

ECONOMETRIC ANALYSIS OF THE MACROECONOMIC DETERMINANTS OF YOUTH UNEMPLOYMENT IN ROMANIA (1991–2025)

AVRĂMESCU TIBERIU-CRISTIAN

PHD ASSOCIATE PROFESSOR, NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
POLITEHNICA BUCHAREST, PITESTI UNIVERSITY CENTER

e-mail: tiberiu.avramescu@upb.ro

Abstract

This study examines the determinants of youth unemployment (ages 15–24) in Romania over the period 1991–2025 by analyzing the relationship between the youth unemployment rate and three macroeconomic indicators: GDP growth, inflation, and the level of investment. The analysis is based on annual data obtained from the World Bank database and employs a multiple linear regression model, including tests of statistical significance, multicollinearity, and a specification with one-year lagged variables. The empirical findings show that youth unemployment in Romania followed a cyclical pattern influenced by major economic events, including the post-communist transition, Romania's accession to the European Union, the global financial crisis, and the COVID-19 pandemic. GDP growth becomes marginally significant, with the expected negative coefficient, when introduced into the model with a one-year lag, suggesting that macroeconomic effects on the youth labor market occur with a delay. The results indicate that youth unemployment is determined not only by macroeconomic conditions but also by structural factors, such as skills mismatches between young workers and employers' requirements, labor market institutions, and youth labor migration. Consequently, reducing youth unemployment requires sustained and well-targeted public policies that address both short-term economic fluctuations and long-term structural challenges.

Keywords: youth unemployment, GDP growth, inflation, investments.

JEL classification: C01, E31, J64

1. Introduction

Youth unemployment is one of the most significant contemporary economic challenges, affecting both developed and developing economies. Over the past four decades, the economic literature has evolved from descriptive analyses of youth unemployment rates to sophisticated econometric models that capture the long-term consequences of unemployment experienced at a young age. The seminal contributions in this field are organized around four central themes: the "scarring" effect, the school-to-work transition, structural and institutional determinants, and the implications of public policies for youth unemployment.

One of the most influential strands of research concerns the so-called "scarring effect", according to which a period of unemployment during youth leaves persistent negative marks on an individual's subsequent career trajectory, even after reintegration into the labor market. Arulampalam (2001), using panel data from the United Kingdom, demonstrated that an unemployment spell leads to a significant wage penalty upon re-employment, with this gap widening during the first years before gradually diminishing [2]. The central conclusion is that the first unemployment experience causes the greatest damage, while collective redundancies appear to be less stigmatizing than other forms of job separation.

This perspective was extended by Arulampalam, Gregg, and Gregory (2001), who showed that scarring is not limited to wage losses but is also reflected in a higher probability of experiencing repeated unemployment spells, a phenomenon known as state dependence [3]. Gregg and Tominey (2004) further developed this line of research by documenting the so-called "wage scar" associated with youth unemployment: individuals who experienced unemployment before the age of 23 continue to earn significantly lower wages even by the age of 30 compared with those who did not

experience unemployment, and this effect persists regardless of the duration of the initial unemployment spell [13].

A second major research direction examines how young people navigate the transition from education to stable employment. Rees (1986), in one of the earliest systematic analyses of the issue, argued that youth unemployment cannot be understood independently of the broader structure of the labor market and of decisions regarding education and vocational training [20].

Ryan (2001) provided a cross-national comparative perspective by examining the school-to-work transition in seven developed economies (France, Germany, Japan, the Netherlands, Sweden, the United Kingdom, and the United States) [21]. His analysis revealed substantial institutional differences across countries. The main conclusion was that failures in public policy require the development of institutions tailored to national contexts rather than the simple transplantation of models regarded as "successful" in other countries.

Bell and Blanchflower (2010, 2011) placed youth unemployment within the broader context of economic recessions, particularly the 2008–2009 global financial crisis. They showed that individuals aged 16 to 25 were disproportionately affected by the recession and argued that the relatively large youth cohort during that period could, in the medium term, improve overall employment prospects, although it did not eliminate the need for immediate active labor market policy interventions. Their research reinforced the conceptual link between youth unemployment and its long-term consequences for earnings, health, and job satisfaction [5], [6], a relationship later synthesized by McQuaid (2017) as multiple scarring effects that continue to influence affected individuals well into their forties and fifties [18].

