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IMPACT OF ECONOMIC GROWTH ON NEET RATE IN DEVELOPED AND DEVELOPING COUNTRIES

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Abstract: The NEET problem, which policy makers have felt obliged to put on the agenda since the 1990s in order to find a solution, has increased its importance by including Generation Z in terms of age. Countries have included the NEET problem in their government policies to solve this marginal problem and have tried to take precautions to prevent it from becoming a further problem in society. Many academic studies have been conducted on the causes of the concept, which is closely related to the concept of youth unemployment. The relationships between unemployment and economic growth are examined for a similar purpose, and the unemployment-reducing effects of growth are investigated within the framework of Okun's Law. As it is known, Okun's Law argues that the unemployment rate will decrease when a certain growth rate is achieved in the economy. Similarly, this study examines whether economic growth has a decreasing effect on NEET rates. In other words, the question of whether economic development leads the population between the ages of 15-24 to become more employed or NEET constitutes the main problem of the study. Based on this, panel data analysis was performed to investigate the effect of economic growth on NEET rates in developed and developing countries and the results were evaluated. As a result of the results, it has been seen that a similar relationship between the growth rate in Okun's Law and unemployment also exists between the growth rate and the NEET rate. Accordingly, after an average growth of 2.24% in 23 selected OECD countries, every 1% growth increase would lead to a 6.35% decrease in the NEET rate.

Keywords: Okun’s Law, NEET Rate, Growth Rate, Youth, NEET

1. Introduction

Economic growth, or in other words, real increase in the amount of goods and services produced, occurs through processes such as increasing the capital stock, increasing the labor used in production quantitatively and/or qualitatively, technological development and productivity increases. While trying to achieve economic growth through these mechanisms, it is aimed to increase social welfare through increased production (Tüzün et al., 2020). Based on this, growth; It shows the continuous increase in the earnings of individuals in society. However, unemployment and the underproduction level caused by unemployment appear as an obstacle in achieving this goal. Okun's Law emerged to explain exactly this point and revealed the relationship between growth and unemployment in achieving the goal of full employment.

Based on this, it is important to ensure full employment in the economies of underdeveloped and developed countries in the world. In order to ensure full employment, the continuity of employment policies becomes important. In this context, increasing employment in the economies of developing countries as well as underdeveloped countries is among the basic economic policies (Arı, 2016). However, in addition to the unemployment problem, which is seen as one of the obstacles to full employment, following the economic and technological developments, another dimension of youth unemployment is the increase in the number of NEETs, which represent young people who are "neither in employment, nor in education, nor in training". NEET numbers are seen as an obstacle to achieving full employment and growth goals.

In recent years, it has been observed that young people are not only not employed, but also not in education and training, and the number of young people not being involved in education, employment and training is increasing day by day. The concept of NEET emerged because concepts such as youth unemployment and youth employment were insufficient to explain the extent of the problem due to various problems experienced in the labor market. When the concept expressed as NEET, which covers the fact that young people are not in employment, as well as not taking part in education and training, is examined on a global scale, it is seen that the young people in this group come from a heterogeneous structure. In other words, these people come from different social segments, they are in this group for different reasons, and the number of young people in the NEET group is increasing every year (Köken and Koç, 2022).

2. Conceptual Framework

The most commonly used criterion by countries in determining their level of development is the gross domestic product (GDP) ratio. GDP is “the total monetary value of all final goods and services produced within the borders of a country in a certain period” (Erden Özsoy and Tosunoğlu, 2017). Potential GDP gives the production potential of the economy and is important for monetary policy. The determinants of Potential GDP are capital, labor and the productivity of these two variables (Demiroğlu, 2012). However, while unemployment is seen as another issue that negatively affects this size, new studies have begun to appear in the literature in recent years that it also affects the population that remains idle despite being young and working age (Bruno et al. 2013; Maynou et al., 2022; Amendola, 2022; Berigel et al. 2023; Pacelli et al. 2023).

In addition to the fact that young people are disadvantaged in the labor market compared to adults, there are certain youth groups among young people who are more socially and economically disadvantaged and are quite vulnerable to both education and business life (ETF, 2012). Young people who are neither in education nor in employment (NEET) can be given as an example of these disadvantaged youth groups. The term "NEET", which was first used in the United Kingdom to refer to young people who are not employed and not engaged in education, has subsequently begun to be used frequently to describe young people who have difficulty transitioning from school to business life (Furlong, 2006). The International Labor Organization (ILO) defined the share of young people who are neither in employment nor in education within the total young population as "NEET" (ILO, 2019). The NEET group, which feels vulnerable both socially and economically due to many reasons such as inadequacies in the labor market, young people not having sufficient experience and skills, temporarily taking a break from education and planning to return to school, is considered to be at high risk in economic, psychological and social terms. (Henderson, Hawke, and Chaim, 2017). This group, which generally includes young people who leave school early, are unemployed, discouraged, and have low self-confidence, also includes those who are out of the workforce due to the obligation to care for family members, being sick or disabled. Among the NEET figures, which reach serious levels in many countries, the segment with the highest share is generally the unemployed and individuals with care roles in the family (Çolak and Koç, 2023a).

