

TRENDS IN ARMENIA'S LABOR MARKET AND AN ECONOMETRIC ANALYSIS OF WAGES

Alvard KHARATYAN

PhD, Associate Professor Head of the YSU Chair of MME

Tatevik RAFYAN

Lecturer at YSU Department of MM in Economics

Rita VARDANYAN

YSU Faculty of Economics and management graduate

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Introduction

In the modern world, the labor market is considered one of the key components of any country's economy, directly influencing the population's standard of living, social stability, and the pace of economic growth. Therefore, analyzing the labor market and evaluating the factors that affect it hold both theoretical and practical significance. *The aim of this study is to analyze the trends in Armenia's labor market and to assess, using econometric models at both the micro and macro levels, the impact of certain factors on the average wage.*

In the early 1990s, the reduction in employment and the rise in unemployment in Armenia's labor market did not correspond proportionally to the country's macroeconomic decline. Specifically, in 1993, Armenia's GDP had decreased by a factor of 2.1 compared to 1990, while employment had fallen by only a factor of 1.1. Despite the fact that by 1998 GDP was 120% higher than its 1992 level, employment declined by an average of 2.4% per year during that period, and the unemployment rate increased from 1.8% to 9.4% [Reforms in Armenia, 1991-1998, 24-26]. By 2000, a large share of the labor force was engaged in informal employment, while the official unemployment rate stood at 11.7%, significantly understating the actual level of joblessness [Socio-Economic Situation of RA, 2000, 83]. Since 2001, Armenia's official unemployment statistics have become more realistic. The high registered unemployment rate of 38.4% in 2001 declined steadily until the global financial and economic crisis of 2008, reaching 16.4%. In 2010, the rate rose again to 19%. During the period from 2011 to 2018, unemployment remained relatively stable, while between 2019 and 2024, it declined from 18.3% to 13.9% (figure 1). When viewed by region, the highest unemployment rate up to 2023 was recorded in the Shirak region. Between 2018 and 2023, Shirak accounted for 18.2% to 20.3% of the total number of unemployed in Armenia. However, the picture changed in 2024–2025. According to data from March 2025, Shirak accounted for 11.5% of the unemployed in Armenia, Lori for 15.1%, Kotayk for 14.9%, and Ararat for 12.2% [ARM-STAT, 2025]. In 2024, 11% of registered unemployed held higher and postgraduate education degrees (17% of urban residents, 6% of rural residents) [ARMSTAT, 2024, 109].

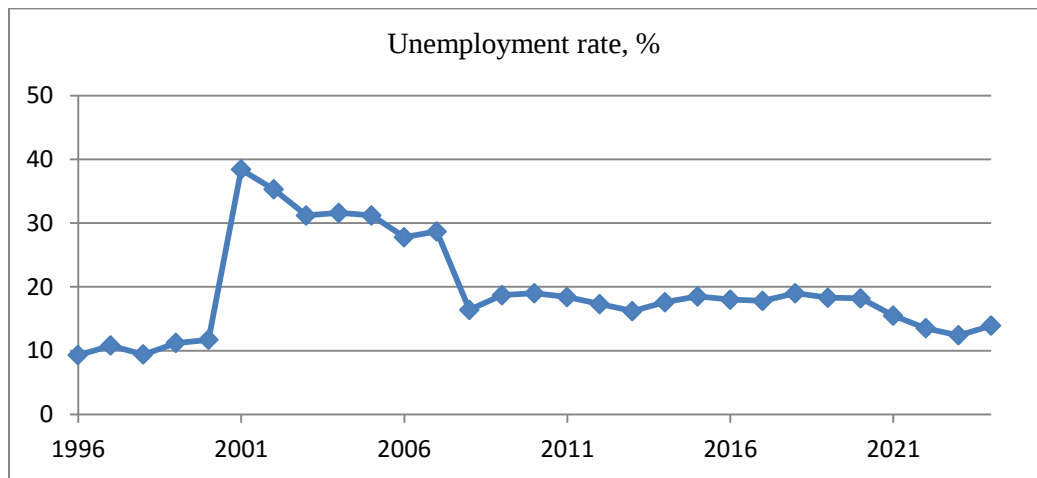


Figure 1. Unemployment rate in Armenia, 1996–2024 [ARMSTAT, 2025]

The number of employed individuals and the average wage are key indicators characterizing the labor market. Between 1994 and 2016, the number of employed persons declined from 1,435.6 thousand to 1,006.2 thousand. In 2017, 1,011.7 thousand people were employed across various sectors of the economy, and by 2024, this number had increased to 1,174.4 thousand (figure 2). In terms of the number of employed individuals, Yerevan ranked first in 2024, followed by Kotayk region, while the Vayots Dzor region had the lowest level of employment [ARMSTAT, 2025].



