

YOUNG PEOPLE DISCOURAGED TO WORK IN ROMANIA BETWEEN 2019 AND 2023 – SEASONAL ANALYSIS USING JDEMETRA+ 3.3.0

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Abstract

The COVID-19 pandemic brought severe disruptions upon the labor market. Young people, aged 15 to 24 were especially affected. Also, in 2024, Romania had the highest NEET rate. In this context, it is essential to explore data concerning discouragement to work. This paper studied whether or not the time series concerning the number of young people aged between 15 to 24 in Romania discouraged to work present seasonality. Quarterly data from 2019 to 2023 was considered in order to capture the effects of the COVID-19 pandemic. Data for males and females were analyzed. Seasonality tests (Ljung-Box - Auto-correlations at seasonal lags; Friedman – non-parametric; Kruskal-Wallis – non-parametric) and periodograms in JDemetra+ 3.3.0 were used. The results show that neither series present seasonality, suggesting a severe issue, not alleviated by the availability of seasonal jobs. Thus, governmental policies should be designed accordingly. Such policies may include, as presented in the conclusion section based on existing literature: increasing the opportunities of young people to learn new skills, supporting youth centers, where young people can increase their social capital and promoting active measures to increase participation on the labor market. The paper is limited by the data availability: quarterly data at national level doesn't permit a very detailed analysis.

Keywords: youth discouraged to work, periodogram, seasonality tests, JDemetra+

JEL Classification: C01, E60, J01

1. Introduction

In 2018, the European Commission proposed a new strategy aimed to increase participation of young people on the labor market by “providing a safe environment for them to gain self-confidence, and learn in a non-formal way” and recognising their skills [4]. However, after the COVID-19 pandemic, the transition from formal education to the labor market has become more complex, with many young people struggling to settle on a job [5]. In this context, in 2024, the share of people between 15 and 29 years neither in employment nor in training was 11% in the EU, Romania registering the highest value among the European countries, of 19% [5]. Therefore, it is essential to analyse the data related to this phenomenon, especially data concerning discouragement to work.

This paper aims to explore whether or not the time series concerning the number of young people aged between 15 to 24 in Romania discouraged to work presents seasonality. The 2019–2023-time frame was considered in order to capture the effects of the COVID-19 pandemic.

2. Literature review

The Covid-19 pandemic issued many challenges for the Romanian labor market. Although the Romanian Government took immediate measures to support both employers and employees at the beginning of the pandemic, the crisis amplified the already high degree of mismatch between supply and demand on the labor market [3]. Young people, entering for the first time on the market were particularly affected and were discouraged to work.

First, discouragement to work is amplified by job insecurity [6]. Romania registered one of the highest percentage of people who felt that their job was insecure during the pandemic and many relied mostly on government measures to mitigate this risk rather than on measures at local level or personal resources [8]. Women reported job insecurity 60% more than men, due to gender and social expectations and youths relied on their families to provide them with a safety net [8].

Second, the economic activities during the lockdown measures were disproportionately affected. The most severely affected sectors were those where most of the labor force is formed of young women, such as hospitality [16]. This empahsieve for the need to equip young people (women in particular) with more skills to make them more adaptable on the labor market. Among these skills, digital ones are the most important [17].

3. Methodology

For the purpose of this paper, data concerning the number of young people aged between 15 to 24 in Romania between 2019 and 2023 was retrieved from the Tempo Online database provided by the National Institute of Statistics on January 2, 2026. Two quarterly time series were considered, one for males and one for females. The 4 years period corresponds to the minimum time span in order to check the presence of seasonality in quarterly series, although, scientific literature recommends a 5 years period [11].

In order to perform the analysis, JDemetra 3.3.0 was chosen. Migrating from JDemetra 2.x. family to JDemetra 3.3.0 might be problematic for practitioners in official statistics [12]. However, JDemetra+ 3.3.0 has various new features and contains many improvements in the seasonal adjustment algorithms [18] which makes it suitable for analyzing complex time series.

In order to test for the presence of seasonality, both graphical analysis and statistical tests were used. Considering the graphical analysis, the periodogram was used as it detects seasonality of unknown frequency (for more details, see https://jdemetradocumentation.github.io/JDemetra-documentation/pages/theory/spectral_periodogram.html accessed January 2, 2026). Regarding the statistical tests, three tests available in JDemetra+ 3.3.0 were used: two nonparametric (Friedman and Kruskal-Wallis) and one parametric (Ljung-Box). These tests are used in various staged of the seasonal adjustment process including the preliminary checks (for more details, see <https://jdemetradocumentation.github.io/JDemetra-documentation/pages/case-studies/seasonalitytests.html> accessed January 2, 2026). The significance level is 5%.

