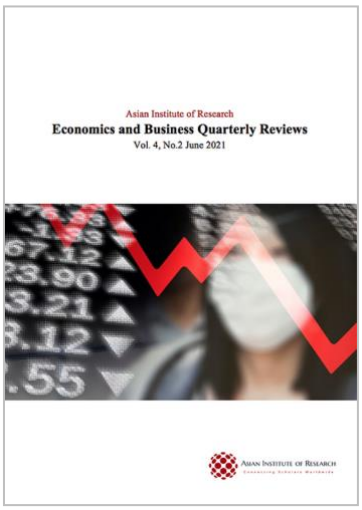

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An Application for the Impact of the Agricultural Labor Force and Employment Structure on the Economic Growth in Turkey

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Abstract
In this research, agricultural employment and labor structure in Turkey between the years 1991-2019 aimed to investigate the impact on economic growth. In this framework, the relationship between agricultural employment (TI), agricultural male employment (TEI) and agricultural value added (TKD) and growth was analyzed using the World Bank Country Report. According to the results obtained in the study, the relationship of all three parameters with GDP is statistically highly significant ($p < 0.05$). However, when the analysis is repeated as year-controlled, the effect of agricultural added value on GDP becomes statistically insignificant ($p > 0.05$). The regression analysis results showed that only the TI variable, that is, the agricultural employment variable, had a significant effect on growth ($p < 0.05$). Apart from this, there is no statistically significant effect of male employment and agricultural value added parameters on growth in agriculture ($p > 0.05$). Increased employment in agricultural production in Turkey, has a negative effect on growth. It can be stated that the main reasons for this are that there are not enough agricultural innovations, modernization and technological developments.

Keywords: Growth, Labor, Employment, Agricultural Employment, Agricultural Added Value

1. Introduction

Conceptually, the growth implies an expansion and it is also development in line with the enhanced success. The growth in economy is possible with the financial development according to the economy theory. Because of this reason, it is necessary to clarify how the financial development could be possible at first in order to comprehend the growth. For centuries, particularly following the industrialization, the economic growth and development have been discussed and the importance of the subject even increased further together with the globalization on account of the relationships of the country economies (Durmuş, 2019; Auer et al., 2017; Dao, 2011; Blanchard et al., 2010; Barro, 2003; Barro, 1996; Romer, 1990).

The increase in income is necessary in order to reach the social and even political developments. The countries which grow strongly and on a continual basis could decrease their own poverty levels to a crucial extent, they

could reinforce their democratic and political stabilities, could improve the quality of their natural environments and even they could reduce the crime and violence cases. However, the economic growth does not bring solution for every problem. On the other hand, though its direct useful effects are limited, it considerably facilitates the implementation of the public programs which complete its effects and eliminate its deficiencies (Kraay, 2006; Khan et al., 2005; Wilson and Briscoe, 2004; Loayza and Soto, 2002; Ahmed, 1994; Caballe and Santos, 1993).

The human community is compelled to the process of continuous renewal of the production of various material commodities and services, in order to meet the increasing needs of the population. As we define these four stages, that is to say distribution, exchange and consumption, as the social reproduction, such continuous renewal of the production process is a general legality and obligation in each production style. We note that there is simple, scaled and extended social reproduction and the production volume could remain same or it may decrease or increase from year to year. The growth is necessary by means of taking into consideration the fact that the coverage of the social needs grows on a continual basis and then the general legality pushes the extended social reproduction process (Ivic, 2015). Although the studies relating to growth and agriculture have been performed relatively, no sufficient study has been encountered between the agricultural employment and the growth. Because of this reason, in this study, it is aimed to research the effect of the agricultural employment and manpower structure between the years 1991-2019 in Turkey on the economic growth.

2. Conceptual Framework

The economic growth is a new phenomenon in the human civilization. The per capita income in the Western Europe which had been at approximately the same or even lower level than the Chine and India until the 15th century then increased more than 30 times until the year 2000. Following the industrial revolutions which started in the ends of the 16th century in the West, it became possible with the usage of the scientific technology in production and the usage of much more sophisticated transportation means and communication tools in commerce (Bruno, 1995).

The positive growth of the economy indicates the existence of the higher living standards, quality and serial production, increase in the per capita income, higher educational levels and decrease in unemployment. The positive growth gives rise to an increase in the production of the goods and services. In a growing economy, there are lots of jobs and investment opportunities and the health, education and other fundamental living standards of the population improve as well. At this point, it is possible to say that the growth could be positive, zero or negative. In general, the positive growth implies development. The zero growth implies a balanced economy. In this case, no development is possible but it could still be considered as a risk factor in this epoch in which there are relationships between all of the world economies with the high increase of the technology and development. As it could also be understood by its name, the negative growth causes a financial crisis, high inflation and risks (Durmuş, 2019).

The growth performance in the world showed some huge differences between the regions and countries recently; in some economies, some great changes have been undergone within the course of time. For the entire world as a whole, the growth speed of the production per capita followed a reducing path beginning from the 1960s. To a certain extent, it reflects the inclination in the industrialized countries and the influence over the developing countries. However, there are some important differences between the geographical territories as well.

