THE IMPACT OF SCHOOL CHOICE ON EMPLOYMENT IN OECD COUNTRIES[1]

Kafkas University
Economics and Administrative Sciences Faculty
KAUJEASF
Vol. 16, Issue 31, 2025
ISSN: 1309 – 4289
E – ISSN: 2149-9136

Article Submission Date: 26.10.2024 *Accepted Date: 05.04.2025*

Müzeyyen Merve ŞERİFOĞLU
PhD
Development and Investment Bank of Türkiye,
İstanbul, Türkiye
mzymerve@gmail.com
ORCID ID: 0000-0002-5908-6772

ABSTRACT | Education is crucial in preparing individuals with the skills needed for the labor market. Understanding how different types of institutions contribute to employment is vital for policymakers. This paper examines the relationship between student enrollment in different types of institutions and employment in OECD countries from 1998 to 2017. It focuses on tertiary, post-secondary, and upper secondary levels, in public and private institutions. Using the two-step System GMM, the study finds that enrollment in both private and public schools positively affects employment at all education levels, with public schools making the most significant contribution. This paper fills an empirical gap by analyzing the relationship between employment and school choice rather than relying on standardized test scores. Unlike most studies, it covers multiple education levels and compares results across countries, providing a broader and more comprehensive perspective.

Keywords: *Institutions, employment, education*
JEL Codes: *I25, I21, O1*

Scope: *Economics*
Type: *Research*

DOI: 10.36543/kauiibfd.2025.009

Cite this article:., (2025). The impact of school choice on employment in OECD countries. *KAUJEASF, 16*(31), 226-247.

[1] Compliance with ethical principles regarding the relevant study has been declared.

OECD ÜLKELERİNDE OKUL TERCİHLERİNİN İSTİHDAM ÜZERİNDEKİ ETKİSİ

Kafkas Üniversitesi
İktisadi ve İdari Bilimler
Fakültesi
KAÜİİBFD
Cilt, 16, Sayı 31, 2025
ISSN: 1309 – 4289
E – ISSN: 2149-9136

Makale Gönderim Tarihi: 26.10.2024 *Yayına Kabul Tarihi:05.04.2025*

Müzeyyen Merve ŞERİFOĞLU
PhD
Türkiye Kalkınma ve Yatırım Bankası,
İstanbul, Türkiye
mzymerve@gmail.com
ORCID ID: 0000-0002-5908-6772

ÖZ | Eğitim, bireyleri iş gücü piyasasında ihtiyaç duyulan becerilerle donatmada hayati bir rol oynar. Farklı türdeki kurumların istihdama nasıl katkıda bulunduğunu anlamak, politika yapıcılar için büyük önem taşır. Bu çalışma, 1998-2017 yılları arasında OECD ülkelerinde farklı eğitim kurumlarına kayıtlı öğrenci sayısı ile istihdam arasındaki ilişkiyi incelemektedir. Çalışma, kamu ve özel kurumlarda yükseköğretim, ortaöğretim sonrası ve üst ortaöğretim seviyelerine odaklanmaktadır. İki aşamalı sistem GMM yöntemini kullanan çalışma hem özel hem de kamu okullarına kayıtların tüm eğitim seviyelerinde istihdamı olumlu etkilediğini ve kamu okullarının en büyük katkıyı sağladığını ortaya koymaktadır. Bu çalışma, standart test sonuçlarına dayanmaktan ziyade, istihdam ile okul tercihlerinin ilişkisini analiz ederek ampirik bir boşluğu doldurmaktadır. Çoğu çalışmadan farklı olarak, birden fazla eğitim seviyesini kapsamakta ve ülkeler arasında sonuçları karşılaştırarak daha geniş ve özgün bir perspektif sunmaktadır.

Anahtar Kelimeler: *Kurumlar, istihdam, eğitim*
JEL Kodları*: I25, I21, O1*
Alan: *İktisat*
Türü: *Araştırma*

1. INTRODUCTION

The determinants of economic growth have been extensively debated by economists. As a result, numerous in-depth analyses have been conducted to explain the differences in growth across countries over the past three decades. These analyses suggest that long-term economic growth is largely dependent on the skills of the population in each country (Hanushek &Woessmann,2010). Likewise, it fosters technological innovation, which is widely recognized as a key driver of sustained long-term growth, along with other advantages (Solow, 1994). Therefore, education is the primary mechanism for developing human capital, and it is important to explore how education contributes to economic prosperity.

In addition to economic growth, employment is also a key indicator for the well-being of society. A more educated population encourages innovative ideas, leading to increasingly more and more favorable labor market outcomes for individuals (OECD, 2024). Traditionally, governments have been the primary providers of education in many countries, given its nature as a public good. However, this landscape is gradually changing, with increasing participation from private sector providers. Accordingly, the key decision for parents is whether their child will engage in an educational institution (Bizenjo, 2020). The quality and accessibility of education play a crucial role in shaping this outcome. Different educational systems, such as private and public schools, may have varying impacts on the skills and opportunities available to individuals. Private schooling, in its many forms, plays a significant role in education systems worldwide. It offers parents the opportunity to choose alternatives to state-provided schooling for their children (Green, Machin, Murphy, &Zhu,2010). As a key component of an education system, it is essential to compare the educational performance of private schools with that of public schools. Therefore, understanding the impact of public and private schools is crucial, particularly in relation to their influence on employment prospects and economic development.

OECD countries, with their similar socio-economic contexts and educational systems, provide comprehensive datasets on education, employment, and economic indicators. Such a classification allows for a more comprehensive analysis of the impact of school choice and its outcomes, highlighting how different types of institutions affect employment rates and overall economic activities. Educational institutions in these countries can generally be classified as follows: public schools, which are managed by a public education authority and private schools, which are managed directly or indirectly by a non-governmental organization. Private schools can be further divided into government-dependent and independent private schools, depending on the degree of their reliance on government funding (OECD, 2024). Despite the clear

classification of educational institutions across OECD countries, research on their comparative effectiveness remains limited.

