The business cycle: dynamical coupling and chaotic fluctuations

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Preface

"[A]ll theory depends on assumptions which are not quite true. That is what makes it theory" (Solow, 1956, 65)

My interest in the subject of this thesis started long ago, with the publication of J-M. Grandmont's 1989-article On Endogenous Competitive Business Cycles. The occurrence of chaos in an overlapping generation model, based on perfect information and flexible prices was an extension of research I had done before. Another source of inspiration was the 1947-article of R.M. Goodwin, Dynamical Coupling with Especial Reference to Markets having Production Lags. Both articles laid the foundation of the models developed in part three of this thesis. Starting with this thesis I shared the hope of Jude that "Once there I shall so advance that my present knowledge will appear to me but as childish ignorance". (Jude the Obscure, Thomas Hardy, 1895 (reprint 1985), 34). Presenting the result of my research here, hopefully, proves this statement.

Chaos has been a fashionable concept in all sciences during end of the twentieth century. Or, in the words of Terry Pratchett:
"the trouble was that ignorance became more interesting, especially big fascinating ignorance about huge and important things like matter and creation, and people stopped patiently building their little houses of rational sticks in the chaos of the universe and started getting interested in the chaos itself -partly because it was a lot easier to be an expert on chaos, but mostly because it made really good patterns that you could put on a t-shirt. And instead of getting on with proper science* scientists suddenly went around saying how impossible it was to know anything .. .
* Like finding that bloody butterfly** whose flapping wings cause all those storms we've been having lately and getting it to stop" (Witches Abroad, 1993, 7/8).
** The Quantum Weather Butterfly (Papilio tempestaе) is an undistinguished yellow colour, although the mandelbrot patterns on the wings are of considerable interest. Its outstanding feature is its ability to create weather" (Terry Pratchett, Interesting Times, 1995, 13).

In my view finding "the butterfly" can help to understand human behaviour. Particularly because humans interact with each other and their environment, non-linearities and feedbacks occur: the requirements for the occurrence of chaos. Economic behaviour is not different from other social behaviour. Social relations are at the heart of economics, even when these relations are cast in mathematical equations.
"No man is an island", I have to thank a great number of people for their support during the research which led to this thesis. During the writing of this thesis, I worked at the Open University of the Netherlands. This project has received the support of several deans, by allowing time consuming research among other things. My gratitude also goes out to professor H. Peer, who as both dean of the faculty and as a colleague stimulated this project. My colleagues at the economics department also need recognition for their support during this time.

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