

Global Analysis in a Growth Economic Model with Perfect-Substitution Technologies

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Abstract : The purpose of the present paper is to highlight some features of an economic growth model with environmental negative externalities, giving rise to a three-dimensional dynamic system. In particular, we show that the economy, which is based on a Perfect-Substitution Technologies function of production, has no neither indeterminacy nor poverty trap. This implies that equilibrium select by economy depends on the history (initial values of state variable) of the economy rather than on expectations of economies agents. Moreover, by contrast, we prove that the basin of attraction of locally equilibrium points may be very large, as they can extend up to the boundary of the system phase space. The infinite-horizon optimal control problem has the purpose of maximizing the representative agent's instantaneous utility function depending on leisure and consumption.

Keywords : Hopf bifurcation, open-access natural resources, optimal control, perfect-substitution technologies, Poincarè compactification

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