This study addresses this gap by conducting a robust empirical analysis using data from OECD countries. Existing literature primarily relies on secondary education and standardized test scores such as PISA (Cox & Jimenez,1988; Bedi &Garg,2000; Donkers & Robert,2003; Pfefferman & Landsman ,2011; Maulin,2022). Considering studies on this topic for OECD countries, Donkers and Robert (2003), for instance, focus on PISA scores and 15 -year-old students, similar to other studies in literature. The paper expands its scope to include post-secondary and tertiary education, in addition to upper secondary education. Additionally, while many studies focus on a single country, this paper employs its analysis across OECD countries, providing a broader perspective on educational outcomes.

In this context, the paper aims to investigate the relationship between students enrolled in different types of schools and employment across 23 OECD member countries from 1998 to 2017, with the time period selected based on data availability. The objective is to understand how different educational systems, particularly public and private institutions, contribute to labor market outcomes. Using the two-step system GMM method, I include students enrolled in public and private institutions, covering upper secondary, postsecondary and tertiary level education. I find a strong correlation between students in public schools and employment across all education levels. I also report that private schools contribute positively to employment, following public institutions.

Therefore, the findings of this study are intended to provide valuable insights for policy makers to strengthen both public and private education, ultimately fostering better employment opportunities. The paper contributes to the literature by comparing education systems in OECD countries, using advanced econometric methods to explore new areas of study.

The rest of the paper is organized as follows: Section 2 summarizes the literature. Section 3 describes model, methodology and data. Section 4 discusses the estimation results. Section 5 concludes the paper.

2. LITERATURE

The impact of education on economic variables has been extensively discussed in literature. Various indicators have been used to demonstrate the contribution of education to economic outcomes. For instance, Marquez-Ramos and Mourelle (2019) employed secondary and tertiary enrollment rates as measures of education and found a nonlinear relationship between education and economic growth in Spain. Su and Nguyen (2020) indicated that human capital

accumulation, based on years of schooling and returns to education, enhances the capacity of FDI inflows to foster economic growth in African countries. Habibi and Zabardast (2020) highlighted a positive correlation between primary gross enrollment, as a proxy for the education variable, and economic growth for 10 Middle Eastern and 24 OECD countries. Agasisti and Bertoletti (2020) argued that regional economic growth in Europe is positively influenced by the number of universities, with research quality and Science, Technology, Engineering and Mathematics (STEM) specialization as key drivers. Suwandaru, Alghamdi and Nurwanto (2021) found that public expenditure in the education sector positively affects economic growth in Indonesia. Similarly, Ziberi, Rexha, Ibraimi and Avdiaj (2022) used public expenditure on education as an education indicator, showing a positive correlation between economic growth and public expenditure on education in North Macedonia. Apostu, Mukli, Panait, Gigaru and Hysa (2022) also pointed to a positive correlation between economic growth and tertiary educational attainment across 30 European countries.

In addition to these studies focusing on the direct effects of education, factors influencing labor market outcomes are also crucial for understanding the broader effects of education. Lachenmaier and Rottmann (2015) estimated the positive effect of innovation on employment in German manufacturing firms, emphasizing the importance of skilled labor in fostering innovation. Similarly, Bouzid (2016) identified a positive correlation between the unemployment rate for people with secondary education as dependent variable and corruption across 92 countries, including developed and developing nations. Accordingly, it is essential to consider not only the direct effects of education but also the factors that influence labor market outcomes and shape economic dynamics.

Building on this, the relationship between school choice and economic dynamics-such as the type of institution-plays a critical role in shaping parents' decisions regarding school choice (OECD, 2024). Accordingly, numerous studies have been conducted to explore the connection between school types and economic outcomes, with most research indicating that private schools outperform public schools. For instance, Cox and Jimenez (1988) used student performance on standardized achievement test to compare the effectiveness of private and public secondary schools for Tanzania and Colombia. They found students in private schools to be more successful than those in public schools in the two countries. Lockheed and Jimenez (1994) compared the efficiency of public and private secondary schools based on math, English and verbal test scores across five developing countries, including Colombia, the Dominican Republic, Philippines, Tanzania and Thailand, concluding that private secondary schools had a superior effect compared to public schools. Bedi and Garg (2000)

found strong evidence that graduates of private secondary schools are superior to those of public schools in Indonesia. Donkers and Robert (2003) also reported that private schools are more efficient than public schools in 19 OECD countries, based on PISA scores for 15-year-old students in reading and mathematics. Similarly, Pfefferman and Landsman (2011) demonstrated that PISA test scores of pupils in private schools are higher than pupils in public schools. Chudgar and Quin (2012) conducted a regression analysis in rural and urban India to assess the efficiency of public and private schools at primary education level. Their findings indicate that students in private schools outperform their peers in public schools for both rural and urban areas. Bizenjo (2020) analyzed the effect of low-cost private schools (LCPSs) compared to public schools in Pakistan, highlighting that LCPSs outperform public schools. Furthermore, Kumar and Choudhury (2020) pointed out that families in India prefer private schools over public schools. Maulin (2022) showed that private lower secondary schools have a large and significant effect on educational success in France. Likewise, Shakeel and Dills (2024), using test scores at secondary education level across 120 countries, showed that private institutions have a slightly higher positive effect on student performance compared to public institutions.

Conversely, some studies have shown that public schools better perform than private ones. Lassibille and Tan (2001) documented, using longitudinal data based on survey of students in some 150 schools, that students enrolled in private secondary schools in Tanzania are less efficient than those in public schools. Jin and Rubin (2009) showed, using longitudinal data from New York City School Choice, that public schools have an advantage over private schools. These findings highlight that the effectiveness of educational institutions may be dependent on various factors, including local context, resource availability and policy frameworks.

