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ANALYSING THE DETERMINANTS OF YOUTH UNEMPLOYMENT IN TRANSITIONAL ECONOMIES EVIDENCE FROM HUNGARY

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ABSTRACT

Youth unemployment in Europe poses a serious challenge to the European Union and its member states. The main objective of the study was to investigate the macroeconomic determinants of youth unemployment in Hungary using the Autoregressive Distributed Lag (ARDL) model. To achieve the objective of the study, secondary data was used, which was collected from the World Bank for the period 1992–2022. The study employed a descriptive and explanatory research design with a quantitative research approach. The Augmented Dickey-Fuller (ADF) and Phillips-Perron unit root test was conducted to assess the stationarity of the data. The dependent variable was the youth unemployment rate, while the explanatory variables include gross domestic product, gross domestic saving, inflation rate, and real effective exchange rate. The finding suggests that gross domestic product, real effective exchange rate, and inflation have statistically significant impacts on the youth unemployment rate in the short run. The long run model suggests that gross domestic product, gross domestic saving, real effective exchange rate, and inflation have a statistically significant impact on youth unemployment. Finaly, policy makers need to concentrate on enacting measures that promote economic growth, such as bolstering important sectors of the economy and concentrate on industries with a high capacity for absorbing labour to guarantee that growth results in job creation.
Keywords: Youth unemployment, gross domestic product, gross domestic saving, effective exchange rate, Hungary
JEL codes: J64, J21, J23, E24

INTRODUCTION

There are 1.21 billion young people on the globe between the ages of 15 and 24. This represents 15.5% of the overall population (*United Nations*, 2020). These young individuals are vital human resources that are needed to create resilient societies and promote sustainable development (*Lalitha*, 2023). Nonetheless, the global phenomenon of pervasive unemployment seriously affects today's youth (*Rodin & Lore*, 2013). Despite the efforts to solve it, this issue still exists since high unemployment rates particularly

among youth remain a concern in many nations (*Kang*, 2021; *Yoon*, 2018). In 2023, the global youth unemployment rate was 13%, a marked improvement from the peak of 15.6% during the 2020 COVID-19 crisis. Despite this progress, around 65 million young people worldwide continue to face significant challenges in securing paid employment (*ILO*, 2024). Problems with youth employment are always important to policymakers because they have an immediate effect on social cohesion, economic stability, and the long-term development of human capital (*Barcucci et al.*, 2024). This unemployment rate, whether low or high, is influenced by a combination of economic, social, and political factors (*Avdullahi et al.*, 2022).

There are several reasons why unemployment is seen negatively by society and businesses (*Redlin*, 2023). Unemployment leads to reduced living standards and psychological distress (*Mankiw*, 2018). A utilitarian social welfare function is used to quantify the cost of unemployment, which is perceived as a welfare loss. This function takes into consideration the individual disutility that jobless workers encounter, reflecting the overall detrimental effect that unemployment has on social welfare (*Gorjón et al.*, 2020). The rise in youth unemployment and its adverse consequences are pressing social issues in contemporary society (*Abzhan et al.*, 2020; *Rodríguez-Caballero & Vera-Valdés*, 2020). It results in psychological problems of hopelessness, frustration, hostility & gradual drift of unemployed youth into all manner of criminal behaviour (*Oniore et al.*, 2015); depression constitutes a significant concern among unemployed youth (*Mokona et al.*, 2020). Being unemployed raises the chance of vulnerability to disease, mental stress, starvation, and low self-esteem (*Bell & Blanchflower*, 2011). In the face of recent economic crises and disruptions, unemployed youth individuals have experienced disproportionate adversity and are poised to emerge as the most vulnerable demographic cohort within the European Union countries for the foreseeable future (*Putun & Karatas*, 2017). Every European Union (EU) member state faces an issue with youth unemployment (*Lambovska et al.*, 2021). There exists a substantial correlation between the employment status of youth and the overall economic and labour market circumstances. A rising rate of unemployment frequently signals a deteriorating state of the labour market as a whole (*Bal-Domańska*, 2022).

The labour market has experienced a significant shock following the global financial crisis, leading to unprecedented spikes in unemployment rates across numerous countries, reaching levels unseen for decades (*Gorjón et al.*, 2020). Over the past decade, the number of young people neither in employment, education, nor training (NEET) has reached a seriously high level in many European countries (*Assmann & Broschinski*, 2021). This higher unemployment was due mainly to the presence of more stringent rules of the labour market, which represented an obstacle to achieving full employment (*Liotti, 2022; Potužáková & Bílková*, 2022).

