

ESTIMATES REGARDING THE EVOLUTION OF THE LABOR FORCE IN AGRICULTURE AT THE LEVEL OF ROMANIA

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Abstract

The labor force in agriculture is an essential component of agriculture. The paper addresses the evolution of the number of employees in the period 2008-2019, at national level and in agriculture, forestry and fishing. Also, the evolution of the net earning in agriculture in the period 2008-2019 was analyzed. The aim of the paper is to identify the trend of the evolution of the number of employees in agriculture, as well as the net earnings in this sector, thus, based on these data we can estimate their evolution by 2030, using the Expert Modeler method (SPSS), and determining the main statistical indicators.

Keywords: labor, agriculture, net income

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Introduction

Worldwide, the latest data show that the labor force has declined recently, so that currently around 884 million people are employed in agriculture (27% of the global labor force), while in 2000, the number of people working in agriculture was 1.05 billion people (40% of the global form of work). It should be noted that in Europe there was the sharpest decline among agricultural workers (5.3% of the employed population working in the agricultural sector), as well as in Asia.

The labor force in agriculture in Romania has been endangered by various factors, along with Romania's accession to the European Union, since 2007, when a large part of the active population chose to go to Western European countries, especially in agriculture, in countries such as Italy or Spain. At the same time, the Romanian agriculture, through the two National Rural Development programs, benefited from funds meant to renew the old and morally outdated machinery and equipment, with new ones, with a much higher yield and with a much lower labor force. Next, one of the most successful sub-measures financed by PNDR was sub-measure 4.1. – Investments in agricultural holdings, through which farmers were financed in a proportion of maximum 90% of the eligible value of the project, for the purchase of high-performance agricultural machinery and equipment.

This study aims to estimate the evolution of the labor force in agriculture, taking into account the different challenges it affects. In this sense, the SPSS program was used, using the Expert Modeler method to predict the evolution of the labor force in agriculture until 2030.

The structure of the paper is based on an estimate of the labour force in Romania as a whole, as well as broken down by branch relating to agriculture, forestry and fisheries, up to the year 2030, as well as the earnings related to this branch.

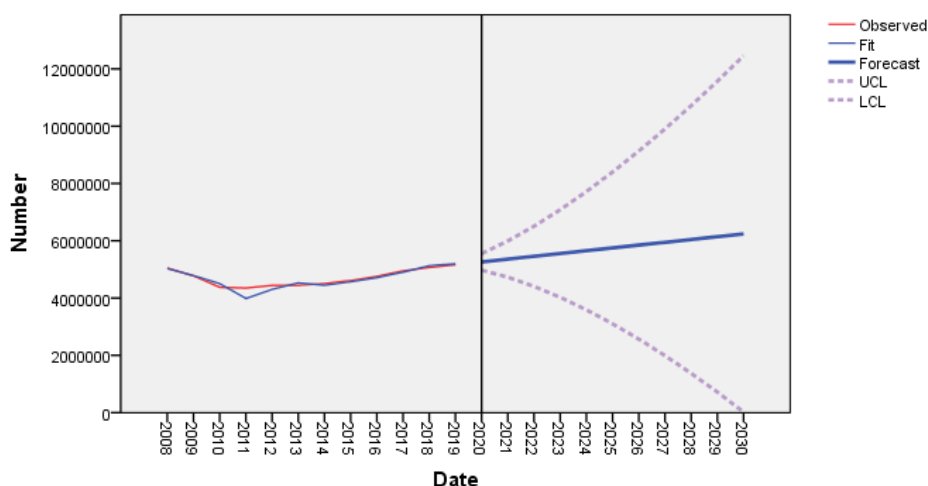
1. Literature review

In the paper "Study on the labor force in Romanian agriculture" by Nica (2018), describes the current context and responds to the statement that in Romania there is no labor force in agriculture, especially seasonal labor. Data collected from national, European and international databases on the total population, were analyzed indicators such as the active population, the employed population, the share of the total workforce, as well as the unemployed and the unemployment rate.

2. Labor force employed in Romania

Analyzing the evolution of the employed labor force at national level, it is found that since 2012, the number of employees has registered an upward trend, after a difficult period determined by the global "economic crisis". This is highlighted by the fact that if in 2008 the number of employees was over 5.04 million, by 2011 it contracted by about 13%, registering 4.34 million employees (Figure 1.).

Figure 1. Estimating the evolution of the labor force at national level



Source: INS statistical data processing, accessed 27.10.2020.

