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## **CHAOS IN THE LABOUR MARKET**

In this paper, we propose a mathematical model of the labour market, taking into account the special properties of the supply and demand functions in the labour market. The relevance of this study is due to the problems of predicting dynamic evolution in nonlinear discrete models. These mathematical models describe the functioning of market interaction in heterogeneous systems of economic nature, coupled with a variety of behaviour of the trajectories of the studied objects, including various bifurcations and chaos. Unlike well-known methods in econometrics, in this work the approaches oriented on qualitative analysis of temporal changes in such environments and structures have been further developed. From the standpoint of the paradigm of equilibrium, the methods of comparative statics and dynamics that determine the conditions for achieving equilibrium with the establishment of a character of stability are used.

The qualitative properties of the nonlinear difference equation for the dynamics of wages are investigated with the identification of period doubling bifurcation and a chaotic regime. The economic interpretation of the bifurcation parameter is given as the difference between two equilibrium values of wages. Critical values of differences in equilibrium payroll values can lead to undesirable bifurcations and catastrophes.

The equilibrium position with a low level of wages

corresponds to the discriminating segment of the labour market, where it is quite difficult to provide socially normal conditions for the reproduction of labour. At the same time, it should be emphasized that the discriminatory market has a high degree of professional mobility. The transition from this market segment to the so-called socially normal market is characterized by a cascade of bifurcations leading to a chaotic change in wages. The subsequent evolution of the socially normal labour market with the growth of wages generates an elite segment of this market with low professional mobility of its participants. In any case, it is necessary to monitor the differences between equilibrium values, corresponding to low and high wages in order to avoid undesirable bifurcations and catastrophes leading to various shocks and social tensions.

#### **REFERENCES:**

1. Nyzhehorodtsev R. R ynok truda: ylluzyyi ravnovesiya y problem y perekhodnoi ekonomyky. // Problem y teoryy y praktyky upravleniya, #5, 2004. – S. 89-95.
2. Kyzym N.A. Ustoichyvost nelyneinoi pautynooobraznoi modely/ Kyzym N.A., Voronyn A.V.// Byznes Ynform. – 2006. – #3. – S. 39-41.
3. Kronover R.M. Fraktal y y khaos v dynamycheskykh systemakh. Osnov y teoryy. – M.: Post market, 2000. – 352 s.