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Investigating the Impact of Education Expenditure on Labor Force Participation in Türkiye

Türkiye’de Eğitim Harcamalarının İşgücüne Katılım Üzerindeki Etkisinin Araştırılması

ABSTRACT

Grounded on key economic theories such as Human Capital Theory and Endogenous Growth Theory, this study investigates the long-term nexus between labor force participation and education expenditure in Türkiye during the period spanning from 1991 to 2021, utilizing advanced econometric methods, including Ng & Perron (2001) and Elliott et al. (1996) unit root tests, and Fourier Shin and Shin cointegration tests, to analyze the dynamics between these variables. The results confirm that both education expenditure and labor participation are non-stationary. Moreover, there is a piece of evidence exhibiting long-term cointegration between the employed variables, particularly under the OLS method. Furthermore, the results indicate a significant positive nexus between education expenditure and labor force participation, with a stronger effect identified through Dynamic Least Squares (DOLS) estimation compared to Fully Modified Least Squares (FMOLS), suggesting that increased investment in education can enhance labor market outcomes by improving workforce skills and employability. Policymakers should address employment challenges and consider prioritizing educational investment as a strategy to boost labor force participation. Moreover, investments in education can have a substantial and positive impact on labor force participation by improving the employability and skills of the workforce. Future research is required to provide deep investigation regarding the relationship between labor force and education.

Keywords: Labor Force, Education, Türkiye.

ÖZET

Bu çalışma, İnsan Sermayesi Teorisi ve İçsel Büyüme Teorisi gibi temel ekonomik teorilere dayalı olarak, Türkiye’de 1991-2021 döneminde işgücüne katılım ile eğitim harcamaları arasındaki uzun vadeli ilişkiyi araştırmaktadır. Çalışmada, bu değişkenler arasındaki dinamikleri analiz etmek için Ng & Perron (2001) ve Elliott vd. (1996) birim kök testleri ile Fourier Shin ve Shin eşbütünlük testleri gibi ileri düzey ekonometrik yöntemler kullanılmıştır. Sonuçlar, hem eğitim harcamalarının hem de işgücüne katılımın durağan olmadığını doğrulamaktadır. Ayrıca, özellikle OLS yöntemiyle kullanılan değişkenler arasında uzun vadeli bir eşbütünlük olduğuna dair kanıtlar bulunmaktadır. Bulgular, eğitim harcamaları ile işgücüne katılım arasında önemli ve pozitif bir ilişki olduğunu göstermektedir. Dynamic Least Squares (DOLS) tahmin yöntemiyle belirlenen etkinin, Fully Modified Least Squares (FMOLS) yöntemine göre daha güçlü olduğu gözlemlenmiştir. Bu durum, eğitime yapılan yatırımların işgücü becerilerini ve istihdam edilebilirliği artırarak işgücü piyasası sonuçlarını iyileştirebileceğini önermektedir. Politika yapıcılar, istihdam sorunlarına odaklanmalı ve işgücüne katılımı artırmak için eğitime yatırım yapmayı öncelikli bir strateji olarak değerlendirmelidir. Ayrıca, eğitime yapılan yatırımlar, işgücünün istihdam edilebilirliğini ve becerilerini geliştirmek suretiyle işgücüne katılım üzerinde önemli ve olumlu bir etki yaratabilir. Gelecekteki araştırmalar, işgücü ve eğitim arasındaki ilişkiyi daha derinlemesine incelemek için gereklidir...

Anahtar Kelimeler: İşgücü, Eğitim, Türkiye.

1. INTRODUCTION

As education is a critical enabler of workforce development and economic growth, the nexus between education expenditure and labor force participation is an essential domain of inquiry in the economic literature. Underpinning by seminal theories in economics and social sciences, this study probes the relationship between education expenditure and labor force participation in Türkiye during the time period spanning from 1991 to 2021. Human Capital Theory posits that education is an investment in individuals’ productivity and employability, significantly enhancing workforce participation and emphasizing the significant role education plays in shaping labor market outcomes (Becker, 1964). Becker suggests that education enhances individuals’ skills and knowledge, serving as a form of human capital investment. He proposed that higher wages and better employment opportunities can be achieved through education and training that boost an individual’s productivity since education equips them with the necessary skills to meet the demands of modern economies. Endogenous Growth Theory focuses on how internal factors within an economy—such as knowledge, technology, and human capital—drive long-term economic growth (Romer, 1990), considering the idea that education plays a crucial role in sustaining economic development by promoting innovation and skill acquisition. The technological progress is largely a result of intentional investment in knowledge and human capital. The Lifecycle Theory of Labor Supply argues that education affects lifetime earnings potential through its impact on workforce decisions across different life stages (Ben-Porath, 1967). This theory posits that education is an investment in human capital, influencing labor supply

