

## Rethinking the Relationship between the Growth of the Secondary Education System and Employment: Evidence from Turkey

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**Abstract:** The contribution of the secondary education system to employment is among the priority areas of educational policy since it has employment-related aims for students who do not/cannot continue on to higher education. In Turkey, the secondary education system has increasingly grown with students and schools included in the system. Consequently, secondary school graduates have increasingly demanded access to employment opportunities. Therefore, this paper investigates the relations between the growth based on the number of students and schools in the secondary education system and the employment of secondary school graduates in Turkey. Long- and short-run relationships between the growth in the secondary education system and employed secondary school graduates were investigated by employing Autoregressive Distributed Lag (ARDL) Bounds Testing approach. Although analysis pointed out a cointegration between the growth in the secondary education and employment, long-run coefficients of variables were found to be insignificant.

**Keywords:** secondary education system, employment, growth of education system, compulsory secondary education policy.

### Introduction

There is no doubt that providing the outcome required for contributing to social development and economic growth is among the primary objectives of education systems. According to the Organisation for Economic Co-operation and Development (OECD, 2022), an average 14.3% of young men aged 20-24 and 17.4% of young women were not in employment, education or training in 2020. Labour market inclusion of young people especially in undeveloped and developing countries is therefore one of the most important goals of the economic growth process (Torun & Tumen, 2019). Thus, the objective of raising qualified labour is increasingly shaping the schooling policies of countries (Spohr, 2003).

Economic growth has become an indispensable part of educational reforms. Hence, it should be examined with respect to external economic efficiency to see whether education policies meet economic growth requirements and whether they are able to raise the alumni in accordance with the new economic structures (Cheong Cheng et al., 2002). Education policies for education levels directly related to employment need to be evaluated depending on the economic profile of a country. The economic return of schooling at the secondary education level is greater especially in underdeveloped countries compared with developed countries (Spohr, 2003). Therefore, it is important to increase the participation rates in secondary education that will contribute to economic growth and to make it functional for meeting the requirements of the labour force market especially in developing countries such as Turkey. Expanding secondary education results in quantitative growth through the increase of



the number of students accessing and succeeding in schooling. For this reason, establishing the link between secondary education and employment becomes more complex, especially for developing countries.

Discussions on the functionality of secondary education relating to employment lead to the questioning of policies on obligatory secondary education in Turkey, as in many countries (Calp & Calp, 2015; Kasa & Ersöz, 2016; Orhan-Karsak, 2017; Popov, 2019; Raimondi & Vergolini, 2019). Also, there are too many high school graduates seeking entry to too few university places in Turkey (Council of Higher Education, 2019). Although growth based on the number of students and schools has occurred in the secondary education system, a similar increase in the employment of secondary school graduates is not observed in Turkey. Therefore, this situation gives rise to questioning the link between growth in the secondary education system and employment. Education expenditures related to the growth of secondary education also require a strong connection between employment and the aforementioned growth in terms of efficiency in education. Allocated budget to operate secondary schools was approximately 23% of the Ministry of National Education (MoNe) budget for the 2020 fiscal year (MoNe, 2019). Considering the role of compulsory secondary education policy in the increased student and school numbers as well as education expenditures, the functionality of this policy needs to be questioned in the context of employment.

## **Literature Review**

According to human capital theory, education increases the productivity and efficiency of individuals thus making them ready for employment by improving their occupational skills. In this regard, education is considered a positive signal for employers who follow the labour market (Brekke, 2014). Young people who continue their education consider education a tool enabling them to reach better employment opportunities rather than increased productivity and assess the market signal role played by education more strongly than the role it plays in productivity (Killeen et al., 1999). Especially, young people who need or desire to be employed at a young age consider secondary education an effective tool in terms of employment.

The positive impacts of secondary education on employment have been effective in the implementation of compulsory secondary education policies in various countries. Compulsory secondary education reduces secondary school dropout rates (Cabus & De Witte, 2011) and the increase in student enrollment has long-term positive impacts on human capital (Xiao et al., 2017). However, all children still do not complete the compulsory secondary education despite the increase in the rates of compulsory secondary education completion (Liu & Rozelle, 2020). Children with unemployed parents display low academic performance and experience problems in continuing their education (Guio et al., 2018). As a result, students who drop out of high school education struggle to find permanent and productive employment (Rumberger & Lamb, 2003). It is also stated that there is no increasing relation between the employment of high school students and the rates of completing high school (Warren & Cataldi, 2006). For this reason, in order to benefit from the positive effect of secondary education on employment, it is necessary to ensure that the time spent in secondary education is suitable for the employment of socio-economically disadvantaged high school students who do not attend a university.

