobile phone supply chain system stability based on the chaos theory

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Academic Editor: name

Abstract: This paper, based on the China's communications and the current situation of the mobile phone industry, focuses on the stability of a supply chain system that consists of one supplier and one bounded rational retailer. We explore the influence of the decision makers' loss sensitivity and decision adjustment speed on the stability of the supply chain. It is found that when the retailer is not sensitive to the loss or adjusts decisions cautiously, the system can be stable. The single-retailer model is extended to a multi-retailer one to study the influence of competition on the system stability. The results show that the market share of each retailer does not affect the system stability when it is fixed. The decision of each retailer does not affect that of any other retailer and the system stability. We present two decision adjustment rules ("bounded rationality expectation (BRE)" and "adaptive exponential smoothing (AES)") and compare their performances on the system stability, and find that the AES rule does not affect the system stability, while the BRE rule will make the system stability be sensitive to the retailers' loss sensitivity and the decision adjustment speed. We also reveal the unstable system's negative impact on the retailers' decisions and profits, to emphasize the importance to maintain the system stability.

Keywords: Newsvendor model; mobile phone industry; decision making; market stability; chaos; demand uncertainty

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Highlights

- We study the influence of the loss sensitivity and decision adjustment speed on the market stability.
- We extend the single-retailer model to a multi-retailer model to explore how the competition and the number of retailers affect the multidimensional system stability.
- We compare the different effects of the decision adjustment rules on the system stability.
- We present the harm of a chaotic system in the decision-making and the accumulated profits and show the importance of the system stability.