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The Extent to Which Nominal Wage Determines Employment in Public Sector: in Uzbekistan's Case

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Abstract
This article describes medium term forecast of employment in state sector, and tries to find the answer to the question of which do the common factors really cause dynamic changes in the labor market of Uzbekistan. The literature suggests that there is high and positive relationship between the common independent variables and employment. The results show that only the average nominal wage performed a statistically significance. Because of the changes in the average nominal wage, the projection of employment in state sector for medium term fluctuated between -2 and 6. Moreover, applied models in the forecast for VAR represented positive and less positive scenarios until 2025q3.

Keywords: public sector employment, nominal wage, VAR model, labor market.

Introduction

In this article, we will analyze the short term future fluctuations of employment in the labor market in Uzbekistan under the influence of what factors are changing. According to the experience of the world economy, it is very important to assess the dynamic changes of indicators related to the labor market of countries and to ensure quantitative and qualitative adjustments in labor supply and demand for it.

At the current stage of development of socio-economic relations, employment and its forms are completely different from the traditional ones. The relevance of reducing the effectiveness of the ratio between demand and supply to changes in the labor market caused by factors such as technological progress in the world, changes in production processes, and geopolitical tensions is increasing.

LITERATURE REVIEW

Mixed findings have been found in the research on the association between nominal wage and employment in the public sector. Kraay (1995) discovered a favorable correlation between government employment and some criteria, such education level and urbanization, whereas Kézdi (1998) emphasized the detrimental effect of budgetary limitations on pay in the public sector. Bradley (2016) and Gomes (2009) both stressed how crucial it is to take into account how the

private sector would react to public sector employment policies. Gomes (2009) even pointed out that public sector pay and employment shocks may have an impact on unemployment rates. Together, these studies imply that a variety of factors, such as labor market dynamics and economic conditions, might affect the association between employment in the public sector and nominal wage.

Mixed findings have been found in the research on the association between nominal pay and employment in the public sector. While Navarro (2017) and Navarro (2021) stated that employment in the public sector might lessen the negative consequences of a minimum wage legislation, Cardullo (2017) revealed that a nationwide wage negotiating procedure in the public sector can lead to greater unemployment in poorer regions. Kerr (2017) examined the size and compensation structure of South Africa's public sector and discovered a sizable pay differential for employees in this sector. These studies draw attention to the intricate relationships that exist between employment, nominal pay, and public sector policy.

METHODOLOGY

The necessary statistical data for the model analysis obtained from the official websites of the Statistics agency under the President of the Republic of Uzbekistan. In this part of our scientific research, we make forecasts for indicators such as employment (in the public and private sector), nominal wages, related to the ratio of supply and demand in the labor market.

Today, various econometric models are used for forecasting. We use autoregression models (VAR and ARIMA) for forecasting employment in state sector.

VAR (vector autoregression) models generalize one variable autoregression models in the style of a multiple factor analysis. Regression with one variable is an equation model, in which current value of the variable is explained through its previous values. VAR is a model in which each variable is the function of its previous value, with n variables and n equations. VAR is a consistent and reliable model for forecasting macroeconomic indicators such as GDP, inflation, employment.

Two variable VAR model - (y_t, x_t) and first lag:

$$y_t = a_1 + b_{11}y_{t-1} + b_{12}x_{t-1} + u_t \quad (1)$$

$$x_t = a_2 + b_{21}y_{t-1} + b_{22}x_{t-1} + v_t \quad (2)$$

Here:

Assumptions of the model:

- $y_t$andx_t variables are stationary (if necessary logarithmic value or difference);
- Main variables in the matrix is evaluated via OLS.

We know from economic theory that the main factor affecting the balance in the labor market is the salary. Using the VAR model, we try to explain the fluctuation of employment (semp) in the public sector through nominal wages (nwg). To do this, we will do the following in sequence:

- data features: stationary or isn't it?
- is there a correlation between the variables (using Johansenn cointegration test);
- determining the number of lags;
- model diagnostics: autocorrelation and stability condition of the model;
- impulse response functions and variation decomposition;

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- forecasting.

Model structure as follows:

$$\pi_t^{dsemp} = a_1 + \sum_{k=1}^{k=3} b_{11}\, \pi_{t-k}^{dsemp} + \sum_{m=1}^{m=3} b_{12}\, \pi_{t-m}^{dnwg} + u_t \quad (3)$$

$$\pi_t^{dnwg} = a_2 + \sum_{k=1}^{k=3} b_{21}\, \pi_{t-k}^{dsemp} + \sum_{m=1}^{m=3} b_{22}\, \pi_{t-m}^{dnwg} + v_t \quad (4)$$

RESULTS AND DISCUSSION

Initially, we test the stationarity of the variables used in the model, public sector employment (semp) and nominal wages (nwg). For this, we use Dicky-Fuller and Phillips-Perron tests.