Young people with less education start their professional careers at earlier ages thus acquiring more experience in the labour market as well as having more time to find an occupationally safe profession (United Nations Educational, Scientific and Cultural Organization [UNESCO] & Understanding Children's Work [UCW], 2013). Therefore, secondary education is expected to fulfill the mission of preventing socio-economic inequalities (Winding et al., 2013). However, students from low socio-economic backgrounds are over-sensitive to the conditions of the labour market (Guio et al., 2018). Income and price shocks lead to increase in unemployment at the high school level (Berument et al., 2006). In addition to unemployment, financial difficulties also lead young individuals to work at low quality jobs (Awad, 2020). The fact that socio-economically disadvantaged high school graduates cannot gain experience in the constantly changing labour market at an early age reduces their employment opportunities. Therefore, the longer duration of secondary education especially limits the employment of socio-economically disadvantaged graduates.

In addition to continuous unemployment of high school graduates, they are also faced with cases of periodical unemployment (Ganderton et al., 2002) which can be associated with late employment. Late employment of secondary school graduates has an adverse impact on their productivity thus leading to long-term inefficiency (Rosenbaum et al., 1990). This is also disadvantageous for the economic growth of countries. On the other hand, employment of high school students during their high school education reflects positively on their employment in the long run. Employment during high school education increases lifelong earnings through its positive impact on employment after high school (Light, 1999). Job experiences of students at early ages contribute to their skill development while supporting the formation of social networks for future job opportunities in addition to making a positive impact on their work engagement (Painter, 2010). Hence, long-term compulsory education may have negative impacts on future employment opportunities especially for young individuals who will not attend higher education. It is an important policy in terms of secondary education completion that minimum employment age is made compatible with the duration of compulsory education (Heymann et al., 2013).

The relationship between secondary education and employment is also evaluated within the scope of cost-benefit analysis in education systems. Cost-benefit analyses in education systems examine the link between the cost of education and the earnings of the educated workforce (Woodhall, 2004). Therefore, the increase in unemployment rates of graduates with a lack of experience due to the long duration of high school decreases the benefits of secondary education and increases its cost. While cost-benefit analysis does not show the number of students to be included in secondary education, it helps to decide on investments to be made in education. Therefore, it can be misleading to calculate the rates of return to education based on a single variable (Woodhall, 2004). Rates of return for education vary depending on the changing nature of employment (Lewin, 2001). The longer duration of the secondary education also increases the number of students and schools in the system and thus causes an increase in numerous cost areas. For this reason, the increasing number of students and schools and also employment rates should be taken into account in the cost-benefit analyses for the secondary education system. Despite the role of secondary education in economic growth, supply-side analyses show that the financial cost of operating secondary schools is an obstacle for developing countries (Binder, 2006).

## **The Relationship between Secondary Education and Employment**

Today, higher education fails to provide employment guarantee due to the continuous increase in the number of higher education graduates along with the development of conditions that may damage occupational safety (Dimaki et al., 2005). Rapid development of higher education has led to what is called “over education.” Higher education graduates have become over-qualified for jobs suited for secondary school graduates. Hence, higher education graduates are now facing greater difficulties in finding employment opportunities in line with their qualifications (Cheong Cheng et al., 2002). In this regard, the correlation between higher education and employment has come under question within the scope of various studies (Bhorat et al., 2016; Salas-Velasco, 2007). At this point, ensuring the employability of secondary education graduates has become the centre of attention for both economy and education policies. It is known that higher education has greater private return compared with secondary education, however it is also indicated that the returns of both education levels have reached stability over time (Al-Samarrai & Reilly, 2008).

It is expected that secondary education programmes conform to the necessity of supply-side investment for welfare and that secondary education will raise young people with the required skills (Abbott & McTaggart, 2010). Secondary education plays a significant role with its contributions to ensure qualified employment especially for developing countries (Sheehan & Shi, 2019). Similarly, there is causality in Turkey moving from young unemployment to secondary education schooling rate (Sayın, 2011). The fact that the secondary education system has an impact on the individual productivity skills (Ilieva-Trichkova & Boyadjieva, 2018) plays an indicative role in the qualified employment of secondary school graduates. As an example, those who drop out of university education have low-skilled jobs compared with high school graduates and they are more adversely affected in terms of labour market outcomes (Ghignoni et al., 2019). High school dropouts who have completed their education afterwards are less productive than those who have never dropped out of high school (Rumberger & Lamb, 2003).

