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DYNAMIC APPROACH OF THE KEY DESTABILIZING FACTORS ON THE UKRAINIAN LABOR MARKET

The state of the labor market is one of the socio-economic parameters that have a significant effect on the development and competitiveness level of the national economy. Labor market plays an important role in ensuring the success of market reforms, especially in the emerging economies such as Ukraine. Moreover, current state of the Ukrainian labor market is also affected by complex political and economic situation and may be generally characterized by a continuous recession and financial imbalances. In spite of a sufficiently wide range of studies dedicated to the analysis of the Ukrainian labor market stability, most papers are more focused just on the statistical analysis and general overview of the market trends. However, dynamic nature of both labor market itself and socio-economic stability of Ukraine requires conducting more comprehensive scientific researches, in particular by applying System Dynamics approach.

Research problem overview. According to W. Gimpelson [1], there are two channels for labor market to react on the internal or external shocks: a) wage adjustment; b) employment adjustment. Both channels work to stabilize the market as

a response to a new market condition, new equilibrium. Consequently, there are two major types of the state market regulation to fight market imbalances:

• minimum wages policy;

• employment protection legislation (EPL).

In highly developed countries, economy reacts on shocks mostly by change of the employment level rather than by adaption through the change in the average wage level. Wages turns out to be less flexible to market conjuncture on the micro level. However, empirical assessment proves that employment in Ukraine is not characterized by high volatility. On contrary, wage adaption mechanism works much more efficiently. Such behavior is also observed across other post-Soviet countries, in particular in the Russian Federation. Wage dynamics was further reflected in the establishment of wages in a more flexible regime, so-called integrated wages. In Ukraine it is common that wage consists of two sources: 1) basic rate - the official salary; 2) “shadow bonuses” depending not only on one’s labor productivity, but also on the general state of economic development and on the growth of the specific industry. Such wage structure makes it possible to use it as a mechanism for adapting to changes in the labor market, optimizing cash flows by the enterprise management and, in general, offset the negative effects of market fluctuations, periods of crises and high inflation.

By applying econometrics methodology (linear regression and Vector autoregression models), I have already tested the following hypotheses:

1. Change in wages will directly affect the unemployment rate. *(failed to reject)*

2. Change in the share of shadow economy will indirectly affect the employment rate. *(failed to reject)*

3. Change in wages will directly affect the size of the shadow economy. *(rejected)*

The results of the designed econometric models revealed that we can accept the first two hypotheses, but the third one has not been confirmed.

To continue my further research on the labor market stability I am going to enhance my analysis with System Dynamics approaches in order to test confirmed hypotheses with application of System Dynamics methods. Thus, ***the main objective of the study*** is to build a comprehensive SD model of the labor market in Ukraine that could be used for scenario shock-analysis.

Current state. At the moment the model already consists of three submodels: demographic part, labor demand, and labor supply. The model will be complemented by the wage formation part to investigate the impact of changes in wages on unemployment in the short/long terms and analyze interconnections between wage level and unemployment rate and its possible short term effect on price index (to test Philips curve concept in case of Ukraine). The calculation of expected labor productivity will also be improved. Namely, the level of technological equipment will be included as a factor of influence on productivity. For further scenario analysis, it is crucial to introduce a new parameter - the level of shadow employment to analyze its impact on labor market stability.

CLD. Figure 1 presents the diagram of the expected interconnections of the main structural elements of the model based on their macroeconomic nature. However, during the simulations, the results can be adjusted.

