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Does economic freedom alleviate youth disengagement? An empirical analysis of NEET in the European Union

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ABSTRACT

This study explores the impact of economic freedom on NEET (Not in Employment, Education, or Training) rates among youth aged 15–29 across 27 EU countries. Using data for 2002–2022, the study conducts a panel data analysis employing the Augmented Mean Group (AMG) estimator. Findings show that greater economic freedom significantly reduces NEET rates, with consistent effects across age subgroups. Results remain robust across alternative measurements, while economic growth and inflation are also influential. In line with SDG 8, policies promoting youth entrepreneurship, expanding vocational training, easing labour market entry, and enhancing structural economic freedom are recommended to foster decent work, inclusive growth, and long-term youth engagement in the EU.

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1. Introduction

Young people who are neither in employment nor in education and training (NEET) represent a significant aspect of the development issue. The exclusion of young people from education and employment processes can lead to economic challenges such as productivity loss, increasing poverty, and lower living standards. Moreover, it can give rise to social problems such as social exclusion, mental health disorders, and increased crime rates. Recognizing its impact on development, the reduction of NEET rates has been included under the 'Decent Work and Economic Growth' goal of the United Nations Sustainable Development Goals. The European Union's target in the context of NEET is 9% of the population of young people aged 15–29 by 2030 (EUROSTAT 2024). EUROSTAT data show that some EU member countries have exceeded this target by 2023, while others are facing challenges in reaching it. There are significant differences in NEET rates across member states. The EU average rate is 11.2%. The lowest rate belongs to the Netherlands with 4.8%, while the highest rate belongs to Romania with 19.3%. This difference between member countries is not easily explained by their income levels. According to World Bank (2024) data, Italy's real GDP per capita (constant 2015) is $34,088, while Slovenia's is $25,708. However, the NEET rate in Italy is 16%, while in Slovenia it is 7.8%. The differences in rates between member states need to be explained. In this study, we explain the differences in NEET rates by the countries'

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levels of economic freedom. In countries where young NEET rates are relatively high, such as Romania, Italy, and Greece, the economic freedom indicators show lower levels of freedom than in countries where the rate is low, such as the Netherlands and Sweden (The Heritage Foundation 2024). The indicators raise the research question of whether NEET rates across European countries can be explained by levels of economic freedom.

Economic freedom refers to a system that protects individual property rights, guarantees contractual freedom, and supports open competition within the framework of market-based rules (Gwartney and Lawson 2003; Rabushka 1991). It is seen as a mechanism that enhances both economic prosperity and social security. This form of freedom contributes to growth by expanding opportunities, enabling efficient resource allocation, and encouraging innovation (Li 2012). In addition to economic gains, economic freedom is linked to favourable social outcomes. These include reduced corruption, longer life expectancy, lower infant mortality, and higher living standards. It also supports political and civil liberties by strengthening democratic processes and improving governance quality (Berggren 2003; Shen and Williamson 2005). Friedman and Friedman (1980) conceptualized economic freedom as the ability to determine how one's income is used, particularly with taxation and government expenditure. Economic freedom was portrayed as a mechanism through which secure property rights and consistent public policies enable individuals to realize their potential and enhance social mobility. However, subsequent empirical research has indicated that the effectiveness of these mechanisms may depend on institutional context. For example, Hall and Lawson (2014) show that while economic freedom generally supports growth and opportunity, its impact on equity and inclusion is shaped by the presence of complementary regulatory and welfare frameworks. Institutional economists such as North (1991) and Acemoglu, Johnson, and Robinson (2005) argue that economic development depends on robust institutions, especially those protecting property rights and upholding the rule of law. In their view, higher levels of economic freedom promote institutional transparency and accountability, which in turn create a favourable environment for investment and innovation. Public choice theorists, including Buchanan and Tullock, offered a different angle. They viewed economic freedom primarily as a safeguard against excessive state intervention. Limiting government influence, according to this perspective, empowers market participants and helps reduce inefficiencies caused by rent-seeking behaviour and political favouritism (Rabushka 1991, 26).

Fundamentally, economic freedom is considered likely to reduce youth unemployment by improving labour market functionality and fostering economic development. As emphasized in Schumpeter's (1950) theory of creative destruction, encouraging the entrepreneurial and innovative ideas of young people can transform economies and create more flexible job opportunities. This process may, in turn, reduce NEET rates. Youth who frequently move between work and education can particularly benefit from the growth effects generated by expanded economic freedoms. According to Becker's (1964) human capital theory, youth unemployment often stems from mismatches between skill supply and labour market demand. Well-designed human capital policies can help young individuals build confidence and acquire market-relevant skills. Economic freedom facilitates not only individual mobility within labour markets but also enables societies to translate human capital investments into broader economic gains

more effectively. The dynamic interaction between economic freedom and youth human capital is thus essential for promoting growth and social welfare. In a similar vein, the dual labour market theory highlights that young workers are often confined to insecure, secondary labour market positions. Active and adaptive labour market policies are needed to integrate these individuals into more stable employment pathways (Uyanık 1999, 3–4). Friedrich A. Hayek is recognized as one of the most influential proponents of economic freedom in the twentieth century. In his view, freedom is a fundamental human value, and it is argued that excessive government intervention and central planning could constrain individuals' ability to make autonomous economic choices (Li 2012, 6). However, more recent empirical studies such as Grier (2024) suggest that the outcomes of economic liberalization, as envisioned by Hayek (1988), may vary depending on institutional quality and the presence of inclusive social policies.