## **Compulsory Secondary Education and Employment**

Changes in the structure of work that took place with the industrial revolution played a role in the emergence of compulsory education in an organisational context (McGrath & Fischetti, 2019). Therefore, the economic growth goal plays a seminal role in the advancement of compulsory education. Compulsory education can make a positive impact on both employment and earnings and is reflected positively on labour market outcomes (Oreopoulos, 2006).

As is the case in Turkey, the aim of upper secondary education is preparation for higher education or the acquisition of the skills required for employment (Eurydice, 2019). High-school graduation rates may be affected positively when a high school diploma creates an expectation for entry into the labour market (Cabus & De Witte, 2011). Also, there are high school students who need to work during their compulsory education due to socio-economic reasons. However, employment throughout high school education reduces academic achievement (Marsh & Kleitman, 2005; Quirk et al., 2001) and long-term employment reduces commitment to school (Weller et al., 2003) while increasing school dropouts (Vickers et al., 2003; Warren & Lee, 2003). The impact of the employment of high school students on dropping out of school also depends on the socio-economic status of the students (McNeal, 2011). In Turkey, student absenteeism rates in the secondary education system also continue to be a major

problem (Balkıs et al., 2016). Absence from school followed by dropping out of school poses a significant obstacle in educating qualified labour and ensuring secondary school graduate employment. Therefore, the socio-economic attributes of families as an indication of the economic growth level of countries play an important role on completing secondary education (Winding et al., 2013) and the employment of secondary school graduates (Vicente, 2016). For this reason, it can be predicted that compulsory secondary education will not yield similar results in every country as to employment.

According to human capital theory, investments in education have an economic return and successful economies make relatively more investments in education. These investments are expressed by schooling rates and schooling duration. Increasing schooling duration is the result of successful economies rather than their cause (Killeen et al., 1999). Hence, it may not always be right to expect economic growth based on employment by increasing schooling duration as a result of compulsory education. In fact, the economic growth level may decrease if the costs involved in compulsory education increase (Lu, 2018). Therefore, cost-effectiveness comparisons should be made between primary, secondary and higher education in accordance with internal efficiency when designing education systems and the interfaces between different education levels should be subject to economic assessments (Cheong Cheng et al., 2002).

## **Research Objectives**

The present study investigated relations between the growth based on the number of students and schools in Turkey at the secondary education level and the employment of secondary school graduates. The aim was to examine the balance between secondary education and employment in Turkey and to assess the long-term functionality of secondary education with regard to employment. Hence, answers were sought for the following question, “Is there a correlation between the growth based on the number of schools and students in the secondary education system in Turkey and secondary school graduate employment?” Sub-questions of the study were as follows:

- (1) Is there a cointegration between the number of students and schools in the secondary education system of Turkey and the number of secondary school graduates employed?
- (2) Are there long- and short-run relations between the number of students and schools in the secondary education system of Turkey and the number of secondary school graduates employed?

## **Methods**

### **Data Set**

The data set on the secondary education system consists of the number of high school students and high schools in the secondary education system in Turkey over the period 1988-2019. The time series of annual student and school numbers were generated by utilising 1923-2009 statistical indicators of Turkish Statistical Institute (TurkStat, 2010) and 2019-2020 national education statistics of the MoNE (2020). The data set on employment consists of the number of employed high school graduates in Turkey over the period of 1988-2019. The annual time series, including the number of employed high school graduates, was generated by combining the 1988-2013 labour force statistics and 2014 and after labour force statistics of TurkStat (n.d.-a, n.d.-b).

The investigated relationship between the variables was restricted to the period 1988-2019 since the earliest year of data on employment accessible was 1988 and the last data year of employment was 2019. All the data related to the variables used in this study were transformed into their natural logarithmic form. Descriptive statistics of the variables are given in Table 1.

