

## Short and long term analysis of some factors effecting youth unemployment in Turkey

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**Abstract.** *In this study, we have used youth unemployment rate (YUR) as dependent; producer price index (PPI), higher education schooling rate (HESR) and economic growth rate (EGR) as independent variables in order to clarify the factors that affect youth unemployment according to data for the period of 1988-2014. Data used in this study were obtained from database of World Bank (WB) and Turkish Statistical Institute. Augmented Dickey-Fuller test was conducted to identify if the series were stationary or not. Additionally, the co-integration test and ARDL bound test was conducted for short and long term analysis of series. According to findings of the study; long term relation was observed between the series. It was seen that PPI and HESR effect YUR negatively and also significantly; EGR effect YUR negatively but insignificantly in the long term.*

**Keywords:** youth unemployment, education, growth, higher schooling rate.

**JEL Classification:** E24, J64.

## 1. Introduction

Unemployment, which is defined as not using labour in the process of production, is observed to be one of the main economic problems in almost all countries. Human is the most important factor among production factors and excluding this factor from production process might cause much heavier costs in the economy. Because as stated by Kökocak et al. (2015), global processes and knowledge-based structural changes in the economy put competent and well-equipped human into the center of economy. Therefore, human is not only a factor of production, but also a factor playing a critical role to determine and improve the other production factors.

It is generally known that young people are more effected by negative conditions experienced in life. Turkey is a country with a young population of about 12 million 782 thousand, and 16.5% of its population consists of people aged 15-24 years (TSI, 2015). However, it is also obvious that the employment growth rate cannot reach the rate of population growth, so there is a low employment performance, and the economic growth in recent years doesn't create any employment opportunities. Additionally, the rate of informal employment is quite high (Sayın, 2012: 34). Therefore, in the next period youth employment that will shape our future is perceived as a serious problem especially in the industrialized countries in recent years. As a result of unemployment of young people, the tendency of exhibiting improper behaviors such as alienation, suicide and collective crimes might be increased with exclusion out of the society in addition to losing economic welfare (Casson, 1979: 3; Adak, 2010: 110-113; TSI, 2014: 26). As a result, it is possible to state that social and economic structure could be damaged to an undesirable extent.

In this study, it was aimed to determine some factors effecting youth unemployment and to develop a number of proposals to decrease youth unemployment. For this purpose in the first part of the study, the concept of youth unemployment and conceptual framework related to the variables of the study are presented. In the second part, variables of the study and analysis methods used are discussed. Then, the findings obtained were discussed within the framework of the economic literature. In the last part, some proposals in regard with decision-makers and academic literature are developed.

## 2. Conceptual Framework

Employment, one of the important indicators of the labour market, can be shortly defined as the inclusion of the labor factor in the production process. But in a broad sense, employment can be defined as including all production factors in the production processes (Ülgener, 1980: 73). On the other hand, unemployment can be defined as a not finding a job while searching for a job actively with enthusiasm for a wage (Ünsal, 2000: 14).

Turkey is a country that has had to struggle with high unemployment rates since the 1960s. In particular, the unemployment rate increased along with increasing globalization and technological progress since the 1980s, and reached higher rates compared to global rates in

the 1990s. The level of improvement in employment rates was considered to be slower than the subsequent recovery in economic growth after 2001 crisis (Ay, 2012: 322).

However, in the concept of unemployment and especially youth unemployment have become extremely important issue in recent years. At this point, there are also some differences in the definition of young population between countries. In the UK and USA, young population refers to the people aged 16-24 years, while people aged 15-24 years are accepted as the young workforce by International Labor Office-ILO and European countries. In our country, in the 3<sup>rd</sup> and 4<sup>th</sup> Five-Year Development Plans prepared by the State Planning Organization (SPO), people aged 12-24 years were accepted as young population, whereas people aged 15-24 years were accepted as young population in the 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> Five-Year Development Plans (Gündoğan, 1999: 65). Also, the OECD accepts the young population aged 15-24 years, declaring his/her unemployment in the reference week and searching for a job within the last four weeks, as the young unemployed (OECD, 2016).

It has been observed that youth unemployment have increased in recent years. Besides the economic losses, the main reasons of youth unemployment, which is damaging the social welfare of the society, are acknowledged to be lack of demand caused by slow trend of economic growth, periodical economic recessions and minimum wage, unqualified young labor force and high young population growth rate. Furthermore, some other reasons may be that young people are the most vulnerable people during the conjunctural economic recession periods and they are supported by their families (Torun and Arıca, 2011: 167).

