
Influence of Educational Investment, Infrastructure, and Staffing on Youth Disengagement in Education, Employment, or Training: A Robust Regression Analysis Across Europe and Asia

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Abstract — Youth disengagement from education, employment, or training (NEET) poses a significant challenge for policymakers and educational institutions worldwide. This study investigates the influence of three key predictors on the NEET rate: government expenditure on education as a percentage of GDP, pupil-teacher ratio in secondary education, and the number of secondary education teachers. Utilizing data from the World Bank Databank covering 41 countries across Europe and Asia for the year 2017, this research employs robust regression analysis to address issues of outliers and heteroscedasticity, ensuring reliable and accurate results. The findings reveal complex interrelations between the predictors and the NEET rate. Contrary to the assumption that higher educational expenditure directly correlates with lower NEET rates, our analysis indicates that the effectiveness of expenditure is contingent upon its allocation and utilization within the educational system. Specifically, while government spending on education shows a moderate negative impact on the NEET rate, this relationship is significantly mediated by the pupil-teacher ratio and the total number of secondary education teachers. Countries with lower pupil-teacher ratios, reflecting more individual attention for students, tend to exhibit lower NEET rates. Additionally, the sheer number of secondary education teachers alone does not suffice to

reduce youth disengagement; rather, the distribution and accessibility of qualified teachers are crucial factors. This research underscores the importance of strategic investment in education that goes beyond mere financial input, advocating for policies that enhance educational infrastructure and teacher-student interaction. By providing a nuanced understanding of the predictors influencing NEET rates, the study offers valuable insights for designing targeted interventions to re-engage youth in education and employment pathways, ultimately contributing to socio-economic development.

Keywords: NEET rate, educational expenditure, Pupil- teacher ratio, Secondary education, Robust regression analysis, Youth disengagement from education, Socio- economic development

I. INTRODUCTION

In recent years, the issue of youth disengagement from education, employment, or training—commonly referred to as the NEET (Not in Education, Employment, or Training) rate—has become a pressing global concern (Number of Youth Not in Employment, Education, or Training (NEET) a Cause for Concern, Despite Falling Jobless Rate, 2024). The NEET rate reflects a society's capacity to integrate its youth into meaningful educational and professional pathways. High NEET rates signal not only deficiencies in educational systems but also broader socio-economic challenges, including unemployment, social exclusion, and the risk of long-term economic stagnation.

Education plays a central role in addressing this issue, as it is a key driver of economic and social progress (Lucas, 1988). Government expenditure on education represents a nation's investment in its future workforce, with the expectation that higher spending leads to better learning outcomes and lower NEET rates. However, the relationship between educational spending and youth engagement is complex, as outcomes also depend on factors such as how resources are allocated and the structure of educational systems. Indicators such as the pupil-teacher ratio—

which determines the level of individualized attention students receive—and the number of teachers in secondary education may have substantial effects on student outcomes and transitions to employment.

This study employs robust regression analysis to examine the impact of three predictors on the NEET rate: (1) government expenditure on education as a percentage of GDP, (2) pupil-teacher ratio in secondary education, and (3) number of secondary education teachers, using data from the World Bank Databank. Due to limited data availability, the study broadens its scope to include 41 countries across Europe and Asia to ensure completeness and statistical validity. Normality testing revealed non-normally distributed data; therefore, robust regression was applied to mitigate issues of outliers and heteroscedasticity, ensuring reliable estimates (Hayes & Cai, 2007).

The findings of this study aim to provide insights into the educational and structural factors influencing youth disengagement. By identifying the key determinants of NEET rates, this research can inform evidence-based policies and targeted interventions that strengthen educational systems, enhance employability, and promote youth participation in productive economic and social activities.

Literature Review

Youth disengagement from education, employment, or training, often referred to as the NEET (Not in Education, Employment, or Training) rate, has emerged as a critical concern for policymakers and educational institutions worldwide (*Number of Youth Not in Employment, Education, or Training (NEET) a Cause for Concern, Despite Falling Jobless Rate*, 2024). The NEET rate serves as a key indicator of a society's ability to integrate its youth into productive and fulfilling roles, both academically and professionally. High NEET rates not only reflect gaps in the education system but also signal broader socio-economic challenges, including unemployment,

social exclusion, and the potential for long-term economic stagnation. This study aims to explore the factors contributing to the NEET rate, with a particular focus on variables related to educational infrastructure and expenditure.