Youth unemployment remains a major concern in Hungary with various macroeconomic and structural factors influencing its dynamic. Several studies have explored the causes and implications of youth unemployment. However, while these studies have made important contributions, there are still gaps in the literature, particularly concerning the integration of macroeconomic variables and the specific Hungarian context. Thus, the main motivation of this research is to fill this gap by

investigating the determinants of youth unemployment in Hungary. The following research issues were generally intended to be addressed by the study.

1. What is the trend of youth unemployment in Hungary?
2. What is the effect of gross domestic product on youth unemployment in Hungary?
3. Does gross domestic saving have an impact on youth unemployment in Hungary?
4. How does inflation influence youth unemployment in Hungary?
5. What is the effect of change in real effective exchange rate on youth unemployment in Hungary?

LITERATURE REVIEW

Theoretical studies

Unemployment is defined as individuals of working age who are not currently employed, have actively sought employment in a recent period, and are prepared to commence work when a suitable opportunity arises. This definition emphasizes three main characteristics of unemployment: lack of employment, active job seeking, and being immediately available for work (*ILO*, 2023). It serves as crucial indicator of the state of the labour market and is often used to assess both the effectiveness of the labour market and the state of the economy (*Bosna*, 2022). Theoretical models often link unemployment with macroeconomic variables such as gross GDP and inflation. For instance, *Okun* (1963), proposed empirical relationship between fluctuations in real Gross Domestic Product (GDP), representing an economy's output, and corresponding changes in the unemployment rate (*Plosser & Schwert*, 1979*; Usman & Elsalih*, 2018) This principle is grounded in the notion that variations in economic activity levels, as indicated by real GDP, are correlated with variations in the level of unemployment (*Bucevska & Kozheski*, 2022). *Phillips* (1958), investigated the relationship between unemployment and the rate of change of money wage rates in the United Kingdom laying the foundation what is now known as the Phillips Curve. The study found an inverse relationship between unemployment and wage inflation. The Phillips Curve concept has been widely applied to analyse labour market stability and the trade-offs policy makers face between maintaining low inflation and reducing unemployment.

According to *Keynes* (1937), unemployment arises not from the imperfection in the labour market but from insufficient aggregate demand in the economy. This framework emphasizes the critical role of macroeconomic factors such as consumption, investment, government spending, and net exports in influencing overall employment level. Keynes argued that in times of economic downtowns, reduced consumption and investment lead to a contraction in aggregate demand, resulting in higher unemployment. Keynesian theory underscores the importance of fiscal and monetary interventions to stimulate demand, especially during recessions to alleviate unemployment. *Krugman* (1994), highlighted the importance of a stable exchange rate for sustaining trade competitiveness. A stable exchange rate fosters investment and export growth, which are critical for reducing unemployment. In

contrast, excessive exchange rate volatility undermines business confidence and reduces labour demand, particularly in export-dependent industries.

Empirical studies

Various research studies have explored the intricacies of youth unemployment, employing diverse variables. For instance, *Shiferaw* (2023) investigated the temporal and frequency dynamics of gross domestic product, inflation rate, and unemployment, revealing that inflation and GDP are highly impacted by unemployment. *Oniore et al.* (2015) examined the macroeconomic determinants of unemployment in Nigeria, identifying GDP growth rate, inflation rate, degree of openness, and private domestic investment significantly influence unemployment in the short run. Similarly, *Olubusoye et al.* (2023) demonstrated that youth unemployment in Nigeria is structurally influenced by factors such as government capital expenditure, real exchange rate dynamics, interest rate fluctuations, and the degree of trade openness. Many variables affect young people's labour market participation: economic conditions (growth dynamics, productivity, unemployment, labour costs), legal and social policies, educational and vocational training systems, technological advancements (*e.g.*, *R&D*, *ICT*), social and cultural aspects, globalization, and demographic trends like population aging and migration (*Pennoni & Bal-Domańska*, 2022).

Regional studies have also provided valuable insights. *TOMIĆ* (2018) identified key determinants influencing youth unemployment in Europe, including inadequate GDP growth, a diminished share of construction activity, and elevated levels of public debt. *Papík et al.* (2022) explored youth unemployment in Slovakia, revealing a statistical relation between high school graduate unemployment rate and various factors including the overall unemployment rate in the region, GDP per capita, quality of high school education, and cost of living immediately after graduation. *Caporale & Gil-Alana* (2014) highlighted the long-term relationships between GDP and inflation, and youth unemployment in Europe. Empirical investigations into the relationship between foreign direct investment and unemployment are abundant. Researchers such as *Chang* (2005), *Schmerer* (2014), *Atilaw Woldetensaye et al.* (2022) and, *Kukaj et al.* (2022) have highlighted the influence of foreign direct investment on unemployment. Furthermore, *Swastika & Masih* (2016) confirmed a negative long-term relation between inflation and unemployment in Australia.