However, there are also some studies trying to explain the higher unemployment rate of young people compared to the general unemployment rate in terms of supply and demand aspects. According to the views examining the problem in terms of lack of demand; some reasons such as economic stagnation and recession periods as well as minimum wage practices increase youth unemployment by reducing demand for young people. On the other hand, according to the views examining the problem in terms of supply; the main source of youth unemployment is considered to be the lack of qualified young labor force (Gündoğan, 1999: 68-69).

In Table 1, youth unemployment rates of some countries between the years of 2005-2014 are presented.

**Table 1.** Youth Unemployment Rates in Selected OECD Countries (%)

Years	Turkey	USA	UK	France	Germany	Italia	Israel	Russia	EU (28)
2005	19.9	11.3	12.2	20.6	15.2	24.1	17.9	15.5	18.4
2006	19.1	10.5	13.8	21.6	13.6	21.8	18.4	16.4	17.3
2007	20.0	10.5	14.2	19.1	11.7	20.4	16.3	14.4	15.5
2008	20.5	12.8	14.1	18.6	10.4	21.2	12.5	14.0	15.5
2009	25.3	17.6	19.0	23.2	11.0	25.3	14.7	18.5	19.9
2010	21.7	18.4	19.5	22.9	9.7	27.9	14.3	16.9	20.7
2011	18.4	17.3	20.2	22.1	8.5	29.2	11.8	15.2	21.2
2012	17.5	16.2	21.2	23.9	8.0	35.3	12.1	18.4	22.9
2013	18.7	15.5	21.1	23.9	7.8	40.0	10.5	13.8	23.5
2014	17.9	13.4	16.3	23.2	7.8	42.7	10.6	13.7	21.9
Ort	19.9	14.3	17.1	21.9	10.3	28.8	13.9	15.7	19.7

Source: OECD. <https://data.oecd.org/unemp/youth-unemployment-rate.htm>, Accessed: January 12<sup>th</sup> 2016.

Considering the data given in Table 1; the youth unemployment rate fluctuated between 17.5% and 25.3% for the years 2005-2014 in Turkey and the average rate for 10 years was observed to be 19.9%. The youth unemployment rate raised up to 25.3% due to the economic crisis in 2008 and then showed a downward trend since 2010. In that time, the youth unemployment rate of EU 21 countries fluctuated in a similar way and the average youth unemployment rate of these countries remained almost the same as Turkey's. It is seen that Germany's youth unemployment rate is continuously decreasing and the average rate is around 10.3%, whereas Italy has the worst youth unemployment rate increasing constantly with an average of approximately 28.8%.

In general, the youth unemployment rate is known to be 2-4 times higher than the adult unemployment rate (Torun and Arıca, 2011: 170; Sayın, 2012: 35). Considering the data presented in Table 2, the youth unemployment rate is nearly twice of total unemployment rate.

**Table 2.** *Unemployment and Labour Participation Rates in Turkey between 1995 and 2014*

Years	Unemployment Rate	15-24 Age Group Youth Unemployment Rate	Growth Rate	Labour Participation Rate	15-24 Age Group Labour Participation Rate
1995	7.3	15.6	7.2	54.4	49.5
1996	6.3	13.5	7.0	54.1	49.4
1997	7.2	14.3	7.5	52.2	47.1
1998	6.7	14.2	3.1	53.8	48.0
1999	7.4	15.0	-4.7	51.0	45.1
2000	6.5	13.1	7.4	49.9	42.5
2001	8.4	16.2	-7.5	49.8	42.1
2002	10.3	19.2	7.9	49.6	40.9
2003	10.5	20.5	5.8	48.3	38.4
2004	10.3	19.7	8.9	48.7	39.3
2005	10.3	19.3	7.4	48.3	38.7
2006	9.9	18.7	6.1	48.0	37.9
2007	9.9	19.6	4.7	47.8	37.8
2008	11.0	20.5	0.7	46.9	38.1
2009	14.0	25.3	-4.8	47.9	38.7
2010	11.9	21.7	9.2	48.8	38.8
2011	9.1	18.4	8.8	47.4	39.3
2012	8.4	17.5	2.1	47.6	38.2
2013	9.0	18.7	4.2	48.3	39.6
2014	9.9	17.9	2.9	50.5	40.8
Ort.	9.2	17.8	3.9	49.8	41.9

**Reference:** Turkish Statistical Institute (TSI) Database, [http://www.tuik.gov.tr/PreTablo.do? alt\\_id=1007](http://www.tuik.gov.tr/PreTablo.do? alt_id=1007), Accessed: January 12<sup>th</sup> 2016.