Using longitudinal data from the National Child Development Study, Gregg (2001) examined how unemployment experienced during youth affects the likelihood of unemployment in adulthood, confirming the existence of a mechanism through which labor market disadvantage is transmitted over time within the same generation [12].

A distinct body of literature has focused on the dynamics of youth unemployment in developing economies, where the underlying determinants differ substantially from those observed in OECD countries [4]. Research on African economies has highlighted the role of intra-African trade and regional economic integration as potential instruments for reducing youth unemployment. Other studies have documented the relationship between youth unemployment, educational quality, and political instability in developing countries, suggesting a bidirectional relationship in which high youth unemployment fuels social discontent, which in turn undermines the institutional stability necessary for economic growth and job creation [1].

The Romanian literature on youth unemployment has developed around three main research directions: identifying the structural determinants of the phenomenon, analyzing regional disparities, and evaluating public policies aimed at reducing youth unemployment. Unlike the international literature, which places greater emphasis on long-term labor market outcomes, Romanian research focuses primarily on diagnosing national and regional labor market conditions, providing a detailed picture of the heterogeneity of Romania's labor market.

One of the most systematic contributions in this field is that of Condratov (2014), who synthesized the international literature on the determinants of youth unemployment and identified four main categories of explanatory factors: demographic trends, economic conditions, labor market regulations, and the characteristics of the educational system [8]. This framework subsequently served as the basis for applied studies on Romanian regions. Condratov (2016) examined the influence of the economic environment on variations in youth unemployment in Romania's North-East region, while in a related study he analyzed the relationship between educational system performance and youth unemployment in the same region [9], [10]. The common conclusion of these studies is that regional economic and educational disparities explain a substantial share of the variation in youth unemployment rates, to a greater extent than uniformly applied national macroeconomic factors.

Another important line of research concerns the spatial and territorial analysis of unemployment. Lincaru and Ciucă (2011) examined the geographical distribution of unemployment at the locality level in the South Muntenia region, demonstrating the existence of strong spatial concentrations of unemployment that cannot be captured by county-level or national aggregate indicators [14]. This research agenda was further developed by subsequent studies conducted by the same authors, together with Pîrciog, Atanasiu, and their collaborators, who developed methods for identifying territorial unemployment clusters using spatial statistical analysis, as well as monitoring and early-warning models for unemployment risk at the local level [15]–[17]. These methodological tools have contributed to a stronger evidence base for active labor market policies by enabling the precise identification of high-risk areas.

A third line of research addresses the institutional and educational dimensions of youth unemployment. Studies on the transition from education to the labor market have highlighted the structural rigidity of Romania's labor market, which has contributed to the expansion of the informal sector and intensified international migration, with young people representing the most mobile group among emigrants [7], [11]. These studies emphasize the need for stronger cooperation between educational institutions and employers, as well as the development of internship and work-placement programs that facilitate the school-to-work transition, following the example of well-performing institutional systems in Western Europe.

2. Research methodology

The main objective of this study is to analyze the statistical relationship between the youth unemployment rate (aged 15–24) in Romania and three macroeconomic factors: GDP growth rate, inflation rate, and the level of investment (gross fixed capital formation as a percentage of GDP). The analysis covers the period 1991–2025 (35 years), encompassing Romania's post-communist transition, its accession to the European Union in 2007, the 2008–2009 global financial crisis, and the COVID-19 pandemic.

The 35-year period is sufficiently long to provide a comprehensive and detailed overview of youth unemployment in Romania and the macroeconomic factors influencing it. The primary aim was to identify which economic indicators have a significant impact on the level of youth unemployment. To achieve this objective, a multiple linear regression model was employed, including tests for the statistical significance of the regression coefficients, multicollinearity, and an alternative specification incorporating one-year lagged explanatory variables in order to determine whether macroeconomic effects are transmitted to the youth labor market with a time delay.

The data used in the analysis were obtained from the World Bank database, while all statistical calculations were performed using the Data Analysis tool available in Microsoft Excel.