Concerning the relationship between gross domestic saving and unemployment, significant negative associations have been observed in the OECD countries (*Bayrak & Tatli*, 2018). Negative relationships have been noted between the exchange rates and unemployment in various countries, such as Iran (*Bakhshi & Ebrahimi*, 2016), Brazil (U*sman & Elsalih*, 2018), and the EU countries (*Belke*, 2005). During the previous decade, Hungarian youth unemployment rates have moved in parallel with the economic and labour market patterns observed across Europe (*Bíró-Nagy & Szabó*, 2022). However, substantial disparities persist within the country. Specifically, Budapest and western regions exhibit notably higher employment rates, while the eastern and southwestern areas demonstrate significantly lower employment rates (*Mura L.*, *et al.*, 2022; *Szegediné Takács*, 2021).

Tosun et al. (2024) conducted a cross-national study exploring young people's perceptions of youth unemployment across 11 European countries, including Hungary. The findings revealed that approximately 50% of respondents perceived youth unemployment as a serious issue. It is also mentioned that the living conditions for most families have deteriorated, accompanied by a rise in the unemployment rate (Kerezsi, 2018). This situation is particularly concerning given the high unemployment rates observed in the country (*Danacica*, 2014). Unemployment is also associated with the risk of suicide in the Roma population in Hungary (*Almasi et al.*, 2009). Likewise, the residents of Túrkeve identify the primary challenges facing the town as elevated levels of unemployment (*Szendrei*, 2013). The other factor contributed to high unemployment in Hungary was attributed to labour force discrimination as explained by *Fuzesi et al.* (2009). *Audas et al.* (2005) investigated youth unemployment and labour market transition in Hungary. The study emphasises individual level determinants such as education, labour market experience, and regional disparities.

MATERIAL AND METHODS

Research design and approach

In this study we employed a descriptive and explanatory research design with a quantitative research approach. The descriptive aspect of the research design is employed to systematically describe the characteristics of the variables under investigation. Descriptive research enables the study to establish a baseline understanding of these variables, offering insights into their distribution, central tendencies, and variability over time. The explanatory component of the research design is essential for investigating the causal relationships between the variables. This design is focused on understanding how different factors, such as economic growth, inflation, and exchange rates, influence youth unemployment rates. By using an explanatory approach, the study aims to identify not only correlations but also the underlying mechanisms that drive changes in youth unemployment.

Data type and source

The study employed a quantitative data type that enables statistical analysis of numerical values related to the variables being examined. The research used only secondary data sources, particularly, the study's secondary data set including 31 years from 1992 to 2022. This dataset was obtained from the World Bank, a reputable international financial organization well-known for its thorough and trustworthy worldwide economic and social data.

Method of Data Analysis

The study employs two complementary types of data analysis: descriptive and inferential analysis. Descriptive statistics are utilized as a preliminary step to summarize and understand the basic features of the dataset. This approach involves calculating measures such as the mean, standard deviation, minimum, and maximum values for each variable under study. For the inferential analysis, the study utilizes the Autoregressive Distributed Lag (ARDL) model, a powerful econometric technique ideal for analysing

time series data. The ARDL model is particularly beneficial when dealing with variables that are integrated of order zero, I (0), or one, I (1), as it can accommodate a mix of stationary and non-stationary data (*Nkoro & Uko*, 2016). The ARDL model is employed to estimate the youth unemployment rate by examining both short-run and long-run relationships between youth unemployment and key explanatory variables, including GDP growth, inflation, gross domestic savings, and the real effective exchange rate.

MODEL SPECIFICATION

In this study, we applied ARDL model since it has many advantages over the other time series models such as VAR and VECM. The ARDL model has an advantage that it does not require all variables to be integrated of the same order I (0) or I (1) and hence we can test the relationship between non-stationary variables which can be converted into stationary at different order of integration. Secondly, this model enables us to select appropriate lag to be included in the equation in a way that it will reduce the possibility of correlation in residuals (*Kripfganz & Schneider*, 2023). Using specific variables of this study, the ARDL functional relationship between youth unemployment rate and its explanatory variables (*Table 1*) can be specified as YUR = f (GDP, GDS, INF, REER). Starting from this, we developed the Auto Regressive Distributed Lag (ARDL) model as specified below (1) and (2).

$$y_t = \alpha_0 + \sum_{i=1}^{p} \gamma_i \Delta y_{t-i} + \sum_{j=0}^{q} \beta_j' \Delta X_{t-j} + \varepsilon_t \quad (1)$$

$$yur_t = \alpha_0 + \sum_{i=1}^{p} \gamma_i \Delta yur_{t-i} + \sum_{i=0}^{q1} \theta_{1i} \Delta gdp_{t-i} + \sum_{i=0}^{q2} \theta_{2i} \Delta gds_{t-i} + \sum_{i=0}^{q3} \theta_{3i} \Delta inf_{t-i} + \sum_{i=0}^{q4} \theta_{4i} \Delta reer_{t-i} + \beta_1 gdp_{t-1} + \beta_2 gds_{t-1} + \beta_3 \inf_{t-1} + \beta_4 reer_{t-1} + \varepsilon_t \quad (2)$$

Where ε_t is the white noise error term, the coefficients γ_i scalars for p lag length of dependent variable and β_j are a row vector for all independent variables included in the model with respective lag length.