The labor force participation rate shows the relative weight of labour in the active population and it should be around 70% according to international standards (Sayın 2012: 37). This rate was 49.8% between the years of 1995-2014 for 20 years in Turkey. The labor force participation rate was observed as 41.9% between these years for the 15-24 age group. In other words, this rate of young people is 8% lower than the overall labor force participation rate.

However, according to the earlier studies in the literature, it has seen that the highest unemployment rate is in the 20-24 age group, and this rate is lower in 15-19 and 25-29 age groups. In other words, considering the age groups, unemployment rate is formed as an inverse U shape (Sayın, 2012; O'Higgins, 1997; Perugini and Signorelli, 2010).

In the studies examined the relationship between growth and employment in Turkey, there are some findings implying that economic growth doesn't decrease the unemployment (Taymaz, 1999; Erlat, 2000; Dietzenbacher and Şenesen, 2003; Tunalı, 2004; Mütevellioğlu and Sayım, 2009: 174; Sayın 2012). Considering the data presented in Table 2, the average economic growth rate was 3.9% between the years of 1995-2014 and the average unemployment rate was 9.2% while the youth unemployment rate was approximately 17.8% respectively. Therefore, as stated in the studies, the economic growth seen in that 20-year period didn't comply with the employment growth rates. In other words, there was an economic growth without employment in that period.

In the literature, according to the study of Green et al. (2000), one of the most important factors effecting the youth unemployment is noted as the level of education. In addition, in the study of Sayın (2012) which was conducted on the youth unemployment, the youth unemployment is effected by growth and higher education schooling rates at most. In addition, in many developed and developing countries, education is considered to be effecting the youth unemployment rate (O'Higgins, 2001: 30), and also increase employment rates (Dursun and Aytaç, 2009: 81). Thus, considering the youth unemployment in terms of education, educational level of young unemployed people in Turkey for the latest five-year period is given in Table 3.

**Table 3.** *The Youth Unemployment Rates of Young People Depending on Their Educational Level in Turkey between the Years 2010-2014 (%)*

Years	Not Literate	Elementary School	High School	Higher Education
2010	16.4	18.1	25.4	32.5
2011	11.2	14.5	21.8	30.0
2012	9.0	14.1	19.4	28.5
2013	10.3	15.5	20.2	29.2
2014	12.2	14.8	19.8	28.3
Ort	11.8	15.4	21.3	29.7

**Source:** Turkish Statistical Institute (TSI) (2014). Youth with Statistics, [www.tuik.gov.tr/PreHaberBultenleri.do?id=18625](http://www.tuik.gov.tr/PreHaberBultenleri.do?id=18625), Accessed: January 15<sup>th</sup> 2016.

Considering the ratios given in Table 3, the highest unemployment rate is found among those getting a higher education degree. In addition, it is possible to say that unemployment rates increase, as the young people gets higher.

The table prepared to see the distribution of the youth unemployment is presented below.

**Table 4.** *The Youth Employment Rates by Sectors in Turkey for Years between 2010 and 2014 (%)*

Years	Agriculture	Industry	Service Sector
2010	22.7	31.1	46.3
2011	22.3	32.1	45.6
2012	21.3	31.9	46.8
2013	20.7	31.5	47.8
2014	19.4	32.7	47.9
Ort	21.3	31.9	46.9

**Source:** Turkish Statistical Institute (TSI) (2014). Youth with Statistics, [www.tuik.gov.tr/PreHaberBultenleri.do?id=18625](http://www.tuik.gov.tr/PreHaberBultenleri.do?id=18625), Accessed: January 15<sup>th</sup> 2016

Considering the data shown in Table 4, nearly half of the young population between 14-24 years of age is employed in the service sector, one-third of them are employed in the industry and the remaining one-five of them are employed in the agricultural sector. In other words; about half of population is employed in the service sector.