**Table 1. Descriptive Statistics of Employment, Student and School Variables**

	Employment	Student	School
Mean	15.09045	14.94841	8.862728
Median	15.18500	14.92457	8.796165
Maximum	15.60527	15.58195	9.476237
Minimum	14.27167	14.21572	8.252967
Standard Deviation	0.398865	0.452960	0.359417
Skewness	-0.723505	0.062525	0.039842
Kurtosis	2.414301	1.611173	1.794926
Jarque-Bera	3.249174	2.592637	1.944736
Probability	0.196993	0.273537	0.378186

## Data Analysis

Long- and short-run relationships between the number of students and high schools in the secondary education system and the number of employed high school graduates were investigated by employing the Autoregressive Distributed Lag (ARDL) Bounds Testing approach. The stationary levels of the variables were primarily tested by applying Augmented Dickey Fuller (ADF) and Kwiatkowski Philips-Schmidt-Shin (KPSS) unit root tests to determine whether the time series, including variables, were suitable to conduct the ARDL test. The existence of cointegration between the number of students and schools and the number of employed high school graduates was tested using the Bounds Test and F - statistics were compared with critical bound values (Pesaran et al., 2001). Following the determination of the cointegration, long-run dynamics between the variables were examined by estimating long-run coefficients of the ARDL model. The Error Correction Model (ECM) based on the ARDL approach was constructed to estimate short-run coefficients and, therefore, the short-run dynamics of the variables were investigated.

The Breusch-Godfrey Serial Correlation LM Test, RAMSEY Reset Test, Jarque-Bera Test, and Breusch-Pagan-Godfrey Test were applied to check whether the ARDL Model meets the assumptions of serial correlation, functional form specification, normality, and heteroskedasticity within the scope of diagnostic tests. Finally, Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMSQ) graphs were examined to test the stability of the ARDL model.

## Findings

### **Findings on stationarity of the variables and cointegration between the student- and school-based growth in secondary education system and employment**

To satisfy the requirement for the ARDL approach, unit root tests were employed to verify that variables were integrated of order at most one. ADF and KPSS unit root test results of the number of students and schools in the secondary education system and employed high school graduates

variables are reported in Table 2. Unit root test results were calculated for the models included an intercept and both an intercept and a trend in the level of the series and the model included an intercept in the first difference of the series.

**Table 2. Unit Root Test Results of the Variables**

	Augmented Dickey Fuller (ADF)		
	Level		First Difference
	Intercept	Intercept & Trend	Intercept
Employment	-2.771565 (0)	-1.252931 (0)	-4.876134* (0)
Student	-1.034717 (0)	-1.743615 (0)	-5.179520* (0)
School	-0.464047 (0)	-3.832869* (0)	-6.711248* (0)

	Kwiatkowski Philips-Schmidt-Shin (KPSS)		
	Level		First Difference
	Intercept	Intercept & Trend	Intercept
Employment	0.715025 (4)	0.180406 (4)	0.448972* (3)
Student	0.735665 (4)	0.094081* (3)	0.145496* (4)
School	0.754056 (4)	0.053912* (3)	0.334322* (19)

Note: \*denotes a significance level of .05. Values in parentheses indicate lag length for the test of ADF and bandwidth for the test of KPSS. Optimal lag length for unit root tests was determined based on Schwarz Information Criterion (SIC).

The variable of employment for high school graduates is stationary in the first difference at the .05 significance level according to both ADF and KPSS tests. While the variable of student becomes stationary in the first difference according to the test of ADF, it is stationary in level according to the test of KPSS at the .05 significance level. The variable of school is stationary in level at the .05 significance level according to both ADF and KPSS tests. Unit root tests indicate that there is no variable stationary in second difference consequently. Considering the unit root test results as a whole, it is concluded that the relationships between the number of students and schools in the secondary education system and employed high school graduates can be tested by applying the ARDL approach. ARDL (2, 1, 0) with unrestricted constant and no trend was selected as the most appropriate ARDL model using the Akaike Information Criterion (AIC) in order to examine the relationships between variables.

To examine the potential long-run equilibrium relationship between the number of students and schools in secondary education system and employed high school graduates, the ARDL Bounds Testing approach to cointegration was applied. Results of the Bounds Test are reported in Table 3.

**Table 3. Results of ARDL Bounds Test**

<i>k</i>	<i>F</i> -statistic	Lower Bound <i>I</i> (0)	Upper Bound <i>I</i> (1)
2	7.074476	3.79	4.85

Note: Critical values are at the .05 level of significance. Asymptotic critical values are obtained from Pesaran et al. (2001, p. 300, Table CI(iii))

As can be seen in Table 3, since the calculated  $F$ -statistic is higher than the lower and upper bound values ( $F = 7.074476 > 4.85$ ), there is a cointegration between the number of students and schools in the secondary education system and employed high school graduates, pointing out a significant and long-run equilibrium relationship. In other words, there is a long-run equilibrium between the student- and school-based growth in the secondary education system and employment of high school graduates. Therefore, long- and short-run relationships between the variables included in the ARDL model can be examined depending on the cointegration.