decisions and leading to higher future earnings. While lower education levels may require extended work to maintain income, higher education levels generally result in greater lifetime earnings, allowing for reduced labor or earlier retirement. The Job-Matching and Employability Theories, as outlined by Jovanovic (1979), emphasize the importance of education in aligning individuals' skills with labor market needs, and enabling reducing job mismatches by providing the specific skills required for particular roles, improving employability, and fostering better job matches. Labor Market Segmentation Theory, developed by Doeringer and Piore (1971), argues that the labor market is divided into distinct segments with varying job quality, highlighting structural barriers, such as discrimination and unequal access to education, that prevent marginalized groups from accessing better job opportunities. The theory emphasizes education's role in promoting workforce equity by improving opportunities, reducing discrimination, and providing marginalized individuals with the skills needed to access higher-paying, more stable jobs in the primary sector. The Capability Approach, introduced by Sen in 1999, emphasizes education's role in expanding individuals' freedoms and participation opportunities, focusing on enhancing people's capabilities, or their real freedoms to pursue goals they value in life, rather than just economic resources. Education is seen as a means to broaden knowledge, skills, and critical thinking, to foster autonomy, self-determination, and inclusivity, particularly for marginalized groups, allowing them to engage in decision-making and contribute to societal development and ultimately enhance both personal empowerment and societal inclusivity. In this paper, we will investigate the bearing of education expenditure on the labor force in Turkiye in the framework of Human Capital Theory and Endogenous Growth Theory. To assess the stationarity of the employed series, Ng & Perron (2001) and Elliott et al. (1996) unit root tests were utilized. Furthermore, the Fourier Shin test (Tsong et al., 2016) and the Shin test (1994) were utilized to examine the long-run relationship between the studied variables. The potential contributions of this study to the existing literature are demonstrated by extending the understanding of how education expenditure influences labor force in an emerging economy like Turkiye and highlighting the significance of including Fourier components to better capture structural breaks. This paper is structured as follows: the first segment is an introductory one, the second explores the relevant studies, the third presents the data methodology and empirical application, and the concluding segment presents the findings

2. LITERATURE REVIEW:

Psacharopoulos and Woodhall (1994) view education as a critical factor for personal and economic growth based on its role in increasing individuals' productivity and lifetime earnings, framing it as an investment in human potential. Acquiring higher levels of education improves a person's skills, knowledge, and efficiency, leading to better economic outcomes by boosting individuals' employability and earning potential over the course of their lives. However, Piore et al. (1974) view that education may not directly influence wage structures in secondary labor markets, proposing a dual labor market that divides the labor market into primary and secondary sectors, and highlighting how education's impact on wages and employment differs across these divisions. While education significantly enhances access to stable, high-paying jobs with opportunities for advancement, as employers value higher qualifications and specialized skills in the primary sector, it has a minimal influence on wages or stability in the secondary sector, where jobs are low-paying, insecure, and offer limited growth. Parasız & Bildirici (2002) offers another perspective proposing that rather than directly improving productivity, education serves as a signalling mechanism to infer potential job candidates' abilities and suitability without assuming that education enhances intrinsic skills. Uyanık (2000) emphasizes the significance of qualifications as indicators of trainability rather than job performance. To the best of our knowledge, there are limited studies that investigate the relationship between the labor force and education expenditure in Turkiye. Utilizing survey data from Turkiye's top 500 firms, Balcı (2004) reveals that managers prioritize education levels when hiring for middle-management, administrative, and engineering positions; however, other factors like work experience and personality traits often complement educational qualifications. Özaydın et al. (2009) highlight educational attainment as a key factor in labor market analysis, emphasizing the critical role of education in aligning labor supply with the demands of the manufacturing system, and pointing out a significant gap in research on the impacts of education on employability from a labor demand perspective in Turkiye. They examine employers' preferences regarding educational qualifications in hiring and promotion processes utilizing data from the 2006 "Turkey's Top 500 Industrial Enterprises" survey, revealing that in-depth studies on Turkiye's labor market can yield valuable insights, particularly at the macro level, to address unemployment and improve education-labor market alignment. Dlugosch (2023) highlights Turkiye's strong economic growth and job creation over the past two decades. Dlugosch stresses the need for improved formal job creation, especially for its young workforce. The author calls for labor market flexibility through reforms, including a broader unemployment insurance scheme and activation policies, emphasizing the need to improve the quality of education and better match

