

Nonlinear Liquidity-Growth Dynamics with Corridor-Stability

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The presentation is based on a joint work with Malte Sieveking, University of Frankfurt. The issue of “corridor stability” has been studied in economic theory by Keynes, Pigou, Fisher, Tobin, Leijonhufvud and others (see Dimand 2005). The idea is that market economies are stable and mean reverting for small shocks but become vulnerable and unstable for large shocks. In our paper we present a dynamic model of the financial/real interaction where we show that (i) liquidity, when facilitated through credit, can be procyclically and thus amplifying, (ii) credit may add to the asymmetry of business cycles and (iii) endogenous propagation mechanisms in monetary economies are shock dependent. For small shocks propagation mechanisms are weak whereas for large shocks the amplification mechanisms are strong. We demonstrate that the portrayal of financial/real forces exhibit corridor-stability properties which means that small shocks have no lasting effects, but large enough shocks can lead to persistent cycles or unstable nonperiodic fluctuations. The Hopf-bifurcation theorem is rendered inapplicable due to the fact that the trajectories are stable in the vicinity of the equilibrium. A global characterization of the dynamics is required instead. To study global properties a Lyapunov function is used. As shown there are two limit cycles, an inner one, that is repelling and then an outer one that is attracting. Though this model type is not an optimally controlled dynamic system, it is indicated, however, how this might be extended to an optimal control model. Empirical work along this line of research can be found in Semmler and Kockesen (2001) and Mitnik and Semmler (2014).