3. Results

Youth unemployment represents one of the most significant economic and social challenges faced by both developed and emerging economies. The literature emphasizes that young people's integration into the labor market is influenced by numerous economic, institutional, and social factors, and that identifying the relationships among these determinants requires the application of rigorous quantitative methods. The studies reviewed in the literature frequently employ econometric models, multiple regression analysis, and panel data techniques to examine the determinants of youth unemployment and to provide an empirical basis for public policies aimed at reducing it.

Econometric models make it possible to quantify the relationships between a dependent variable and a set of explanatory variables. In this study, the dependent variable is the youth unemployment rate, while the independent variables include the GDP growth rate, the inflation rate, and the level of investment, measured by gross fixed capital formation.

Economic growth is widely regarded as one of the most important determinants of employment. From a theoretical perspective, an acceleration in economic growth increases

production, stimulates economic activity, and generates new employment opportunities. Consequently, the literature generally predicts an inverse relationship between economic growth and youth unemployment [5],[6],[21]. The inflation rate is incorporated into the econometric model to capture the influence of macroeconomic conditions on employment. In economic theory, the relationship between inflation and unemployment is commonly explained by the Phillips curve, according to which, in the short run, a moderate increase in inflation may be associated with a reduction in unemployment. However, more recent research suggests that this relationship depends on the specific characteristics of each economy, the conduct of monetary policy, and the nature of prevailing economic shocks [8],[19]. The level of investment is another key determinant of youth unemployment. Both public and private investment stimulate economic activity, modernize productive capacity, and increase labor demand. Consequently, econometric models generally estimate a negative relationship between investment and youth unemployment, as higher investment creates new employment opportunities and facilitates the integration of young graduates into the labor market [8],[1].