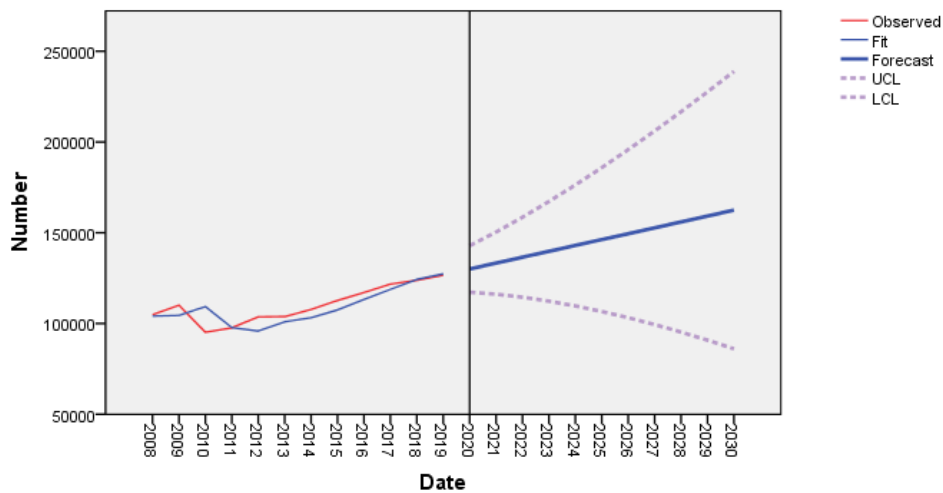
According to the methodology used, an upward evolution is forecast in terms of the employed workforce at national level, thus estimating that by 2030 the number of employees would be about 6.24 million, increasing by about 21% compared to 2019. In the current circumstances, regarding the COVID-19 pandemic, this trend will most likely be negatively influenced by this global disruption (Figure 1.).

3. Employment in agriculture, forestry and fishing

At the level of 2019, the share of employment in agriculture, forestry and fisheries in the total employment was about 2.5%, compared to the share of this sector in 2008, when it was about 2%.

Regarding the evolution of the employed labor force in agriculture, forestry and fishing, the same trend is observed as in the case of the evolution of the labor force in general, so that in 2009 and 2010 there is a decrease in the number of employees due in the most to a large extent to the global economic crisis, as well as to the labor migration in the countries of the European Union as a result of Romania's accession to the EU. Starting with the year 12, the situation of the labor market starts to recover, reaching that in 2019 more than 126 thousand employees in agriculture, forestry and fishing will be registered, thus registering an increase of approximately 33% compared to 2010 (Figure 2.).

Figure 2. Estimation of labor in agriculture, forestry and fisheries

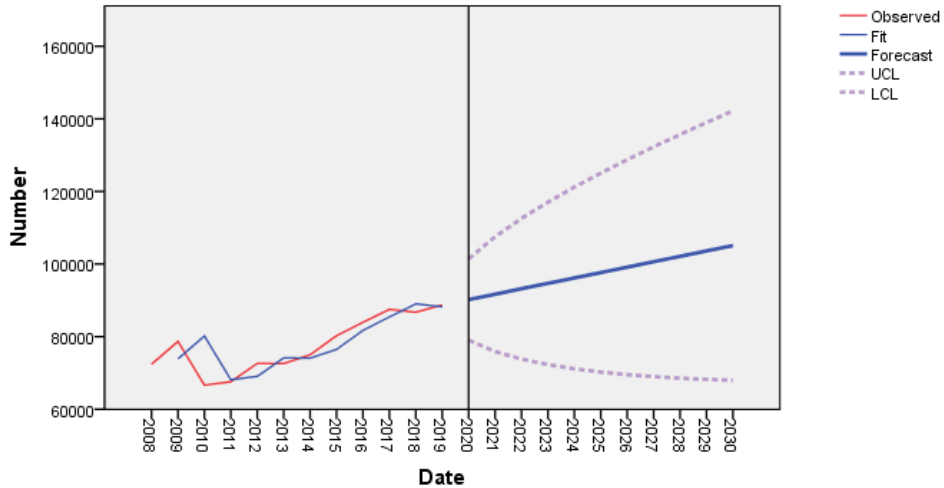


Source: INS statistical data processing, accessed 27.10.2020.

Most likely, the agricultural sector was affected slightly less than in other sectors (HORECA), although some agricultural producers sold their products in this sector, but it is expected that in the next period, this sector will register small decreases. According to the research method, it is expected that by 2030 the number of employees in agriculture, forestry and fishing will reach 162 thousand employees, increasing by 28% compared to 2019 (Figure 2.).

