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Chaotic Sets and Chaos for a Class of Differential Inclusions that Arise in Economic Models.

Some economic models may exhibit a type of indeterminacy known as Euler equation branching. The dynamics in such models are governed by a differential inclusion $\dot{x} \in H(x)$, where H is a set-valued function. In this paper, we introduce the concept of a *chaotic set* and explore its implications for Devaney chaos, Li-Yorke chaos and distributional chaos (adapted to dynamical systems generated by a differential inclusion). We show that a *chaotic set* will imply Devaney and Li-Yorke chaos, but *not* distributional chaos. We show that the existence of a steady state for a differential inclusion on the plane will generate a chaotic set and hence Devaney and Li-Yorke chaos. Though a chaotic set by itself is not sufficient for distributional chaos, we show that since the chaotic set is generated by a differential inclusion, one obtains distributional chaos as well. (Received February 11, 2010)