skills to available jobs to address growing vacancies and skill mismatches. Suna et al. (2020) investigate the horizontal skills mismatch in Türkiye's vocational education and training system, using a sequential mixed-methods approach, including face-to-face interviews with 20 graduates and a survey with 4,863 responses, and revealing that key reasons for out-of-field employment include difficulty finding jobs in their field, low wages, lack of necessary skills, insufficient experience, and poor working conditions. Furthermore, the results revealed that VET graduates desire jobs in their trained field, concluding that horizontal skills mismatch is a widespread issue, with the weak connection between VET and the Turkish labor market. Şahin et al. (2023) examine the causes and effects of being "Not in Education, Employment, or Training" among young people in Türkiye, utilizing data from a field survey of 3,158 youth between September and December 2020, and applying multivariable regression analysis. The study investigates how different causes (individual, familial, educational, environmental, and labor market factors) influence being "Not in Education, Employment, or Training", revealing the important impact of these causes on the selected youth in Türkiye. Mercan & Sezer (2014) highlight the critical role of education in the development of countries, indicating that it does not only provides the necessary labor force for economic growth but also drives technological advancement and knowledge dissemination, helping countries adopt modern manufacturing technologies. The authors underscore that increased education levels enhance labor productivity. Accordingly, it positively influences a country's competitiveness and facilitates global integration. Furthermore, it boosts individual earnings, plays a vital role in combating poverty, particularly in developing countries, and reduces unemployment risks. There is a need in the economic research to further investigate the labor-education relationship. The vital motivation of this paper is to fill, to some extent, the gap in the economic literature on the nexus between the labor force participation and education expenditure in Türkiye during the period spanning from 1991 to 2021.

3. DATA, METHODOLOGY, AND EMPIRICAL APPLICATION

Türkiye has made significant progress in educational attainment over the past two decades, with increasing percentages of the population achieving at least secondary and tertiary education levels. The proportion of individuals aged 25 and older who have completed short-cycle tertiary education (e.g., associate's degrees) grew from 7.33% in 2004 to 21.86% in 2023, with upper secondary education completion rate also experiencing substantial growth, rising from 21.03% in 2004 to 41.06% in 2023, according to the world bank database. However, master's and doctoral attainment rates remain relatively low, with doctoral attainment increasing slightly to around 2.52% by 2022, while the master's completion rate rising from 1.55% in 2013 to about 15.19% by 2022, suggesting ongoing challenges in expanding advanced degree attainment. From 1991 to 2021, Türkiye's education expenditure as a percentage of GNI fluctuated, starting at 2.14% in 1991, peaking at 3.67% in 2011, and reaching its highest point in 2020 and 2021 at 4.12%. Türkiye's labor force participation rate also shows a generally positive trend, increasing from 46.31% in 2004 to 53.37% in 2023. This study investigates the impact of education expenditure on labor force participation in Türkiye during the time period spanning from 1991 to 2021. Two variables from the database were utilized, sourced from the Worldbank database. Table (1) presents descriptive statistics of the utilized variables.

Table (1): Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
Labor participation	50.67	50.49	57	45.52	3.06	-0.002	2.26
Education expenditure	3.13	3.05	4.12	2.14	0.64	0.12	1.64

The methodology employed in this study uses Ng & Perron (2001) and Elliot et al. (1996) unit root tests to determine the stationarity and the cointegration of the time series data. Unit root tests help to identify variables' statistical properties over time. Following this, advanced econometric techniques were applied, including the Fourier Shin test (Tsong et al., 2016) and the Shin test (1994), which were utilized to examine the long-term relationship between labor participation and education expenditure, and assess whether a stable, long-run relationship exists between the variables. The Fourier-Shin test allows for capturing structural breaks in the data, providing with the Shin test robust evidence for the relationship between the analyzed variables and ensuring the validity of the findings. Table (2) presents the reveals of Ng & Perron (2001) and Elliott et al. (1996) unit root tests, demonstrating the non-stationarity of the analyzed series.