Overall, the existing literature provides limited insight into the impact of students enrolled in public and private schools on employment. Therefore, the findings of this paper will help bridge this critical knowledge gap.

3. MODEL, METHODOLOGY AND DATA

3.1. Model and Methodology

The baseline model is based on the empirical studies of Lachenmaier and Rottman (2015) and Bouzid (2016). Accordingly, the baseline model is as follows:

$$logemp_{i,t} = \beta_0 + \beta_1 logemp_{i,t-1} + \beta_2 logX_{i,t-3} + \beta_3 logY_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $logemp_{i,t}$ is the logarithm of employment for country *i,* $L.logemp_{i,t}$ is the initial log of employment, $logX_{i,t-j}$ refers each institution variable by education level in the model which lagged *3* period, including students enrolled in tertiary, post-secondary and upper secondary at public and private institutions, for each level of institutions, respectively, $logY_{i,t}$ represents control variables: trade, inflation, tax, population and foreign direct investment (FDI). The empirical results generally yield better predictions when different combinations of explanatory variables are used. Furthermore, combining estimations enhances predictive accuracy compared to using individual ones (Wu&Blake,2023). Based on this, I construct different combinations of control variables, including trade, population, tax, inflation and FDI, to check the validity of the results. These combinations are based on both theoretical and empirical considerations in literature. For instance, Stepanok (2022) discusses the trade and population combination in relation to employment, while Nguyen, Le, Le, & Duong (2024) focus on FDI and inflation combinations and their impact on employment. On the other hand, OECD (2011) suggests that tax rates influence the investment decisions of multinational corporations, thereby affecting FDI flows and employment levels. Based on this, I use the combination of FDI and tax. Similarly, the World Bank (2020) reports that labour market outcomes are affected by international trade, with tax serving as an important indicator of trade. Accordingly, the model with trade and tax is also estimated in this paper.

Additionally, students may take time to enter the labor market due to economic conditions, industry demand, and skill mismatches, which can delay the full return of their education. The optimal lag length, though unknown, may exceed one year (Tsai, Hung, &Harriott, 2010; Serifoglu &Guney, 2022). Accordingly, I include a 3- year lag of student enrollment variables in the model, taking into account the data span. Based on Equation (1), I specify the main form for each equation used in Tables 4, 5, 6 and 7. Accordingly, Equations above explicitly present the models including different combinations of the control variables. In each equation, as in Equation (1), $logpublic_{i,t-3}$ and $logprivate_{i,t-3}$ indicate the number of students enrolled in tertiary, post-secondary and upper secondary education in public and private schools, respectively,

$$logemp_{i,t} = \gamma_0 + \gamma_1 logemp_{i,t-1} + \gamma_2 logpublic_{i,t-3} + \gamma_3 logtrade_{i,t} + \gamma_4 logpop_{i,t} + \theta_{i,t} \quad (2)$$

$$logemp_{i,t} = \gamma_0 + \gamma_1 logemp_{i,t-1} + \gamma_2 logprivate_{i,t-3} \quad (2.1)$$

$$+ \gamma_3 logtrade_{i,t} + \gamma_4 logpop_{i,t} + \theta_{i,t}$$

$$logemp_{i,t} = \alpha_0 + \alpha_1 logemp_{i,t-1} + \alpha_2 logpublic_{i,t-3} + \alpha_3 logFDI_{i,t} + \alpha_4 loginf_{i,t} + \omega_{i,t} \quad (3)$$

$$logemp_{i,t} = \alpha_0 + \alpha_1 logemp_{i,t-1} + \alpha_2 logrivate_{i,t-3} + \alpha_3 logFDI_{i,t} + \alpha_4 loginf_{i,t} + \omega_{i,t} \quad (3.1)$$

$$logemp_{i,t} = \rho_0 + \rho_1 logemp_{i,t-1} + \rho_2 logpublic_{i,t-3} + \rho_3 logtrade_{i,t} + \rho_4 logtax_{i,t} + \epsilon_{i,t} \quad (4)$$

$$logemp_{i,t} = \rho_0 + \rho_1 logemp_{i,t-1} + \rho_2 logprivate_{i,t-3} + \rho_3 logtrade_{i,t} + \rho_4 logtax_{i,t} + \epsilon_{i,t} \quad (4.1)$$

$$logemp_{i,t} = \mu_0 + \mu_1 logemp_{i,t-1} + \mu_2 logpublic_{i,t-3} + \mu_3 logFDI_{i,t} + \mu_4 logtax_{i,t} + \epsilon_{i,t} \quad (5)$$

$$logemp_{i,t} = \mu_0 + \mu_1 logemp_{i,t-1} + \mu_2 logprivate_{i,t-3} + \mu_3 logFDI_{i,t} + \mu_4 logtax_{i,t} + \epsilon_{i,t} \quad (5.1)$$

Considering equations above, our models consist of the lagged level of dependent variable, which introduces potential autocorrelation in the residuals. Additionally, considering the dynamic structure of the models, as employment may be persistent, with previous levels potentially impacting current employment. There may be a bi-directional relationship between employment and some independent variables, leading to endogeneity bias. As a result, using OLS estimates or other panel data estimators such as fixed effect, random effect could produce biased and inconsistent estimates (Roodman,2009). To address these issues, appropriate estimation techniques such as Generalized Methods of Moments (GMM) are often employed. GMM estimation techniques have become very popular methods for estimating panel data, especially in empirical growth literature. Additionally, these estimators have been widely adopted in labour and industrial studies (Soto, 2009; Kripfganz & Schwarz, 2015). There are two forms of GMM estimation: Difference GMM estimator introduced by Arellano and Bond (1991) and System GMM developed by Arellano and Bover (1995) and Blundell and Bond (1998). According to Roodman (2009), the System GMM estimator produces more efficient results than the Difference GMM Method.