Table 1: Variable description

Acronym	Description	Source	Expected sign
YUR	Youth unemployment rate (% of total labor force ages 15–24) (modeled ILO estimate)	World Bank	Dependent variable
GDP	Gross domestic product (annual %)	World Bank	Negative
INF	Inflation, consumer prices (annual %)	World Bank	Negative
GDS	Gross domestic savings (% of GDP)	World Bank	Negative
REER	Real Effective Exchange Rate (Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.)	World Bank	Negative

DATA ANALYSIS

Descriptive Analysis

Table 2 presents the descriptive statistics for the dependent and independent variables, providing insights into their central tendency, dispersion, and range within the dataset. The average youth unemployment rate over the observed period is documented at 17.25%, with a standard deviation of 5.49%. Fluctuations in the youth unemployment rate span from 10.16% to 28.14%. The mean gross domestic product (GDP) registers at 2.3%, accompanied by a standard deviation of 3.04%. GDP exhibits fluctuations within a range of approximately -6.60% to 7.09%. The average gross domestic saving rate is 25.50% of GDP, with a standard deviation of 4.49%. The values range from 12.42% to 31.24%, indicating a relatively broad dispersion in saving behaviour across the years, which could influence long-term investment and employment dynamics. The inflation rate has a mean value of 8.66%, with relatively high variability (standard deviation of 7.86%). The inflation rate ranges from a slight deflation of -0.23% to a peak of 28.31%, reflecting significant price instability, especially in the early transition years of the Hungarian economy. The REER has an average value of 85.62, with a standard deviation of 12.01. The minimum and maximum values are 64.03 and 104.89, respectively, showing noticeable fluctuations in Hungary's external competitiveness over the period.

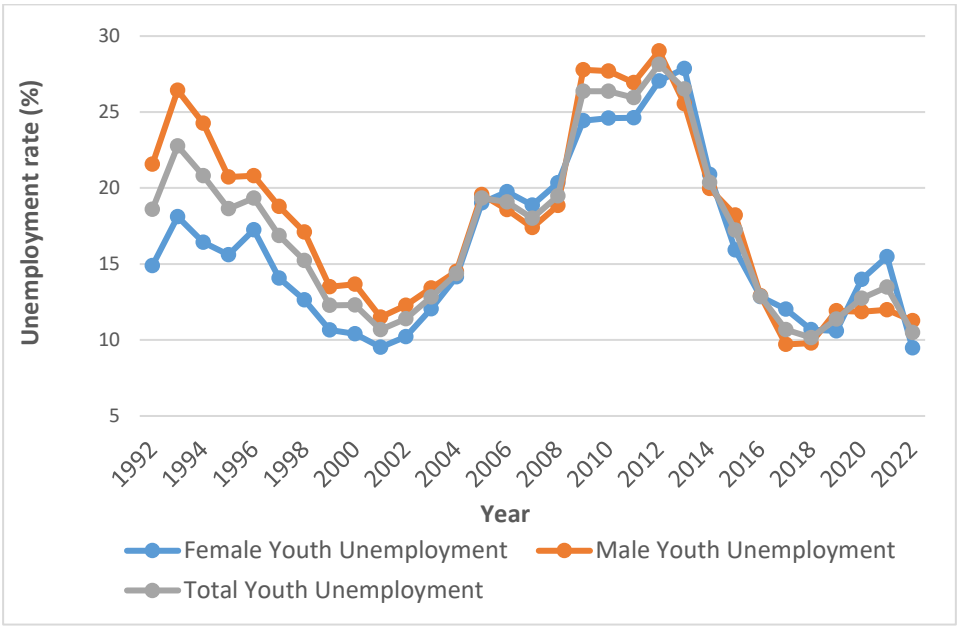
Table 2: Descriptive Statistics

Variables	Mean	Standard dev.	Min	Max
YUR	17.25	5.49	10.16	28.14
GDP	2.31	3.04	-6.60	7.09
GDS	25.50	4.49	12.42	31.24
INF	8.66	7.86	-0.23	28.31
REER	85.62	12.01	64.03	104.89