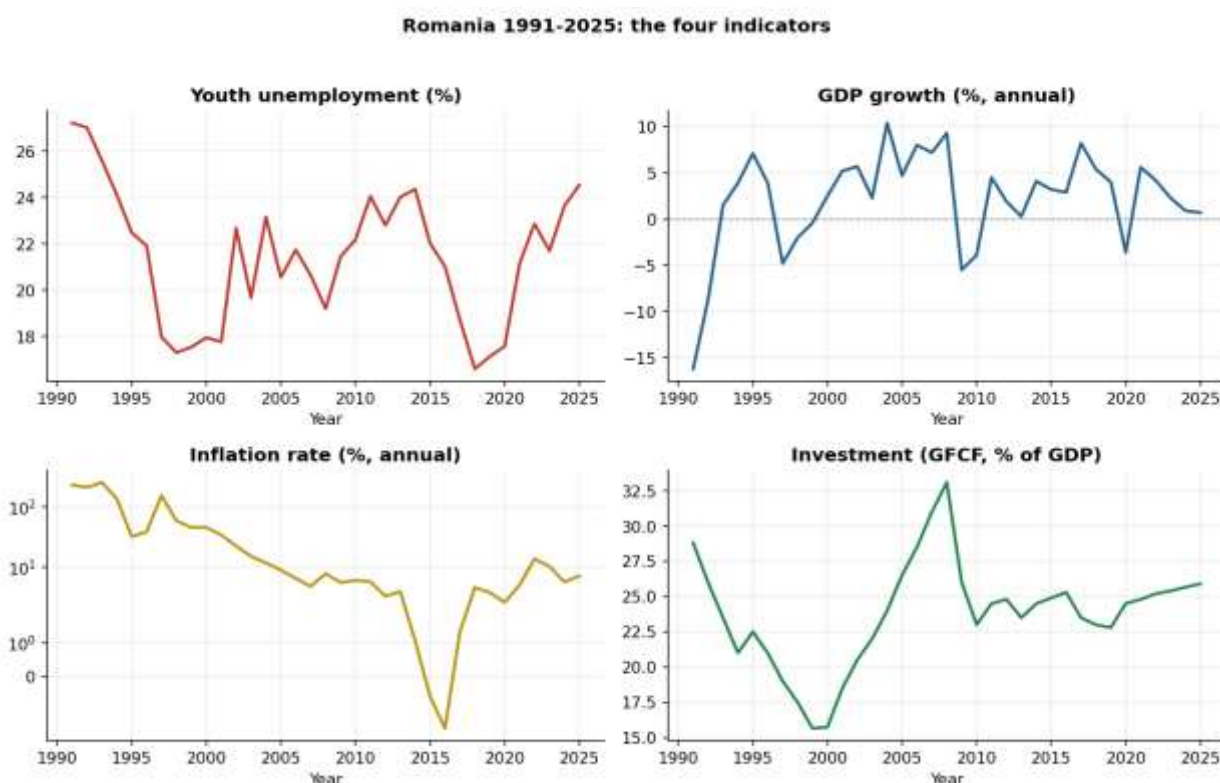


Fig. no. 1 — Comparative evolution of the four series (inflation is shown on a log scale, given the magnitude of the 1990s episodes)

According to the World Bank's World Development Indicators (WDI) database, the youth unemployment rate (ages 15–24) in Romania fluctuated between 16.6% and 27.2% over the period 1991–2025. Its evolution was not linear but rather reflected the major economic transformations experienced by the country. Throughout the 1991–2025 period, youth unemployment exhibited a cyclical pattern that was strongly influenced by both domestic and international economic conditions. Following the sharp increase observed during the post-communist transition, the unemployment rate declined during the period of economic expansion and after Romania's accession to the European Union. However, it rose again during the 2008–2009 global financial crisis and the COVID-19 pandemic. Although the Romanian economy subsequently recovered, youth unemployment remained relatively high compared with the European average, highlighting the persistence of structural challenges within the labor market.

Youth unemployment fell sharply from levels above 25% (1991-1994) to a historic low of 16.6% in 2018, followed by a rebound to 23-24% in 2024-2025. Recession periods (1997-1999, 2009-2010, 2020) coincide with increases or plateaus in youth unemployment.

The economic growth rate, measured as the annual growth rate of real GDP, exhibited substantial fluctuations over the period 1991–2025, reflecting Romania's transition to a market economy, its accession to the European Union, the global financial crisis, the COVID-19 pandemic, and the recent economic slowdown.

A comparison between GDP growth and the youth unemployment rate reveals an inverse relationship. During periods of economic expansion (2000–2008 and 2015–2019), youth unemployment generally declined, whereas during recessionary periods (1991–1992, 1997–1999, 2009–2010, and 2020), youth unemployment increased or remained at relatively high levels. This relationship is consistent with Okun's Law, according to which a slowdown or contraction in economic activity is associated with higher unemployment. Nevertheless, in Romania, youth unemployment remained relatively high even during periods of sustained economic growth, suggesting the presence of structural factors that limit the positive impact of economic expansion on employment opportunities for young people.

The evolution of inflation in Romania between 1991 and 2025 can be divided into several distinct phases corresponding to the country's economic transformation and major macroeconomic events. The early years of the transition to a market economy were characterized by extremely high inflation, driven by price liberalization, the depreciation of the national currency, and significant macroeconomic imbalances. In 1993, Romania recorded the highest inflation rate of the entire study period, reaching 255.2%. After 1994, the implementation of more restrictive monetary and fiscal policies gradually reduced inflation. An exception occurred in 1997, when exchange rate liberalization and a new wave of economic reforms temporarily accelerated inflation once again. Thereafter, the downward trend resumed. Between 2005 and 2019, Romania experienced its most stable period of inflation throughout the study horizon. In 2015 and 2016, the country recorded deflation, mainly as a result of reductions in the value-added tax rate and declining prices of selected goods and services. These were the only years of negative inflation during the period under analysis. Subsequently, the COVID-19 pandemic, followed by the energy crisis and rising commodity prices, triggered a sharp acceleration in inflation.

Comparing inflation with youth unemployment indicates that the relationship between the two variables is not straightforward. During certain periods, such as 2005–2008, moderate inflation coincided with declining youth unemployment amid strong economic growth. Conversely, during periods of economic crisis (2009–2010 and 2020–2022), high inflation was accompanied by deteriorating labor market conditions for young people. These observations suggest that youth unemployment is influenced not only by inflation but also by economic growth, investment, productivity, and labor market policies.