Some scholars have offered opposing views regarding the relationship between economic freedom and NEET outcomes. These perspectives emphasize the importance of government intervention—particularly in educational planning—to support young people during the school-to-work transition. Given the complex nature of this transition, a comprehensive policy approach is needed. This includes not only labour market reforms but also the development of institutional support systems to reduce youth unemployment. Previous studies have suggested that combating NEET requires multifaceted strategies. These include improving the macroeconomic environment, targeting employment growth in sectors such as tourism and information and communication technologies, and introducing reforms in agriculture (Gomez-Salvador and Leiner-Killinger 2008; Görlich, Stepanok, and Al-Hussami 2013). Another critical area is the enhancement of employability. This can be achieved through government-led policies that ease the shift from education into the labour force. Such tailored interventions may help address country-specific youth labour challenges and contribute to lowering unemployment rates (Kang 2021; Yeung and Yang 2020). Dual education systems that combine vocational training with work experience have proven effective, especially in countries like Germany and Japan. In addition, active labour market policies—such as entrepreneurship training and job search assistance—are recommended to further strengthen young individuals' labour market integration (Özdemir, Özcan, and Birecikli 2024; Verick 2023). When comparing the views based on economic freedom and government intervention, it is possible to talk about the advantages and disadvantages of both.

The involvement of young people in precarious employment creates a multidimensional vulnerability that stems not only from a lack of job security but also from unstable living conditions. This situation limits their access to education and vocational development opportunities while also hindering their ability to meet basic needs and achieve economic freedom. Excessive labour market liberalization may lead to the proliferation of temporary, low-paid, and unprotected forms of employment for youth. Thus, while expanding economic freedom can support youth employment, it may also produce adverse consequences if youth-specific protective regulations and social security mechanisms are weakened. To mitigate these risks, several institutional pathways can be pursued. These include expanding access to education and skill development (e.g. certification programmes), strengthening transition mechanisms (such as internship and apprenticeship programmes for precariously employed youth), and enhancing family and social support systems (e.g. integrating youth from low-security households into employment).

In addition, legal regulations aimed at reducing precarious work and gender-sensitive support programmes that ensure equal access for both women and men can promote more equitable and sustainable participation of young people in the labour market (Stuth and Jahn 2019, 706–707)

Economic freedom encourages economic activities by providing an environment where taxes, regulatory barriers, and bureaucracy are less. However, it increases the risk of young people becoming NEET due to the inadequacy of social security systems. Government intervention can contribute to the school-to-work transition process with the help of targeted planning. It can also reduce unemployment by intervening in the market during recession periods. However, it can undermine the idea of competition by increasing dependence on the state. This dilemma in theory makes the issue more empirical. Furthermore, the institutional determinants of NEET status remain largely unexplored in the literature; to our knowledge, this study offers the first empirical investigation of this relationship. The main purpose of this study is to empirically analyze the relationship between economic freedom and NEET. Economic freedom is often associated with growth and employment. To the best of our knowledge, no study about the economic freedom impact on NEET has been conducted in the relevant literature. The findings are insightful for policymakers in reducing the NEET rate while achieving sustainable development goals. Section two includes a literature review, section three presents the empirical study and includes a discussion of the findings, and finally, policy implications are discussed in the conclusion.

2. Literature review

Youth unemployment is a persistent global challenge shaped by a complex interplay of structural, institutional, and individual-level factors. Among the most critical structural drivers are the distribution of opportunities across society, demographic dynamics, macroeconomic conditions, and labour market policies such as employment protection legislation and minimum wage regulations. Equally influential are education systems and their outcomes, including the duration and quality of education and the availability of vocational training opportunities (Banks and Jackson 1982; Clark and Oswald 1994; Goldsmith, Veum, and Darity 1996, 1997; Linn, Sandifer, and Stein 1985). Periods of economic recession, rapid technological change, and shifts in global trade patterns have further exacerbated youth labour market instability. These changes often disproportionately harm younger workers due to their limited experience and weaker labour market attachment (Dietrich 2012; Gomez-Salvador and Leiner-Killinger 2008; Görlich, Stepanok, and Al-Hussami 2013). Additionally, globalization and outsourcing trends have led to more temporary and low-wage employment opportunities for youth, weakening their long-term employment prospects (Banks and Jackson 1982; Goldsmith, Veum, and Darity 1996, 1997; Gomez-Salvador and Leiner-Killinger 2008). Other contributing factors include the ineffectiveness of active labour market policies and the demographic pressure of rising youth populations in regions with limited labour demand, such as the Middle East and North Africa, and OECD (Dietrich 2012; Görlich, Stepanok, and Al-Hussami 2013; Kang 2021; Putun, Karatas, and Akyıldız 2017).

The concept of NEET has gained prominence as a multidimensional indicator encompassing both economic inactivity and social vulnerability among youth.