Figure 2. Number of employed persons in Armenia, 1996–2024 [ARMSTAT, 2025]

Between 1994 and 2024, the average wage in Armenia showed a steady increase – from 1,748 AMD in 1994 to 287,172 AMD in 2024. In 1996, it amounted to 9,469 AMD;

between 2006 and 2009, it rose from 62,293 AMD to 96,019 AMD; and during 2011–2020, it increased from 108,092 AMD to 228,342 AMD (figure 3).

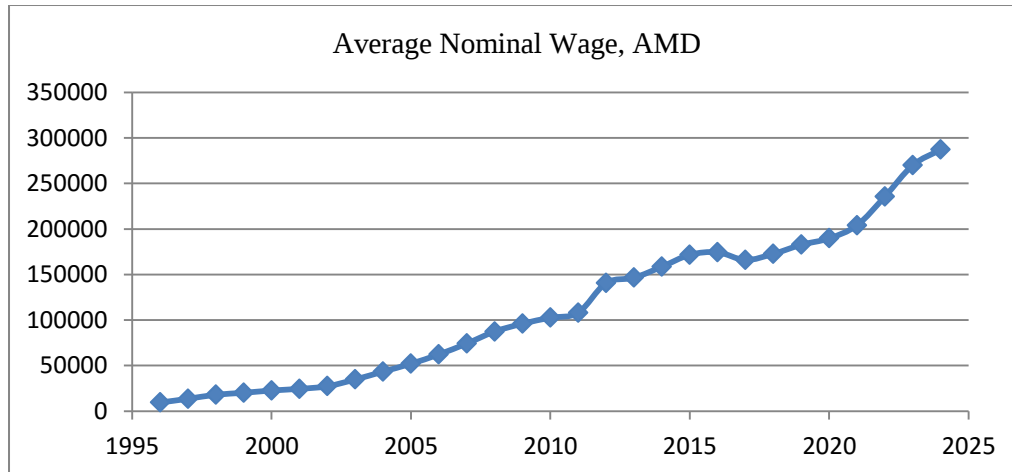


Figure 3. Average nominal wage in Armenia, 1996–2024 [ARMSTAT, 2025]

The highest average monthly wage was recorded in the Syunik region, while the lowest was in Gegharkunik. In terms of gender, between 2000 and 2024, women's wages ranged from 39.3% to 66.5% of men's wages. In 2025, the average wage for men in Armenia amounted to 360,025 AMD, while for women it was 219,325 AMD. According to data from March 2025, the average nominal monthly wage in Armenia was 333,250 AMD [ARMSTAT, 2025].

Methodology

The study was conducted using a static multiple regression model and an Autoregressive Distributed Lag (ARDL) class model. The ARDL model was constructed based on annual data from Armenia for the period 1996–2024. The model variables include nominal GDP (in million AMD) and average monthly wage (in AMD).

The micro-level analysis is based on the microdata from the 2023 Household's Integrated Living Conditions Survey anonymised microdata database [ARMSTAT, 2025]. The variables used in the micro-level model include: average nominal monthly wage, in AMD (wage), level of education (educ), work experience (exper), gender of the worker (sex), duration of the employment contract (cdur), and weekly working hours (whours). Four of the variables were treated as categorical variables. The variable for education level is coded from 1 to 11, where 1 corresponds to "illiterate" and 11 indicates "postgraduate education." The gender variable is coded as 1 for males and 2 for females. Work experience is categorized using values from 1 to 7 (1 – up to 3 months, 2 – 3 to 6 months, 3 – 6 to 9 months, 4 – 9 to 12 months, 5 – 1 to 2 years, 6 – 2 to 3 years, 7 – 3 years and more). The

duration of the employment contract is coded from 1 to 3 (1 – up to one year, 2 – one to three years, 3 – more than three years).

In the ARDL model, stationary time series were considered. To test the stationarity of the series, the Augmented Dickey-Fuller (ADF) unit root test was applied, which estimates the following equation:

$$\Delta X_t = \beta_1 + \gamma X_{t-1} + \beta_2 t + \sum_{i=1}^k c_i \Delta X_{t-i} + \varepsilon_t \quad (1)$$

In equation (1), β_1, β_2, γ , and c_i are coefficients; t is the trend variable; and ε_t is the error term, which follows a White Noise process. The differencing operator is used to make the series stationary.