In macroeconomic analysis, investment is typically measured by gross fixed capital formation. The evolution of this indicator reflects an economy's capacity to expand and modernize its productive base. During the early years following 1990, investment remained low and highly volatile due to economic restructuring, the privatization of state-owned enterprises, high inflation, and limited foreign direct investment. Throughout this period, gross fixed capital formation frequently recorded negative annual growth rates, reflecting declining productive investment and the postponement of development projects. Starting from 2000, investment entered a sustained upward trend as a result of macroeconomic stabilization, lower inflation, accelerated privatization, and increasing foreign direct investment. Romania's accession to the European Union in 2007 provided an additional stimulus to investment, particularly through access to European structural and cohesion funds. The global financial crisis led to a significant decline in investment between 2009 and 2012; however, following the recovery from the crisis, investment resumed its upward trajectory. The COVID-19 pandemic initially generated uncertainty and delayed several investment projects,

although its impact on investment proved less severe than that observed during the 2009 financial crisis.

With respect to youth unemployment, investment represents one of the most important explanatory variables. Higher levels of investment stimulate business expansion and create new employment opportunities, including for individuals entering the labor market. Conversely, declining investment reduces employment opportunities and disproportionately affects young people with limited work experience. This relationship is supported both by the economic literature and by the evolution of the Romanian economy over the past three decades.

The correlation analysis of the variables is presented in the correlation matrix and the accompanying table below.

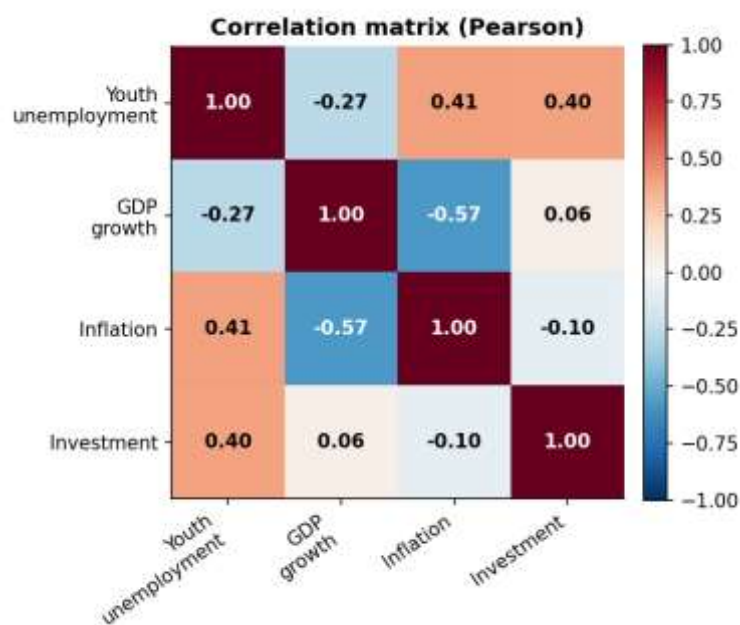


Fig. no. 2 - Pearson correlation matrix
Table no. 1. Variables of the model

Factor	Correlation r	p-value	Interpretation
GDP growth	-0.273	0.113	Weak negative correlation, not statistically significant ($p > 0.05$)
Inflation	0.412	0.014	Moderate positive correlation, statistically significant
Investment (% GDP)	0.400	0.017	Moderate positive correlation, statistically significant

The unexpected positive correlation between investment and youth unemployment (rather than a negative one, as standard economic theory would suggest) is plausibly explained by the fact that investment in Romania grew strongly precisely during 2004-2008 — a period when youth unemployment remained elevated due to structural mismatches between young people's qualifications and labor market demand, as well as the massive emigration of young skilled workers, which paradoxically reduced the active labor supply remaining in the country.

The relationships between the youth unemployment rate and the three explanatory variables are presented in the figures below.