Unlike traditional unemployment metrics, NEET includes not only active job seekers but also discouraged workers, early school leavers, and those excluded from the labour market due to caregiving duties or health constraints (Paabort et al. 2023). NEET youth are often classified as active (still searching) or passive (disengaged or discouraged). While NEET status has traditionally correlated with low-income and low-education backgrounds, recent studies reveal its growing prevalence among higher-educated youth, largely due to school-to-work transition difficulties and saturated labour markets (Carcillo et al. 2015; ILO 2020). The personal consequences of NEET status are profound and lasting. Prolonged detachment from economic life can lead to low self-esteem, mental health issues, social exclusion, and heightened risk of criminal involvement (Khussainova et al. 2023; Matli and Ngoepe 2021). At the societal level, NEET status perpetuates intergenerational poverty and imposes broader economic and social costs. Socioeconomic disadvantage, limited education, and lack of work experience further increase NEET risk, especially in labour markets with high entry barriers or strict experience requirements (Rahmani and Groot 2023). Additionally, increasing youth non-participation—often linked to higher educational enrollment—may obscure underlying unemployment trends, complicating policy evaluation (Dietrich 2012, 2013; Jimeno and Rodriguez-Palenzuela 2002; O'Higgins 2015; Putun, Karatas, and Akyıldız 2017).

In response to growing concerns, policymakers have increasingly focused on NEET as a policy target. The European Commission, for instance, has included NEET rates in its Europe 2020 strategy to reduce youth exclusion and promote inclusive labour markets. However, the heterogeneity of the NEET population—ranging from vulnerable early school leavers to highly educated but inactive individuals—calls for nuanced and data-driven interventions (Paabort et al. 2023). At the micro level, a wide array of demographic and socioeconomic factors has been associated with NEET status. These include gender, age, education level, household income, and parental education. Migration history, geographic location, and caregiving responsibilities are also significant determinants. Additionally, factors such as religion, prior unemployment, and individual risk-taking behaviour have been linked to NEET outcomes. These relationships are documented in a broad body of literature. Early studies emphasized structural and family-based disadvantages (Archer et al. 2005; Pemberton 2008; Strelitz 2003). Other works highlight the effects of socio-demographic background and labour market transitions (Karyda and Jenkins 2018; Ranzani and Rosati 2013; Wong 2016). More recent studies confirm the role of education, economic vulnerability, and behavioural traits in shaping NEET status (Abayasekara and Gunasekara 2019; De Lannoy and Mudiriza 2019; Dvouletý, Lukeš, and Vancea 2019; Quintano, Mazzocchi, and Rocca 2018; Rahmani and Groot 2023; Wickremeratne and Dunusinghe 2018). Collectively, these studies reflect the dominant sociological and demographic orientation in the NEET literature.

The literature can be categorized into four main strands. The first strand explores the individual and social characteristics that increase NEET risk. Bynner and Parsons (2002) emphasize the long-term disadvantages associated with low educational attainment and unstable family structures. Yates et al. (2011) and O'Dea et al. (2014) highlight the impact of mental health and behavioural challenges. Baggio et al. (2015) and Maguire (2015) point to the role of social isolation and limited support networks.

Rodwell et al. (2018) and Raghupathi and Raghupathi (2020) further confirm that poor health and family-related vulnerabilities significantly elevate NEET risk. The second strand critiques the conceptual boundaries of the NEET category. Researchers in this area argue that the label obscures the diversity of youth experiences and fails to distinguish between those temporarily disengaged and those structurally excluded. They advocate for more precise classification systems and more differentiated interventions (Cuervo and Wyn 2014; Furlong 2006; Roberts 2011). The third strand focuses on programme evaluation. Studies here examine the effectiveness of interventions such as vocational training, soft skills development, counselling, internships, job placement services, and financial incentives. They generally find that personalized and intensive programmes—especially those combining several elements—are more successful in improving long-term employment and earnings outcomes (Berigel et al. 2023, 2024; Mawn et al. 2017; Simoes et al. 2022). The fourth strand investigates the macroeconomic and institutional determinants of NEET rates. These include the effects of economic growth, recession, fiscal policy, education spending, part-time employment, and labour market regulation. For instance, Dietrich (2013) and Dietrich and Möller (2016) analyzed youth unemployment transitions in Europe, highlighting the role of institutional factors and education systems. Bruno, Marelli, and Signorelli (2014) found that economic crises significantly raise NEET rates across EU countries. Caporale and Gil-Alana (2014) identified long-term correlations between macroeconomic indicators such as GDP per capita and inflation and youth unemployment.

More recent contributions have examined how macroeconomic volatility and structural labour market reforms impact youth labour outcomes. Caroleo, Rocca, and Mazzocchi (2020) found that economic crises tend to increase both NEET rates and long-term youth unemployment in EU countries, emphasizing the vulnerability of young people to cyclical downturns. In a related analysis, Liotti (2020) assessed the effectiveness of labour market reforms and concluded that flexibility-oriented policies have shown limited success in reducing youth exclusion, particularly in countries affected by recurrent economic shocks. While these studies do not directly assess institutional quality, they underscore the limitations of short-term or one-dimensional policy responses in the absence of stable macroeconomic and structural conditions. Kilishi, Adebowale, and Oladipupo (2021) studied 37 Sub-Saharan African countries and reported that economic institutions—such as fiscal freedom and trade openness—have significant long-run effects on reducing unemployment. Bal-Domańska (2021) showed that GDP per capita and adult employment reduce youth unemployment in the EU, while excessive labour policy spending can have adverse effects. Although economic freedom has been extensively examined in the context of economic growth and employment, its relationship to NEET status remains relatively underexplored. This represents a key gap in the literature. Few studies have directly investigated how institutions that foster market openness, personal choice, and property rights affect the risk of youth economic disengagement. One of the rare contributions is Çizel et al. (2023), who employed fuzzy-set Qualitative Comparative Analysis across OECD countries and identified economic and social welfare factors that distinguish effective NEET reduction strategies. Their findings suggest that welfare-oriented states tend to outperform liberal regimes in minimizing NEET

