

Mode Locking and Inventory Cycles – Synchronizaton and chaos caused by international trade Ken-ichi ISHIYAMA*

Abstract

Selover and Jensen became aware of the fact that business cycles between the United States and Canada appear to follow each other very closely by illustrating annual growth rates of industrial production from January in 1985 to December in 1995 (Selover and Jensen (1999)). They investigated whether the world business cycles could be considered as a kind of mode-locking phenomenon. Stimulated by their practical work, in this paper I construct a nonlinear three-country inventory cycle model based on Franke and Lux (1993), and show that the model represents synchronization of national business cycles caused by weak linkage among countries. Numerical simulations exhibit dynamical properties of the model depend on the degree of the linkage. That is, when international trade among countries is sufficiently active, inventory cycles can disappear; on the other hand, chaotic fluctuation can occur if there exist only almost self-sufficient economies.

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