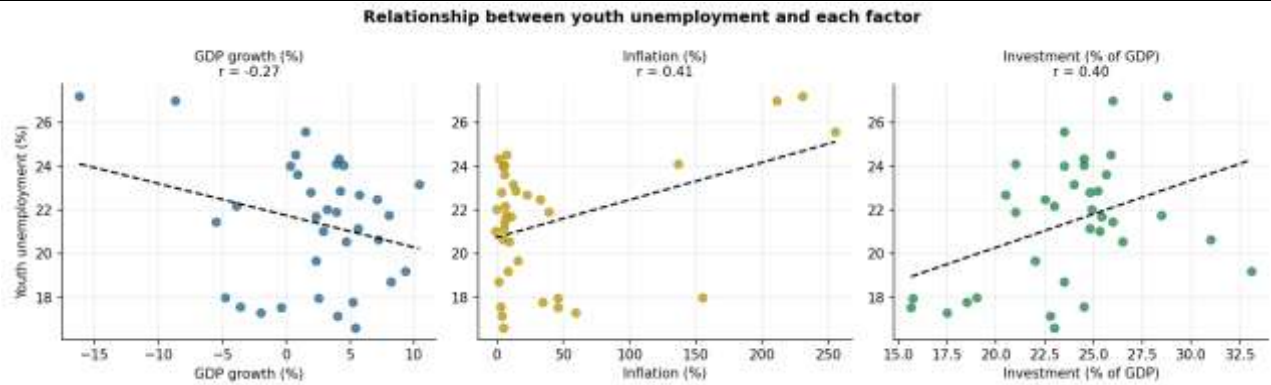


Fig. no. 3 — Scatter plots with simple regression line for each factor

The research is conducted using a multiple regression model for time series data. A general form of a linear multiple regression model is:

$$Y_t = b_0 + b_1X_{1t} + b_2X_{2t} + \dots + b_nX_{nt} + u_t$$

Y_t are the dependent variable of the model;

$X_1, X_2, \dots, X_n$ are the independent variable of the model;

b_0 is coefficient who who represent the predicted value of Y when all X_n are equal to 0;

$b_1, b_2, \dots, b_n$ are coefficients who denote the average predicted change in Y from a one unit increase in $X_1, X_2, \dots, X_n$;

u_t is the error term;

t denotes the time period.

In this study we analyze youth unemployment rate (YU_t) as a dependent variable (Y) of the regression model. Other macroeconomic factors that are included to model are GDP growth rate (GDP_t), inflation rate ($INFL_t$) and investment level (INV_t), who are the independent variables (X_n) of the regression model.

The relationship between youth unemployment and the three macroeconomic factors is specified as a multiple linear regression model:

$$YU_t = \beta_0 + \beta_1GDP_t + \beta_2INFL_t + \beta_3INV_t + \varepsilon_t$$

for $t = 1991, \dots, 2025$ ($n = 35$ annual observations).

Table no. 2. Variables of the model

Symbol	Variable	Definition
YU_t	Youth unemployment rate (dependent variable)	% of labor force aged 15-24 that is unemployed, year t
GDP_t	GDP growth rate	Annual % growth of real GDP, year t
$INFL_t$	Inflation rate	Annual % change in consumer prices (CPI), year t
INV_t	Investment level	Gross fixed capital formation, % of GDP, year t
β_0	Intercept	Baseline youth unemployment level when all regressors = 0
$\beta_1, \beta_2, \beta_3$	Slope coefficients	Marginal effect of each regressor on YU_t , ceteris paribus
ε_t	Error term	Assumed $\varepsilon_t \sim N(0, \sigma^2)$, i.i.d. under classical OLS assumptions

Based on the results generated by the statistical software, the following multiple linear regression model was estimated:

$$YU_t = 12.707 - 0.030 \cdot GDP_t + 0.018 \cdot INFL_t + 0.341 \cdot INV_t$$

Table no. 3. Summary output of regression statistics

Variable	Coefficient (β)	Std. error	t	p-value	Significant?
Constant (β_0)	12.707	2.698	4.71	0.000	Yes
GDP growth	-0.030	0.093	-0.33	0.747	No

Inflation	0.018	0.007	2.42	0.021	Yes (p<0.05)
Investment (% GDP)	0.341	0.110	3.10	0.004	Yes (p<0.01)

The results of the multiple linear regression analysis are presented below:

- $R^2 = 0.368$ — the model explains approximately 37% of the variation in youth unemployment.
- Adjusted $R^2 = 0.307$.
- F-statistic = 6.02, $p = 0.0024$ — the model as a whole is statistically significant.
- Durbin-Watson = 0.95 — indicates strong positive autocorrelation in the residuals (expected for annual time series of a persistent phenomenon such as unemployment; the coefficients remain valid as point estimates, but the standard errors should be interpreted with caution).