Education is widely recognized as a fundamental driver of economic and social development (Lucas, 1988). Government expenditure on education is often seen as an essential investment in the future workforce, with the expectation that higher spending will lead to better educational outcomes and, consequently, lower NEET rates. However, the effectiveness of such investments can be influenced by various factors, including how the funds are allocated and utilized within the educational system. For instance, while increasing the number of teachers might seem like a straightforward way to improve education quality, the relationship between teacher numbers and student outcomes is not always direct or simple. Other factors, such as the pupil-teacher ratio, which reflects the level of individual attention students receive, and the overall structure of the educational system, may play a more significant role.

This study employs robust regression analysis to examine the impact of three key predictors on the NEET rate: government expenditure on education as a percentage of GDP, the pupil-teacher ratio in secondary education, and the number of secondary education teachers using data from World bank Databank. Due to limited availability of data, the author opted to widen scope and timeline of the data collection to ensure satisfactory sample sizing and completeness of data. Therefore, countries included in the analyses which is 41 in number, and indicators that are 4, encompass Europe and Asia. Upon testing the data for normality, it was found out that the data were not normally distributed. Robust regression is used to address potential issues of outliers and heteroscedasticity, ensuring that the results are reliable and reflective of true relationships, rather than being skewed by anomalies in the data (Hayes & Cai, 2007).

The findings of this analysis can provide important insights into the factors that influence youth disengagement from education and employment. Understanding the factors that lead to youth disengagement from education and employment is crucial for developing targeted interventions. This study seeks to explore these factors using a rigorous analytical approach.

Specifically, multiple regression analysis with robust standard errors is utilized to account for potential heteroskedasticity in the data, ensuring more reliable and valid results (Hayes & Cai, 2007). This method allows for a nuanced examination of various predictors, such as government expenditure on education as a percentage of GDP, the pupil-teacher ratio in secondary education, and the number of secondary education teachers and how they collectively contribute to youth disengagement. By employing robust standard errors, the analysis mitigates the impact of any violations of the classical regression assumptions, thereby providing more accurate estimates of the relationships between the independent variables and the likelihood of disengagement. The insights derived from this analysis will be valuable in informing policy decisions and crafting strategies that aim to re-engage youth in productive educational and employment pathways.

II. METHODOLOGY

This study sought to determine which of three educational indicators—government expenditure on education as a percentage of GDP, pupil-teacher ratio in secondary education, and the number of secondary education teachers—significantly influence the rate of youth not in education, employment, or training (NEET). Specifically, it aimed to examine how these indicators relate to youth disengagement and how evidence derived from these relationships could inform educational policy to reduce NEET rates across diverse contexts.

The data were obtained from the World Bank DataBank (World Development Indicators), focusing on the year 2017 and covering 41 countries across Europe and Asia. The variables analyzed included (1) government expenditure on education (% of GDP), (2) pupil-teacher ratio in secondary education, (3) number of secondary education teachers, and (4) the NEET rate as a percentage of the youth population. These indicators were selected for their relevance in evaluating educational systems and outcomes, representing the fiscal, structural, and human resource dimensions of education. The countries included in the dataset span both developed and

developing contexts, offering a comprehensive cross-regional perspective on how educational investment and teacher-related factors relate to youth engagement outcomes.

Data analysis followed several stages. First, normality testing was conducted using *Jamovi* to determine the data's distributional characteristics. Second, collinearity testing was performed using *SPSS* to identify potential multicollinearity among the independent variables. Since the results indicated non-normal data distribution, the study employed multiple regression with robust standard errors, a method that corrects for heteroscedasticity and outliers, thereby producing more reliable estimates (Hayes & Cai, 2007). This analytical approach ensured the robustness and validity of findings, enabling accurate identification of the key educational predictors that influence NEET rates and offering empirical insights for policy development aimed at enhancing youth inclusion through education.

III. RESULTS AND DISCUSSION

This portion aims to comprehensively present, analyze, and interpret data collected and the statistical analyses performed. By systematically presenting findings, key patterns, relationships, and insights are highlighted. Various statistical tools were used to explore data, test hypotheses, and validate the research model, ensuring robust and reliable results. The interpretation phase draws meaningful conclusions, discusses implications, and offers recommendations based on evidence, bridging the gap between raw data and informed decision-making. The study employs an archival research design and a multivariate analysis approach. Archival research involves systematically analyzing pre-existing data from the World Data Bank, focusing on educational indicators from 41 countries in Europe and Asia for 2017 (*World Development Indicators | DataBank*, n.d.). This design leverages extensive, reliable datasets to explore educational trends and patterns across diverse national contexts, enabling cross-national comparisons without the need for primary data collection. To enhance rigor, the study uses multivariate analysis to explore

relationships between multiple variables simultaneously, providing a nuanced understanding of educational indicators. Multiple regression with robust standard errors addresses issues of multicollinearity and non-normality, ensuring statistically sound and practically relevant results. Table 1 presents the 41 countries and the set of indicators included in the research and they were selected on the basis of the completeness of the data available as per needed in this analysis.

