Chaotic behaviour of continuous dynamical system generated by Euler equation branching in plane $\mathbb{R}^2$ and its application in macroeconomics

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We are focused on the special type of continuous dynamical system which is generated by Euler equation branching in the plane $\mathbb{R}^2$. Euler equation branching is a type of differential inclusion $\dot{x} \in \{f(x), g(x)\}$, where $f, g : X \subset \mathbb{R}^2 \to \mathbb{R}^2$ are continuous and $f(x) \neq g(x)$ in every point $x \in X$. This dynamical system typically produces so-called chaotic sets. Chaotic sets leads to existence of Devaney, Li-Yorke and distributional chaos (see [5]). We extend theory presented by Stockman and Raines and create a comprehensive overview of all possibilities with detecting of chaotic sets in such systems.

In the second part we show its application in macroeconomics, more precisely in new own overall macroeconomic equilibrium model called IS-LM/QY-ML including every important economic phenomena like an inflation effect, an endogenous money supply, an economic cycle etc. in contrast of the original IS-LM model on which new model is based.

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