Table 1 The results of the stationarity check of the transformers used in the model[1]

Variable	Dickey-Fuller test		Phillips- Perron test	
	coefficient	p-value	coefficient	p-value
At level *l(0)*				
Semp	-	0.1980	-	0.2591
Nwg	-	0.9974	-	0.9986
1 st Difference *l(1)*				
dsemp	-3.750***	0.0000	-3.750***	0.0000
dnwg	-3.750***	0.0003	-3.750***	0.0003

*p<0.1, **p<0.05, ***p<0.01

From the data in Table 1 above, it can be seen that the variables are not at their initial value, but at their first differences. Also, the first differences of the variables are statistically significant at the 1% level of significance in both tests.

The data used in the model is quarterly and covers the years 2017-2022.

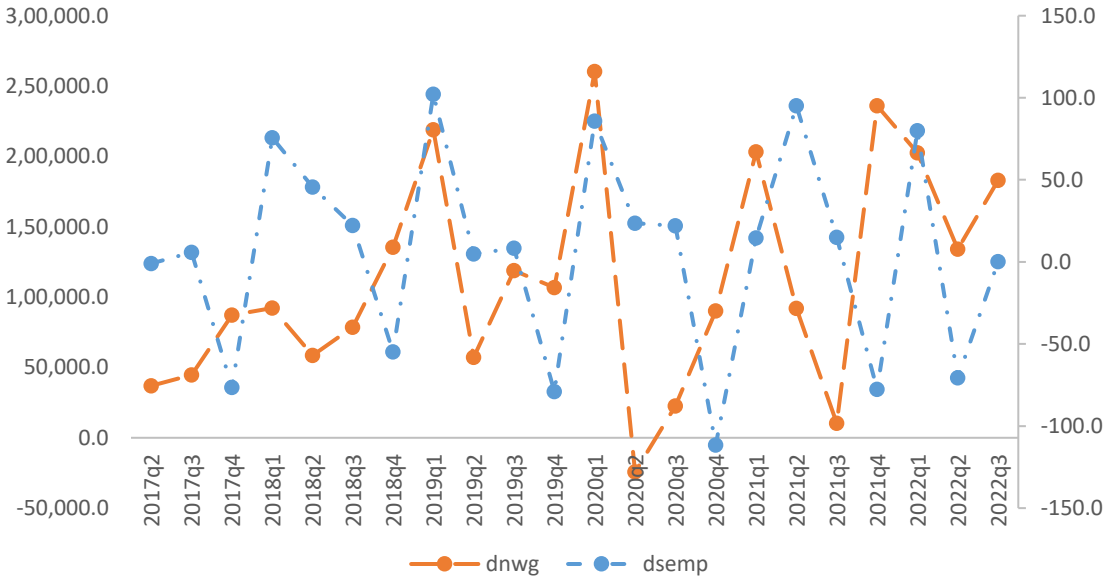

Figure 1. First-difference dynamics of the variables used in the model[2]

[1] Stata14 software using the author by prepared

[2] Prepared by author based on Statistics agency under the President of the Republic of Uzbekistan's information

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According to the data of Figure 1 above, the dynamics of the first differences of employment (dsemp) and nominal wages (dnwg) in the public sector, except for 2017-2018, have become compatible.

Tests:

Also, according to AIC, HQIC criteria (Appendix 1), the third lag of variables was used in the Johansenn cointegration test.

- *H0: "the model has at least one intersected vector";*
- *If the T-statistics p is large, we reject the H0 hypothesis;*
- *In our model, the variables are uncorrelated);*
- *The VAR model satisfies the stability condition;*
- *In the model there is not autocorrelation;*

Variables in the model help to predict each other.