Multifacetedly transforming societies and individuals, as well as economies and working life, complicate young people's education and transition to working life after education. There are many reasons, such as the fact that it has become possible to work until older ages, some jobs disappearing with technological innovations and some jobs are done by robots, the spread of artificial intelligence, the meaning attributed to work differing in new generations, and the existing market conditions and expectations regarding working life not matching up, neither in education nor in education at a global level. This results in a rapid increase in the number of young people in employment. Particularly in developing countries, problems such as low-flexibility hierarchical structures, merit problems, corruption and waste of public resources, and the adoption of populist economic policies, along with the reasons mentioned above, increase the proportion of young people who are neither in education nor in employment in the population in these countries. In other words, one of the biggest economic problems of the modern age on a global scale is the large number of young people who are neither in education nor in employment. The young people who make up this group come from different social layers. Therefore, it is a very heterogeneous group. This situation makes it difficult to address the problem in question within standards and produce solutions (Tolgay and Çakır, 2022).

3. Theoretical Background

Arthur Okun examined the relationship between unemployment and economic growth for the USA after the Second World War in his article published in 1962. The article became a cornerstone for studies on the relationship between growth and unemployment and was included in the literature as Okun's Law. Okun's Law reveals the inverse relationship between cyclical fluctuations in growth and unemployment rates. Economic shocks cause economic output to fluctuate around its potential level, which in turn causes firms to increase or decrease their employment. This relationship is shown as follows (Ball et al. 2016):

$$u_t - u_t^* = \beta(y_t - y_t^*) + \varepsilon_t \quad (1)$$

"u_t^*" and "y_t^*" show the trend value or, in other words, the potential value of unemployment and the logarithmic value of output, respectively. The error term includes factors outside the model, such as changes in production or changes in the labor force participation rate, resulting from fluctuations. The coefficient β gives the magnitude of the relationship. Another version of Okun's equation deals with the relationship between periodic changes in unemployment and growth rates.

$$\Delta u_t = \alpha + \gamma \Delta y_t + \omega_t \quad (2)$$

"Δ" refers to the change in unemployment and growth figures.

It is possible to calculate Okun's Law with the first equation called the "deficit" model or with the second equation called the "difference" model. In the first equation, Okun examined the relationship between these two variables by calculating the average or potential value of national income and unemployment and the deviation rates of real values from the potential value. In the second equation, Okun discussed the relationship between the change in growth rates and unemployment. In the model he calculated between 1948 and 1960, Okun concluded that each 1% growth above 4% reduced unemployment by 0.7% (Arshad 2007).

According to Okun's law, every 1 percent growth rate above the trend growth rate reduces the unemployment rate by 0.5 points. In other words, as a result of a 1 percent increase in the unemployment rate, the labor force not participating in production causes real income to decrease by 2 percent. It is possible to express this situation as follows (Mankiw, 2010):

Percent Change in Real Income = 3.5% – 2 x (change in unemployment rate).

This study will evaluate the relationship between the unemployment rate and growth in terms of the relationship between the NEET rate and the growth rate, and this time the model will be revised as follows:

$$\Delta n_t = \alpha + \beta \Delta y_t + \varepsilon_t \quad (3)$$

In the model, n represents the NEET rate and y represents the change in GDP compared to the previous year. Just like in Okun's law, a negative relationship between the parameters should be expected. We expect growth to reduce the NEET rate, and conversely, the presence of NEET to negatively affect the growth rate.

4. Literature and Scientific Contribution

Thioune and Kane (2018) discussed the relationship between youth employment and economic growth in West African Economic and Monetary Union (WAEMU) countries using data between 1991 and 2015. As a result of the empirical analysis carried out with the panel data analysis method, it was concluded that the economic growth rate negatively affects the youth employment rate to a non-significant extent, but the youth employment rate cannot significantly increase economic growth.

Katumo and Maingi (2020), who investigated the relationship between economic growth and youth unemployment in Kenya, used Granger Causality and OLS tests. Study results using data between 1991 and 2015; It has been revealed that delays in economic growth cause youth unemployment, the coefficient between the two variables is positive and there is a one-way causality relationship connecting the two variables.

Bingöl (2020) conducted a panel data analysis on the variables affecting young people neither in education nor in employment (NEET) covering the period 2005-2018, with data from the fragile five countries, including Brazil, India, Indonesia, South Africa and Turkey, and Russia. Analysis results; It supports that foreign direct investments, GDP per capita, savings for education expenditures and human development index affect NEET rates. According to the analysis, a 1% increase in human development index and direct investments leads to an increase of 2.14% and 0.03% in NEET rates respectively, while a 1% increase in GDP per capita and savings for education expenditure an increase resulted in a decrease in NEET rates of 0.77% and 0.38%, respectively. The results of the inflation variable were not interpreted because they were not statistically significant.