4. Results

Figure 1 displays the number of persons aged 15-24 who are discouraged to work in Romania by sex, from the first quarter 2019 to the fourth quarter 2023. Both series display a clear ascending trend with a peak in the first quarter of 2021.



Figure 1 People aged 15-24 who are discouraged to work in Romania by sex – quarterly series between 2019 and 2023
source: designed by the author, based on data from the National Institute of Statistics

Table 1 displays the probabilities for the seasonality tests for the analyzed series. For all the three tests, the probabilities are higher than 5%. This means that there is no seasonality present.

Table 1 Probabilities for the seasonality tests for analysed series; source: designed by the author

	Number of persons of male sex aged 15-24 who are discouraged to work in Romania – quarterly series between 2019 and 2023	Number of persons of female sex aged 15-24 who are discouraged to work in Romania – quarterly series between 2019 and 2023
Ljung-Box (Auto-correlations at seasonal lags)	1	0.93
Friedman (non parametric)	0.96	0.16
Kruskal-Wallis (non parametric)	0.83	0.41

Figures 2 and 3 display the periodogram for each analyzed series. In both cases, one can observe that there are no peaks on the red lines, there is no trading day effect [14].

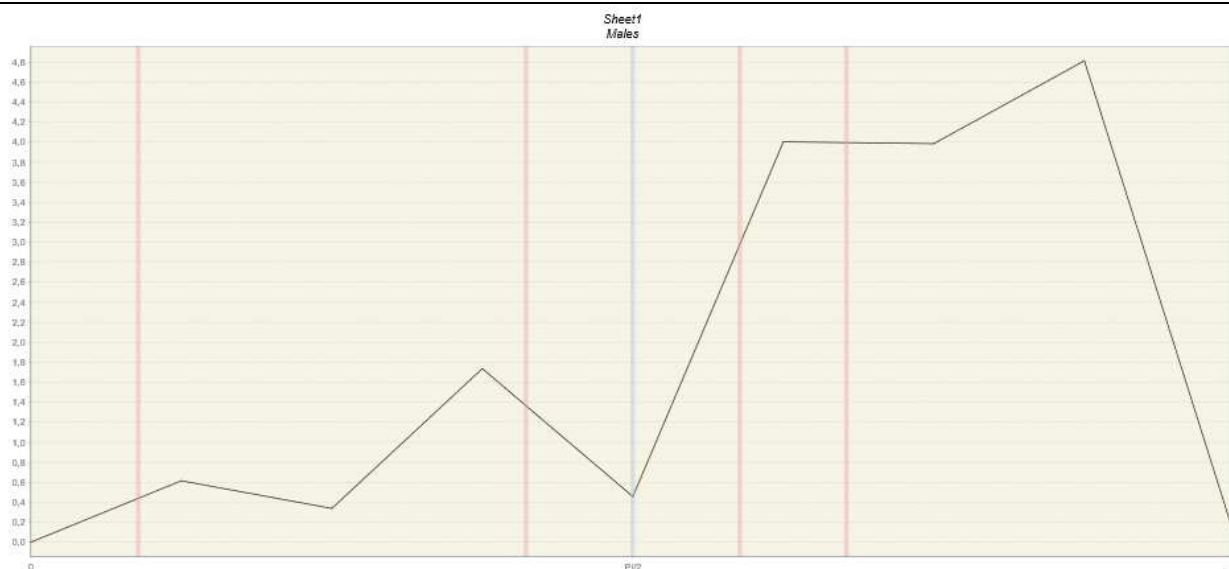


Figure 2 Periodogram for the series Number of persons of male sex aged 15-24 who are discouraged to work in Romania – quarterly series between 2019 and 2023; source: designed by the author, based on data from the National Institute of Statistics