In the absence of cointegration, the ARDL model for a single explanatory variable is expressed by the following equation:

$$\Delta y_t = \alpha_0 + \alpha_1 \Delta y_{t-1} + \dots + \alpha_p \Delta y_{t-p} + \beta_0 \Delta x_t + \beta_1 \Delta x_{t-1} + \dots + \beta_q \Delta x_{t-q} + \varepsilon_t \quad (2)$$

The ARDL model constructed in our study is:

$$\Delta(\ln(wage))_t = \beta_0 + \beta_1 \Delta(\ln(gdp))_t + \beta_2 \Delta(\ln(gdp))_{t-1} + \varepsilon_t \quad (3)$$

The static micro-level model for the i -th household is represented by the following equation:

$$wage_i = \beta_0 + \beta_1 educ_i + \beta_2 exper_i + \beta_3 sex_i + \beta_4 cdur_i + \beta_5 whours_i + \varepsilon_i \quad (4)$$

The statistical significance of the models and estimated coefficients was tested using the F-test and t-test. To assess the quality of the model, the R^2_{adj} was employed. The assumption of homoscedasticity of the residuals was tested using the Breusch-Pagan-Godfrey test, the absence of autocorrelation was checked with the Breusch-Godfrey LM test, and the normality assumption was verified using the Jarque-Bera test [Gujarati and Porter, 34–107].

Literature Review

Econometric studies of the labor market have been carried out in numerous works by economists. In particular, Aleksandravičienė and co-authors [Aleksandravičienė et al., 2023, 29–38] assessed the impact of inflation, GDP growth, and average wages on unemployment in Lithuania. Viadi and Hysa [Viadi and Hysa, 2019, 158–181] used a panel data model to evaluate the influence of macroeconomic indicators on the unemployment rate in six Western Balkan countries. Bal-Domańska [Bal-Domańska, 2022, 1141–1172] conducted a panel data analysis of the labor market across 28 European Union countries, examining the relationship between youth unemployment and macroeconomic determinants such as economic growth, economic structure, and productivity.

Among Armenian economists, A. Stepanyan [Stepanyan, 2018, 11–20] used a regression model to assess the impact of the average annual number of employed persons in various sectors of the Armenian economy on the nominal GDP. Aghajanyan and co-authors

[Aghajanyan et al., 2024, 155-163] analyzed international experience in labor demand modeling, presenting several econometric forecasting models – such as regression, ARIMA, and others. Ananyan [Ananyan, 2018, 83–91] analyzed Armenia's labor market over the period 2012–2016.

Analysis

In the 2023 Household's Integrated Living Conditions Survey microdata database, information is available for 27,007 individuals. Among them, 40% have a primary job, while 1.8% holds a secondary job. Data on average wages is available for 5,397 individuals; thus, the regression model was constructed based on these 5,397 observations.

The correlation matrix of the variables shows that none of the explanatory variables are strongly correlated with wages. The correlation coefficient between education level and wages ($R = 0.034$), as well as between work experience and wages ($R = 0.077$), indicates a very weak positive relationship. A weak negative correlation ($R = -0.312$) is observed between the worker's gender and wages, suggesting that, on average, women earn less than men (see Table 1)¹.

Table 1. Correlation matrix of the variables (Pearson correlation)

Variable	wage	Variable	wage
educ	0.034	cdur	0.147
sex	-0.312	whours	0.359
exper	0.077		

The estimated regression coefficients, along with their corresponding standard errors, t-statistics, and p-values, are presented in Table 2.

Table 2. Dependent variable: wage

Variable	Unstandardized Coefficient		Standardized Coefficient	t statistic	Sig.
	B	Std. Error	Beta		
(Constant)	15262.365	5112.334	2.985	2.985	.003
Sex	-120307.723	760.643	-0.200	-158.166	.000
Educ	13113.605	921.537	0.038	14.230	.000
Cdur	30341.486	659.671	0.206	45.995	.000
exper	8243.900	253.210	0.041	32.558	.000
whours	2464.883	30.215	0.376	81.578	.000

¹ The research was conducted using the SPSS software package.

The regression model and the estimated coefficients are statistically significant at the 1% significance level. The model satisfies the necessary Gauss-Markov assumptions and is represented by the following equation:

$$\text{wage}_i = 15262.37 + 13113.61 * \text{educ}_i + 8243.9 * \text{exper}_i - 120307.72 * \text{sex}_i + 30341.49 * \text{cdur}_i + 2464.88 * \text{whours}_i + e_i \quad (5)$$

$$R^2_{adj} = 0.357, \quad F = 2808, \quad \text{Prob}(F \text{ stat}) = 0.000$$

The variables used in the ARDL model based on macro-level data are time series; therefore, their stationarity was tested using the Dickey-Fuller unit root test. All variables are I(1) processes, becoming stationary after taking first-order differences. The model results indicate that the estimated coefficients and the model are statistically significant at the 1% significance level. Current and previous values of nominal GDP explain 46.6% of the variation in average nominal wages. The Durbin-Watson value=2.046 means that the model residuals are not autocorrelated (table 3)¹.