### 3. Data and method

In this section, description for the data obtained and methods used in the study is provided.

#### 3.1. Data of the study

In this study, in order to determine factors effecting the youth unemployment in Turkey; the variables such as youth unemployment rate (YUR), economic growth rate (EGR), the average annual percentage change in the producer price index (PPI) and higher education schooling rate (HESR) were used for the period between 1988 and 2014. Information about the use of these variables are presented in Table 5.

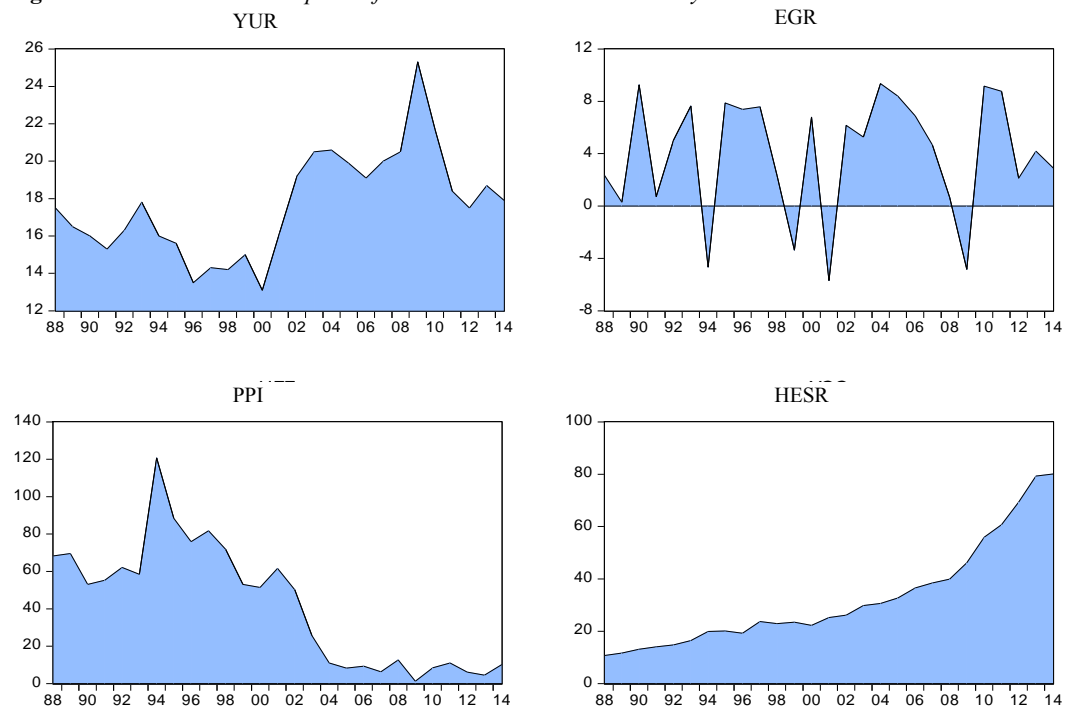
**Table 5.** Variables and Descriptions

Variable	Description	Source
YUR	Youth Unemployment Rate (%)	World Bank Statistical Data Base*
EGR	GDP Growth Rate (%)	World Bank Statistical Data Base*
PPI	The Average Annual Percentage Change in the Producer Price Index (%)	World Bank Statistical Data Base**
HESR	Higher Education Schooling Rate (%)	World Bank Statistical Data Base*

Source: \* <http://data.worldbank.org/>. Accessed: 26.12.2015, \*\* <http://www.tuik.gov.tr>. Accessed: 4.12.2015.

The time series graphics of the variables used in this study are presented in Figure 1.

**Figure 1.** The Time Series Graphics of the Variables Used in This Study



Source: Created by using E-Views software.

As shown in Figure 1; the data of YUR, EGR, PPI variables have conjunctural fluctuations by years; while HESR variable has an upward trend in general.

### 3.2. Analysis method

In the present study, the stability of the time series were tested by using Augmented Dickey–Fuller (ADF) (1979, 1981) methods. Then, existence of co-integration between series and long-short term analyses were conducted by using ARDL-Bound Testing Approach.