Source: Based on *World Bank* (2024) data

Figure 1 displays the overall youth unemployment rate over time as well as the youth unemployment rate by sex (male and female) for Hungary from 1990 to 2022. Female youth unemployment was higher than male youth unemployment in the early 1990s. Around the beginning of the 2000s, there was a noticeable drop in youth unemployment for both genders, with a low point being reached in 2002 - 2003. Following this time frame, the unemployment rate started to climb once more. Youth unemployment rose sharply between 2008 and 2010, reaching a peak around that same year. The effects of the global financial crisis were evident throughout this period, as both male and female jobless rates rose sharply. The rate of youth unemployment began to fall after peaking in 2010, and it reached another low point around 2018. The youth unemployment rates for men and women during this time were comparatively similar.

Figure 1: Youth Unemployment Rate of Hungary by Sex



Source: Based on *World Bank* (2024) data

The graph indicates that there was another increase in youth unemployment around 2020, because of the COVID-19 pandemic. But soon after, there is a drop in rates, with a decrease in unemployment for both men and women. The rates of youth unemployment for men and women have exhibited comparable patterns over the duration, frequently trending in tandem. There have been times, though, when the unemployment rate for one gender was marginally higher than the other. For instance, female youth unemployment was consistently greater than male young unemployment in the early 1990s. However, male youth unemployment did periodically surpass female unemployment between the mid-2000s and around 2015.

The overall youth unemployment rate typically follows the patterns of both the male and female unemployment rates. Significant rises in the total rate occurred during the COVID-19 pandemic and the global financial crisis, however the rate fell in the interim and following these events. The graph's most recent years (2021–2022) demonstrate that the rate of youth unemployment has once again declined following its high, around 2020. This trend suggests a recovery from the pandemic-induced economic downturn.

ECONOMETRICS ANALYSIS

Testing for Stationarity

Most empirical studies that use time series data assume that the series is stationary, which means that its variance and mean do not change over time (*Gujarati D.*, 2004).

The stationarity test serves as a critical step in time series analysis, providing insights into the underlying behaviour of the data. To verify the data's stationarity, we employed the Phillips-Perron unit root test and the Augmented Dickey-Fuller (ADF) test (*Table 3*). The hypotheses of interest are H0: series contains a unit root versus H1: series is stationary (*Rachev et al.*, 2012). Accordingly, gross domestic products were stationary at level, while youth unemployment rate, inflation rate, gross domestic saving, and real effective exchange rate were stationary after taking the first difference.

Table 3: Unit Root Test Results

Variables	ADF test p-value		Perron test p-value		Stationary at level
	At level	At 1st difference	At level	At 1st difference	
GDP	0.0001	-	0.0001	-	
YUR	0.7260	0.0022	0.5156	0.0016	1st difference
INF	0.3151	0.0002	0.3209	0.0002	1st difference
GDS	0.2740	0.0000	0.2793	0.0000	1st difference
REER	0.3555	0.0002	0.3624	0.0001	1st difference

Table 4 illustrates the Bounds test for cointegration. To ascertain whether there is a long-run equilibrium relationship between the variables in a regression model, we employed the Bounds test for cointegration. We used the Bounds test because the variables are integrated at I (0) and I (1) (*Pesaran et al.*, 2001). The outcomes of the ARDL Bounds Test support the long-term relationship between the variables. The null hypothesis is rejected because the F-statistic (12.988) is greater than the upper bound critical values and the t-statistic (-5.698) is less than the lower bound critical values at all significant levels. This suggests that the variables are integrated, moving together over time with a stable long-term relationship.

Table 4: ARDL Bounds Test Result

Significance level	Critical values (F)		Critical values (t)		Decision rule
	I (0)	*I (1)*	*I (0)*	*I (1)*	
10% (L_1)	*2.45*	*3.52*	*-2.57*	*-3.66*	*Reject H0 if;*
5% (L_05)	*2.86*	*4.01*	*-2.86*	*-3.99*	*F > CV for I (1) regressor*
2.5% (L_025)	*3.25*	*4.49*	*-3.13*	*-4.26*	*t < CV for I (0) regressor*
1% (L_01)	*3.74*	*5.06*	*-3.43*	*-4.60*	
F-statistic value = 12.988		H0: There is no long-run relationship between the variables			
t-statistic value= -5.698		H1: There is a long-run relationship between the variables			

As we can see from *Table 5*, the adjustment coefficient for the lagged dependent variable (L1.yur), with a value of -0.4398 and a p-value of 0.000, which has high statistical significance. This negative coefficient means that the youth unemployment rate (yur) has an influence from its past values showing inertia or persistence. The coefficient (-0.4398) points out that about 43.98% of the gap from the long-term

balance gets fixed each period. This means when the youth unemployment rate deviates from its long-term balance value 44% of the difference adjusts back toward balance in the next period. The negative sign suggests that the youth unemployment rate tends to go back to its average or balance value over time. If unemployment was high before, it would go down next, and the other way around. The p-value of 0.000 backs up that this effect matters and is not just by chance supporting the idea that past unemployment levels have a strong impact on future levels. This coefficient hints that any shocks to the youth unemployment rate in Hungary do not last and will fix themselves bringing down the unemployment rate as time goes on.

