

# **SECULAR CYCLES AS A RESULT OF INTERACTION OF STRUCTURALLY SIMPLE SOCIETIES. MATHEMATICAL MODELING**

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In this paper, we present and analyze a mathematical model of a structurally simple commonality, which consists of producers of agricultural product and producers of agricultural equipment. With the use of methods of the nonlinear analysis we show that variations in the population growth rate, which depends on the consumption level, can essentially impact the horizon of predictability of the demographic dynamics. We demonstrate that the barter between communities can lead to the appearance of long-period harmonics in the chaotic time series, which characterize changes in the population size, and also in the level of consumption and production of the agricultural product.