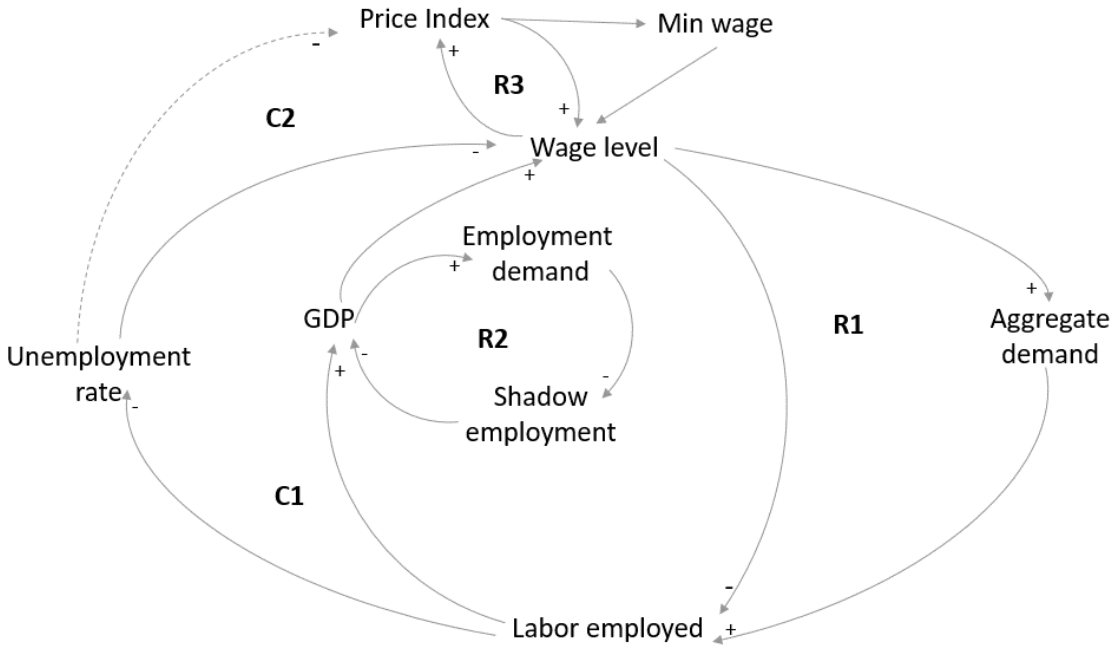

Figure 1 - Causal Loop Diagram of the simplified labor market model.

Source: extracted from Stella Architect software.

The diagram above contains 3 reinforcing loops and 2 counteracting.

Elements of reinforcing feedback loops:

R1: Wage level, aggregate demand, labor employed, GDP.

R2: GDP, employment demand, shadow employment.

R3: Price index and wage level.

Elements of counteracting feedback loops:

C1: Unemployment rate, price index, wage level, aggregate demand, labor employed.

C2: Labor employed, GDP, wage level.

R1 illustrates the macroeconomic link between the main elements of the labor market. *R2* reflects on our assumption that with a growth in production as well as in demand for employment, shadow employment gradually decreases. At the same time *R3* explains link between wages and price index: as wage level rises, production costs also increase which creates pressure on prices.

The greatest research interest concentrated in analysis of the counteracting loops (*C1* and *C2*) which plays a significant role in further policy design in order to define the most efficient regulation mechanism for the labor market. *C1* is based on the Philips curve concept that we aim to test during the simulation. *C2* reflects indirect relationship between wage level and labor employed (as wage is the price for labor, that means the higher the price is the lower demand level for it).

Apart from the testing indicated interconnections our study goal includes determining what factors can provoke shocks and how the system will respond to them. In particular, how a change in unemployment will affect inflation. Moreover, developed model wil; alow to assess the efficiency level of the state financial policy, wage management, determining the consequences of the positive growth in the minimum wage for the Ukrainian labor market during the recent years.

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МАТЕМАТИЧНЕ МОДЕЛЮВАННЯ ПОШИРЕННЯ КОРОНАВІРУСНОЇ ІНФЕКЦІЇ В ХМЕЛЬНИЦЬКІЙ ОБЛАСТІ

Ми живемо в час великих випробувань. Пандемія коронавірусної хвороби 2019-2020 років, що вже повністю змінила світ, і далі продовжує свій наступ.