Table 3. Dependent variable: wage

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.022532	0.022221	1.013989	.3211
D(log(GDP))	0.462241	0.161627	2.859928	.0089
D(log(GDP(-1)))	0.494324	0.156388	3.160874	.0044
R-squared	0.508713		F-statistic	11.90792
Adjusted R-squared	0.494324		Prob(F-statistic)	0.000282
S.E. of regression	0.059096		Durbin-Watson stat	2.046413

The model is represented by the following equation:

$$d(\ln(\text{wage}))_t = 0.023 + 0.462d(\ln(\text{gdp}))_t + 0.494d(\ln(\text{gdp}))_{t-1} + e_t \quad (6)$$

In addition to the nominal GDP variable, the study initially considered the unemployment rate, the Gini income coefficient, and the poverty rate. However, these variables were later excluded from the model, as they did not have a statistically significant effect on wages.

All residual diagnostic tests for the ARDL model indicate p-values greater than 0.05. The residuals are homoscedastic according to the results of the Breusch-Pagan-Godfrey heteroskedasticity test ($F = 0.324609$, Prob. F-statistic = 0.7261, and ObsR-squared = 0.713752, Prob. Chi-Square = 0.6999), not autocorrelated according to the results of the Breusch-Godfrey Serial Correlation LM test ($F = 0.255572$, Prob. F-statistic = 0.7768, and ObsR-squared = 0.617807, Prob. Chi-Square = 0.7343), and are normally distributed

¹ The research was conducted using the EViews software package.

according to the Jarque-Bera test results (Jarque-Bera = 0.681774, Prob. Jarque-Bera = 0.711139).

Conclusions

Analysis of statistical data allows us to conclude that in the labor market of Armenia:

- In the 1990s, the official unemployment rate was significantly lower than the actual rate, while from 2001 to 2024 there has been a downward trend in unemployment;
- The number of employed persons decreased by 261.2 thousand between 1996 and 2024. Specifically, from 1996 to 2016, employment decreased by 429.4 thousand, whereas from 2017 to 2024 a slow growth trend in employment is observed;
- Regionally, the highest wages were recorded in Syunik region and Yerevan, while the average wages in other regions are significantly lower;
- From 2000 to 2024, women's wages ranged from 39.3% to 66.5% of men's wages. In 2024, women's wages accounted for 60.9% of men's wages.

According to the results of the microdata regression model:

- Moving from one educational level to the next higher one increases the average wage by 13,114 AMD, *ceteris paribus*. This means that a person with post-secondary education earns on average 131,140 AMD more than a person with no primary education;
- Moving up one level in work experience increases the average wage by 8,243.9 AMD, *ceteris paribus*;
- Women's wages are on average 120,308 AMD lower than men's wages, *ceteris paribus*;
- Compared to those working under contracts lasting up to one year, employees with contracts lasting one to three years earn 30,342 AMD more, and those with contracts lasting three years or more earn 60,684 AMD more, *ceteris paribus*.
- Working one additional hour per week increases an employee's average monthly wage by 9,860 AMD, *ceteris paribus*.

The regression model of macro variables gave the following results:

- A 1% increase in GDP contributes to a 0.46% increase in the average wage in the current year, and a 0.46% increase one year later, *ceteris paribus*.

Thus, Armenia's labor market is in a transitional phase, simultaneously facing both internal and external challenges. Positive trends can be observed in the reduction of unemployment, growth in employment numbers, and increase in wages. However, there remain significant regional and gender disparities in wages, as well as regional differences in unemployment rates. A higher level of education does not guarantee a high wage, as the correlation between education level and wages is weak. Moreover, 11% of the unemployed in 2024 had higher and postgraduate degrees. The application of econometric models can help provide a clearer and more comprehensive assessment of the labor market situation, facilitating the development of corresponding policies.

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Alvard KHARATYAN, Tatevik RAFYAN, Rita VARDANYAN

Trends in Armenia's labor market and an econometric analysis of wages

Key words: Armenia, labor market, unemployment rate, average wage, regression model

This study explores the prevailing trends in Armenia's labor market. Based on anonymized data from the 2023 sample survey of households in the Republic of Armenia, a multiple regression model was constructed to assess the impact of the worker's gender, level of education, and several other factors on the average nominal wage. According to the model, education in Armenia has a significant but weak positive effect on wages. On average, women's wages are 120,308 AMD lower than those of men. Based on annual data from 1996 to 2024, the results of an ARDL class model show that a 1% increase in GDP leads to a 0.46% increase in the average wage in the current year and a 0.49% increase in the following year.