### Findings on Long-Run Relationship

Long-run coefficients of the ARDL (2, 1, 0) model were estimated on account of the presence of cointegration between the number of students and schools in secondary education and employed high school graduates. Long-run coefficient estimations are presented in Table 4.

**Table 4. ARDL Model Long-Run Coefficients**

Variable	Coefficient	Std. error	t-statistic	p-value
lnStudent	0.640163	0.629189	1.017441	0.3191
lnSchool	-0.490726	0.964249	-0.508920	0.6155

Note: ln denotes that variables are transformed into their natural logarithm by taking natural logs.

Long-run coefficients of student and school variables were insignificant, as can be seen in Table 4. Although coefficients were found to be insignificant, the effects of the variables on the employment can be evaluated. While the number of students had a positive effect on the employment of high school graduates, the number of schools had a negative effect in the long run. Specifically, a 1% increase in the number of students in the secondary education system raised employment of high school graduates by 0.64%. However, a 1% increase in the number of schools led to a 0.49% decrease in employment.

### Findings on Short-Run Relationship

ECM was constructed based on the approach of ARDL to ascertain short-run relationship between the number of students and schools in secondary education system and employed high school graduates. Short-run coefficients of ECM are reported in Table 5.

**Table 5. ARDL Error Correction Model Results**

Variable	Coefficient	Std. error	t-statistic	p-value
C	1.118912*	0.223837	4.998774	0.0000
$\Delta$ lnEmployment(-1)	-0.171888	0.150605	-1.141314	0.2650
$\Delta$ lnStudent	-0.162095	0.108030	-1.500455	0.1465
ECT(-1)	-0.107168*	0.022350	-4.795002	0.0001

Note:  $\Delta$  indicates that the difference of the variable is taken. C: Constant, ECT: Error Correction Term  
 Estimated error correction coefficient, ECT(-1) is -0.107 and significant. It shows that short-run deviations in the employment converge to the long-run equilibrium over time. The disequilibrium occurring in the employment due to a shock adjusts back to the long-run equilibrium at a rate of 11%



per annum. In other words, a deviation from the long-run equilibrium path of employment in a year is corrected by about 11% in the next year. However, the ECM coefficient is fairly small, therefore, it can be concluded that the speed of adjustment in deviations is slow. While constant term is significant, coefficients of other variables are insignificant in the ECM.

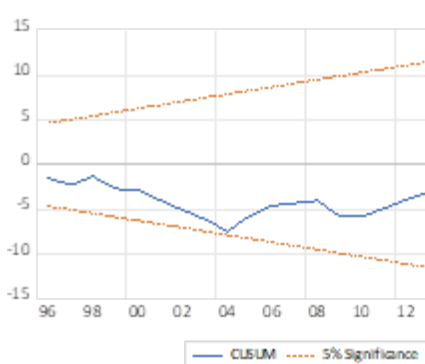
### Findings on Diagnostic Tests

To investigate the robustness of the estimated ARDL model of the study and the validity of the findings based on the ARDL model, the diagnostic tests on the serial correlation, heteroskedasticity, normality, and misspecification were employed and Table 6 reports the results of these diagnostic tests.

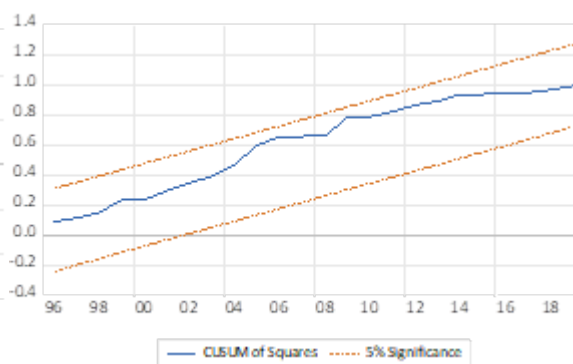
**Table 6. Diagnostic Test Results**

Diagnostic Tests	Test-statistic	p-value
Jarque-Berra Normality	0.240709	0.886606
Ramsey RESET	3.573269	0.0714
Breusch-Godfrey Serial Correlation LM	1.183322	0.3250
Breusch-Pagan-Godfrey Heteroskedasticity	0.319156	0.8965