In his study on macro indicators between 1997 and 2020, Amendola (2022) analyzed the relationships between macro variables and the NEET rate in the panel data analysis he conducted for 40 different OECD countries. In his study, he found that if GDP increases, the NEET rate decreases.

Some key factors leading to the NEET problem include gender discrimination, low wages, insecure jobs, vulnerability to the effects of the financial crisis, ongoing unemployment, inefficient transition from school to work and inadequate on-the-job training. In addition, the distributive effects of skill-driven technological change or the decline in the effectiveness of tax and welfare systems to redistribute market income, non-standard forms of employment and lack of social protection between jobs, and their potential associations with NEET rates are discussed by Maynou et al. (2022) examined it with panel data analysis.

Pacelli et al. (2023) conducted a panel data analysis between 2008 and 2016 in the European Union countries using micro and macro data sets from the years after the global crisis in 2008. With this study, they showed the impact of family support policies, education, labor market

flexibilization and economic growth in reducing the likelihood of becoming NEET over a long period of time.

Unlike these studies in the literature, this study will focus on the relationship between growth rate and NEET rate, based on Okun's Law. Based on the model of Okun's Law, there will be an analysis to measure the positive or negative impact of the growth rate on the NEET rate, as well as the extent of its impact, in the light of data in selected OECD countries.

5. Dataset and Model

The aim of this study is to reveal the relationship between (NEET) and economic growth (GDP) in the light of data in OECD countries in the 2000-2022 time period. Data on young people who are neither in education nor in employment (NEET) were obtained from the official website of OECD Data (2024) and show the share of young people who are not in education and training activities and/or employment in the total population between the ages of 15-24. Likewise, the data on the economic growth (GDP) indicator includes the increase rates of GDP compared to the previous period, compiled from the same website. The variables used in the model were compiled from annual data, and panel data analysis for 23 selected countries with complete data between 2000-2022 and econometric tests of the process of this analysis were obtained from the E-views 10 program.

Table 1. Selected OECD Countries

1	Australia	7	Germany	13	Mexico	19	Spain
2	Belgium	8	Greece	14	Netherlands	20	Sweden
3	Canada	9	Hungary	15	Norway	21	Türkiye
4	Czechia	10	Ireland	16	Poland	22	United Kingdom
5	Denmark	11	Italy	17	Portugal	23	United States
6	France	12	Luxembourg	18	Slovak Republic		

The selected countries in Table 1 were first compiled from OECD (2024) data, and then among all countries with complete data sets for the selected years. The tables used are also given in the Appendix section. The fact that there are developing countries as well as developed countries among these countries will reveal the relationship between growth rates and NEET rates in accordance with the purpose of the article. Therefore, the model to be applied will benefit from equation (3) above.

$$\Delta n_{it} = \alpha_{it} + \beta \Delta y_{it} + \varepsilon_{it} \quad (4)$$

"i" indicates the countries and "t" time period in the model, α is the constant term, and β is the slope parameter of the model. In the study, NEET rates of selected countries were used as the dependent variable. As an independent variable, the growth rates of selected countries compared to the previous period were used.

6. Method

In the study, first the cross-section dependence of the model will be tested and then the panel regression model will be estimated after the unit root test. Based on the obtained model and Okun's Law, the relationship between growth and NEET rates will be analyzed.

6.1. Testing Cross-Section Dependency

Cross-sectional dependence means that shocks occurring in any of the countries forming the panel data model affect other countries equally (Tarı et al. 2019). Unit root tests applied without taking cross-sectional dependence into account will lead to unrealistic and inconsistent results.

Before testing the correlation between units, it is necessary to determine the time dimension and cross-section dimension that form the model (Mamedov and Koç, 2023).

6.1.1. Breusch-Pagan (1980) LM Test

The Lagrange Multiplier (LM) test was developed by Breusch & Pagan (1980) to analyze the correlation relationship between the variables modeled in panel data. The basic idea of this type of testing is to substitute the parameter estimates obtained from the constrained model under the null hypothesis into the score vector and check whether the null vector is close enough to zero (Sarafidis & Wansbeek, 2012). Breusch-Pagan (1980) LM test is preferred when the time dimension is large in cross-sectional size. The LM test statistic is given in the equation below. To test cross-section dependence, Breusch Pagan (1980) LM, Pesaran (2004) CD, Pesaran Ullah, Yamagata (2008) LMadj, Friedman (1937), Frees (1995), Sarafidis et al. (2009) and Baltagi et al. (2011) tests were developed (Tatoğlu, 2017:315). Since the time dimension is larger than the cross-section dimension in the study, Breusch-Pagan (1980) LM Test, Pesaran, Ullah, Yamagata (2008) LMadj and Pesaran (2004) CD cross-section dependence tests were used.