The hypothesis that economic effects are felt on the labor market with a one-year delay was also tested (GDP growth, Inflation, and Investment from year $t-1$ explaining youth unemployment in year t).

$$YU_t = \gamma_0 + \gamma_1 GDP_{t-1} + \gamma_2 INFL_{t-1} + \gamma_3 INV_{t-1} + u_t$$

Estimated lagged equation ($n = 34$):

$$YU_{t-1} = 13.808 - 0.168 \cdot GDP_{t-1} + 0.006 \cdot INFL_{t-1} + 0.320 \cdot INV_{t-1}$$

Table no. 4. Summary output of regression statistics

Variable (1-year lag)	Coefficient (β)	p-value	Significant?
GDP growth (t-1)	-0.168	0.070	Marginal ($p < 0.10$)
Inflation (t-1)	0.006	0.378	No
Investment (t-1)	0.320	0.005	Yes ($p < 0.01$)

$R^2 = 0.365$ (similar to the non-lagged model). Interestingly, with a one-year lag, GDP growth from the prior year becomes marginally significant (with the theoretically expected negative sign), suggesting that stronger economic growth reduces youth unemployment with a delayed rather than an immediate effect.

Inflation has the most consistent, statistically significant positive effect on youth unemployment — episodes of high inflation (1991-1998, 2021-2023) frequently coincided with greater difficulties for young people entering the labor market, plausibly through the channels of economic uncertainty and reduced real firm investment.

Investment shows a positive correlation that runs counter to simple theoretical expectations — this likely reflects the fact that Romania's investment boom (2004-2008) occurred at the same time as massive emigration of young workers and a labor market that failed to absorb enough young people, rather than a direct causal link from investment to unemployment.

GDP growth has, as expected, a negative effect (a growing economy reduces youth unemployment), but this effect is not statistically significant in the same year — it becomes marginally significant with a one-year lag, suggesting that the youth labor market responds to the business cycle with a delay.

The model explains roughly one-third of the variation in youth unemployment — the remaining two-thirds is attributable to other factors not modeled here: the structure of the education system, skills mismatch relative to employer requirements, labor emigration, active employment policies, the minimum wage, labor market regulation, etc.

4. Conclusions

Youth unemployment is not a temporary phenomenon without consequences; rather, it generates long-lasting effects on earnings, employment stability, and overall well-being. Second, the quality of the institutions that facilitate the transition from education to employment plays a crucial role in mitigating these effects. Third, in developing economies, youth unemployment must be understood in relation to broader structural factors, such as labor market informality, education–employment mismatches, and institutional fragility.

Romanian research on youth unemployment converges on a central conclusion: the phenomenon cannot be fully understood or effectively addressed through a uniform national approach. Instead, it requires territorially differentiated policies tailored to the economic and educational characteristics of each region or locality. Furthermore, the persistence of youth emigration, despite the implementation of labor market policies aimed at reducing unemployment, suggests that national measures alone are insufficient without closer alignment with the dynamics of the European labor market.

These findings support the recommendation for early and sustained policy intervention. Public policies that delay assistance to unemployed young people risk allowing scarring effects to become entrenched, resulting in long-term economic and social costs that persist throughout individuals' working lives.

For the 1991–2025 sample period, youth unemployment in Romania is found to be statistically significantly associated with the inflation rate and the level of investment, whereas contemporaneous GDP growth does not have a statistically significant immediate effect. However, GDP growth becomes significant—with the expected negative coefficient—when introduced into the model with a one-year lag. The regression model incorporating the three explanatory variables accounts for approximately 37% of the variation in youth unemployment, indicating that the phenomenon is also strongly influenced by structural factors that extend beyond short-term macroeconomic fluctuations.