The Jarque-Berra Normality test shows that the residuals of the estimated ARDL model of the study are normally distributed. According to the Ramsey’s RESET test, there is no misspecification with respect to functional form of the ARDL model. While the Breusch-Godfrey Serial Correlation LM test confirms the absence of serial correlation, the Breusch-Pagan-Godfrey Heteroskedasticity test shows that the model is free from heteroskedasticity. To assess the stability of the estimated ARDL model, the CUSUM and CUSUMSQ tests were conducted. CUSUM and CUSUMSQ test results are shown in Figures 1 and 2, respectively.



**Figure 1: CUSUM of recursive residuals**



**Figure 2: CUSUMSQ of recursive residuals**

As can be seen in Figures 1 and 2, CUSUM and CUSUMSQ of the recursive residuals stay within lines that symbolise the critical bounds at the .05 level of significance. Therefore, both tests indicate that the estimated model is stable and predictable over the sample period.

## Discussion

Limited resources have forced every country to make increased productivity one of their primary targets, thus, leading them to take into consideration economic concerns when developing education policies. In this context, meeting the short- and long-term economic demands of different education levels has been one of the important subjects considered within the scope of policies (Cheong Cheng et al., 2002). Secondary education is considered an opportunity for undeveloped and developed countries to increase the employability of young individuals since there are no differences between the earnings of secondary and higher education graduates (Tsamadias et al., 2001). Thus, making secondary education compulsory has become an education policy that has received increased importance over time. At this point, it should be considered that the impacts of education on employment may differ among countries (Habibov et al., 2019).

The present study provides evidence that there is a long-run equilibrium relationship between the number of students and schools in the secondary education system and the number of employed secondary education graduates in Turkey. The equilibrium between growth in secondary education and employment in Turkey may be considered as an indication that policies related to growth in secondary education assure stability of employment. In line with the findings of the present study, Warren and Cataldi (2006) determined that the relationship between employment of high school students and rates of high school completion is stable. On the other hand, Brudevold-Newman (2021) found that increased access to education as a result of the expansion in secondary education increases schooling and more qualified employment. Similarly, Kusakabe's (2012) study detected a limited correlation between the expansion in secondary education and employment. Therefore, the relevant literature points out that completing secondary education has important impacts on income and employment (Heymann et al., 2013) and reduces informal employment and likelihood of unemployment (Sheehan & Shi, 2019). Employment probability is lower for students who drop out of school at the secondary education level compared with those who complete their secondary education (Brekke, 2014). In the meantime, the productivity of employers is also shaped with the rates of completing secondary education (Sheehan & Shi, 2019).

Even though a long-term positive impact on employment was observed in the study for the number of students and a long-term negative impact was observed for the number of schools, these effects were not found to be statistically significant. These findings show that growth in secondary education should be examined from a holistic perspective. However, school dropouts and early age employment opportunities for high school students may have been effective in the emergence of this situation. Studies that take into account school dropout and the socio-economic characteristics of students have also revealed similar results. Kusakabe (2012) found that expansion in secondary education did not significantly increase employment opportunities for poor students. Zhang (2015) determined that high-school enrollment rates decrease due to increased employment opportunities for high-school students. In Zhongchang and Yongqiu's (2007) research, no significant relationship was found between high-school education and unemployment rates. Employment status was taken into consideration for individuals aged 15 and above within the scope of the present study. While the age factor may have strong positive impacts for employment in various countries, there are various other countries in which employment options decrease with age (Habibov et al., 2019). Hence, evaluating a wide age range may be related with the results indicating that increasing the number of secondary

education students has a positive impact on employment. It is a striking outcome of the present study that increasing the number of schools has a negative impact on employment. The lack of studies on the direct effect of the number of schools on employment makes it difficult to interpret this finding. However, it is necessary to consider the link between the lack of such a contribution by the number of schools and the ineffective investments as a result of the unsatisfactory cost-benefit analyses. In this regard, Berument et al. (2006) determined that financial policies in Turkey do not have an impact on total unemployment rates and unemployment related to education level.