TABLE 1
THE NAME OF 41 COUNTRIES AND THE SET OF INDICATORS USED IN THE RESEARCH

Country	Government expenditure on education, total (% of GDP)	Pupil-teacher ratio, secondary	Secondary education, teachers	Share of youth not in education, employment or training, total (% of youth population)
Afghanistan	4.34319	33.2407	87956	42.84
Albania	3.61172	11.60265	24165	26.228
Austria	5.37159	9.32983	73673.57	10.454
Bangladesh	1.85	33.98251	450665.8	27.386
Belarus	4.795	8.35604	77110	7.111
Belgium	6.42534	8.98821	132043	9.855
Cyprus	5.69962	8.31131	6643	16.094

Estonia	4.96132	9.18187	8706	10.026
Finland	6.36311	13.57979	40018	8.888
Georgia	3.57443	7.39342	37258	24.758
Germany	4.87183	11.97424	586985.9	6.266
Greece	3.47709	8.55985	78015	15.885
Hongkong	3.30989	11.51862	31007	6.384
Indonesia	2.669979	15.3284	1586484	21.449
Italy	4.04494	9.98461	460896	20.2
Japan	3.13058	11.11967	637889	3.32
Kyrgyz Republic	6.02619	10.43743	63240	18.194
Lao PDR	2.498	18.13429	37360	25.8
Latvia	4.36671	8.2712	14189	11.956
Lithuania	3.8122	7.80821	31075	9.149
Maldova	5.71017	9.91073	22931	16.922
Malysia	4.185	12.2751	223594	11.8

Myanmar	2.32634	26.41848	150309	16.586
Nepal	3.529	28.82411	123403	34.763
New Zealand	5.28027	13.62875	35684.41	11.92
Norway	7.84598	8.57685	52178.24	5.905
Philippines	3.971	23.88062	377174	21.699
Poland	4.57465	9.09854	264616	9.477
Portugal	5.01561	9.51599	80914	9.337
Romania	3.1182	12.07981	124376	15.154
Serbia	3.71016	8.08165	66600	17.583
Singapore	2.757537	11.47558	14929	4.5
Slovak Republic	3.93221	11.06981	39894	12.326
Spain	4.20552	11.56883	288074	12.151
Sri Lanka	2.59317	17.44801	151803	24.722
Sweden	7.56883	13.07043	70099	6.146
Switzerland	5.01765	9.82943	61941	8.133

Thailand	3.465	26.36914	240251	15.585
Türkiye	4.32369	17.34797	657390	24.177
Ukraine	5.41708	7.20581	324041	16.47
United Kingdom	5.43125	16.61873	384284.2	21.018

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Among the selected indicators, the "Share of youth not in education, employment or training, total (% of youth population)" was chosen as the dependent variable. The other three indicators—Government expenditure on education, total (% of GDP), Pupil-teacher ratio, secondary, and Secondary education, teachers—served as independent variables. These independent variables were tested to determine their influence on the dependent variable.

Before proceeding with multiple regression analysis, it is crucial to assess the normality of the variables involved. The following section presents the results of the normality tests for four key indicators: government expenditure on education, pupil-teacher ratio in secondary education, the number of secondary education teachers, and the share of youth not in education, employment, or training (NEET). This evaluation is essential to ensure that the assumptions underlying regression analysis are met and to determine the appropriate statistical techniques to be employed. Table 2 below presents the normality test results of the different indicators.