The long-term relationships between economic variables are examined by Engle-Granger (1987) test, which is based on residual widely, and Johansen and Juselius (1990) and Johansen (1988, 1991) tests, which are based on the similarity mostly. In the model established to conduct these tests, all variables should be non-stationary  $I(0)$  at the first level and they should become stationary when their first difference is taken (Pesaran et al., 2001: 289-290). Bound Testing Approach, which is used if variables are either  $I(0)$  or  $I(1)$  and not used if variables are co-integrated at  $I(2)$  or higher level, is seen to be widely used in the economic literature in recent years. Bound Testing Approach (ARDL) is developed by Pesaran and Pesaran (1997), Pesaran and Smith (1998), Pesaran and Shin (1995) and Pesaran et al. (2001).

## 4. Findings

In this section firstly, unit root results of the series used in the study are given. Then, results of co-integration and ARDL-Bound Testing Approach are presented.

### 4.1. ADF Unit Root Test Results

The ARDL method, which is used to determine long and short term relationships between dependent variable YUR and independent variables EGR, PPI, HESR, can be used when series of the variables are either  $I(0)$  or  $I(1)$ . However, this method cannot be used when variables are  $I(2)$  or higher in terms of co-integration. Therefore, Dickey Fuller (1979, 1981) test and unit root analysis were performed in order to see whether variables are co-integrated at either  $I(2)$  or higher levels and results are presented in Table 6.

**Table 6.** Unit Root Test Results

Variables	Level	First Differences	Result
YUR (No Trend)	-1.718	-4.664**	1 (1)
EGR (No Trend)	-5.765**	-	1 (0)
PPI (No Trend)	-1.236	-6.014**	1 (1)
HESR (No Trend)	3.371	-3.157**	1 (1)

\* %5 significance level, \*\* %1 significance level.

**Source:** The table is created by the author based on Dickey Fuller (1979, 1981).

Test results

As seen in Table 6, the first difference of YUR, PPI and HESR is stationary, and level values of EGR are stationary. This result shows also that the data of the study can be analyzed by using ARDL method.

### 4.2. Co-integration and ARDL-Bound Test

According to the ARDL method, first the long-term relationship between variables in the model should be examined. For this purpose, Unrestricted Error Correction Model

(UECM) is created. Accordingly, the maximum number of delays is found as four because of yearly data.

The adapted version of this test according to UECM is as follows:

$$\Delta GIO_t = \beta_0 + \sum_{i=1}^m \beta_{1i} \Delta GIO_{t-i} + \sum_{i=0}^m \beta_{2i} \Delta BO_{t-i} + \sum_{i=0}^m \beta_{3i} UFEK_{t-i} + \sum_{i=0}^m \beta_{4i} \Delta YOO + \beta_5 GIO_{t-1} + \beta_6 BO_{t-1} + \beta_7 UFE_{t-1} + \beta_8 YOO_{t-1} \mu_t \tag{1}$$

$\Delta$  in equation (1) describes first differences. The hypothesis, which examines the integration between first term delay of dependent and independent variables, are presented in Table 7.

**Table 7.** Hypothesis of F ve t Statistics

	H <sub>0</sub> Hypothesis	H <sub>1</sub> Hypothesis
F <sub>III</sub>	H <sub>0</sub> : $\beta_5 = \beta_6 = \beta_7 = \beta_8 = 0$	H <sub>A</sub> : $\beta_5 \neq \beta_6 \neq \beta_7 \neq \beta_8 \neq 0$
t <sub>III</sub>	H <sub>0</sub> : $\beta_5 = 0$	H <sub>A</sub> : $\beta_5 \neq 0$

The null hypothesis and alternative hypotheses of no-trend model created to test the co-integration relationship between the variables in the equation (1) can be established as  $H_0: \beta_5 = \beta_6 = \beta_7 = \beta_8 = 0$ ,  $H_A: \beta_5 \neq \beta_6 \neq \beta_7 \neq \beta_8 \neq 0$ . The co-integration relationship between variables is determined by testing significance of  $\beta_5, \beta_6, \beta_7$  and  $\beta_8$  coefficients in equation (1) with F test. The value of F and t-statistics of delayed level value of a dependent variable is compared with critical limit values in Pesaran et al. (2001) in order to see whether there is a co-integration relationship between variables. Since yearly data is used in this study, the model number (1) is estimated with maximum 4 delays with no trend. The results of F statistics in regard with test of co-integration relationship is presented in Table 8.