6. References

- [1] **Anyanwu, J. C.** – Does Intra-African Trade Reduce Youth Unemployment in Africa?, African Development Bank Group, Working Paper Series, 2014.
- [2] **Arulampalam, W.** – Is Unemployment Really Scarring? Effects of Unemployment Experiences on Wages, *The Economic Journal*, vol. 111, Issue 475, 2001.
- [3] **Arulampalam, W., Gregg, P., Gregory, M.** – Unemployment Scarring, *The Economic Journal*, vol. 111, Issue 475, 2001.
- [4] **Azeng, T. T., Yogo, T. U.** – Youth Unemployment, Education and Political Instability: Evidence from Selected Developing Countries, *Cogent Economic and Finance*, Vol. 10, Issue 1, 2015.
- [5] **Bell, D. N. F., Blanchflower, D. G.** – Youth Unemployment: Déjà Vu?, IZA Discussion Paper No. 4705, 2010.
- [6] **Bell, D. N. F., Blanchflower, D. G.** – Youth Unemployment in Europe and the United States, IZA Discussion Paper No. 5673, 2011.
- [7] **Cojocaru, T.M.** – Youth Unemployment in the EU and Romania - Challenge of European and National Policies, *Annals of the „Constantin Brâncuși” University of Târgu Jiu, Economy Series*, Issue 1/2021.
- [8] **Condratov, I.** – Determinants of Youth Unemployment: A Survey of the Literature, *EcoForum*, "Stefan cel Mare" University of Suceava, Romania, vol. 3(2), 2014.
- [9] **Condratov, I.** – Analysis Regarding the Influence of the Economic Environment on the Unemployment Variety Among the Young People in the North-East Region of Romania, *EcoForum*, "Stefan cel Mare" University of Suceava, Romania, vol. 5(2), 2016.

- [10] **Condratov, I.** – Study Concerning the Correlation Between the Education System Performances and the Unemployment Among the Young People in the North-East Region of Romania, EcoForum, "Stefan cel Mare" University of Suceava, Romania, vol. 5(Special I), 2016.
- [11] **Epure, M., Barna, C. F.** – Youth Unemployment in Romania: A Problem that Needs to be Solved, Review of Applied Socio-Economic Research, Pro Global Science Association, vol. 21(1), 2021.
- [12] **Gregg, P.** – The Impact of Youth Unemployment on Adult Unemployment in the NCDS, The Economic Journal, Volume 111, Issue 475, 2001.
- [13] **Gregg, P., Tominey, E.** – The Wage Scar from Youth Unemployment, The Center of Market and Public Organisation 04/097, 2005.
- [14] **Lincaru, C., Ciucă, V.** – The Geographical Distribution of Unemployment at Localities Desegregation Level. Case Study for South Muntenia Region – Romania, Romanian Journal of Regional Science, Romanian Regional Science Association, vol. 5(2), 2011.
- [15] **Lincaru, C., Ciucă, V., Pîrciog, S., Atanasiu, D., Chiriac, B.** – Socio-Economic Dimensions in Locations by Clusters Identified for Registered Unemployed Persons at LAU2/NUTS 5 Level in 2013 and 2010, EcoForum, "Stefan cel Mare" University of Suceava, vol. 4(Special I), 2015.
- [16] **Lincaru, C., Pîrciog, S., Atanasiu, D.** – A Model of a System of Monitoring and Alert System of the Risk of Unemployment – Romanian Case, Regional Science Inquiry, Hellenic Association of Regional Scientists, vol. 0(3), 2016.
- [17] **Lincaru, C., Ciucă, V., Atanasiu, D.** – The Tendency Identification of Overall Clustering of Registered Unemployment at Territorial Administrative Unit Level – UAT2 in Romania, Institute for Economic Forecasting Conference Proceedings, 2015.
- [18] **McQuaid, R.** – Multiple Scarring Effects of Youth Unemployment, Skills Development Scotland/Scottish Funding Council, 2017.
- [19] **Pastore, F., Giuliani, L.** – The Determinants of Youth Unemployment: A Panel Data Analysis, Discussion Papers 2, CRISEI, University of Naples "Parthenope", 2015.
- [20] **Rees, A.** – An Essay on Youth Joblessness, Journal of Economic Literature, vol. 27, no. 3, 1986.
- [21] **Ryan, P.** – The School-to-Work Transition: A Cross-National Perspective, Journal of Economic Literature, vol. 39(1), 2001.