Table 5: Long-run and Short-run Estimation of ARDL Model

D.yur	Coefficient	Std. err.	t	P>|t|	[95% conf. interval]	
ADJ						
yur						
L1.	-0.4397688	0.0771768	-5.70	0.000	-0.6007568	-0.2787809
LR						
Gdp	-1.099651	0.3649074	-3.01	0.007	-1.860834	-0.3384672
Gds	-0.6847485	0.2347497	-2.92	0.009	-1.174428	-0.1950691
Reer	0.577349	0.1383608	4.17	0.000	0.2887334	0.8659647
Inf	0.5580994	0.2341709	2.38	0.027	0.0696274	1.046571
SR						
gdp						
D1.	0.2447488	0.1126526	2.17	0.042	0.0097597	0.4797379
gds						
D1.	-0.0003161	0.1789775	-0.00	0.999	-0.3736566	0.3730244
reer						
D1.	-0.3247618	0.1013543	-3.20	0.004	-0.5361831	-0.1133405
inf						
D1.	-0.2573694	0.1022495	-2.52	0.020	-0.4706582	-0.0440806
-cons	-7.480551	6.621917	-1.13	0.272	-21.29363	6.332526

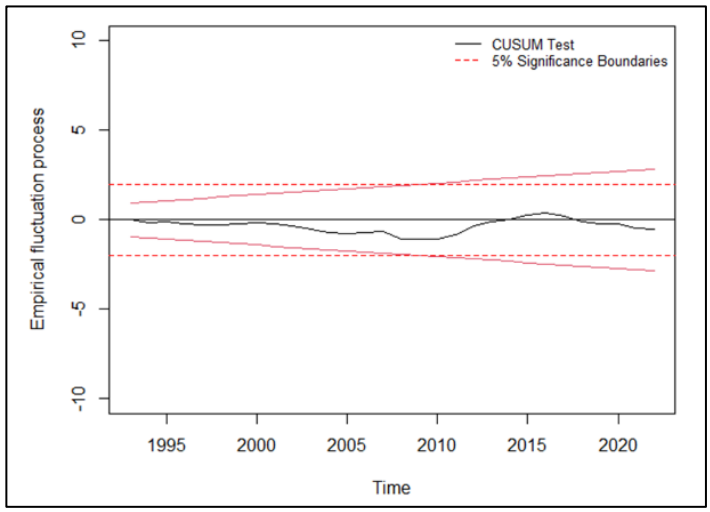
R-squared = 0.7931; Adj R-squared = 0.7000; Breusch–Pagan/Cook–Weisberg test for heteroskedasticity chi2 = 0.90 Prob > chi2 = 0.3416; Ramsey RESET test F (3, 23) = 0.74 Prob > F = 0.5404; Durbin–Watson d-statistic (10, 30) = 2.0355533; Shapiro-Wilk W test for normality: Prob > F=0.31421; Mean VIF=2.58

The R-squared value of 0.7931 indicates that 79.31% of the variance in the youth unemployment rate is explained by the model's predictors, suggesting a robust fit. The adjusted R-squared value of 0.70, which adjusts for the number of predictors, further confirms the model's strong explanatory power, indicating that the model accounts for a substantial portion of the variability in youth unemployment. To check the stability of the estimated ARDL model, we performed the CUSUM test. The results are shown in *Figure 2* which indicates that the model residuals are stable over time, suggesting no significant structural break in the model.

GDP has a statistically significant negative relationship with youth unemployment rate in the long run. This suggests that a one-unit increase in GDP is associated with a decrease of approximately 1.10 units in youth unemployment rate. The negative

sign implies that as GDP increases, the variable youth unemployment rate decreases, which reflects inverse economic relationships. The finding is consistent with studies such as *Bruno et al.* (2014), Dietrich (2012), *Hasan & Sasana* (2020), and, *Živković* (2022). However, the short-run estimation results of the ARDL model portrays that GDP had a positive effect on youth unemployment. Specifically, a one unit increase in GDP is associated with an increase of approximately 0.2447 units in the youth unemployment rate.