The duration of compulsory education including secondary education is effective on employment (Spohr, 2003). However, compulsory education cannot display this expected impact in low-income countries with a high level of informal employment and indirect education costs (Diaz-Serrano, 2020). The holistic picture revealed by the findings of the study could not point to an inference regarding the absolute benefit of long-term compulsory secondary education. In line with the findings of the study, Hall (2016) found that there was no evidence that staying longer in secondary education reduces the risk of unemployment. Similarly, Lu (2018) determined that extended duration of compulsory education had no impact on economic growth in the case the total cost of education is met by the state and the unit costs for compulsory education and higher education are the same. Thus, it is an important requirement for underdeveloped and developing countries that their secondary education systems are structured for contributing to employment. The families of the student group with increased participation in compulsory secondary education are naturally less educated and in lower status job positions (Raimondi & Vergolini, 2019). However, the cost of education is a precursor for the impact of socio-economic attributes on schooling duration (Rouse & Barrow, 2006). Therefore, raising the school leaving age does not lead to similar results for all students concerning permanent employment. While the literature indicates an increase in the duration of compulsory education is relevant, opinions differ regarding the effect of an increase in the school leaving age (Woodin et al., 2013). The increase in the minimum age for leaving school does not always lead to an increase in welfare. As an example, negative long-term results for the individual may occur when long-term schooling leads to adverse impacts, especially on educational acquisitions and labour market outputs (Avenida et al., 2020).

Although the link between secondary education and employment is discussed from a quantitative perspective in this study, it should be mentioned that the type of high school and the quality of secondary education also shape employment opportunities. The growth of the secondary education system only in terms of the number of its components cannot increase the employment of secondary education graduates. In addition to secondary education diplomas, the quality of the education system is effective in finding a job for secondary school graduates (Vicente, 2016). Failure of schools to transfer necessary knowledge and skills to students (Rosenbaum et al., 1990) and the lack of employability skills in curriculum (Guy et al., 2009; Sermsuk et al., 2014) can create obstacles to the employment of secondary school graduates. Therefore, there is a need for education policies that enable secondary school students to have the skills necessary for employment.

The understanding of education adopted in schools can have a positive or negative effect on the quality of employment opportunities (Choi et al., 2019; Tabbron & Yang, 1997). Therefore, policies for secondary school students to acquire employability skills should focus on improving the structure and functioning of education in line with the requirements of the labour market and the age. In other

words, high schools should be structured to prepare students for employment. While students are relatively more prepared for employment in technical education, there are deficiencies in preparing students for employment in other school types (Guy et al., 2009). As a result, vocational and technical high school students have more employment opportunities than students in other high school types. For this reason, structuring the secondary education system in a way that allows student mobility across vocational and technical high schools and other types of high schools can be considered as an effective policy.

To structure the secondary education system in a way that facilitates employment, especially the teaching processes should be carried out with an understanding in line with the requirements of the age. The use of in-class and out-of-class teaching together in teaching processes can be an effective alternative in improving the employability skills of secondary school students. In addition to traditional classroom teaching, the design of teaching processes based on distance education, online education and blended learning will contribute to the education of students by equipping them with the skills required by the age. Today, blended instructional models based on establishing a balance between the use of technology and traditional teaching are recommended for workforce development, so that skill-building instruction can be integrated into technology-based education (Gan et al., 2014). Therefore, the structure of the secondary education system is expected to allow mobility across different types of education as well as across different types of high schools. The successful integration of online and traditional teaching programmes is considered as an effective way to respond to the changing needs of the labour market (Seibold, 2007). Gauthier (2020) stated that today, employers consider experience and competence more important than having a diploma and that the time spent sitting in the classroom is not considered equal to education. Therefore, he emphasised that education should be offered in a variety of formats. As a result, the requirements of the labour market determine the competences gained by students (Allais, 2012), and competency-based recruitment practices are increasingly preferred (Gauthier, 2020). The increasing importance given to the employment based on the competencies of students in the labour market necessitates the spread of the competency-based education. In competency-based education, which is also expressed as performance-based learning, an outcome-based approach was adopted and students demonstrated the skills they had gained (Gervais, 2016). It is considered more beneficial for students to earn employability skill micro-credentials that certify the core or technic competencies they have acquired as a result of completing a programme or course (Gauthier, 2020).