prevalence. Similarly, Gouider (2022) used panel OLS analysis to examine youth unemployment in GCC countries. The study found a negative relationship between economic freedom and youth unemployment, suggesting that liberalization policies may improve youth labour market outcomes. Grier (2024), using propensity score matching across 154 countries, showed that greater economic freedom is associated with significant improvements in young women's labour force participation and primary school completion, often outperforming gender-specific policy interventions.

Despite these valuable contributions, the role of economic freedom in shaping NEET rates remains insufficiently addressed, particularly in the European context. Existing studies have predominantly focused on labour market regulations, macroeconomic indicators, and educational factors without adequately considering the broader institutional environment. This study contributes to the emerging literature by empirically analyzing the relationship between economic freedom and NEET rates in 27 European Union countries over the period 2002–2022, using a panel data approach. By adopting a macro-institutional lens, the study aims to complement the existing micro-level explanations of youth disengagement.

3. Empirical framework

3.1. Model and data

The study tested the effect of economic freedom on NEET in European Union member countries. A set of control variables was used to reduce the omitted variable bias. Since the employment problem is mostly associated with growth and inflation in the literature, these variables were included in the model. In addition, both the data and the literature show that gender is an important determinant of NEET. Gender inequality was included in the model to observe this effect. Urbanization is also an important determinant of employment. The presence of more opportunities in education, industry, and trade in cities, contrasted by the lesser diversity of economic activities in rural areas, may affect NEET. (Bruno, Marelli, and Signorelli 2014; Dietrich 2013; Feldmann 2007, 2010; Jimeno and Rodriguez-Palenzuela 2002; Liotti 2020; Yeung and Yang 2020). The estimated model was constructed following existing literature.

$$\text{neet}_{it} = \alpha_0 + \alpha_1 \text{economic freedom}_{HFIit} + \alpha_{2Xit} + \alpha_3 \varepsilon_{it} \tag{1}$$

$$\text{neet}_{it} = \beta_0 + \beta_1 \text{economic freedom}_{FIIit} + \beta_{2Xit} + \beta_{3\mu it} \tag{2}$$

Equations (1) and (2) show the models estimated to determine the relationship between economic freedom and NEET, where X_{it} denotes control variables. Variable definitions and sources are given in Table 1.

The data set consists of 21 years of data covering the period 2002–2022, for 27 EU member countries. All variables are used in natural logarithmic form, except growth and inflation rates due to negative values. Explanatory variables are measured contemporaneously with the dependent variable. The selection of countries and periods is based on data availability to ensure a balanced panel. The list of analyzed countries is presented in Table 2.

Table 1. Variable definitions and sources.

Variable	Definition	Source
neet	The share of young people aged 15–29 who are neither in employment nor in education and training.	EUROSTAT (2024)
growth	Annual GDP growth rate.	World Bank (2024)
inflation	Annual inflation rate based on the consumer price index.	
urban population	The percentage share of the urban population of the total population.	
gender inequality	The gender inequality index calculated by the United Nations Development Program (UNDP) is based on reproductive health, empowerment, and the labour market.	UNDP (2024)
economic freedom$_{HFI}$	Economic Freedom Index of The Heritage Foundation	The Heritage Foundation (2024)
economic freedom$_{FII}$	The Fraser Institute's index of economic freedom is based on the work of Gwartney, Lawson, and Block (1996).	Fraser Institute (2024)

3.2. Preliminary analysis

Before selecting the analytical method for the study, a preliminary test for cross-sectional dependency was conducted. Ignoring cross-sectional dependency in panel data analysis, as traditional methods do, can result in biased and inconsistent outcomes, leading to misleading conclusions (Chudik and Pesaran 2013). Given the high degree of integration among countries, the assumption of cross-sectional independence is challenging to meet (Menyah, Nazlioglu, and Wolde-Rufael 2014). Consequently, the presence of cross-sectional dependence was assessed using the CD test developed by Pesaran (2015). This method delivers reliable results regardless of the relative sizes of the panel's time and cross-sectional dimensions. The CD test is formulated based on the equation given in Appendix A.

If the CD statistic exceeds the critical value, the null hypothesis of weak cross-sectional dependence is rejected, indicating the presence of strong cross-sectional dependence. This test was applied to the variables to determine the appropriate unit root test and to the error terms to select the estimation methods. Additionally, the homogeneity of the slope coefficients was assessed using the homogeneity test developed by Pesaran and Yamagata (2008). This test is based on Swamy's (1970) random coefficient model. The equations are illustrated in Appendix B. $\tilde{\Delta}_{adj}$ performs better than $\tilde{\Delta}$ in small samples. Both test statistics are reported to check sensitivity. If the value exceeds the critical value, the null hypothesis of homogeneity will be rejected. $\tilde{\Delta}$ In this case, it is more appropriate to use mean group estimators.