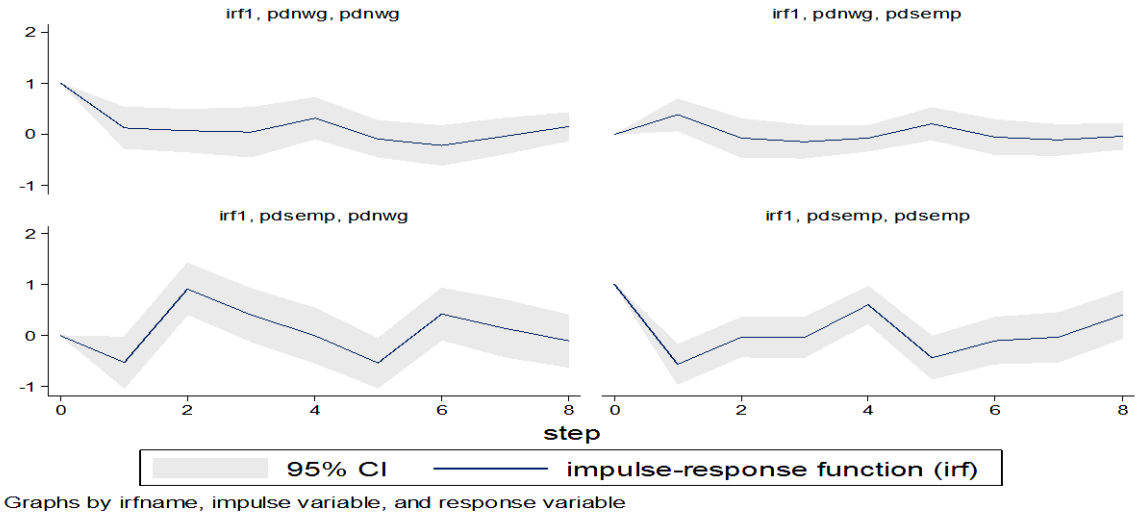

Figure-2. Impulse-response functions of public sector employment (dsemp) and nominal wages (dnwg)[3]

According to the data of the above Figure 2, we will perform the analysis diagonally. That is, we interpret the influence of two different factors on each other, not on the interaction of two identical variables. Nominal wage (dnwg) has a positive effect on the number of employment (dsemp) in the public sector. This can be clearly observed in the first quarters of 2023 and 2024.

According to the Cholesky decomposition, the first lag of wages (dnwg) does not affect the number of public sector employment (dsemp), but explains 18% of its variation after the eighth quarter.

[3]Stata14 software using the author by prepared

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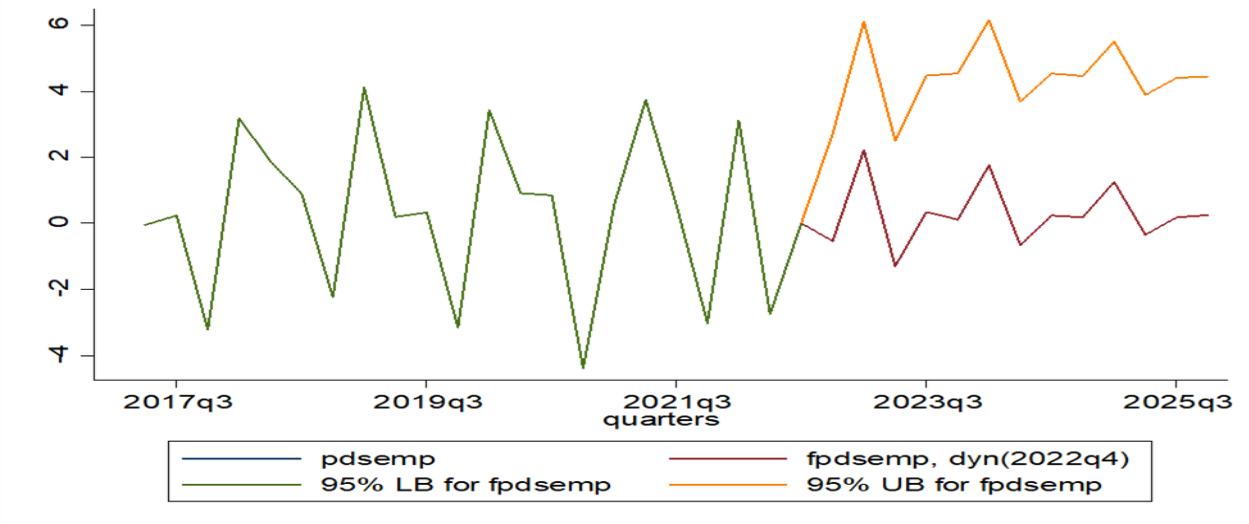

Figure 3. Short-run forecasting for employment in public sector.

According to our forecast, until the end of 2025, the number of employment (dsemp) in the public sector will fluctuate between -2% and 6% under the influence of nominal wages (dnwg).

CONCLUSION

In conclusion, it can be concluded that labor force-related concerns have captured the attention of economists irrespective of time and space. The variables might lead to a different outcome than anticipated when the issue is examined. Our assessment indicates that employment in public sector should positively respond to an increase in nominal wage. But analysis's findings, however, revealed that it is impossible to fix some imbalances of labor market by public sector. With the share of public sector employment in total employment shrinking, the government should focus more on increasing employment through the private sector. Research shows that public sector wage fluctuations definitely affect private sector employment. Due to the fact that the supply of growing labor force is unique to Uzbekistan, there is a need to implement effective economic measures and activities in the long and short term. In order to normalize the balance between demand and supply in the labor market, it is necessary to eliminate some imbalances between labor supply and real wages.

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