**Table 8.** Results of Co-integration Test

Model	m	k	F-Statistics	I(0) and I(1) Critical Values
				3.65-4.66*
ARDL(2,1,4,1)	4	3	6.287	2.79-3.67**
				2.37-3.20***

\*, \*\* and \*\*\* represent % 1, % 5 and % 10 significant levels, respectively. *M* is the maximum delay numbers, and *k* is the number of independent variables in the model. Critical values belong to the *k*=1 condition presented by Pesaran et al. (2001: 300) in Table CI(iii). The value in parenthesis represents the p (probability) value of F statistics.

F statistics calculated in Table 8 seem to be higher than upper critical values in all significance levels. Thus, the null hypothesis suggesting that there is no long term co-integration relationship between YUR and EGR, PPI and HESR is rejected. Accordingly, it can be said that there is a long term relationship between EGR, PPI and HESR and the youth unemployment variables for the period between the years 1988-2014 in Turkey.

After determining the long-term relationship between the variables, ARDL model should be estimated in the second step in order to analyze the short and long term relationship between variables. The adapted version of ARDL model, which was established to analyze the relationship between variables, is as follows:



$$GIO_t = \beta_0 + \sum_{i=1}^p \beta_{1,i} GIO_{t-i} + \sum_{i=0}^q \beta_{2,i} BO_{t-i} + \sum_{i=1}^q \beta_{3,i} UFE_{t-i} + \sum_{i=1}^q \beta_{4,i} YOO_{t-i} + \omega_t \quad (2)$$

First, all possible values of equation (2) with  $p$  and  $q = 1, 2, \dots, m$  and  $i = 1, 2, \dots, k$  are estimated with OLS approach in order to determine the most appropriate ARDL model with Eviews software. The maximum delay in this estimation is considered as  $m$  (4). The model chosen in the basis of criteria such as  $R^2$  Akaike Information Criterion (AIC), Schwartz Bayesian Criterion (SBC) or Hannan-Quinn criterion (HQC) among all models. The best ARDL (2, 1, 4, 1) model for equation (2) is estimated in accordance with SBC. Considering YUR is the dependent variable, the short and long-term coefficient estimations of ARDL (2, 1, 4, 1) are presented in Table 9.

**Table 9.** Short and Long Term Coefficients

Independent Variables	Short Term Coefficients		Long Term Coefficients
$GIO_{t-1}$	0.845	(4.453) *	
$GIO_{t-2}$	-0.714	(-3.278) *	
$BO_t$	-0.156	(-2.347) *	-0.019 (0.146)
$BO_{t-1}$	0.140	(1.778)	
$UFE_t$	-0.080	(-4.794) *	-0.123 (-6.546) *
$UFE_{t-1}$	0.069	(2.909) **	
$UFE_{t-2}$	-0.067	(-3.163) *	
$UFE_{t-3}$	0.025	(1.291)	
$UFE_{t-4}$	-0.055	(-2.803) **	
$YOO_t$	0.108	(1.055)	-0.112 (-3.667) *
$YOO_{t-1}$	-0.205	(-1.899) ***	
C	23.151	(4.690) *	26.632 (12.881) *
$ECM_{t-1}$	-0.869	(-6.547) *	
	Diagnostic Tests		
$R^2$	0.930	$\chi^2_{BG}(1)$	6.158 [0.104]
$\bar{R}^2$	0.861	$\chi^2_{RAMSEY}(1)$	0.006 [0.995]
DW	2.592	$\chi^2_{NORM}$	0.554 [0.757]
F statistics	13.381	$\chi^2_{BPG}(1)$	13.848 [0.242]

The values in parenthesis are t statistic values.  $\chi^2_{BG}$ ,  $\chi^2_{RAMSEY}$ ,  $\chi^2_{NORM}$ ,  $\chi^2_{BPG}$  are the tests used for Breusch-Godfrey autocorrelation, Ramsey Regression model establishment error, Jarque-Bera normality and Breusch-Pagan-Godfrey varying variance analysis, respectively. RSS refers to the sum of square errors. The values in brackets represent p-values of probability. \*, \*\* and \*\*\* represent % 1, % 5 and % 10 significant levels, respectively.