The share of labor in agriculture and related services in the total labor force in agriculture and related services in 2019 was about 70% of the total, compared to the share held in 2008 when it was approximately equal (Figure 3.).

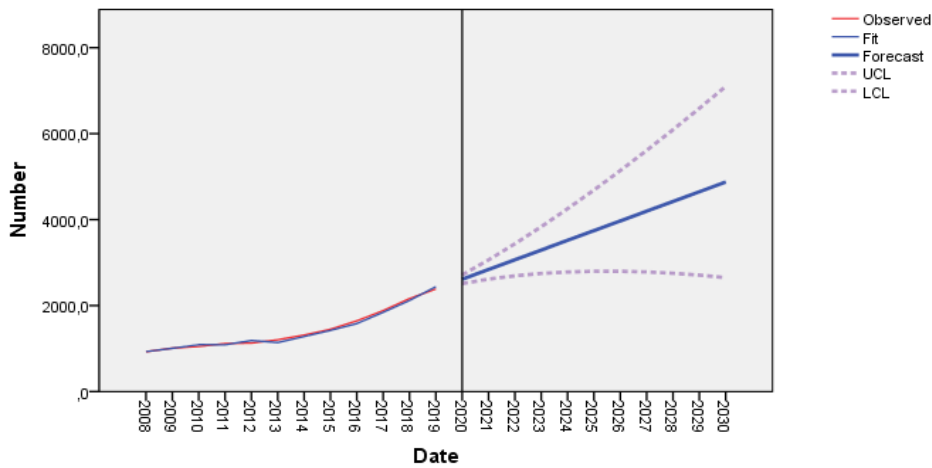
Figure 3. Estimation of labor in agriculture and related services



Source of INS statistical data processing, accessed 27.10.2020.

The number of employees in agriculture and related services decreased in 2010 and 2011, due to the economic crisis that also affected this sector. If in 2010 the number of employees was 66.6 thousand, in 2019 their number was 88.7 thousand, representing an increase of over 33%. Given that even in the case of the economic crisis that began in 2008, there were repercussions on the agricultural workforce, with a decrease in the number of employees, it is expected that in the period following the COVID-19 pandemic there will be an effect negative in this regard. At the same time, according to estimates, it is expected that by 2030 the number of employees in agriculture and related services will exceed 105 thousand, in the situation where this trend analyzed in the period 2008-2019 is maintained (Figure 3.).

Figure 4. Estimated average net gain in agriculture, forestry and fishing (monthly)

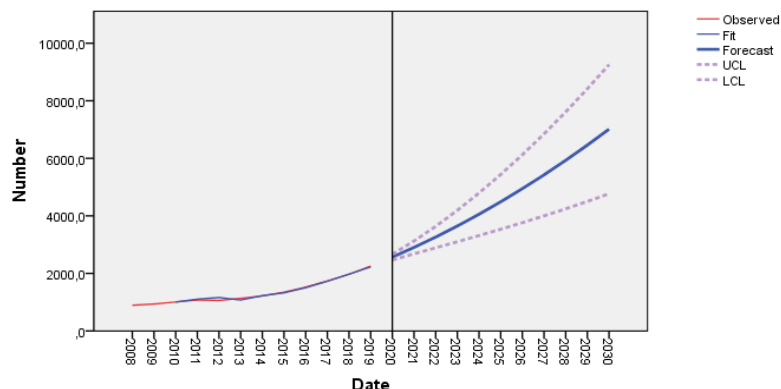


Source: INS statistical data processing, accessed 27.10.2020.

The net gain in agriculture, forestry and fishing shows an upward trend, so that if in 2008 it had an average value of 925.9 lei / month, in 2019 the net gain in this sector was 2387.1 lei / month, so that in the course of 10 years this has increased 2.5 times. The increase in net earnings in this sector can also be attributed to the increase in farmers' incomes, due to subsidies obtained through direct support from the European Union budget (Figure 4.).

According to estimates, the trend of net gain continues to be increasing, reaching a value of 4875 lei / month in 2030. Keeping the same annual growth rate, these values seem justifiable, given that this sector is becoming increasingly important for food safety and security, but also through the need for skilled labor (Figure 4.).

Figure 5. Estimated average net gain in agriculture, forestry and fishing (monthly)



Source of INS statistical data processing, accessed 27.10.2020.

Regarding the average net gain in agriculture and related services, there is an upward trend, so in 2008 the average net gain was 891.7 lei / month, while in 2019 it was 2257.2 lei / month, so that over 10 years it increased 2.5 times (Figure 5.).