$$LM = T\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}(\hat{\rho}_{ij}^2) \sim \chi^2_{\frac{N(N-1)}{2}} \quad (5)$$

$\hat{p}_{ij}^2$ in the model; it estimates the correlations between units i and j. Broad form of test:

$$\hat{\rho}_{ij} = \hat{\rho}_{ji} = \frac{\sum_{t=1}^{T} e_{it}e_{jt}}{\left(\sum_{t=1}^{T} e_{it}^2\right)^{1/2}\left(\sum_{t=1}^{T} e_{jt}^2\right)^{1/2}}, \quad (6)$$

It is shown in equation (6) (Peseran, 2015). The LM test statistic developed by Breusch & Pagan (1980) fits the chi-square asymptotic distribution with (N(N-1))/2 degrees of freedom. This test gives invalid results when used in cases where the cross-sectional dimension is larger than the time dimension (Pesaran et al., 2008).

6.1.2. Pesaran (2004) CD Test

Pesaran (2004) CD test was developed to be an alternative to the Breusch-Pagan (1980) LM test. This test is used not only when the time dimension is larger than the cross-sectional dimension, as in the Breusch-Pagan (1980) LM test, but also when the cross-sectional dimension is larger than the time dimension (Pesaran et al., 2008):

$$CD = \sqrt{\frac{2T}{N(N-1)}}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\widehat{p_{ij}} \quad (7)$$

Peseran CD test model is given in equation (7). Here, the residue represents the correlation coefficient between the residues of the units. According to Monte Carlo Simulation, which is a type of mathematical calculation algorithm, the reliability of the results obtained from the Pesaran (2004) CD test is higher than the results obtained from the Breusch-Pagan (1980) LM test (Mamedov and Koç, 2023).

6.1.3. Pesaran, Ullah and Yamagata (2008) Test

Breusch & Pagan (1980) LM test gives erroneous results when the group mean is zero and the individual mean is different from zero. For this reason, Pesaran, Ullah & Yamagata (2008) cross-sectional dependence test is used when it is valid under strong exogenous regressions and normal errors and when the time dimension is larger than the cross-sectional dimension. The test statistic is given by the following equation:

$$LM_{adj} = \sqrt{\frac{2}{N(N-1)} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \frac{(T-K)\widehat{p_{ij}^2} - \mu_{Tij}}{\sigma_{Tij}}} \quad (8)$$

In the equation, μTij represents the mean and σTij represents the variance. The test statistic asymptotically shows a standard normal distribution.

6.2. Pesaran (2007) Unit Root Test

Pesaran (2007) developed a new method to approach the problem of cross-section dependence. By stopping the difference process from the factors estimated by unit root tests, instead, with a more advanced method, the cross-sectional averages of the individual lagged levels and first differences of all series used in the study were included in the Dickey Fuller (DF) or Extended Dickey Fuller (ADF) regression. At the same time, when the first difference is taken, the correlation between units disappears (Mamedov and Koç, 2023). The method in question is “Horizontal Section Generalized Dickey Fuller” and is briefly referred to as CADF. 'Horizontal Section Generalized Dickey Fuller (CADF)' test is an improvement of the first generation panel unit root tests, Im, Pesaran & Shin (IPS) (2003), Maddala & Wu (1999) and finally Choi (2001) tests (Pesaran, 2007).).

The CADF test takes cross-sectional dependence into account and is used in conditions where either the time dimension is larger than the cross-sectional dimension or the cross-sectional dimension is larger than the time dimension, and the regression is given in the following equation:

$$\Delta Y_{it} = \sigma_i + \dot{\rho}_\iota Y_{it-1} + d_1 Y_t + \varepsilon_{it} \quad (9)$$

In order to obtain the CIPS (Cross-Sectionally Augmented IPS) unit root statistic across the created panel, the average of the unit root test statistics (CADFi) of the horizontal section units must be taken and the CIPS test statistic is calculated with the following formula:

$$CIPS = \frac{1}{N} \sum_{i=1}^{N} CADF_i \quad (10)$$

CIPS and CADF values obtained as a result of the application of the unit root test should be compared with the critical table values created by Monte Carlo Simulation, a mathematical calculation algorithm by Pesaran (2007) (Pesaran, 2006). Before considering the obtained values at the 1%, 5% and 10% significance level, the absolute value obtained with the applied analysis should be compared by taking into account the time dimension (T) and cross-sectional dimension (N) of the model. If the critical table value is greater than the absolute value obtained, the series is not stationary. If the absolute value obtained with the test result is greater than the critical table value, the null hypothesis is rejected and the alternative hypothesis is accepted (Pesaran, 2007:265-312).