Table (2): Results of Unit root tests (with Constant and Trend):

		Labor participation				Education expenditure			
		Test Statistic	Critical Values			Test Statistic	Critical Values		
			1%	5%	10%		1%	5%	10%
ERS Test	ERS Test	34.748	4.220	5.720	6.770	8.897	4.22	5.72	6.77
	MZa	-2.562	-23.8	-17.3	-14.2	-9.646	-23.8	-17.3	-14.2
MGLS Test	MZt	-1.052	-3.42	-2.91	-2.62	-2.193	-3.42	-2.91	-2.62
	MSB	0.411	0.143	0.168	0.185	0.227	0.143	0.168	0.185
	MPT	32.633	4.03	5.48	6.67	9.458	4.03	5.48	6.67

Table (3) presents the results of the Fourier Shin (Tsong et al., 2016) and Shin (Shin, 1994) cointegration tests. The results of the Tsong et al. test reveal that the F-statistics for the OLS and DOLS methods are 74.552 and 25.376, respectively. While the F-statistics for the OLS test show a test statistic of 74.552, which is clearly above the critical value at the 5% level (0.124), the DOLS test, on the other hand, gives a lower F-statistic of 25.376, suggesting that while the null hypothesis of no cointegration is rejected at the 5% level, indicating evidence of a long-term relationship between the variables based on OLS, that based on the DOLS method cannot be rejected.

Table (3): Cointegration Results

	Fourier Shin		Shin (constant and trend)			
	F-Stat	Freq.	Cif	Test Stat.		
OLS:	74.552	1	0.147	0.446		
DOLS:	25.376	1	0.068	0.077		
Critical Values:						
	1%	5%	10%	1%	5%	10%
OLS:	0.198	0.124	0.095	0.184	0.121	0.097
DOLS:	0.198	0.124	0.095	0.184	0.121	0.097

The results of the Shin cointegration test reveal that in the model without a constant or trend, the OLS test statistic was 4.376, exceeding the critical values at all significance levels (1%, 5%, and 10%), leading to the rejection of the null hypothesis of no cointegration at the 1% level, indicating evidence of a long-term relationship between the variables, however, the DOLS test statistic was 1.673, higher than the critical values at the 10% and 5% levels but lower than the 1% critical value, leading to the rejection of the null hypothesis at the 5% level. In the model with a constant, the OLS test statistic was 0.870, which was higher than the critical value at the 1% level but lower than at the 5% and 10% levels, allowing for the rejection of the null hypothesis at the 1% level; however, the DOLS test statistic was 0.100, significantly lower than the critical values at all levels, meaning the null hypothesis of no cointegration could not be rejected. In the model with both a constant and trend, the OLS test statistic was 0.446, exceeding the critical value at the 1% level but lower than at the 5% and 10% levels, leading to the rejection of the null hypothesis at the 1% level, while the DOLS test statistic of 0.077 was well below the critical values, meaning the null hypothesis of no cointegration could not be rejected. Table (4) shows the results of Dynamic Least Squares (DOLS) and Fully Modified Least Squares (FMOLS) models, suggesting a positive relationship between education expenditure and labor participation.

Table (4): Coefficient estimation reveals

	DOLS	FMOLS
Education expenditure	6.994885(t = 3.382086, p = 0.0027)	6.209213 (t = 3.205284, p = 0.0035)
Constant (C)	35.77318(t = 7.706965, p = 0.0000)	38.39098(t = 8.395341, p = 0.0000)