Figure 2: Cumulative Sum of Residuals (CUSUM) Test for Model Stability



The relationship between Gross Domestic Saving (GDS) is negative and significant in the long run, indicating an increase in GDS leads to a decrease in youth unemployment rate. That means a one-unit increase in gross domestic saving is associated with a decrease of about 0.68 units in the youth unemployment rate. This suggests that higher savings might be correlated with lower youth unemployment rate, possibly due to shifts in investment patterns or consumption. However, in the short run GDS has no effect on youth unemployment.

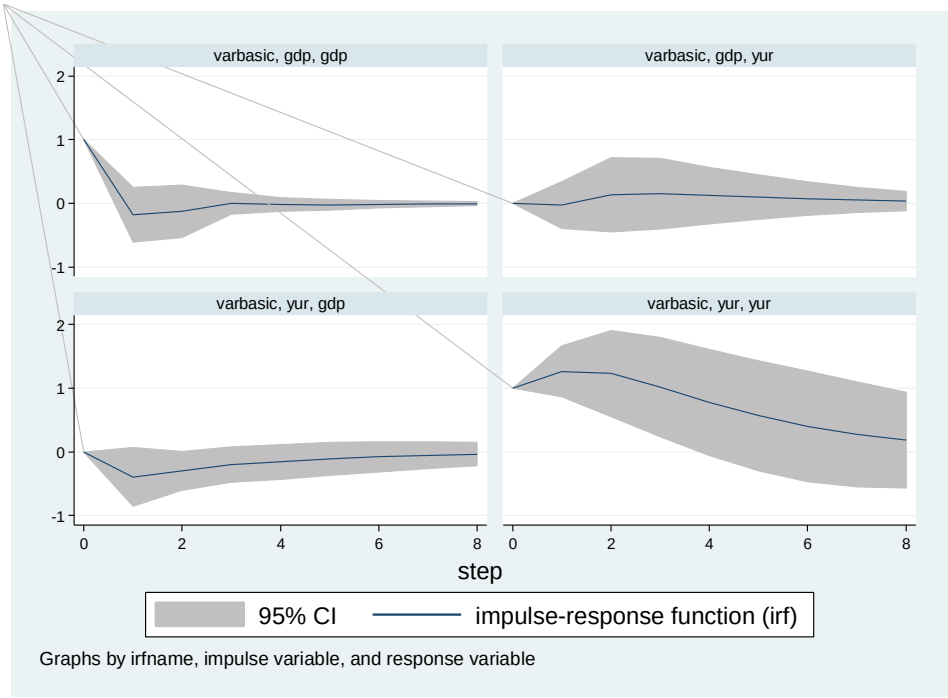
Gross domestic saving has a connection to investment, but investments need time to create jobs. In the short term, savings might not turn into productive investments that generate employment for young people, who may need specific programs or industries to open chances for them (*Nunziata*, 2002). The positive coefficient of 0.5773 for real effective exchange rate (REER) is statistically significant, indicating that an increase in REER (appreciation of Hungarian Forint) is associated with an increase in youth unemployment rate in the long run. Specifically, a one-unit increase in REER leads to an approximate increase of 0.58 units in youth unemployment rate. This positive relationship suggests that as the real exchange rate is appreciated, the youth unemployment rate also tends to rise. The result is consistent with studies such as *Banda & Choga* (2015), and *Adzugbele et al.* (2020).

Our finding shows that there is an inverse relationship between Hungary's youth unemployment rate and inflation rate, supporting the Phillips model in the short run. That means, a 1-unit increase in the inflation rate is associated with a decrease of approximately 0.2574 units in youth unemployment rate. However, the long-term result shows a positive relation between youth unemployment and inflation. The result is coherent with *Tenzin* (2019). Generally, the short run model suggests that GDP, REER, and inflation have statistically significant impacts on the dependent variable in the short run. GDP has a positive effect, while REER and inflation have negative effects. GDS does not show a significant effect in the short run. A similar finding is observed in (*Popescu & Diaconu (Maxim)*, 2022)

IMPULSE RESPONSE FUNCTION OF YOUTH UNEMPLOYMENT RATE FOR GDP

The Impulse Response Function (IRF) graph (*Figure 3*) provides valuable insights into the dynamic interactions between gross domestic product and the youth unemployment rate over time, following shocks to each variable.