7. Findings and Discussion

In the first stage of the study, the cross-sectional dependency of the data sets was tested. Breusch-Pagan (1980) LM, Pesaran (2008) CD and Pesaran, Ullah & Yamagata (2008) LMadj tests were applied to test the cross-section dependence of 23 selected countries among OECD countries against 23 years of data covering the years 2000-2022. Accordingly, it was concluded that the probability values of the variables were less than 0,05. In short, the H_0 hypothesis, which stated that there is no cross-sectional dependence, was rejected for the test, and the H_1 hypothesis, which stated that there was a cross-sectional dependence, was accepted.

Considering the results of cross-sectional dependence between the series, it was preferred to apply second generation unit root tests instead of first generation panel unit root tests. CADF (Cross Sectionally Augmented Dickey Fuller) test, which is the second generation unit root test and developed by Pesaran (2007), was applied. If the CADF test statistic values are greater than the CADF critical table values, the H_0 hypothesis (H_0: The series is not stationary) is rejected and the H_1 hypothesis (H_1: The series is stationary) is accepted. In terms of both NEET rate series and Growth Rate series, both data sets are stationary at level. So H_1 hypothesis is accepted. The results of unit root tests are also shown in the appendix section below.

A choice is made between fixed and random effects models depending on whether unit effects are correlated with independent variables or not. If the independent variables and unit effects are not correlated, the random effects model is valid. However, if the unit effect and the independent variables are correlated, it is decided that the random effects model is inconsistent and the fixed effects model is valid. The fact that the difference between the parameters is not significant in this test shows that the random effects estimator is effective. In this case, the random effects model is preferred. However, if the difference between the parameters is significant, that is, systematic, the random effects estimator is not consistent, but the fixed effects estimator is consistent, so the fixed effects model is preferred. For this, the Hausman (1978) test is applied. It is a test in which it is decided which estimator to use when the unit effect, time effect or both unit and time effects are valid. After deciding that the classical model is not suitable with the F test, a choice can be made between fixed and random effects estimators with the Hausman test.

When subjected to the Hausman (1978) test in terms of the data sets used for the applied panel data regression model; In response to the basic hypothesis Ho: There is no correlation between explanatory variables and unit (specific) effect, the alternative hypothesis H_1: There is a correlation between explanatory variables and unit (specific) effect is tested. As a result of the test, the H_0 hypothesis is accepted, in which case the fixed effects model is preferred.

Finally, when the panel is run to estimate the panel data regression model, the results in Table 2 below are obtained.

Table 2. Panel Data Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GROWTH_RA	-0.157436	0.053809	-2.925822	0.0036
C	15.41602	0.161864	95.24055	0.0000

Effects Specification
Cross-section fixed (dummy variables) Period fixed (dummy variables)

R-squared	0.873605	Mean dependent var	15.06371
Adjusted R-squared	0.861829	S.D. dependent var	6.692973
S.E. of regression	2.487867	Akaike info criterion	4.743670
Sum squared resid	2989.520	Schwarz criterion	5.115060
Log likelihood	-1208.701	Hannan-Quinn criter.	4.889050
F-statistic	74.18575	Durbin-Watson stat	0.235402
Prob(F-statistic)	0.000000		

As can be seen from Table 2, in the panel data regression model, the regression was significant and calculated as R2 = 0.87, and the F test was significant. Likewise, t statistics values and Prob. values are meaningful. As a result of these results, the model:

$$\Delta n_t = 15{,}41602 - 0{,}157436(y\text{-}2{,}24) + \varepsilon_t \qquad (11)$$

It will be written as . Based on this, we can conclude that a 1% increase in NEET rates reduces growth by 0.15. However, when we look at the result we want to achieve, according to the algebraic operation result for equation (11), every 1% growth above the 2.24% growth rate will decrease the NEET rates by 6.35%. In other words, when growth exceeds the average growth rate of 2.24% in OECD countries, a 6.35% decrease in NEET rates can be expected.

Conclusion

According to the panel data regression model for selected OECD countries, Okun's Law is valid. Of course, each country has its own population, labor force and capital dynamics and they vary. Therefore, the validity and coefficients of Okun's Law will be determined according to these dynamics within each country. The main purpose here was to determine the existence of a relationship between NEET rates and growth rates from the perspective of developed and developing countries.

As can be seen, just as growth rates have a negative impact on NEET rates, it also appears that an increase in NEET rates has a decreasing or slowing down effect on growth rates for countries. Just like the negative impact on unemployment rates, the idle young population that is not in the economically active labor market can also pose an obstacle to the economic growth of a country. When considered in terms of OECD countries, every 1% increase in NEET rates causes a loss of 0.157% in GDP. Of course, this loss should be interpreted as the difference from the potential.

Considering the slowing effect of NEET rates on growth rates such as unemployment rates, it is important to attract the idle but potentially active segment of the 15-29 age group back to productivity. For this reason, each country should use active labor force policies and apply passive policies in a balanced manner, according to its own labor force and capital dynamics. The population that is actively involved in the workforce and productive will definitely contribute positively to GDP.