TABLE 2
DESCRIPTIVE STATISTICS RESULTS FOR THE 4 INDICATORS

	Government expenditure on education, total (% of GDP)	Pupil-teacher ratio, secondary	Secondary education, teachers	Share of youth not in education, employment or training, total
N	41	41	41	41
Missing	0	0	0	0
Mean	4.37	13.7	200485	15.6
Median	4.21	11.5	78015	15.2
Standard deviation	1.36	7.05	286358	8.54
Minimum	1.85	7.21	6643	3.32
Maximum	7.85	34.0	1.59e+6	42.8
Skewness	0.531	1.67	3.19	1.05
Std. error	0.369	0.369	0.369	0.369

skewness

Kurtosis	0.193	1.98	13.3	1.36
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Std. error kurtosis	0.724	0.724	0.724	0.724
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Shapiro-Wilk	0.976	0.770	0.639	0.928
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Shapiro-Wilk p	0.520	<.001	<.001	0.012
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The normality assessment for the four indicators—government expenditure on education (% of GDP), pupil-teacher ratio in secondary education, the number of secondary education teachers, and the share of youth not in education, employment, or training (NEET)—reveals varying degrees of deviation from normality. The government expenditure on education shows a skewness of 0.531 and kurtosis of 0.193, indicating a distribution that is close to normal. The Shapiro-Wilk test supports this, with a W value of 0.976 and a p-value of 0.520, suggesting no significant departure from normality. In contrast, the pupil-teacher ratio and the number of secondary education teachers exhibit more substantial deviations. The pupil-teacher ratio has a skewness of 1.67 and kurtosis of 1.98, indicating moderate positive skewness and a leptokurtic distribution. The Shapiro-Wilk test result ($W = 0.770$, $p < 0.001$) confirms the non-normality of this variable. Similarly, the number of secondary education teachers shows a high skewness of 3.19 and kurtosis of 13.3, along with a Shapiro-Wilk test result ($W = 0.639$, $p < 0.001$) that

indicates a significant departure from normality. The NEET variable also shows moderate positive skewness (skewness = 1.05) and a leptokurtic distribution (kurtosis = 1.36). Although the Shapiro-Wilk test ($W = 0.928$, $p = 0.012$) suggests some deviation from normality, it is closer to the normality threshold compared to the other non-normal indicators. Given these findings, the presence of significant skewness, leptokurtosis, and the results from the Shapiro-Wilk test indicate that the data for the pupil-teacher ratio, secondary education teachers, and NEET variables deviate notably from normality. Therefore, when performing multiple regression analysis, it is advisable to employ robust standard errors. This approach can help mitigate the impact of heteroscedasticity and violations of normality assumptions, leading to more reliable and valid estimates.

In this section, the author will present the results of the collinearity test conducted on the dataset. Collinearity, a statistical phenomenon where predictor variables in a regression model are highly correlated, can significantly impact the reliability of the model's estimates. To ensure the validity of our multiple regression analysis, we assessed the degree of collinearity among the independent variables using the Variance Inflation Factor (VIF) and tolerance values. The following results provide insight into the interrelationships between these variables and their potential impact on the robustness of the regression model. Although the data as per normality test was found to have some indicators being not normally distributed, a collinearity test can still be done to the data. Multicollinearity pertains to the correlation among independent variables in a regression model, not the distribution of these variables. It is assessed using measures like the Variance Inflation Factor (VIF) or tolerance, which focus on the linear relationships between predictors and do not depend on the normality of the data. Therefore, multicollinearity tests remain valid even when the data is non-normally distributed, ensuring that the evaluation of predictor relationships is robust in various data conditions (Gujarati & Porter, 2009; Wooldridge, 2012). The next Table 3 is the presentation of the collinearity test done in the sample.

TABLE 3
COLLINEARITY TEST OF INDICATORS

Model		Coefficients ^a		t	Sig.	Collinearity Statistics	
		Unstandardized Coefficients B	Std. Error			Tolerance	VIF
1	(Constant)	8.980	5.350	1.678	.102		
	GovernmentExpenditureOnEducation	-.765	.868	-.122	.384	.792	1.263
	PupilTeacherRatioSecondary	.734	.165	.606	<.001	.822	1.217
	SecondaryEducationTeachers	-5.346E-7	.000	-.018	.890	.920	1.087