Firstly, System GMM method allows us to use more instruments, thereby improving the effectiveness of results (Piper, 2014). Secondly, Difference GMM estimator increases the gaps in unbalanced panels, so that if some values of the dependent variable are missing, both the change in dependent variable and the change in its previous value will also be missing in the transformed data (Baum,2013), which contribute to the development of the System GMM. To deal with weakness of Arellano and Bond estimator, Blundell and Bond (1998) develop a System GMM method, suggesting an additional set of extra moment conditions (Roodman, 2009). System GMM method is applied in both one-step and two-step GMM, with the two-step GMM method often considered superior due to its ability to provide more efficient estimates. Accordingly, the two-step System GMM method developed by Arellano and Bover (1995) and Blundell and Bond (1998) have been adopted to estimate the models in the paper. To ensure the validity of the results, the AR test is implemented to check for serial correlation, and Hansen test is applied to assess the validity of the instruments.

3.2. Data

The dataset consists of 23 OECD countries presented in Table 1 over the period from 1998 to 2017, depending on data availability. The dependent variable in the models is total annual employment, sourced from OECD database. Education variables by institution type, cover students enrolled in tertiary education, post-secondary education and upper secondary education at private and public institutions, are also taken from OECD database. Control variables in the models, including trade, inflation, tax, population and FDI, are obtained from the World Bank (WB) database.

Table 1: Country List

Australia	Ireland	Slovenia
Austria	Italy	Spain
Belgium	Japan	Sweden
Czechia	Netherland	Switzerland
Estonia	New Zealand	United States
Finland	Norway	
France	Poland	
Hungary	Portugal	
Iceland	Slovak Republic	

Source: OECD

Table 2 provides detailed information about the data and sources used in

the models. I use a logarithmic transformation of all variables in the models to stabilize the variance and reduce skewness, allowing for a more accurate interpretation of the relationships between the variables.

Table 2: Data and Source

Variable	Description	Source
logemp	annual employment by economic activity, domestic concept, total (all activities)	OECD
logtrade	the sum of exports and imports of goods and services (% of GDP)	WB
logFDI	net inflows (BoP, current US $)	WB
logpop	total population between the ages 15 to 64 as a percentage of the total population	WB
loginf	consumer prices (annual %)	WB
logtax	tax revenue (% of GDP)	WB
logpublicter	tertiary education enrolled in public institutions	OECD
logprivater	tertiary education enrolled in private institutions	OECD
logpublicpost	post-secondary education in public institutions	OECD
logprivatepost	post-secondary education in private institutions	OECD
logpublicupper	upper secondary education in public institutions	OECD
logprivateupper	upper secondary education in private institutions	OECD

Table 3 shows the descriptive statistics for variables in the models. Considering all the variables in models, FDI has the highest average value at 9.284, followed by employment at 5.165, while inflation has the lowest average value at 0.250. The average values for tax and population are 1.233 and 1.825, respectively. Regarding the education variables, the average values for students enrolled in post-secondary education are higher than those at other education levels. The values are as follows: private institutions at 1.694 and public institutions at 1.617. The lowest values belong to upper secondary education, ranging from 1.404 to 1.450. In terms of tertiary education, values fall between 1.447 and 1.469.

Table 3: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Logemp	460	5.165	1.107	2.170	6.993
Logtrade	460	1.909	0.232	1.258	2.358
logFDI	460	9.284	2.734	0.000	11.866
Logpop	460	1.825	0.013	1.772	1.858
Loginf	460	0.250	0.406	-1.746	1.151

Logtax	459	1.233	0.265	0.000	1.575
logpublicter	460	5.448	1.447	0.000	1.000
logprivater	457	4.810	1.469	0.000	9.602
logpublicpost	447	3.912	1.617	0.000	6.944
logprivatepost	449	3.573	1.694	0.000	6.987
logpublicupper	460	5.537	1.404	0.000	9.041
logprivateupper	460	4.731	1.450	0.000	6.998

Source: Author's calculations.

4. ESTIMATION RESULTS AND DISCUSSION

The paper begins the analysis by estimating the model using trade and population variables, as shown in Table 4. All models in Table 4 report that the lagged level of employment exhibits a positive effect on employment, as expected. The estimated coefficient for the lagged level of employment ranges from 0.463 to 0.509. Considering the effect of population, as a reflection of the working-age population, across all models in Table 4, the estimated population coefficient, varying between 3.605 and 8.581, demonstrates a robust positive influence on employment. This suggests that as the working-age population increases, the employment level rises significantly, supporting the notion that a growing working-age population contributes positively to employment growth, as reported by Georgieva (2024). Looking at the effect of trade on employment, the results show no correlation between trade and employment in Models 1, 2 and 6. Furthermore, trade negatively affects employment in Model 3, with a coefficient -0.707, and in Model 4, with a coefficient of -0.621, while a positive effect is observed only in Model 5, with a coefficient of 0.245. Based on these results, it is difficult to draw a definitive conclusion about the effect of trade on employment, as the relationship varies across different models- some showing no effect, some showing negative effects, and only one showing a positive effect.