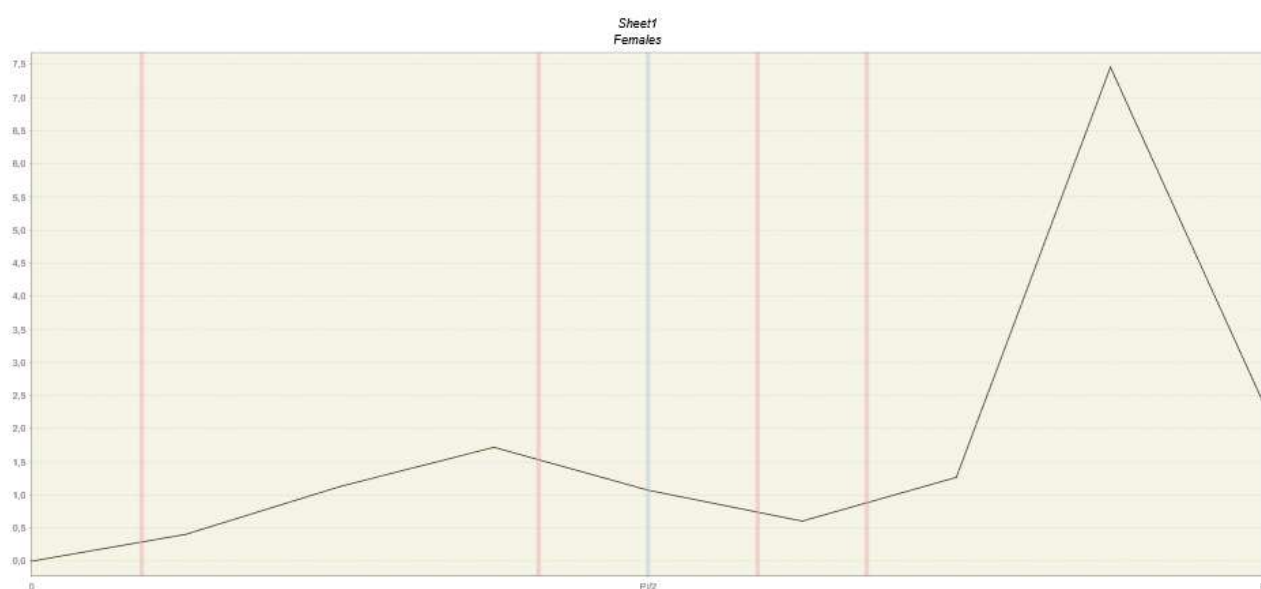


Figure 3 Periodogram for the series Number of persons of female sex aged 15-24 who are discouraged to work in Romania – quarterly series between 2019 and 2023; source: designed by the author, based on data from the National Institute of Statistics

The lack of seasonality in both series means that young people, between 15 and 24 years are discouraged to work even when seasonal jobs are available in the summer. Such jobs may be an opportunity to integrate them on the labor market.

Romanian youths are generally discouraged to work due to the inadequate school preparation and lack of adequate professional integration policies [13]. Policies based on seasonal jobs should consider the particularities of each group they address. There are many groups of people in Romania discouraged to work, each of them with their own needs. For example, people with disabilities are discouraged to work due to the challenges of transportation to and from workplace [1]. Also, in the case of Roma people (especially among women), the traditional culture, household deprivation and living in segregated communities are key factors that discourage them to engage on the labor market [15].

5. Conclusions

This study showed that discouragement to work among people aged 15 to 24 in Romania is a persistent issue, not alleviated by the opportunities of seasonal jobs. The study used quarterly data from 2019 to 2023, thus covering the COVID-19 pandemic and the recovery period.

In the aftermath of the COVID-19 pandemic, it is very important to understand the new dynamics of the labor market as well as the challenges that young people face in order to design best policies to encourage them to work. First, employers will “emphasize on adaptability, agility and versatility” (Goga et al, 2023, p. 47), while young people entering the labor market are expected to display these skills [7]. Second, employers must be offered incentives in order to increase the programs that can support young people to enter the labor market: providing internships, providing mentoring and coaching, creating an inclusive organizational culture, signing partnerships with educational institutions [7]. Third, the government should support youth centers that provide learning activities (modern languages, photography and communication skills) and recreational activities, so that young people from all backgrounds to increase their social capital [10]. Also, a special attention needs to be directed towards young migrants, who face even greater challenges on the labor market, such as high bureaucracy and exploitation [2]. Finally, many youths face with isolation due to the remote work or disconnection to their professional activity [9], thus adequate social services providing emotional support are needed.

This paper presents two limitations, due to lack of data availability. Firstly, the quarterly data don't allow for a detailed view upon the seasonality of a time series. Monthly data would be more suitable. Secondly, the analyzed series may display variations at county or regional level.

6. References

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