Figure 3: Impulse Response Function for GDP and Youth Unemployment Rate



The response of GDP to its own shock indicates an initial decline in domestic savings, as seen by the downward trend in the first period, suggesting that a disruption in the savings sector leads to a short-term contraction. However, this

effect stabilizes after two periods, with GDP returning to its pre-shock level, implying that the economy can absorb and adjust to such disturbances relatively quickly. When it comes to the impact of a GDP shock on youth unemployment, the response suggests that a positive shock to GDP initially leads to a small, yet noticeable, increase in unemployment rate. This outcome might appear counterintuitive but could be explained by the possibility that in the short run, increased savings could reflect reduced consumer spending or economic contraction in sectors that immediately impact employment. Nevertheless, this increase in youth unemployment is only temporary, as the unemployment rate begins to stabilize and gradually dissipate over time. This suggests that while GDP shocks might negatively affect employment in the short run, the long-term impact is neutral. On the other hand, the response of GDP to a shock in youth unemployment reveals that an increase in youth unemployment has a negative impact on GDP in the short run. The immediate decline in GDP following youth unemployment tare shock suggests that rising unemployment, particularly among the youth, suppresses overall economic activity, possibly due to reduced productivity or consumption. However, like the previous case, the adverse effect on GDP diminishes over time, with the economy showing signs of recovery after two periods, ultimately stabilizing in the long run. Finally, the response of the youth unemployment rate to its own shock shows that an increase in youth unemployment leads to a further rise in unemployment initially, but this effect gradually decreases over time. This suggests that shocks to youth unemployment tend to be temporary, with the economy slowly adjusting and unemployment rates declining back toward their original levels in subsequent periods. In summary, the IRF analysis highlights the short-term vulnerabilities and long-term resilience of both GDP and youth unemployment rate in response to shocks. While shocks to GDP and youth unemployment can have significant immediate impacts on the other variable, both tend to stabilize over time, reflecting the economy's capacity for adjustment and recovery. This dynamic underscore the complex but ultimately transient relationship between savings and employment, where short-term disruptions do not necessarily translate into prolonged economic distress. The shaded confidence intervals further illustrate that while the effects are significant in the short term, the uncertainty increases over time, highlighting the need for cautious interpretation of long-term projections.

CONCLUSION AND IMPLICATIONS

This study applied the autoregressive distributed lag (ARDL) model to examine the dynamic relationship between macroeconomic variables and youth unemployment in Hungary, using time series data from 1992 to 2022. The youth unemployment rate served as the dependent variable, with GDP, gross domestic savings (GDS), inflation, and the real effective exchange rate (REER) as explanatory variables. Unit root tests (ADF and Phillips-Perron) were conducted to ensure the stationarity of the variables before estimating the model. The empirical findings reveal a complex interplay between macroeconomic indicators and youth unemployment. In the short run, GDP exerts a positive and statistically significant effect on youth unemployment,

suggesting that short-term economic growth in Hungary may not be immediately translated into better job prospects for young people. Conversely, both inflation and REER have negative short-run effects, implying that moderate price increases and improved external competitiveness may temporarily alleviate youth unemployment. Gross domestic savings do not exhibit a significant short-run impact. In the long run, all four variables GDP, GDS, inflation, and REER show statistically significant effects on youth unemployment. Notably, GDP and GDS are associated with the reductions in youth unemployment over time, supporting theoretical propositions that long-term economic growth and higher national savings can foster a more robust labour market. On the other hand, inflation and REER have positive long-run relationships with youth unemployment, indicating that persistent price instability and reduced international competitiveness may hinder youth employment prospects.

From a theoretical standpoint, the Hungarian case lends itself well to testing key economic hypotheses regarding the roles of macroeconomic stability and resource mobilization in addressing structural unemployment. For example, the inverse long-run relationship between GDS and youth unemployment supports endogenous growth theories that link domestic saving and capital formation to labour market outcomes. Similarly, the positive short-run effect of GDP on youth unemployment highlights the limitations of traditional Keynesian assumptions when applied to labour market rigidities and skill mismatches. The results underscore the importance of context-specific economic mechanisms. While macro-level variables are influential, the time dimension and structural characteristics of Hungary's labour market including youth-specific barriers must be considered when interpreting the effects. The evidence suggests that aggregate economic expansion alone is insufficient to reduce youth unemployment in the short term without parallel structural adjustments, such as better matching between educational output and labour market demand.

The long-run negative relationship between gross domestic savings and youth unemployment underscores the role of domestic capital in fostering job creation. Economic policies that encourage household and institutional saving and effectively allocate these resources toward labour-intensive and innovation-driven sectors, can contribute to long-term reductions in youth unemployment. Moreover, efforts to control price volatility and maintain external competitiveness (through an appropriate real exchange rate policy) can enhance the long-term prospects for youth employment.

In conclusion, this study contributes to the literature by empirically validating several theoretical relationships between macroeconomic variables and youth unemployment. Hungary serves as a relevant case through which these dynamics can be explored, but the findings also invite further comparative research to test the generalizability of these results across different institutional contexts.

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