Since today's employees are expected to have the potential to work in different jobs and to be flexible in acquiring skills, students need to be trained to have 21st century skills (van Laar et al., 2020). 21st century skills are considered within the scope of the skills required in working life (Väisänen & Hirsto, 2020). It is possible for students to gain 21st century skills by experiencing a teaching process suitable for the acquisition of these skills. With the development of technology, different delivery methods have emerged that can provide students with this type of teaching experience. Emphasising the use of technology to facilitate student learning, technology-enabled learning can help students prepare for employment opportunities in different sectors (Kirkwood & Price, 2016). In the flipped classroom approach, which enables the effective use of technology in learning processes, students' learning experiences are enriched by enabling the practice of business skills both inside and outside the classroom (Wang et al., 2019). Flipped teaching techniques can facilitate the transition of students to

work life and can help students receive education that responds to the needs of the market (James et al., 2014). To strengthen the link between secondary education and employment, due attention should be given to policies focused on the dissemination of alternative teaching approaches that support the development of students' employability skills along with policies focused on growth in the secondary education system.

## **Conclusions**

The present study concludes that the growth based on the numbers of students and schools in the secondary education system of Turkey contributes to stability of the employment of secondary education graduates in the long run. Even though there is a long-term equilibrium relationship between growth based on the numbers of students and schools in the secondary education system and employment, neither the school nor the student variable is associated with employment. Since secondary education is a system, variables related to this system explain employment together. On the other hand, this situation shows that the links among the number of students, the number of schools and employment could not be directly established. This result points to the practical and policy implications that education authorities should consider for compulsory secondary education, secondary education curriculum and education financing. Shorter compulsory secondary education duration can be considered as a possible solution in this regard. The fact that students miss out on early employment opportunities as a result of the long time they spend in secondary education and cannot attend university increases the numbers of individuals in society who are neither in education nor in employment. Therefore, shortening the period of compulsory secondary education may help reduce the increasing number of students waiting to attend university and help solve the growing unemployment problems of university graduates in Turkey. The long duration of compulsory secondary education increases the number of secondary schools and the students in the system and, therefore, increases the cost of education that the state has to cover. For this reason, education authorities should evaluate the functionality of the compulsory secondary education period in terms of both employment and efficiency in education.

As another suggestion, strengthening the link between high schools and the labour market could be considered if the duration of compulsory secondary education remains the same. Education authorities should expand cooperation and partnership agreements between high schools and the business world. It should also be ensured that vocational courses are included not only in vocational and technical high schools but also in other types of high schools, within certain limits. In other types of high schools, vocational courses could be delivered through blended instructional models so that students acquire basic knowledge and skills that could increase their chances of taking part in the labour market.

Even though the aim of the study was not to examine the compulsory secondary education policy of Turkey in practice, the contribution of compulsory secondary education to employment could be examined starting from the year 2012. However, it would not be proper to accept a short-term data set for analysis. Since employment was considered in terms of the quantitative characteristics of the secondary education system in the study, the relationship between primary indicators of growth in secondary education and employment was examined. However, different factors such as per capita income, characteristics of the labour market and demographic factors may have an impact on the employment of high-school graduates. Therefore, future studies could examine the relationship

between employment and the secondary education system from perspectives based on different factors.

Vocational and technical high schools in the secondary education system make the highest contribution to secondary education graduate employment. Hence, failure to make a sufficient increase in the number of vocational and technical high schools or a greater increase in other high school types may negatively reflect on employment. Therefore, making comparison between different high school types regarding employment opportunities may provide a different perspective.

Considering the advantages of vocational and technical high schools in terms of employment, it is recommended to develop an education policy that allows student mobility across vocational and technical high schools and other types of high schools. However, teaching processes in all high school types should serve to build employability skills in order to structure a secondary education system that increases access to employment opportunities. The increase in the number of higher education graduates experiencing unemployment more clearly demonstrates the need for a secondary education system in which high school students acquire 21st century skills and thus develop employability skills.

The conditions of today's labour market require the secondary education system to have a dynamic and flexible structure that is sensitive to both individual and market needs. Allowing mobility across traditional education programmes and distance education programmes in secondary education may provide a dynamic structure to secondary education. The dissemination of the competence-based education approach, which emphasises the formation of skills, may also contribute to the creation of a flexible secondary education system that is sensitive to market needs. The creation of programmes in which students gradually earn micro-credentials for specific employment skills in the secondary education system may increase access to employment opportunities. However, for the effective use of the competency-based education and the micro-credentialing in line with the needs of today's labour market, instructional approaches that facilitate skill use and technology-enabled learning in secondary education should be adopted. In the context of such instructional approaches, blended instruction and flipped classrooms may enable secondary education to serve the formation of employability skills by making students active in learning processes, facilitating learning through the use of technology, and enabling students to practise the skills they have learned.

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