4. CONCLUSION

This study investigates the relationship between education expenditure and labor participation in Türkiye over the period 1991–2021, utilizing Ng & Perron (2001) and Elliott et al. (1996) unit root tests and the Fourier Shin (Tsong et al., 2016) and Shin (Shin, 1994) cointegration tests to provide a nuanced understanding of the long-term dynamics between these variables. The results confirm the non-stationarity of both labor participation and education expenditure. Moreover, the affiliation between education expenditure and labor participation unveils long-term cointegration under the OLS method. Nevertheless, the DOLS method stipulates weaker evidence for cointegration, suggesting that, while there is a long-term liaison between education spending and labor force participation, the strength of it is sensitive to the choice of estimation method. Furthermore, the coefficient estimates from both the DOLS and FMOLS models indicate a significant positive relationship between the estimated variables, specifically, an increase in education expenditure is associated with a rise in labor participation, with the DOLS estimate slightly higher than the FMOLS estimate, suggesting a stronger dynamic effect when using DOLS. For policymakers, these findings offer compelling evidence that investments in education can have a substantial and positive impact

on labor force participation in Türkiye, implying that increasing public spending on education could enhance labor market outcomes by improving the employability and skills of the workforce. Future research could explore further the potential role of higher education in fostering labor market participation and the sector-specific impacts of education expenditure, particularly in regions or sectors where labor force participation remains lower.

REFERENCES

- Balcı, A. (2004). *Sosyal Bilimlerde Araştırma: Yöntem, Teknik ve İlkeler*. Pegema Yayınları.
- Becker, G. S. (1964). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. University of Chicago Press.
- Ben-Porath, Y. (1967). The production of human capital and the life cycle of earnings. *Journal of Political Economy*, 75(4), 352-365.
- Dlugosch, D. (2023). Labour market and education reforms are needed to create more and better jobs. In *OECD Economic Surveys: Türkiye 2023*. OECD. <https://doi.org/10.1787/6d27aecf-en>
- Doeringer, P. B., & Piore, M. J. (1971). *Internal Labor Markets and Manpower Analysis*. Heath and Company.
- Elliott, G., Rothenberg, T. J., & Stock, J. H. (1996). Efficient tests for an autoregressive unit root. *Econometrica*, 64(4), 813–8136. <https://doi.org/10.2307/2171846>
- Jovanovic, B. (1979). Job matching and the theory of turnover. *Journal of Political Economy*, 87(5), 972-990.
- Mercan, M., & Sezer, S. (2014). The Effect of Education Expenditure on Economic Growth: The Case of Turkey. *Procedia-Social and Behavioral Sciences*, 109, 925– 30.
- Ng, S., & Perron, P. (2001). Lag length selection and the construction of unit root tests with good size and power. *Econometrica*, 69(6), 1519–1554.
- Özaydın, M. M., Metin, B., & Kurnaz, I. (2009). The role of education in labor markets in Turkey: A labor demand-side approach. *Gazi Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 11(2), 141-170.
- Parasız, İ., & Bildirici, M. (2002). *Modern Emek Ekonomisi*. Ezgi Kitabevi Yayınları.
- Piore, M. J., Wachter, M. L., & Gordon, R. A. (1974). Primary and secondary labor markets: A critique of the dual approach. *Brookings Papers on Economic Activity*, 1974(3).
- Psacharopoulos, G., & Woodhall, M. (1994). *Education for Development: An Analysis of Investment Choices*. Oxford University Press.
- Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy*, 98(5), S71-S102.
- Sen, A. (1999). *Development as Freedom*. Oxford University Press.
- Shin, Y. (1994). A residual-based test of the null of cointegration against the alternative of no cointegration. *Econometric Theory*, 10(1), 91–115.
- Suna, H. E., Tanberkan, H., Eroğlu, E., Özet, M., & Gür, B. S. (2020). Horizontal Skills Mismatch in Vocational Education in Turkey: The Reasons for Out-of-Field Employment. *İstanbul Üniversitesi Sosyoloji Dergisi*, 40(2). <https://doi.org/10.26650/sj.2020.40.2.0101>
- Şahin, L., Ersöz, H. Y., Demir, İ., Kocakaya, M. E., Akgül, O., & Bükey, A. M. (2023). The Relationship between Cause and Effect Dimensions of Young People’s Being “Not in Education, Employment, or Training (NEET)” in Turkey. *Sustainability*, 15(21), 15274. <https://doi.org/10.3390/su152115274>
- Tsong, C.-C., Lee, C.-F., Tsai, L.-J., & Hu, T.-C. (2015). The Fourier approximation and testing for the null of cointegration. *Empirical Economics*, 51(3), 1085–1113. <https://doi.org/10.1007/s00181-015-1028-6>
- Uyanık, Y. (2000). Eleme hipotezi: Eğitimin işgücü piyasalarında eleme fonksiyonu. *Gazi Üniversitesi İİBF Dergisi*, 2(1).