According to estimates, the trend of net gain continues to be upward, reaching in 2030 to have a value of approximately 7000 lei / month. Maintaining the same annual growth rate, these values seem justifiable, given that this sector is becoming increasingly important for food safety and security, but also through the need for skilled labor (Figure 5.).

Table 1. Main statistical indicators on labor force and average net earnings in the period 2008-2019

Indicators	Total employees	Employees - agriculture, forestry, fishing	Employees - agriculture and ancillary services	Net income - agricultural sector, forestry, fishing	Net income - agriculture and ancillary services
Mean	4707393,92	110395,83	77728,25	1439,258	1346,808
Std. Deviation	293104,622	10182,179	7737,843	480,1072	438,0667
Minimum	4348739	95185	66634	925,9	891,7
Maximum	5164471	126554	88738	2387,1	2257,2
R-squared	,799	,673	,598	,991	,989

Source: INS statistical data processing, accessed 27.10.2020.

Analyzing the main statistical indicators in the period 2008-2019, we find the following:

- The total number of employees in Romania has an average of 4.7 million employees in the analyzed period, and the standard deviation has a value of 2.9 million employees. Determining the value r^2 , a coefficient of 0.799 was obtained, indicating a close connection between the two variables.
- Analyzing the labor force in agriculture, forestry and fishing, an average of the analyzed period of 1.1 million employees was determined, and the standard deviation has a value of 10.1 thousand employees. Determining the value of r^2 , a coefficient of 0.673 was obtained, indicating a close connection between the two variables.
- Regarding the monthly net gain from agriculture, forestry and fishing, an average value of 1439 lei was determined for the analyzed period, and the standard deviation was calculated at the value of 438 lei. The coefficient of variation has a value of 0.991 indicating a very close link between the analyzed variables.
- In the case of the monthly net gain from agriculture and related services, an average value of the analyzed period of 1346 lei was determined, and the standard deviation has a value of 438 lei. The coefficient of variation has a value of 0.989 indicating a very close link between the variables analyzed (Table 1.).

Conclusions

The national labor force shows a significant decline in 2010 and 2011, which can be explained by the effects of the financial crisis, which has affected various sectors of the economy. Also, by opening up new opportunities in terms of the European job market, more and more Romanians have chosen to leave for these countries.

In the case of the agricultural, forestry and fisheries workforce, the same trend is registered in 2010 and 2011, in which the main factors determined were the same as in the case mentioned above.

In terms of net agricultural earnings, they showed an upward trend which was determined by the importance of this sector for ensuring national security and the fact that farmers' incomes have increased due to subsidies in agriculture from the Union budget. Europeans, so they had to increase wages in order to keep employees on the farm.

References

1. Bălan M., (2018), Vulnerabilities on the regional labour market in Romania, *Creșterea economică în condițiile globalizării*, Ediția 13, Vol. 2.
2. Bălan M., (2019), Particularities of the Youth Labour Market in Romanian Rural Areas, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 19, Issue 1.
3. Bordeianu G.D. et. Al. (2020), COVID-19 - The Impact on the Labour Market. Technical Unemployment in Romania, *Economy Transdisciplinarity Cognition*, vol. 23 (1), 17-21.
4. Botezatu M. A. (2015), *Modele de analiză în studiul forței de muncă din României*, Editura Pro Universitaria, pp. 129-147.

5. Condei R. et. al. (2015), Aspects of Employment in Agriculture in the Main Development Regions of Romania, Scientific Papers-Series Management Economic Engineering In Agriculture And Rural Development, Volume: 25, Issue: (2), Pages: 67-74.
6. Frunzaru V., (2012), Ocuparea fortei de munca. Politici europene, Editura Tritonic, București, pp. 120-136.
7. Leoveanu-Soare B. et. al., (2020), Social and Economic Aspects Regarding the Development of Agriculture in Romania, Scientific Papers-Series Management Economic Engineering In Agriculture And Rural Development, Volume: 20, Issue: (2), Pages: 281-285.
8. Mocanu I. et. al., (2018), Regional Disparities Related to Socio-Economic Determinants of Agriculture in the Romanian Plain, Journal of Urban & Regional Analysis, Vol. 10 Issue 1, p79-99
9. Nica M., (2018), Study on Labour Force in Romanian Agriculture, International Journal of Sustainable Economies Management (IJSEM) 7(2), pp. 9.
10. Nicolae I. (2012), Migrația internațională a forței de muncă, Editura Pro Universitaria, pp. 102-112.
11. *** Bază de date Institutul Național de Statistică, accesat 27.10.2020.