**Note:** Series of the Error Term (ECM) is determined to be stationary at level  $P < 0.01$ .

**Source:** Created by the author based on ARDL analysis results.

Considering the parameters measuring dependent and independent relationship presented in Table 9; PPI and HESR variables have been observed statistically significant at level of 1%, while EGR has not been found statistically significant. Considering the data given in Table 9; in the long term, PPI and HESR variables have been observed to be significantly effecting YUR in a negative way.

In this study, EGR variable has been observed to be negatively effecting YUR, but this effect is not significant. However, considering some earlier studies in the literature; there is a significant and negative (Yüceol, 2006; OECD, 2009) relationship between unemployment level and long term economic growth (Aghion and Howitt, 1994; Erikson, 1997;

Brauninger and Pannenberg, 2002). In some other studies, there are findings suggesting that growth doesn't decrease unemployment (Taymaz, 1999; Erlat, 2000; Dietzenbacher and Şenesen, 2003; Tunalı, 2004; Sayın 2012).

PPI has a negative and significant effect on the youth unemployment. The increase in PPI significantly decrease the youth unemployment. This result can be said to be compatible with economic expectations. A unit increase in the PPI decrease youth unemployment by 0.123 unit. This parameter is quite significant statistically. This result is consistent with the literature.

In addition, the higher education schooling rate (HESR) was found to have a significant and negative effect on the YUR. Accordingly, one unit increase in HESR decreases youth unemployment by 0.112 unit. These findings are consistent with the results of earlier studies emphasizing the relationship between unemployment and education in the literature (Green et al., 2000; Sayın, 2012).

After establishing a long term relationship, short term relationship is estimated by using error terms and difference values of these variables. Estimated short-term results are presented in Table 9. Considering the short term coefficients; current period coefficient value of EGR (except the value of previous period) has been observed both economically and statistically significant. Thus, current period coefficient value of EGR significantly effected the youth unemployment in a negative way in the short term in Turkey.

In the short term; the current, two and four periods earlier coefficient values of PPI (except the value of previous period) have been observed both economically and statistically significant. The coefficient of PPI for the previous term has been found to be significantly effecting youth unemployment in a positive way.

The sign of current coefficient value of HESR, which is an independent variable in the econometric model, has been estimated to be negative and statistically insignificant. In contrast, the value of HESR for the previous term has been found to be significantly effecting youth unemployment in a negative way.

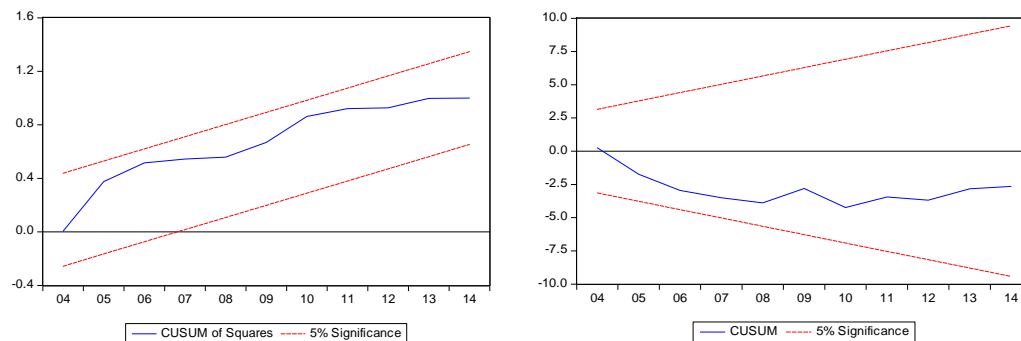
Because Error Correction Coefficient of  $ECM_{t-1}$  is statistically significant and negative (as seen in Table 9), that there is a long-term relationship between YUR and EGR, PPI and HESR. The error correction term of the model has been estimated to be -0.869 and it is significant at 1% level.

Therefore, a deviation in youth unemployment in the short term implies that the long-term balance can be achieved, since 86.9% of the rate can be improved in the following period. Thus, when a short-term shock takes place between variables, it is possible to state that this can be normalized in the long term. This also means that the model developed is significant and it works properly.

Considering the diagnostic test results of ARDL (2, 1, 4, 1) model (as seen in Table 9); autocorrelation, heteroscedasticity, model building error and  $p$  (probability) values of normal distribution tests are higher than all  $\alpha$  significance levels (1%, 5% and 10%). Therefore, it can be said that there are no diagnostic tests problems for ARDL (2, 1, 4, 1) model established.