The economic growth rates in the Eastern Asia and Pacific region have been not only the highest but also most stable ones among all of the developing economies and it has shown a stable increase in the 1970s and 1980's and then it showed only a slight decrease in the 1990s. The East Asia had also relatively successful growth experience in the recent twenty years and the output growth rates per capita increased more than 3 percent in a year with an outstanding stability (Loayza and Soto, 2002).

Today, not only the do economists not agree on the trends and theories but also they describe the sources of the economic growth. They attach a special importance to the calculation of the growth, thus the components which cause the growth trends could be calculated properly. Japan and, in the previous period of 1930-1960, the Soviet

Union experienced a magnificent economic growth for years. The economy specialists discovered that GDP of Japan grew by 10% in a year because of the growth of the inputs with the rapid technological change, with the help of the calculation of the economic growth. While analyzing the growth of the Soviet Union in the above-mentioned period, it resulted from the increase in the compulsory capital and effort inputs (Ivic, 2015).

According to the economic history of the world, the long term growth rates and actually the average living standards fluctuated considerably within the course of time. The growth fluctuated around 0 percent until the year 1000. The per capita income differences between the richest and poorest regions of the world did not exceed 10 percent. Between 1000 – 1820, the global income increase per capita reached 0.05 percent at average in a year, from 0 percent in the poor regions of Africa to 0.14 percent in the richest areas of the Western Europe. Just before the Industrial Revolution, the income per capita in the richest regions of the world was roughly three times of the income in the poorest regions of the world (Balcerowicz and Rzonca, 2015).

The technological changes include the changes in the production processes or presenting new products in order to increase the output from the same amount of inputs or to increase the outputs. The most important technological developments in the modern world have been realized and experienced in the areas such as electronics, computers, telecommunication and aviation industry, etc. The technological change is a continuous process of smaller and bigger improvements, as it is shown by means of reaching millions of patents by most of the developed countries. Afterwards, the changes which were made in the military industrial complexes which were implemented in the civil production sector should be considered among the most important changes. The civil technological developments are much less dramatic, however it does not increase the contribution of the market economies to the living standards in a less affecting manner. Whenever we look at this subject from the neoclassical technological change model, it means that more outputs could be produced with the same capital and effort inputs and this will imply that such technological change forces the limitations of the arbitrary characteristics (Ivic, 2015).

3. Method

The data which are stated in the Table-1 which are compiled from the Country reports of the World Bank are used in the study.

Table 1: World Bank codes and explanations concerning the research variables

Code	Description	World Bank Codes
GDP	Growth	GDP per person employed (constant 2017 PPP $)
Tİ	Agricultural Employment	Employment in agriculture (% of total employment) (modeled ILO estimate)
TEİ	Agricultural Man Employment	Employment in agriculture, male (% of male employment) (modeled ILO estimate)
TKD	Agricultural Added Value	Agriculture, forestry, and fishing, value added (% of GDP)

The World Bank data are compiled from the values between the years 1991-2019 and it is refined from the seasonal effects and the deflator effects have been calculated as well.

In the analysis of the data, the SPSS 17.0 for Windows and Eviews 7.0 for Windows package programs were used. The measurement data are defined with the average and standard deviation values and, in addition to this, the maximum and minimum values are also given. The Kolmogorov Smirnov Test is used for the normality test of the data. The Augmented Dickey-Fuller unit root test (ADF) is used for the unit root test of the data. Because all of the data are distributed normally and they do not contain any unit root, the Pearson's Moments correlation, year controlled partial correlation and linear regression analyses are carried out. All of the analyses are realized at 95% confidence interval and 0.05 significance level.

4. Findings

The average, standard deviation, minimum and maximum values of the variables which are used in the study are given in the Table-2.

Table 2: The average, standard deviation, minimum and maximum values of the variables which are used in the study (1991-2019)

	Minimum	Maximum	Average	Standard Deviation
GDP (PPP $)	37404,76	82049,78	58887,22	14346,37
Tİ	18,11	29,76	24,93	3,61
TEİ	14,85	21,83	18,27	2,10
TKD	5,78	16,85	9,95	3,50

In the whole time interval, the GDP value is between 37404.76 and 2049.78 with the fixed price of 2017 and it has average value as 58887.22±14346.37. The agricultural employment is between 18.11% and 29.76%, the agricultural man employment is between 14.85% and 21.83% and the agricultural added value varies between 5.78% and 16.85%. The results of the Pearson's Moments correlation and the controlled correlation analysis for the correlation of the variables with GDP are provided in the Table-3.

Table 3: The results of the Pearson's Moments correlation and the controlled correlation analysis for the correlation of the variables with GDP

	Pearson's Correlation		Year controlled partial correlation	
	r	p	r	P
Tİ	-0.981**	0.000	-0.520**	0.005
TEİ	-0.970**	0.000	-0.410**	0.030
TKD	-0.900**	0.000	0.062	0.753

According to the correlation analysis results, the correlation of each of three parameters with GDP is highly significant statistically ($p<0.05$). However, whenever it is analyzed again with year control, the effect of the agricultural added value over GDP becomes statistically insignificant ($p>0.05$).