However, for this to be sustainable, countries that can achieve an average increase rate of 2.24%, which we can describe as a sustainable growth rate for OECD countries, can find a response of 6.35% for the next 1% increase. To understand the reasons for this, more specific analyzes should be made by associating the economic growth factors of developed and developing countries with the NEET rates. By determining the impact factors, the probability of success of the policies to be implemented will increase accordingly.

The most important change that should not be forgotten here is that the NEET problem should be accepted as a structural problem, and the age group of 15-24 will now consist of Generation Z young people. It should be expected that the concept of NEET will change in its identity, structure and personality analysis as of 2024, and new strategies should be prepared accordingly and adapted to the programs. Today, it cannot be clearly predicted how this situation will affect GDP or whether the growth in GDP will activate NEETs (Çolak and Koç, 2023b).

Appendix

Cross-Section Dependence Test
Series: GROWTH_RA
Null hypothesis: No cross-section dependence (correlation)
Sample: 2000 2022
Periods included: 23
Cross-sections included: 23
Total panel observations: 529
Note: non-zero cross-section means detected in data
Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	2896.773	253	0.0000
Pesaran scaled LM	117.5300		0.0000
Bias-corrected scaled LM	117.0073		0.0000
Pesaran CD	52.25398		0.0000

Cross-Section Dependence Test
Series: NEET_RATE
Null hypothesis: No cross-section dependence (correlation)
Sample: 2000 2022
Periods included: 23
Cross-sections included: 23
Total panel observations: 529
Note: non-zero cross-section means detected in data
Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	1302.549	253	0.0000
Pesaran scaled LM	46.65814		0.0000
Bias-corrected scaled LM	46.13541		0.0000
Pesaran CD	17.95483		0.0000

Levin-Lin-Chu unit-root test for GrowthRa

Ho: Panels contain unit roots Number of panels = 23
Ha: Panels are stationary Number of periods = 23

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included Cross-sectional means removed

ADF regressions: 0.22 lags average (chosen by AIC)
LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-17.1947	
Adjusted t*	-11.5431	0.0000

Levin-Lin-Chu unit-root test for NEETRate

Ho: Panels contain unit roots Number of panels = 23
Ha: Panels are stationary Number of periods = 23

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included Cross-sectional means removed

ADF regressions: 0.35 lags average (chosen by AIC)
LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-8.4654	
Adjusted t*	-3.7708	0.0001

Redundant Fixed Effects Tests
Equation: EQ01
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	146.133001	(22,483)	0.0000
Cross-section Chi-square	1076.785188	22	0.0000
Period F	4.863933	(22,483)	0.0000
Period Chi-square	105.861859	22	0.0000
Cross-Section/Period F	75.740716	(44,483)	0.0000
Cross-Section/Period Chi-square	1093.355359	44	0.0000