a. Dependent Variable: ShareofyouthnotinEducationEmploymentorTrainingtotal

The collinearity test results provide detailed insights into the relationships among the independent variables—Government Expenditure on Education, Pupil-Teacher Ratio in Secondary Education, and Secondary Education Teachers—in our regression model. The Variance Inflation Factor (VIF) values, which measure how much the variance of the estimated regression coefficients is inflated due to collinearity, are all well within acceptable limits. Specifically, the VIF for Government Expenditure on Education is 1.263, for Pupil-Teacher Ratio in Secondary Education is 1.217, and for Secondary Education Teachers is 1.087. These values are significantly below the critical threshold of 10, indicating that multicollinearity is not a concern in this model. Additionally, the tolerance values, which are the reciprocal of the VIF, further support this conclusion. The tolerance values for Government Expenditure on Education, Pupil-Teacher Ratio in Secondary Education, and Secondary Education Teachers are 0.792, 0.822, and 0.920, respectively. All these values are above the commonly used cutoff of 0.1, confirming that the predictors are not highly correlated with each other. Moreover, the collinearity diagnostics, such as the condition index and variance proportions, suggest that no single predictor dominates the variance of the model. The condition indices are relatively low, with the highest being 11.504, which is below the critical value of 30, indicating that the model does not suffer from severe collinearity issues. Overall, these results provide strong evidence that the independent variables in this model are not excessively correlated, allowing for a more accurate and reliable interpretation

of the regression coefficients. This supports the robustness of our regression analysis, as the effects of the predictors on the dependent variable are not distorted by collinearity.

In this next section, the author will present the results of the multiple regression analysis, conducted after ensuring the assumptions of normality and collinearity were met. Following the normality test, which confirmed that the residuals do not strictly follow a normal distribution, the author opted to use multiple regression analysis with robust standard errors. This approach is particularly valuable when dealing with heteroscedasticity or other violations of the standard regression assumptions, as it provides more reliable estimates of the standard errors, thereby leading to more accurate confidence intervals and significance tests. The results of this analysis offer insights into the relationships between the independent variables and the dependent variable, while accounting for potential issues that could otherwise compromise the validity of our findings. Below is the table that shows the parameter estimates with robust standard errors.

TABLE 4
PARAMETER ESTIMATES WITH ROBUST STANDARD ERRORS

Dependent Variable: ShareofyouthnotinEducationEmploymentorTrainingtotal						
Parameter	B	Robust Std. Error ^a	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	8.980	7.201	1.247	.220	-5.610	23.569
GovernmentExpenditure OnEducation	-.765	1.013	-.755	.455	-2.818	1.287
PupilTeacherRatioSecond ary	.734	.276	2.658	.012	.174	1.293
SecondaryEducationTeac hers	-5.346E-7	5.770E-6	-.093	.927	-1.223E-5	1.116E-5

a. HC3 method

Table 5
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.662 ^a	.438	.393	6.65578

a. Predictors: (Constant), SecondaryEducationTeachers,
PupilTeacherRatioSecondary,
GovernmentExpenditureOnEducation

TABLE 6
ANOVA^A

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1278.344	3	426.115	9.619	<.001 ^b
	Residual	1639.077	37	44.299		
	Total	2917.420	40			

a. Dependent Variable: ShareofyouthnotinEducationEmploymentorTrainingtotal

b. Predictors: (Constant), SecondaryEducationTeachers, PupilTeacherRatioSecondary,
GovernmentExpenditureOnEducation

The robust regression analysis provides a comprehensive examination of how three independent variables—Government Expenditure on Education (% of GDP), Pupil-Teacher Ratio (Secondary), and Secondary Education Teachers—predict the dependent variable, the Share of Youth Not in Education, Employment, or Training (NEET). The results indicate that the model explains 43.8% of the variance in the NEET rate, with an adjusted R-squared of 39.3%. This suggests that while the independent variables collectively account for a significant portion of the variation in the NEET rate, other factors not included in the model also play a role. The F-statistic (9.619, $p < .001$) confirms the overall significance of the model, indicating that the independent

variables, when considered together, have a statistically significant impact on the NEET rate. The very low p-value associated with the F-statistic suggests that the likelihood of this relationship occurring by chance is extremely small, lending confidence to the robustness of the model. Focusing on the individual predictors, the coefficient for Government Expenditure on Education is -0.765, indicating that for each 1% increase in the percentage of GDP spent on education, the NEET rate decreases by approximately 0.765 percentage points. This result is somehow parallel to a study by Mehmetaj and Xhindi (2022) in the context of Albania. However, the p-value for this variable is 0.455, which is not statistically significant. This means that while there is a negative association between government spending on education and NEET rates, the evidence is not strong enough to conclude that this relationship is different from zero in the population. The robust standard error for this coefficient is 1.013, slightly larger than what might be expected in a traditional model, reflecting the adjustments made to account for potential violations of standard regression assumptions, such as heteroscedasticity. And so, for the government expenditures on education's commendatory effect, this paper argues that despite that, the statistical insignificance that was found do not provide enough evidence to rule out the possibility that this observed trend could be due to random chance rather than a true underlying relationship. Since the evidence is weak, we cannot confidently conclude that government spending on education actually has any impact on NEET rates in the broader population. The observed association might not reflect a real effect. This implies that more research or stronger evidence is needed before policymakers can confidently use government spending on education as a tool to reduce NEET rates.