The stationarity of the variables was tested with the Cross-sectionally Augmented Dickey-Fuller (CADF) test developed by Pesaran (2007). This method solves the cross-section dependency using Pesaran's (2006) factor modelling approach by including the cross-section averages in the model as proxies of unobserved common factors. In

Table 2. List of countries.

Austria	Estonia	Italy	Portugal
Belgium	Finland	Latvia	Romania
Bulgaria	France	Lithuania	Slovakia
Croatia	Germany	Luxembourg	Slovenia
Cyprus	Greece	Malta	Spain
Czechia	Hungary	Netherlands	Sweden
Denmark	Ireland	Poland	

addition to providing robust results under cross-sectional dependency, this method is also reliable in the cases of N<T and N>T. The equations are given in Appendix C. If the CIPS statistic exceeds the critical values specified in Pesaran's (2007) study, the null hypothesis of the unit root, which refers to non-stationarity, will be rejected.

3.3. Estimation technique

Eberhardt and Bond (2009) proposed a novel estimator that performs well under cross-sectional dependency. This method is based on a factor modelling approach that results from the inclusion of the so-called common dynamic effect in the regression model. This is a two-stage process in which time dummies are added to the model as proxies for unobserved common factors.

$$\Delta y_{it} = b'\Delta X_{it} + \sum_{t=2}^{T} c_t \Delta D_t + e_{it}, \quad \hat{c}_t = \hat{\mu}_t^{\cdot} \tag{3}$$

$$y_{it} = \alpha_i + b_i' X_{it} + c_i t + d_i \hat{\mu}_t^{\cdot} + e_{it} \tag{4}$$

$$\hat{b}_{AMG} = \frac{1}{N} \sum_{i} \hat{b}_i \tag{5}$$

Equation (3) represents the first stage. This is a standard first difference OLS estimation with T-1 year dummies, where the coefficient is denoted as $\hat{\mu}_t^{\cdot}$ in the second stage. In the second stage, which is represented in equation (4), this variable is included in the models with linear trend terms for individual country regressions. Then, the individual estimates are averaged as shown in equation (5). Similar to the estimator of Pesaran (2006), the AMG estimator provides robust results in the presence of both non-stationarity and cross-sectional dependence, whether series are cointegrated or not (Eberhardt 2012).

3.4. Findings and discussion

The results of Pesaran's (2015) CD test are presented in Table 3. The tests conducted on both the variables and the error terms indicate that the null hypothesis of weak cross-sectional dependence is rejected at the 1% significance level. Consequently, the unit root test and the estimation method must account for cross-sectional dependence to ensure robust results.

Table 3. Results of the CD test.

	Statistic	*P* value
neet (%)	26.102	0.000
growth	57.765	0.000
inflation	69.023	0.000
urban population (%)	38.560	0.000
gender inequality	60.257	0.000
economic freedom$_{HFI}$	25.152	0.000
economic freedom$_{FII}$	28.319	0.000
Model$_{HFI}$	14.257	0.000
Model$_{FII}$	17.964	0.000

The homogeneity of the long-term coefficients was investigated with the Pesaran and Yamagata (2008) test, and the results are presented in Table 4. Using this test, slope homogeneity was investigated for two models based on the HFI and FII economic freedom indices. Results show the null hypothesis of homogeneity is rejected at 1% according to both $\tilde{\Delta}$ and $\tilde{\Delta}_{adj}$ statistics.

Table 5 presents the results of the CADF unit root test. At the level, both constant and trend terms are included, while the trend term is excluded in the first differenced models. The maximum lag length is set to 2, with the optimal lag determined using the F joint test, following a general-to-specific approach. The CADF test results indicate that the dependent variable, NEET, is stationary. Among the explanatory variables, gender inequality and the HFI economic freedom index are first-order integrated, while the remaining explanatory variables are stationary. The null hypothesis of a unit root is rejected at 1% for stationary variables. The AMG estimator is robust against different levels of stationarity.

The estimation results of equation (1) are reported in Table 6, where Model 1 denotes the estimations using HFI and Model 2 denotes those using FII. According to baseline estimations, economic freedom significantly reduces NEET. A 1% increase in HFI leads to about a 1.38% reduction in the NEET rate. In Model 2, where estimations are made with FII, the effect is observed to be larger at 1.67%. Both coefficients are significant at 1%. The effect is also observed to remain in the expanded models. In Model 1, a 1% increase in HFI reduces the NEET rate by 0.94%. In the estimation using FII, the effect is approximately 1.35%. Both coefficients are statistically significant at the 1% level. Additional evidence suggests that NEET is negatively associated with economic growth and inflation, as expected. A 1 % increase in economic growth reduces the NEET rate by about 0.005 %, while the impact of inflation is around 0.01 %. However, other control variables do not provide significant effects. The coefficient of urbanization is negative in both models, and it is statistically insignificant. Gender inequality is also negative and statistically insignificant. Therefore, the evidence suggests that the NEET rate in European countries is influenced more by economic and institutional factors than by demographic ones.