Table Growth and NEET Rates in Selected OECD Countries

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	G.R.	3,40	2,70	4,00	3,10	4,00	3,00	2,70	4,40	2,40	2,00	2,50	2,70	3,90	2,20	2,60	2,30	2,70	2,50	2,90	1,80	-2,20	5,50	3,90
Australia	N.R.	13,19	12,98	12,74	12,59	12,32	11,44	11,4	10,53	10,41	12,32	11,83	11,52	11,72	13,02	12,65	11,83	11,35	10,95	10,84	10,4	14,24	10,38	9,62
	G.R.	3,70	1,10	1,70	1,00	3,60	2,30	2,60	3,70	0,40	-2,00	2,90	1,70	0,70	0,50	1,60	2,00	1,30	1,60	1,80	2,20	-5,30	6,90	3,00
Belgium	N.R.	12,92	11,74	14	14,36	13,99	14,19	13,9	12,73	12,11	12,74	14,21	13,89	14,96	14,98	15,01	13,81	12,99	13,24	12,75	12,6	12,46	11,27	9,6
	G.R.	5,10	1,90	3,00	1,80	3,10	3,20	2,60	2,00	1,00	-2,90	3,10	3,10	1,80	2,30	2,90	0,60	1,00	3,00	2,70	1,90	-5,00	5,30	3,80
Canada	N.R.	13,71	13,08	13,51	12,87	12,98	12,33	12,02	12,09	11,92	13,36	13,67	13,36	13,4	12,48	13,4	13,26	13,09	12,18	11,95	11,27	13,58	13,7	10,98
	G.R.	4,00	3,00	1,60	3,60	4,80	6,60	6,80	5,60	2,70	-4,70	2,40	1,80	-0,80	0,00	2,30	5,40	2,50	5,20	3,20	3,00	-5,50	3,60	2,40
Czechia	N.R.	18,55	17,42	16,9	16,88	17,18	15,9	14,07	11,74	10,88	12,83	13,24	12,75	13,42	13,24	12,49	12,23	11,62	10,91	9,99	9,8	10,58	11,89	11,88
	G.R.	3,70	0,80	0,50	0,40	2,70	2,30	3,90	0,90	-0,50	-4,90	1,90	1,30	0,20	0,90	1,60	2,30	3,20	2,80	2,00	1,50	-2,40	6,80	2,70
Denmark	N.R.	5,84	6,18	5,58	8,89	8,61	8,22	6,23	7,06	7,58	8,85	11,94	12,76	13,29	12,59	13,08	11,43	9,7	12,67	12,03	11,62	11,69	10,89	10,3
	G.R.	3,90	2,00	1,10	0,80	2,80	1,70	2,40	2,40	0,30	-2,90	1,90	2,20	0,30	0,60	1,00	1,10	1,10	2,30	1,90	1,80	-7,50	6,40	2,50
France	N.R.	14,99	14,48	14,74	14,12	14,6	14,52	15,15	14,47	14,03	15,63	16,61	16,41	16,58	16,34	16,25	17,2	17,19	16,55	16,1	15,45	15,03	15,06	13,42
	G.R.	2,90	1,70	-0,20	-0,70	1,20	0,70	3,80	3,00	1,00	-5,70	4,20	3,90	0,40	0,40	2,20	1,50	2,20	2,70	1,00	1,10	-3,80	3,20	1,80
Germany	N.R.	13,31	13,09	12,62	12,86	13,45	14,7	13,6	12,58	11,65	11,64	11,97	11	9,94	9,68	9,17	8,57	9,61	9,34	9,19	8,23	9,22	10,2	8,86
	G.R.	3,90	4,10	3,90	5,80	5,10	0,60	5,70	3,30	-0,30	-4,30	-5,50	-10,10	-7,10	-2,50	0,50	-0,20	-0,50	1,10	1,70	1,90	-9,30	8,40	5,60
Greece	N.R.	21,52	19,79	20,14	19,38	20,4	19,55	16,7	16,57	15,98	16,62	18,09	21,59	26,74	28,47	28,31	26,15	23,54	22,75	21,45	19,58	18,75	21,38	16,01
	G.R.	4,50	4,10	4,70	4,10	5,00	4,30	3,90	0,30	1,00	-6,60	1,10	1,90	-1,30	1,80	4,20	3,70	2,20	4,30	5,40	4,90	-4,50	7,10	4,60
Hungary	N.R.	20,21	18,86	19,49	18,83	17,08	17,24	17,04	15,61	16,27	17,74	18,92	18,53	18,88	20,48	17,48	15,89	15,18	14,02	13,5	13,3	14,32	13,08	10,79
	G.R.	9,40	5,30	5,90	3,00	6,80	5,70	5,00	5,30	-4,50	-5,10	1,70	1,30	-0,10	1,20	8,80	24,50	1,80	9,30	8,50	5,30	6,60	15,10	9,40
Ireland	N.R.	8,97	8,95	10,29	10,79	10,72	10,48	10,4	10,75	12,79	18,58	20,79	21,92	21,09	19,24	18,03	16,2	14,84	13,11	11,73	11,05	11,01	11,79	8,94
	G.R.	3,80	2,00	0,30	0,10	1,40	0,80	1,80	1,50	-1,00	-5,30	1,70	0,70	-3,00	-1,80	0,00	0,80	1,30	1,70	0,90	0,50	-9,00	8,30	3,70
Italy	N.R.	23,29	22,16	20,67	20,6	20,53	21,06	20,08	20,02	19,15	21,17	22,98	23,16	24,62	26,1	27,71	27,38	26,02	25,11	23,67	23,54	23,52	26	22,93
	G.R.	6,90	3,10	3,20	2,60	4,20	2,50	6,00	8,10	-0,30	-3,20	3,80	1,00	1,60	3,20	2,60	2,30	5,00	1,30	1,20	2,90	-0,90	7,20	1,40