Table 4: Test Results with Trade and Population

	1	2	3	4	5	6
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
L.logemp	0.463***	0.509***	0.464***	0.472***	0.492***	0.491***
	(0.030)	(0.035)	(0.024)	(0.015)	(0.010)	(0.012)
Logtrade	-0.159	-0.214	-0.707***	-0.621***	0.245**	0.089
	(0.152)	(0.242)	(0.149)	(0.073)	(0.107)	(0.077)
Logpop	8.581***	5.547***	5.078***	3.605***	7.814***	4.613***
	(1.344)	(1.523)	(0.764)	(0.671)	(0.383)	(1.076)
L3.logpublicter	0.168***					

	(0.027)					
L3.logprivater		0.059**				
		(0.027)				
L3.logpublicpost			0.137***			
			(0.031)			
L3.logprivatepost				0.118***		
				(0.027)		
L3.logpublicupper					0.342***	
					(0.047)	
L3.logprivateupper						0.265***
						(0.049)
Constant	-13.48***	-7.461**	-5.671***	-3.064**	-13.99***	-7.132***
	(2.395)	(2.768)	(1.659)	(1.378)	(0.913)	(2.018)
Observations	391	388	387	387	391	391
Number of countries	23	23	23	23	23	23
Number of instruments	22	22	22	22	22	22
AR (1)	0.002	0.003	0.002	0.003	0.002	0.003
AR (2)	0.147	0.116	0.111	0.107	0.353	0.196
Hansen	0.313	0.367	0.474	0.462	0.447	0.489

Standard errors in parentheses *** p<0.01, **p<0.05, * p<0.1

Taking into account students enrolled in tertiary education, it is evident that the impact of students from public institutions on employment is greater than those from private institutions. The coefficient for students enrolled in public institutions is 0.168, followed by 0.059 for private institutions. This is consistent with OECD (2024) data, which indicates that the share of tertiary graduates from public schools surpasses that of private schools, reaching 63% at bachelor's level, 65% at the master's level, and 76% at the doctoral level or equivalent across OECD countries. According to OECD (2024), various factors influence the choice of institutions, including whether they are private or public institutions: tuition fees, living costs, availability of scholarships and expectations after graduation. Given these factors and our findings, public institutions seem to attract more students than private institutions in tertiary education. Similarly, at the post -secondary and upper secondary levels, the test results indicate that students tend to prefer public institutions over private institutions. The coefficient for students enrolled in public institutions is 0.137 at post-secondary level and 0.342 at upper secondary level, whereas the coefficient is 0.118 at post-secondary level and 0.265 at upper secondary level.

Overall, based on test results, students enrolled in upper secondary level at public institutions contribute more to employment compared to those from tertiary and post-secondary levels. In OECD countries, upper secondary education provides students with crucial skills and vocational training that meet labor market demands, making them more employable and contributing significantly to economic development (OECD,2024). Therefore, the results suggest that upper secondary education could lead to a boost in employment. On

the other hand, at the tertiary and post- secondary levels, students enrolled in private institutions make the most significant contribution to employment, followed by those in public institutions.

To determine the reliability of the models, the paper employs the AR test for serial correlation and the Hansen test to assess the validity of the instruments. Based on the models presented in Table 4, all models fit correctly within the specified parameters.

I present different results based on a combination of various variables to demonstrate confidence in the findings shown in Table 4. Accordingly, Tables 5, 6 and 7 provide test results, covering different cases. For the models with FDI and inflation, as noted in Table 5, students enrolled in public institutions at the tertiary level, with a coefficient of 0.218, are positively correlated with employment, followed by those in private institutions, with a coefficient of 0.065. Up until now, the test results in Table 5 align with the findings in Table 4. In terms of post-secondary and upper secondary levels, as reported in Table 4, public institutions exhibit a positive correlation with a coefficient of 0.165 at the post-secondary and 0.411 at the upper secondary. In addition to the findings for upper secondary education, private institutions, after public institutions, have a statistically significant effect on employment, with a coefficient of 0.386. When it comes to post-secondary education, students enrolled in private institutions also have a positive effect on employment, with a coefficient of 0.106. Regarding control variables for models in Table 5, it is observed that FDI has no effect on employment in most models; however, it exhibits a negative effect on Model 2, with a coefficient of -0.003, and in Model 6, with a coefficient of -0.004. Inflation is also insignificant in Models 1, 3, and 5, while it has a positive effect with a coefficient of 0.010 in Model 2, 0.010 in Model 4, and 0.077 in Model 6. Based on these results, it appears difficult to explain the overall effect of inflation and FDI on employment. On the other hand, as indicated in Table 4, all models in Table 5 confirm the validity of these results regarding education levels.

Table 5: Test Results with FDI and Inflation

	1	2	3	4	5	6
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
L.logemp	0.481***	0.503***	0.489***	0.506***	0.499***	0.525***
	(0.010)	(0.008)	(0.020)	(0.016)	(0.012)	(0.012)
logFDI	-0.002	-0.003***	0.002	0.002	-0.002	-0.004**
	(0.001)	(0.001)	(0.003)	(0.002)	(0.005)	(0.002)
Loginf	0.010	0.010*	0.008	0.010**	0.004	0.077***
	(0.014)	(0.005)	(0.005)	(0.004)	(0.012)	(0.010)

L3.logpublicter	0.218*** (0.031)					
L3.logprivater		0.065*** (0.008)				
L3.logpublicpost			0.165*** (0.029)			
L3.logprivatepost				0.106*** (0.028)		
L3.logpublicupper					0.411*** (0.048)	
L3.logprivateupper						0.386*** (0.071)
Constant	1.516*** (0.139)	2.285*** (0.024)	1.982*** (0.061)	2.164*** (0.043)	0.350* (0.203)	0.661* (0.373)
Observations	391	388	387	387	391	391
Number of countries	23	23	23	23	23	23
Number of instruments	22	22	22	22	22	22
AR (1)	0.003	0.003	0.003	0.003	0.002	0.003
AR (2)	0.168	0.156	0.116	0.107	0.452	0.43
Hansen	0.476	0.51	0.483	0.468	0.394	0.342

Standard errors in parentheses ** p<0.01, ** p<0.01, ** p<0.05, * p< 0.1

Table 6 summarizes the test results including trade and tax. As reported in Table 4 and 5, the lagged level of employment consistently demonstrates a positive impact on employment across all models, with the coefficient ranging from 0.459 to 0.491. In terms of control variables, in some models, trade is found to have a negative effect, while in others, it appears to have no effect. As previously discussed in Table 4, the influence of trade on employment remains inconclusive. Conversely, tax has a positive contribution to employment in most models, with the coefficient of tax ranging from 0.100 to 0.200. When comparing students from public and private schools, Table 6 indicates that public schools have a greater impact across all education levels. The coefficient for students from public schools is 0.131 at the tertiary level, 0.158 at the post-secondary level, and 0.357 at the upper secondary level, while students from private school have coefficients of 0.027 at the tertiary level, 0.131 at the postsecondary level, and 0.342 at the upper secondary level. Furthermore, as shown in Tables 4 and 5, students from upper secondary schools make the highest contribution to employment across OECD countries. The education findings in Table 6 align

with the results reported in Tables 4 and 5. All models in Tables 6 have successfully passed the post-estimation tests including AR and Hansen tests, confirming their accuracy and validity.