Tables 7 and 8 present the estimation results, using the five-year age bands 15–19, 20–24, and 25–29 as dependent variables. According to baseline estimations, the impact of economic freedom is negative and significant for all age bands. Augmented models with controls also support these findings. The effect of the Heritage Foundation Index (HFI) on the 15–19 age group is negative but not statistically significant. In contrast, the use of the Fraser Institute Index (FII) yields a statistically significant and substantial negative effect. Specifically, a 1% increase in FII is associated with a 2.6% reduction in NEET rates. The results indicate that NEET youth aged 15–19 are comparatively less responsive to the Heritage Freedom Index (HFI) than to the Fraser Index of Economic Freedom (FII). Members of this cohort are typically still subject to compulsory schooling,

Table 4. Results of the slope homogeneity test.

	$\tilde{\Delta}$	*P* value	$\tilde{\Delta}_{adj}$	*P* value
$Model_{1,\ HFI}$	10.501	0.000	10.565	0.000
$Model_{2,FII}$	12.861	0.000	12.939	0.000

Table 5. The CADF unit root test.

	CIPS Statistics		
	Level	1st difference	Result
neet	−2.842***	–	I_0
growth	−3.123***	–	I_0
inflation	−3.342***	–	I_0
urban population	−3.325***	–	I_0
gender inequality	−1.974	−3.482***	I_1
economic freedom$_{HFI}$	−2.451	−3.950***	I_1
economic freedom$_{FII}$	−2.831***	–	I_0
CV	**%1**	**%5**	
Constant and trend	−2.81	−2.66	
Constant	−2.32	−2.15	

***indicates rejection of the null hypothesis at 1%.

so those classified as NEET are predominantly early school leavers whose labour-market prospects hinge on access to apprenticeships and other entry-level training schemes. Whereas the HFI abstracts from such hiring frictions, the FII incorporates a ratio of the statutory minimum wage for trainees or first-time employees to the average value added per worker. A higher ratio raises the marginal cost of creating 'first-chance' positions, leading firms to restrict apprenticeship and trainee opportunities—an effect that disproportionately affects early school leavers. Consequently, the stronger FII coefficient for the 15–19 group is plausibly driven by this labour-market regulation component, which is absent from the HFI. Model 1 fails to adequately explain NEET in this age group, whereas Model 2 provides a better fit, capturing the influence of both NEET dynamics and inflation. Inflation exhibits a negative and statistically significant relationship with NEET, while other control variables do not show significant associations. For the 20–24 age group, both indices of economic freedom display negative and statistically significant effects. A 1% increase in HFI is linked to a 0.85% decline in NEET, whereas the corresponding figure for FII is approximately 1.68%. Economic growth also exerts a negative and statistically significant effect, although the magnitude of the coefficient remains modest. Notably, inflation has a stronger effect within this age group. In the

Table 6. Estimation results.

	Model 1		***Model*** 2	
economic freedom$_{HFI}$	**−1.375*** **	**−0.942*** **		
	(−3.53)	**(−2.69)**		
economic freedom$_{FII}$			**−1.675*** **	**−1.354*** **
			(−2.88)	**(−2.52)**
economic growth		**−0.005*** **		**−0.004** **
		(−2.75)		**(−2.04)**
inflation		**−0.011*** **		**−0.015*** **
		(−3.72)		**(−6.44)**
urban population		−0.569		−0.601
		(−0.19)		(−0.20)
gender inequality		−0.101		−0.113
		(−1.35)		(−1.19)
C	**8.419*** **	9.987	**6.050*** **	8.736
	(5.08)	(0.74)	**(4.99)**	(0.67)
X^2_{WALD}	12.48***	61.26***	8.29***	77.18***
NxT	567			

***, **, and * refer to rejection of the null hypothesis at 1%, 5%, and 10%, respectively.

Table 7. Baseline estimations with 5-year bands.

	15-19		20-24		25-29	
Economic freedom$_{HFI}$	**−1.206***		**−1.456*****		**−1.569*****	
	(−1.84)		**(−3.22)**		**(−4.01)**	
Economic freedom$_{FII}$		**−2.634*****		**−2.015*****		**−1.359****
		(−3.28)		**(−3.09)**		**(−2.14)**
C	**7.015****	**7.358*****	**8.888*****	**6.858*****	**9.497*****	**5.644*****
	(2.50)	**(4.55)**	**(4.62)**	**(5.08)**	**(5.72)**	**(4.25)**
X^2_{WALD}	3.37*	10.77***	10.35***	9.54***	16.08***	4.58**

***, **, and * refer to rejection of the null hypothesis at 1%, 5%, and 10%, respectively.

Table 8. Estimations of 5-year bands with controls.

	15–19		20–24		25–29	
Economic freedom$_{HFI}$	**−0.764**		**−0.853****		**−1.096*****	
	(−0.96)		**(−2.37)**		**(−3.16)**	
Economic freedom$_{FII}$		**−2.601*****		**−1.685*****		**−1.127***
		(−2.87)		**(−2.77)**		**(−1.72)**
economic growth	−0.003	−0.004	**−0.007*****	**−0.006*****	**−0.004****	−0.002
	(−0.81)	(−1.09)	**(−3.44)**	**(−2.94)**	**(−2.12)**	(−1.17)
inflation	−0.005	**−0.014****	**−0.011*****	**−0.017*****	**−0.009*****	**−0.013*****
	(−0.70)	**(−2.39)**	**(−3.53)**	**(−6.10)**	**(−3.12)**	**(−4.19)**
urban population	−7.857	−13.040	1.625	3.080	**2.769****	2.107
	(−1.42)	(−1.54)	(0.55)	(1.18)	**(1.13)**	(0.99)
gender inequality	−0.189	−0.109	−0.079	−0.101	−0.064	−0.130
	(−1.39)	(−0.70)	(−0.79)	(−0.84)	(−0.77)	(−1.21)
C	39.716	**63.941***	0.151	−6.762	−3.705	−3.450
	(1.60)	**(1.75)**	(0.01)	(−0.60)	(−0.35)	(−0.38)
X^2_{WALD}	5.92	30.92***	48.56***	63.77***	35.70***	29.10***