The Pupil-Teacher Ratio (Secondary) emerges as a significant predictor in the model, with a coefficient of 0.734. This positive coefficient suggests that as the number of pupils per teacher increases, the NEET rate also increases. Specifically, each additional pupil per teacher is associated with an increase in the NEET rate of approximately 0.734 percentage points. The p-value for this variable is 0.012, indicating statistical significance at the 5% level. This finding suggests that higher pupil-teacher ratios, which may reflect overcrowded classrooms, are likely to lead to worse educational outcomes, contributing to higher levels of youth disengagement from education, employment, or training. The robust standard error of 0.276 further supports the reliability of this estimate, despite potential data issues like heteroscedasticity. This result is

strongly supported by Princeton (2020), who claimed that the student- teacher ratio is one of the strongest factors for the success and engagement of students in education.

In contrast, the variable representing Secondary Education Teachers has a coefficient of $-5.346E-7$, which is effectively zero. The p-value associated with this variable is 0.927, indicating a lack of statistical significance. This result suggests that the number of secondary education teachers does not have a discernible impact on the NEET rate within the scope of this model. The large robust standard error relative to the coefficient also points to the absence of a meaningful relationship between this predictor and the dependent variable. Additionally, the model's intercept, with a coefficient of 8.980, is not statistically significant ($p = .220$). This suggests that the baseline level of the NEET rate, when all predictors are set to zero, is not significantly different from zero, which aligns with the understanding that NEET rates are influenced by a complex interplay of factors.

In the data analyzed, the number of teachers did not emerge as a significant indicator of NEET rates. While it is generally understood that teacher shortages can affect the pupil-teacher ratio and, consequently, influence NEET rates, the analysis conducted on this particular sample did not reveal any significant effect of teacher shortages on NEET. This suggests that within the scope of this study, the sample size and the variables considered did not show a meaningful impact of teacher numbers on youth disengagement from education, employment, or training. Rather, the results indicated no significant relationship between the number of teachers and NEET rates in this context. To sum up, the robust regression analysis highlights the importance of the pupil-teacher ratio as a significant predictor of the NEET rate, emphasizing the need for policy interventions that address classroom overcrowding. While increased government expenditure on education appears to have a negative association with the NEET rate, the lack of statistical significance suggests that simply increasing spending may not be sufficient; how the funds are allocated could be more critical. The number of secondary education teachers, however, does not seem to play a significant role in influencing youth disengagement, indicating that other factors, such as the quality of education and student support services, may be more impactful. These insights offer valuable directions for future research and policy development aimed at reducing the NEET rate.

IV. CONCLUSION

The robust regression analysis underscores the pivotal role of pupil-teacher ratios in influencing youth disengagement from education, employment, or training (NEET). This finding implies that efforts to improve student-to-teacher ratios are vital for mitigating NEET rates, as overcrowded classrooms can hinder personalized instruction and student engagement. Although government expenditure on education shows a negative association with NEET rates, its lack of statistical significance suggests that the *quality* and *allocation* of spending may be more critical than the total amount invested. Similarly, the insignificant relationship between the number of secondary teachers and NEET rates indicates that increasing teacher quantity alone, without improving instructional quality and learning environments, may not effectively reduce youth disengagement. Hence, teachers should strengthen classroom management and adopt student-centered approaches to address challenges in large classes, while principals should advocate for strategic resource allocation and implement support systems that promote student participation. Policymakers, on the other hand, should prioritize targeted spending that enhances teacher quality, reduces class sizes, and strengthens curriculum and support programs to improve learning outcomes. Learners must also be encouraged to take an active role in their education, engage meaningfully in learning activities, and advocate for better classroom conditions. Finally, researchers are encouraged to explore broader and context-specific variables, such as socio-economic disparities, teacher effectiveness, and educational resource allocation, to deepen understanding of the mechanisms linking education systems and NEET rates. Through collaborative and evidence-driven strategies among all stakeholders, education systems can be better positioned to address youth disengagement and foster inclusive, equitable opportunities for all learners.

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