Table 7 presents the test results in the models with FDI and tax. As illustrated in Tables 4,5 and 6, the lagged level of employment positively affects employment, with effects ranging from 0.471 to 0.510. Regarding control variables for Table 7, tax has a positive impact on employment in most models across both tables, similar to Table 6. The coefficient of tax ranges from 0.112 to 0.223. In contrast, FDI shows an insignificant effect on employment in most models. However, it demonstrates a negative coefficient in Model 2 with a value of -0.003, and in Model 6, with a value of -0.005. In terms of tertiary education, the coefficient for public schools is 0.235. Similar to the findings in Tables 4, 5 and 6, private institutions, with a coefficient of 0.046 in Table 7, make the second largest contribution to employment. Considering upper secondary and post-secondary levels, students enrolled in upper secondary at public institutions have the greatest effect on employment, with a coefficient of 0.456 in Table 7, compared to other education levels as noted in Tables 4,5 and 6. Additionally, for upper secondary education, the second highest contribution comes from private institutions, the coefficient of 0.346 in Table 7. When looking at the post-secondary education, as shown in Tables 4,5 and 6, the effect of public institutions on employment is 0.176 in Table 7. Following public institutions, like other education levels, private institutions have the second highest effect on employment, with coefficient of 0.110. As reported in Tables 4,5 and 6, all models in Table 7 provide robust estimates, confirmed by AR and Hansen tests.

Overall, the findings of this study align with the broader literature on education and economic indicators. The results confirm that education positively influences economic activities, consistent with the findings of Marquez-Ramos and Mourelle (2019), Agasisti and Bertoletti (2020), Suwandaru, Alghamdi and Nurwanto (2021), and Apostu, Mukli, Panait, Gigaru and Hysa (2022). The findings also correspond with studies examining the direct effects of education, such as those conducted by Lachenmaier and Rottmann (2015) Bouzid (2016). Furthermore, the analysis of public and private schooling, irrespective of education level, aligns with the studies of Lassibille and Tan (2001) and Jin and Rubin (2009), with public schools showing a stronger impact on employment outcomes. However, these findings differ from many previous studies, such as those by Bedi and Garg (2000), Donkers and Robert (2003), Chudgar and Quin (2012), and Maulin (2022). The literature on employment and school type generally indicates that private schools outperform public schools. The findings in this paper, which focus on different education levels, may differ from the

majority of studies due to variations in methodological approaches, sample characteristics, or institutional factors across countries. For instance, Cox and Jimenez (1988), Bedi and Gang (2000), Chudgar and Quin (2012), Bizenjo (2020), Donkers and Robert (2003), Choudhury (2020) and Shakeel and Dills (2024) conducted studies focusing on secondary education and relied on PISA test scores. However, according to International Standard Classification of Education (ISCED) 2011, secondary education consists of lower secondary, upper secondary and post-secondary non-tertiary education, yet these studies do not differentiate between these sublevels. In contrast, this paper specifically distinguishes between upper secondary and post-secondary education. Furthermore, unlike previous studies, the paper extends the analysis to include tertiary level. Beyond these factors, sample characteristics can also contribute to the contrasting results. For example, most studies are based on country-specific analyses, except for Shakeel and Dills (2024) and Donkers and Robert (2003), which examine multiple countries. In conclusion, estimation results in this paper highlight the importance of educational institutions in shaping employment and suggest that, based on the literature, the impact of schooling on employment may be influenced by broader structural factors.

Table 6: Test Results with Trade and Tax

	1	2	3	4	5	6
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
L.logemp	0.459***	0.491***	0.464***	0.470***	0.486***	0.480***
	(0.007)	(0.008)	(0.028)	(0.021)	(0.012)	(0.014)
logtrade	-0.437**	-0.0345	-1.026***	-0.753***	-0.0543	-0.00789
	(0.167)	(0.189)	(0.103)	(0.145)	(0.065)	(0.260)
logtax	0.007	-0.137***	0.188***	0.200***	0.137***	0.100***
	(0.009)	(0.009)	(0.028)	(0.038)	(0.024)	(0.022)
L3.logpublicter	0.131***					
	(0.016)					
L3.logprivater		0.027**				
		(0.013)				
L3.logpublicpost			0.158***			
			(0.042)			
L3.logprivatepost				0.131***		
				(0.027)		
L3.logpublicupper					0.357***	
					(0.040)	
L3.logprivateupper						0.342***

						(0.073)
Constant	2.931***	2.712***	3.892***	3.469***	0.617**	0.973
	(0.403)	(0.312)	(0.208)	(0.245)	(0.241)	(0.803)
Observations	391	388	387	387	391	391
Number of countries	23	23	23	23	23	23
Number of instruments	22	22	22	22	22	22
AR (1)	0.003	0.003	0.002	0.02	0.002	0.004
AR (2)	0.145	0.14	0.09	0.088	0.355	0.359
Hansen	0.43	0.35	0.365	0.504	0.468	0.398