Luxembourg	N.R.	8,1	8,18	7,48	7,03	8,74	7,33	8,56	8,94	8,48	7,93	7,14	7,24	8,18	6,06	8,21	8,43	8,085	7,74	8,39	5,55	7,91	7,76	6,68
	G.R.	5,00	-0,50	-0,20	1,20	3,60	2,10	4,80	2,10	0,90	-6,30	5,00	3,40	3,60	0,90	2,50	2,70	1,80	1,90	2,00	-0,30	-8,60	5,70	3,90
Mexico	N.R.	24,63	24,59	24,24	24,76	24,24	23,72	23,23	23,33	23,43	24,38	23,7	24,02	22,88	22,3	22,38	21,94	21,77	21,2	20,88	20,66	22,14	20,86	19,48
	G.R.	4,20	2,30	0,20	0,20	2,00	2,00	3,50	3,80	2,20	-3,70	1,30	1,50	-1,00	-0,10	1,40	2,00	2,20	2,90	2,40	2,00	-3,90	6,20	4,30
Netherlands	N.R.	6,7	6,73	7,07	7,71	7,54	7,26	6,2	6,72	5,11	7	6,77	6,88	6,71	8,45	8,14	7,24	7,04	6,62	6,29	6,07	5,61	5,29	4,52
	G.R.	3,30	2,10	1,40	0,90	4,00	2,70	2,50	2,90	0,50	-1,90	0,80	1,10	2,70	1,00	2,00	1,90	1,20	2,50	0,80	1,10	-1,30	3,90	3,00
Norway	N.R.	6,95	7,49	8,01	8,74	8,62	8,06	7,89	7,52	6,67	7,98	8,45	8,46	8,4	9,08	9,28	9,16	9,41	8,82	8,67	7,93	7,92	8,36	6,48
	G.R.	4,60	1,30	2,00	3,50	5,00	3,50	6,10	7,10	4,20	2,80	2,90	5,00	1,50	0,90	3,80	4,40	3,00	5,10	5,90	4,50	-2,00	6,90	5,30
Poland	N.R.	22,08	20,7	20,99	20,53	20,34	18,37	17,43	15,54	13,66	14,22	15,02	15,48	15,98	16,95	15,84	15,65	15,05	13,26	12,69	12,5	13,45	13,84	13,11
	G.R.	3,80	1,90	0,80	-0,90	1,80	0,80	1,60	2,50	0,30	-3,10	1,70	-1,70	-4,10	-0,90	0,80	1,80	2,00	3,50	2,80	2,70	-8,30	5,70	6,80
Portugal	N.R.	10,53	9,93	10,66	12,06	12,7	12,87	12,39	13,43	12,22	12,8	13,47	15,29	16,62	17,32	19,16	16,54	16,87	13,33	12,49	12,19	11,72	13,97	11,07
	G.R.	1,20	3,30	4,50	5,50	5,30	6,60	8,50	10,80	5,60	-5,50	6,70	2,70	1,30	0,60	2,70	5,20	1,90	2,90	4,00	2,50	-3,30	4,80	1,80
Slovak Republic	N.R.	30,41	31,39	26,81	23,86	21,79	20,55	19,13	17,21	16,17	16,12	18,82	19,12	18,79	19,11	18,71	17,21	15,9	16,22	15,15	13,33	14,22	14,28	12,5
	G.R.	5,20	3,90	2,70	3,00	3,10	3,70	4,10	3,60	0,90	-3,80	0,20	-0,80	-3,00	-1,40	1,40	3,80	3,00	3,00	2,30	2,00	-11,20	6,40	5,80
Spain	N.R.	15,65	14,67	14,98	15,02	14,65	17,14	15,88	15,61	16,67	22,63	23,65	24,31	25,63	27,15	24,31	22,82	21,68	19,87	19,06	18,26	18,47	19,41	16,48
	G.R.	4,80	1,40	2,20	2,30	4,30	2,90	4,70	3,40	-0,50	-4,30	6,00	3,20	-0,60	1,20	2,70	4,50	2,10	2,60	2,00	2,00	-2,20	6,10	2,90
Sweeden	N.R.	7,9	7,34	7,95	8,41	9,54	9,18	10,46	10,08	8,75	10,99	10,27	9,06	9,7	9,36	9,45	9,08	8,23	8,04	8,86	7,03	7,56	8,77	7,28
	G.R.	6,90	-5,80	6,40	5,80	9,80	9,00	6,90	5,00	0,80	-4,80	8,40	11,20	4,80	8,50	4,90	6,10	3,30	7,50	3,00	0,80	1,90	11,40	5,50
Türkiye	N.R.	37,83	38,89	39,64	41,14	41,91	43,58	42,64	41,33	41,99	39,58	36,63	34,62	32,94	31,26	31,56	28,78	28,2	27,22	26,48	28,77	28,73	28,69	27,93
	G.R.	4,30	2,60	1,80	3,10	2,40	2,70	2,40	2,60	-0,20	-4,60	2,20	1,10	1,50	1,80	3,20	2,20	1,90	2,70	1,40	1,60	-10,40	8,70	4,30
UK	N.R.	13,32	13,06	13,31	13,65	13,46	14,17	15,11	14,94	14,75	15,67	15,93	15,5	16,29	15,59	14,4	13,74	13,19	12,19	12,6	12,28	12,41	11,81	10,6
	G.R.	4,10	1,00	1,70	2,80	3,80	3,50	2,80	2,00	0,10	-2,60	2,70	1,60	2,30	2,10	2,50	2,90	1,80	2,50	3,00	2,50	-2,20	5,80	1,90
USA	N.R.	11,71	12,05	13,37	12,92	13,12	13,43	12,46	12,11	12,78	14,54	15,61	14,84	13,99	16,95	16,36	15,56	14,68	13,66	13,49	13,37	13,4	16,35	14,46

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