***, **, and * refer to rejection of the null hypothesis at 1%, 5%, and 10%, respectively.

case of the 25–29 age group, both economic freedom indices again demonstrate negative and statistically significant effects. The estimated impact is around 1.1% for HFI and 1.12% for FII. Similarly, economic growth and inflation are found to reduce NEET rates in this cohort, and both effects are statistically significant. Although urbanization appears to be positively associated with NEET, the robustness of this finding is questionable.

The empirical findings of this study provide clear and consistent evidence that economic freedom significantly reduces NEET rates among youth aged 15–29 in the European Union. This relationship holds across different specifications, including both baseline and controlled models, and remains robust when using two widely cited indices of economic freedom: the Heritage Foundation Index and the Fraser Institute's Economic Freedom Index. The strength and consistency of these results contribute to an emerging but still limited body of research that explores how macro-institutional environments shape youth labour market outcomes. Although the majority of existing NEET literature focuses on micro-level determinants such as family background, education level, or prior employment experience (Quintano, Mazzocchi, and Rocca 2018; Strelitz 2003; Wong 2016), a growing number of studies have begun to explore the structural and institutional dimensions of youth inactivity. In this context, the present findings align with Kilishi, Adebowale, and Oladipupo (2021), who reported that fiscal freedom and trade openness are important factors in reducing unemployment. They also support the evidence provided by Gouider (2022), who found a negative relationship

between economic freedom and youth unemployment in GCC countries. Similarly, Grier (2024) found that increased economic freedom is associated with higher labour force participation and educational attainment among young women globally. While both studies suggest that institutional openness supports youth inclusion, neither directly addressed the NEET population or focused on the European Union. This study, therefore, fills a critical empirical gap by examining this relationship in the EU context with a specific focus on NEET status, using both age-stratified data and multiple institutional indicators.

The findings also complement the work of Çizel et al. (2023), who concluded that welfare states tend to outperform liberal regimes. Çizel et al. (2023) have emphasized that economic freedom can complement, rather than contradict, the welfare state. Implementing economic freedoms alongside inclusive and accessible social policies can increase youth labour force participation, while welfare models tailored to a country's level of economic development can enhance social cohesion and employment opportunities. For instance, it has been noted that countries with social democratic welfare state policies promote the elimination of NEET through policies that appeal to a broad segment of society. Similarly, it has been stated that the understanding of individual well-being is high in countries where social welfare policies are widespread and accessible. It is recommended that economic freedom and social protection mechanisms be designed in a balanced and mutually reinforcing manner. While the present study does not directly assess welfare systems, the consistent negative effect of economic freedom across EU countries suggests that market openness and institutional quality can also be decisive in shaping youth labour outcomes. This opens space for more integrated and adjunct models of explanation where economic freedom is not positioned in opposition to public support but as part of a broader institutional framework that fosters individual autonomy and labour market access.

Importantly, the current results highlight that economic freedom explains variations in NEET rates even when traditional macroeconomic variables are accounted for. Economic growth and lower inflation rates were also associated with reduced NEET rates. The results imply that moderate inflation can curb youth NEET rates because demand-driven price rises boost hiring, sticky nominal wages compress real entry-level pay, and the real value of fixed benefits falls, raising the opportunity cost of inactivity. However, the impacts of economic growth and inflation appear noticeably weaker than those of economic freedom. These findings challenge perspectives that attribute youth inactivity solely to cyclical economic dynamics and instead point to the importance of long-run institutional conditions—such as transparent regulations, protection of property rights, and freedom to enter markets—that structure youth opportunities. This observation echoes Dietrich (2013) and Dietrich and Möller (2016), who emphasized that institutional factors shape transitions from school to work, especially in the aftermath of economic shocks. Interestingly, the current study did not find strong evidence that urbanization or gender inequality significantly influences NEET rates once institutional factors are considered. The limited effect of these variables in the EU context may reflect regional convergence on certain social norms and infrastructural characteristics, or it may suggest that economic institutions override sociodemographic variables when it comes to shaping youth economic engagement.

Regional convergence spurred by EU cohesion policies has clustered most member states at similarly high levels of gender equality, leaving insufficient cross-sectional

variation for the model and thus likely explaining the non-significant coefficient. Urbanization does not exhibit the same pattern. Among EU member states, urbanization rates vary widely, from roughly 53 % to 95 % (World Bank 2024). Theory yields no unambiguous expectation regarding the net impact of this variation on NEET prevalence. Higher levels of urbanization can expand access to jobs and education, yet they may simultaneously heighten labour-market competition and inflate housing costs, thereby deterring youth participation. In addition, the aggregate urban-population ratio obscures substantial intra-urban heterogeneity in transport connectivity, job density, and service quality. These offsetting mechanisms and measurement limitations may explain why the urbanization coefficient is statistically insignificant in our estimates. The disaggregated age-band findings further deepen the discussion by demonstrating that the relationship between economic freedom and NEET rates holds across all youth subgroups.