Standard errors in parentheses *** p<0.01i ** p<0.05, * p<0.1

Table 7: Test Results with FDI and Tax

	1	2	3	4	5	6
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
L.logemp	0.471***	0.506***	0.486***	0.504***	0.486***	0.510***
	(0.007)	(0.007)	(0.027)	(0.016)	(0.016)	(0.015)
logFDI	-0.002	-0.003***	0.002	0.002	-0.001	-0.005**
	(0.001)	(0.001)	(0.003)	(0.002)	(0.005)	(0.002)
logtax	0.189***	-0.135***	0.116***	0.087***	0.223***	0.112***
	(0.030)	(0.009)	(0.030)	(0.019)	(0.042)	(0.020)
L3.logpublicter	0.235***					
	(0.027)					
L3.logprivater		0.046***				
		(0.006)				
L3.logpublicpost			0.176***			
			(0.040)			
L3.logprivatepost				0.110***		
				(0.029)		
L3.logpublicupper					0.456***	
					(0.053)	
L3.logprivateupper						0.346***
						(0.066)
Constant	1.230***	2.526***	1.810***	2.053***	-0.132	0.842**
	(0.109)	(0.031)	(0.078)	(0.063)	(0.276)	(0.362)

Observations	391	388	387	387	391	391
Number of countries	23	23	23	23	23	23
Number of instruments	22	22	22	22	22	22
AR (1)	0.003	0.003	0.003	0.003	0.003	0.003
AR (2)	0.167	0.154	0.112	0.101	0.484	0.327
Hansen	0.458	0.518	0.456	0.463	0.477	0.325

Standard errors in parentheses *** p<0.01i ** p<0.05, * p<0.1

5. CONCLUSION

Understanding the effect of school choice is crucial for developing educational policies that promote employment outcomes for students. In this paper, I analyze the impact of students attending different types of educational institutions at various education levels on employment outcomes across 23 OECD countries from 1998 to 2017. Through the two-step System GMM estimation method, I found a strong relationship between students enrolled in public institutions and employment for all education levels. Additionally, the results show that public institutions provide the greatest contribution at the upper secondary level, while private schools have a positive, though secondary, effect on employment outcomes.

Given these findings, public schools play a crucial role in influencing labor market outcomes. Policymakers should prioritize the enhancement by improving access to public education, affordability, and alignment with labor market needs. Supporting public institutions with additional funding and improving teaching quality could further boost the employability of graduates. On the other hand, the test results indicate that private institutions have a relatively significant impact on employment. Based on this, private institutions could also be encouraged to better align with labor market conditions to increase their contribution to employment outcomes. Another point is highlighted by the findings, for both public and private schools, the contribution of upper secondary education is higher than that of other education levels in OECD countries. At this stage, encouraging students to pursue higher education, perhaps by increasing employment opportunities, could enhance their interest in higher education and contribute to better labor market outcomes.

Limitations of this study include exclusion of other potential factors, such as gender-specific variables, which may also play a significant role in shaping employment outcomes. Further research could explore the gender-specific effects of educational institutions on employment outcomes, as well as how different

education levels—such as bachelor's, master's, and doctoral degrees—impact labor market participation and outcomes. This paper also focuses on total employment, so extending the research to examine sector-specific employment distributions could offer a more comprehensive understanding of the effect of schools on employment within various sectors. Additionally, expanding the analysis to include non-OECD countries could provide a broader perspective on how schools impact employment outcomes across different economic contexts.

6. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

7. FUNDING ACKNOWLEDGEMENTS

This study did not receive any specific funding from any agency.

8. AUTHOR CONTRIBUTIONS

The author developed research design, conducted data analysis, and reviewed the final manuscript.

9. ETHICS COMMITTEE STATEMENT

The study does not require approval from an ethics committee.

10. REFERENCES

Agasisti, T., & Bertoletti, A. (2020). Higher education and economic growth: A longitudinal study of European regions 2000-2017. *Socio-Economic Planning Sciences, 81 (C),* 1-18. https://doi.org/10.1016/j.seps.2020.100940.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58(2),* 277-297. doi:10.2307/2297968.

Arellano M., & Bover O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics ,68(1),* 29–51. doi:/10.1016/0304-4076 (94)01642-D.

Apostu, S.M., Mukli, L., Panait, M., Gigauri,I., &Hysa (2022). Economic growth through the lenses of education, entrepreneurship, and innovation. *Administrative Sciences, 12(74),*2-14. doi:10.3390/admsci12030074

Baum, C.F. (2013). Dynamic panel data estimators. EC 823: Applied Econometrics, Boston College, Spring. Retrieved October 20, 2024, from http://fmwww.bc.edu/EC-C/S2013/823/EC823.S2013.nn05.slides.pdf

Bedi, A.S, &Garg, A. (2000). The effectiveness of private versus public schools: the case of Indonesia. *Journal of Development Economics, 61(2),* 463-494. doi:10.1016/S0304-3878(00)00065-1.

Bizenjo, S. (2020). Education in Pakistan: Are low-cost private schools closing the gender

gap? *International Journal of Educational Development, 77(C),* 1-6. https://doi.org/10.1016/j.ijedudev.2020.102209.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87(1),* 115-143. doi:10.1016/S0304-4076(98)00009-8.

Bouzid, B.N. (2016). Dynamic relationship between corruption and youth unemployment: empirical evidence from a system GMM approach. *World Bank Policy Research Working Paper*,*7842*.

Chudgar, A., & Quin, E. (2012). Relationship between private schooling and achievement: Results from rural and urban India. *Economics of Education Revie*w, *31(4),*376-390. doi:10.1016/S0304-3878(00) 00065-110.1016/j.econedurev.2011.12.003.

Cox, D., &Jimenez, E. (1990). The relative effectiveness of private and public schools: Evidence from two developing countries. *Journal of Development Economics, 34(1-2),*99-121. doi:10.1016/0304-3878(90)90078-P.

Dronkers, J., & Robert, P. (2003). The effectiveness of public and private schools from a comparative perspective. *European University Institute (EUI) Working Paper,13*, 1-65.

