

# Global attractor in Solow growth model with differential savings and endogenous labor force growth.

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## Abstract

In this paper we study the dynamics of a discrete triangular system  $T$  in capital per capita and population growth representing the neoclassical growth model with CES production function and differential savings, under the assumption that the labor force growth rate is endogenous and described by a generic iterative scheme having a unique positive globally stable equilibrium  $\bar{n}$ . The study herewith presented aims at confirming the existence of a compact global attractor for system  $T$  along the invariant line  $\bar{n}$ . Consequently asymptotic dynamics of growth models with constant population growth rate can be related to those with non-constant population growth if the steady state rate is globally stable. Furthermore we prove that the system exhibits cycles or even chaotic dynamics patterns if shareholders save more than workers, when the elasticity of substitution between production factors drops below one (so that capital income declines). The analytical results are supplemented by numerical simulations.

**JEL codes:** C62, O40

**keywords:** Compact global attractor, chaotic dynamics, endogenous population growth.

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