

## **SYSTEM DYNAMIC MODELING OF UNEMPLOYMENT IN PUBLIC SERVICE**

The aim of this research is to provide a system dynamic model in order to explain behavior of unemployment rate in public service. Unemployment is an economic and social phenomenon, when on the labor market the supply of labor is bigger than the demand for it. Therefore, there are more application for a job in public administration service than vacancies in this sector. The problem of unemployment is urgent at the current stage of the development of our country in time of war disasters overcoming. The higher unemployment rate, the lower is the level of economic and social development.

In this investigation we apply a system dynamic approach to explain the unemployment rate in public service sector using Stella Architect.

System dynamics (SD) is an approach that help us understand the nonlinear behavior of complex systems over time using stocks, flows, internal feedback loops, and time delays.

At the beginning the model includes two stocks: the amount of unemployed people and employed people that have an effect on the unemployment rate (UR)

$$UR = \text{Unemployment} / (\text{Unemployment} + \text{Employment}).$$

Hiring is defined as difference between people that public service sector needs to hire and people that are already employed. Some workers are retiring so government need to hire new persons instead of retired that's why we add Retirement flow to Net hiring. We suppose that the hiring adjustment time is one quarter. Certain share of LF is leaving the labor force because of natural circumstances that defines Fraction of death rate. The labor demand based on the amount of desired labor, and it relies positively on expected demand for public services and negatively on average wages. Average wage is defined as nominal wages divided by amount of



Unemployment is defined as fraction of new unemployed people in the labor force. Labor force is defined as seventy five percent of working age population. Therefore, the wage positively affects the processes of labor force extension whereas the unemployment rate negatively affects the wage in public service. The model shows that the unemployment rate in public administration sector has oscillating behavior, it exceeds the natural average level while the nominal wage is decreasing.

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