Georgieva, D. (2024). What do demographic changes mean for labor supply? Retrieved October 20,2024, from: https://blogs.worldbank.org/en/developmenttalk/what-do-demographic-changes-mean-for-labor-supply.

Green, F., Machin, S., Murphy, R., & Zhu, Y. (2010). The changing economic advantage from private school. *IZA Discussion Paper, 5018,*1-36.

Habibi, F., & Zabardast, M.A. (2020). Digitalization, education and economic growth: A comparative analysis of Middle East and OECD countries. *Technology in Society, 63(C),* 1-9. doi: 10.1016/j.techsoc.2020.101370.

Hanushek, E.A., &Woessman, L. (2010). Education and economic growth. Retrieved November 9, 2024, from https://hanushek.stanford.edu/sites/default/files/publications/Hanushek%2BWoessmann%202021%20OxfResEncEcoFin.pdf

Jin, H., & Rubin, D.B. (2009). Public schools versus private schools: causal inference with partial compliance. *Journal of Educational and Behavioral Statistics, 34(1),* 24-45. doi:10.3102/1076998607307475.

Kripfganz, S., & Schwarz, C. (2015). Estimation of linear dynamic panel data models with time-invariant regressors. *European Central Bank* (*ECB) Working Paper, 1838,* 1-53.

Kumar, D., & Choudhury, P.K. (2020). Determinants of private school choice in India: all about the family backgrounds? *Journal of School Choice,* 15(4), 576-602. doi: 10.1080/15582159.2020.1852517.

Lachenmaier,S.,& Rottmann, H. (2015). Effects of innovation on employment: A dynamic panel analysis. *International Journal of Industrial Organization, 29(2),* 210-220. doi: 10.1016/j.ijindorg.2010.05.004

Lockheed, M., & Jimenez, E. (1994). Public and private secondary schools in developing

countries: what are the differences and why do they persist? *The World Bank ESP Discussion Paper Series*, *33,*1-38.

Lassibille, G., & Tan, J.P. (2001). Are private schools more efficient than public schools? Evidence from Tanzania. *Education Economics, 9(2),* 145-172. doi:10.1080/09645290110056985.

Marquez-Ramos, L., & Mourelle, E. (2019). Education and economic growth: an empirical analysis of nonlinearities. *Applied Economic Analysis, 27(79),*21-45. doi: 10.1108/AEA-06-2019-0005.

Moulin, L. (2022). Do private schools increase academic achievement? Evidence from France. *Education Economics, 31(2),* 247-274. doi:10.1080/09645292.2022.2061428.

Nguyen, H. T., Le, A. N.N.,Le, H.V., & Duong, K.D. (2024). Foreign direct investment and employment in Asia Pacific nations: The moderating role of labor quality. *Heliyon, 10(9),* 1-12.doi: 10.1016/j.heliyon. 2024.e30133.

OECD (2011). The effects of taxation on employment: An overview. *OECD Publishing*, 13-47. doi:10.1787/9789264120808-en

OECD (2024). Education at a glance 2024: OECD indicators. *OECD Publishing*. doi:10.1787/c00cad36-en.

OECD (2024). Education indicators in focus. *OECD Publishing*.doi:10.1787/22267077.

OECD (2024). Economic & social outcomes. Retrieved November 9, 2024, from https://gpseducation.oecd.org/revieweducationpolicies/#!node=41761&filter=all

Pfeffermann, D., & Landsman, V. (2011). Are private schools better than public schools? appraisal for Ireland by methods for observational studies. *Annals of Applied Statistics*, 5(3), 1726–1751. doi:10.1214/11-AOAS456

Piper, A.T. (2014). The benefits, challenges and insights of a dynamic panel assessment of life satisfaction. *Munich Personal RePEc Archive*, *59556,* 1-31.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal, 9*, 86-136. doi:10.1177/1536867X0900900106.

Shakeel, M.D., & Dills, A.K. (2024). The effects of private schooling on pupil achievement: A global systemic analysis. *Comparative Education, 8(2),*259–277. doi:10.1080/03050068.2023.2265280

Serifoglu, M.M., & Öge Güney, P. (2022). The effect of different fields of tertiary education on economic growth. *Review of Economic Analysis, 14(4),*543-571. doi: 10.15353/rea. v14i4.4053.

Solow, R.M. (1994). Perspectives on growth theory. *Journal of Economic Perspectives ,8 (1)*, 45–54. doi:10.1257/jep.8.1.45.

Soto, M. (2009). System GMM estimation with a small sample. *Barcelona Economics Working Paper Series,95*, 1-28.

Stepanok, I. (2022). FDI and unemployment, a growth perspective. *Review of International Economics, 31(2),* 761-783.doi:10.1111/roie.12643.

Su, T.D., &Nguyen,C.P.(2020). Foreign financial flows, human capital and economic

growth in African developing countries. *International Journal of Finance & Economics, 27(3),* 3010-3031.doi: 10.1002/ijfe.2310.

Suwandaru, A., Alghamdi,T.,& Nurwanto,N.(2021). Empirical analysis on public expenditure for education and economic growth: Evidence from Indonesia. *Economies, 9(146),* 1-13. doi:10.3390/ economies9040146

Tsai, C.L., Hung, M.C., & Harriott, K. (2010). Human capital composition and economic growth. *Social Indicators Research, 99,*41-59. doi: 10.1007/s11205-009-9565-z.

Wu,X. & Blake,A. (2023). Does the combination of models with different explanatory variables improve tourism demand forecasting performance? *Tourism Economics, 29(8),* 2032-2056. doi: 10.1177/13548166221132645.

Ziberi, B.F., Rexha, D., Ibraimi, X., & Avdiaj,B.(2022). Empirical analysis of the impact of education on economic growth. *Economies,10(89),* 1-10. doi.org/10.3390/economies10040089