4. Conclusions and policy implications

Reducing NEET rates is a critical policy objective closely aligned with the Sustainable Development Goals (e.g. Decent work and economic growth), given the considerable economic costs and long-term social risks associated with youth disengagement. NEET status not only undermines the productive potential of young people in the short term but also threatens inclusive growth and social cohesion in the long run. While its causes are multidimensional and context-dependent, the challenge of youth inactivity is shared by both developed and developing economies. This study investigates the impact of economic freedom on NEET rates across European Union member states using panel data methods. The findings provide robust empirical evidence that higher levels of economic freedom are associated with lower NEET rates among individuals aged 15–29. This negative relationship holds across multiple model specifications, remains consistent when disaggregated into five-year age cohorts, and is confirmed by both the Heritage Foundation and Fraser Institute measures of economic freedom. Additional results show that economic growth and lower inflation are also correlated with lower NEET rates.

These findings suggest several policy implications, particularly for EU countries seeking to reduce youth inactivity. First, efforts to expand economic freedom through transparent regulation, reduced barriers to entry, and enhanced labour market flexibility may contribute to lowering NEET rates. Policymakers should consider reforms that foster more elastic labour market frameworks and reduce administrative burdens that disproportionately affect young workers. Simplifying business registration processes, easing licensing requirements, and promoting digital entrepreneurship platforms may help young people transition more easily into self-employment or small-scale enterprise. Second, international labour mobility and broader trade openness may complement domestic strategies by expanding employment opportunities and encouraging innovation-driven sectors. In economies where over-regulation constrains job creation, moderate liberalization of labour and product markets could create a more dynamic environment for youth inclusion.

When interpreting our findings, several limitations should be considered. First, the sample is restricted to EU member states, most of which possess relatively strong

institutional frameworks. Consequently, the results may not be readily generalizable to countries with weaker institutions. Comprehensive and reliable NEET data for many developing economies remains scarce, however, which limits the feasibility of extending the analysis beyond Europe at this stage. Second, both the Fraser and Heritage indices are composite measures that, by construction, may overlook some country-specific regulations that shape economic freedom. This underscores the value of complementary country-level studies that can capture such nuances. Finally, the NEET phenomenon could be further unpacked by considering heterogeneity not only across age cohorts but also by educational attainment, migrant status, and other socio-economic dimensions. Future micro-level research incorporating these layers of diversity would provide a richer understanding of the mechanisms at work and enhance the external validity of our conclusions.

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Appendices

Appendix A. Equations of cross-sectional dependence test

The CD test developed by Pesaran (2015) is based on the following equation.

$$CD = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}\right) \tag{A1}$$

In equation (A1), T and i represent the time and cross-sectional dimensions, respectively, while $\hat{\rho}_{ij}$ denotes the correlation of the error terms derived from individual ordinary least squares estimations.

Appendix B. Equations of slope homogeneity tests

$$\hat{S} = \sum_{i=1}^{N}(\tilde{\beta}_i - \widetilde{\beta}_{WFE})\frac{x_i' M_T x_i}{\tilde{\sigma}_i^2}(\tilde{\beta}_i - \widetilde{\beta}_{WFE}) \tag{B1}$$

Equation (B1) shows a random coefficient model where M_T is the identity matrix. $\tilde{\beta}_i$ and $\widetilde{\beta}_{WFE}$ indicate coefficients obtained from the pooled OLS and weighted fixed effects estimates, respectively. Pesaran and Yamagata (2008) developed Swamy's approach as follows.

$$\tilde{\Delta} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - k}{\sqrt{2k}}\right) \tag{B2}$$

$$\tilde{\Delta}_{\text{adj}} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - E(\tilde{Z}_{it})}{\sqrt{\text{Var}(\tilde{Z}_{it})}}\right) \tag{B3}$$

In equations (B2) and (B3) $\tilde{S}$ refers to Swamy's test statistic, k is the number of explanatory variables, and $\text{Var}(\tilde{Z}_{it}) = 2k(T-k-1)/T+1$.

Appendix C. Equations of the CADF unit root test

$$\Delta y_{it} = \alpha_i + \rho_i^* y_{i,t-1} + d_0\bar{y}_{t-1} + d_1\Delta\bar{y}_t + \varepsilon_{it} \tag{C1}$$

The CADF regression is given in equation (C1), where $\bar{y}_t$ refers to cross-section averages. To solve the autocorrelation problem, the equation needs to be expanded with the lags of the first differences of the variables y_{it} and $\bar{y}_t$ as follows.

$$\Delta y_{it} = \alpha_i + \rho_i^* y_{i,t-1} + d_0\bar{y}_{t-1} + \sum_{j=0}^{p} d_{j+1}\Delta\bar{y}_{t-j} + \sum_{k=1}^{p} c_k\Delta y_{i,t-k} + \epsilon_{it} \tag{C2}$$

Pesaran (2007) calculated cross-sectionally augmented IPS (Im, Pesaran, and Shin 2003) statistic (CIPS) that is the average of individual CADF statistics as follows.

$$CIPS = \frac{1}{N}\sum_{i=1}^{N} CADF_i \tag{C3}$$