The results of the Augmented Dickey Fuller (ADF) unit root test for the variables of the study are given in the Table-4.

Table 4: The results of the Augmented Dickey Fuller (ADF) unit root test for the variables of the study

	T value	%1 KD	%5 KD	%10 KD	p
GDP (PPP $)	-0.262531	-3.689194	-2.971853	-2.625121	0.9186
Tİ	0.9075557	-3.724070	-2.986225	-2.632604	0.9939
TEİ	-0.040531	-3.689194	-2.971853	-2.625121	0.9467
TKD	-1.170026	-3.689194	-2.971853	-2.625121	0.6728

The ADV unit root test results indicate that there is no unit root in all of the research parameters and, because of this reason, the variables could be used in the model directly ($p>0.05$). The p values which are calculated for the variables are quite high. Because of this reason, no advanced analysis is performed with the Philip Peron or similar other unit root test.

In the study, the following model has been established for the effect of the agricultural employment and the manpower structure on the economic growth:

$$\mathbf{GDP = \beta_0 + \beta_1 x (Tİ) + \beta_2 x (TEİ) + \beta_1 x (TKD)}$$

The results of the regression analysis which is carried out for the test of the model are given in the Table-5.

Table 5: The results of the regression analysis concerning the research model

Variable	Beta	Std. Error	t-Statistic	p
Tİ	-3801.588	928.9404	-4.092392	0.0004
TEİ	711.6561	1870.911	0.380379	0.7069
TKD	-575.6117	416.0624	-1.383474	0.1787
C	146400.1	11617.91	12.60124	0.0000

R-squared	0.964568	Mean dependent ex.	58887.22
Adjusted R-squared	0.960317	S.D. dependent ex.	14346.37
S.E. of regression	2857.898	Akaike info criterion	18.88100
Sum squared resid	2.04E+08	Schwarz criterion	19.06959
Log likelihood	-269.7745	Hannan-Quinn criter.	18.94007
F-statistic	226.8614	Durbin-Watson stat	0.970974
Prob(F-statistic)	0.000000		

The regression analysis results indicated that only the TI variable, namely the agricultural employment variable, has significant effect on the growth ($p<0.05$). Apart from that, the man employment in agriculture and the agricultural added value parameters do not have any significant effect on growth statistically ($p>0.05$).

5. Discussion

In this study carried out, it is aimed to research the effect of the agricultural employment and the manpower structure on the economic growth between the years 1991-2019 in Turkey. In this framework, an electrometric and statistical analysis study is carried out over the World Bank data.

In literature, particularly in the economies with higher agricultural potentials and agricultural societies, it is reported that the agriculture is an important source of growth and employment. However, this situation has been changing recently and the effect of the agriculture in the effort or service-intensive markets and in the capital-intensive markets could be below the expected level in comparison with the other sectors. Consequently, while the direct effect of the agriculture on the economic growth was a more definite information and approach in the past, in today's modern economies, the situation is slightly different now (Durmuş, 2019; Kremer et al., 2009; Sepehri and Moshiri, 2004; Bruno and Easterly, 1998; Sarel, 1996; Bruno, 1995; Fischer, 1993). On the other hand, thanks to the advanced usage of the agricultural knowledge and technology at advanced levels in some countries, the agriculture has become a much more important economic value at the same time.

According to the results of the study obtained, whenever the employment in agriculture is examined with regard to the man employment rate in agriculture (it also represents the woman rate at the same time) and the agricultural added values, it is seen that it has negative effects on the economic growth. As a matter of fact, it is an expected situation because the yield and added value of the agricultural production reduce every day in our country and the costs of the production items other than the raw materials in the agricultural production increase gradually as well. In the year controlled correlation analysis, while only the agricultural added value is not in a significant correlation, the agricultural employment and the man employment in agriculture affect the growth negatively.

According to the regression analysis results, only the agricultural employment has significant effect on the growth and this effect is in negative direction. In other words, as the employment in agriculture increases, it has negative effect on the economic growth. While there could be lots of reasons for obtaining such results, the deficiencies in the agricultural policies, the country's economy and the capital structure could be listed as the potential reasons.

6. Conclusion

The study results indicate that, the increase of the employment in the agricultural production in Turkey makes a negative impact on the growth. It could be stated that the agriculturally sufficient renovation, modernization and technological developments do not take place among its main reasons. In particular, whenever lots of reasons get together such as the products which are made according to the market price in full every year and then could not be sold at the end of the year and decayed, the usage of the agricultural incentives for some different purposes, it would also be seen that the increase of the agricultural production and employment has a negative effect on growth. In the frame of the results which are obtained in the study, it is necessary to rehabilitate and modernize the agricultural employment urgently, to eliminate the deficiencies and failures resulting from the production planning and to establish a more effective production and marketing system in agricultural meaning. Besides that, by means of making crosswise comparisons with the different countries which became successful in agriculture for the advanced researches, it could be possible to explain the problematic of the study in a further detailed manner.

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