Finally, CUSUM and CUSUM Q graphics, which use the square values of residuals and examine the structural breaks for the variables in the system, have been used to search for the presence of structural breaks for the variables.

**Graphics 2.** CUSUM and USUMQ Graphs (1988-2014)



**Source:** Created by using E-Views software.

If CUSUM and CUSUMQ charts are within the critical limits of 5% significance level, the parameters estimated are decided to be consistently. Thus, considering the CUSUM and CUSUMQ charts in Graph 2, the long term coefficients obtained by making estimations with ARDL model are consistent and there are no structural changes in the model.

## 5. Conclusion and discussion

In this study, which was conducted to clarify a number of factors effecting the youth unemployment in Turkey; the annual data for the 1988-2014 period have been analyzed by ARDL bound test developed by Pesaran et al. (2001).

As a result of the analysis conducted, the producer price index and higher education schooling rates in Turkey are found to be negatively effecting the youth unemployment and this effect is found to be significant. This result indicates that inflation and higher education schooling rate in Turkey significantly decrease the youth unemployment in the long term. There is a negative relationship between GDP growth rate and youth unemployment and this result is appropriate with economic expectations. However, this relationship is found to be statistically insignificant. The negative relationship between inflation, growth rate and youth unemployment is supported by the findings of the study conducted by Valadkhani (2003) for the Iranian economy.

In the short term, GDP growth rate is found to be significantly decreasing the rate of youth unemployment in the current period. In the short term; the current, two and four periods earlier coefficient values of PPI are found both economically and statistically significant. The coefficient of PPI for the previous term is found to be significantly effecting youth unemployment in a positive way. The sign of current coefficient value of HESR in the short term is found to be positive; however, the relevant coefficient was

estimated to be insignificant. In contrast, the previous value of higher education schooling rate was found to be significantly decreasing the youth unemployment.

Another important finding of the study is that a positive change in youth unemployment could be balanced in the long term, because 86.9% of that deviation might be improved in the following period.

Covering the findings and relevant literature; some recommendations for decision-makers, policy-makers and researchers have been developed and listed below.

In the literature, the process of migration from rural to urban areas doesn't make a quality transition between sectors since most of these people are not well-educated and well-trained. In other words, the uneducated masses migrating from rural areas to the cities are far from meeting the qualified human resources needed by the sectors (Tatlıdil and Xanthocou, 2002; Tunali, 2004; Dayıoğlu and Ercan, 2010; Bayrakdar and İncekara, 2013). Therefore, these people should be trained in accordance with demands of the labor market with an effective planning.

In addition, since there are also some problems in terms of finding intermediate staff for the areas needed by the economy, vocational and professional education opportunities should be provided for young people in line with needs of the labor market. The dual system in Germany, where technical school-employment relationship is established, (Gündoğan, 1999: 75) can be adapted. This system provides a structure that facilitates the transition to working life for people.

In the study of Eriksson (1997) in the literature; employment is stated to be more sensitive to incentives such as low tax rate and unemployment insurance. Thus, considering that employment taxes are high among labor costs, only these tax rates but not revenues, might be reduced (Ay, 2012: 328). In this way, the internal demand for making investments will be triggered for investors because of increased revenues.

In this study, although a negative relationship was found between the growth rate and youth unemployment in the long run in accordance with economic expectations, this relationship was not statistically significant. In the short term, the GDP growth rate was observed to be significantly decreasing the rate of youth unemployment. At this point, both decision-makers and policy-makers should review their growth strategies for the long-term employment.

Comprehensive active employment policies for social and economic development should be developed rather than passive employment policies in order to decrease the rate of youth unemployment. In this context; young people should be guided with career counselling in line with market demand, and additionally regional incentive systems should be used to encourage young entrepreneurship in places where unemployment becomes a greater issue.

As stated by Torun and Arica (2011); a comprehensive employment policy which is formal, inclusive and consistent with macroeconomic policies should be created and National Reform Programme should be adopted in accordance with the EU Employment Strategy.

In the future studies to be conducted in the academic field; the scope of the study can be extended by changing the variables and time period of the data. Furthermore, since the level of regional socio-economic development in Turkey is thought to be effectual on the results; it is possible to imply that the validity of the findings can be increased by inclusion of socio-economic development as a variable in the future studies.

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