

## EUROPEAN STRUCTURAL FUNDS AND HUMAN RESOURCE PRODUCTIVITY

Andrei-Alexandru MOROȘAN

*Stefan cel Mare University of Suceava, 720229, Romania  
alexandrumorosan@gmail.com***Abstract**

*Following the accession to the European Union, Romania and the other former communist countries are facing multiple problems in their attempt to reduce the economic and social disparities between them and the older members of the EU. In order to support the efforts of the young members in alignment process with the Community norms and standards, the EU, through the Regional Development Policy, gives these countries structural and cohesion funds.*

*In the present article we intend to analyze the impact that these structural funds have on the efficiency with which the human resource is used in the beneficiary companies. The analysis is performed at the level of the North-East Region of Romania on the financial statements of the companies benefiting from structural funds during the multi-annual exercise 2007-2013.*

*In the analyzes made on the basis of the financial statements of the companies receiving non-reimbursable financial aid, we find that there are statistically representative changes regarding the increase in the average number of employees, but we could not identify any noticeable effect on the average labor productivity.*

**Key words:** *Structural Funds, Number of employees, Work productivity.*

**JEL Classification:** *D200, F150, F360, F430, R110*

**I. INTRODUCTION**

During its evolution the European Union has had several waves of enlargement, the first of which was in 1975. Since then the European Commission has recognized the need to help new members in order to achieve economic and social convergence. Thus, the first country that benefited from Structural and Cohesion Funds under the Regional Development Policy was Ireland, and since then all countries that have joined the EU, with a GDP per capita lower than the community average, have received financial aid. grants.

Between 2004 and 2007, the EU accepted as new members several countries that had notable disparities between their GDP per capita and the community average. Thus, the new members were in greater need of the non-reimbursable financial aid offered by the Commission.

The major disparities between the new members and the community media have led some authors to suspect that the Regional Development Policy, in its current configuration, cannot fully respond to the needs of the new members. Thus, an increasing number of authors studying the problem of structural and cohesion funds at the level of the members which joined in the period 2004-2007 claim that the effect of these non-reimbursable financial aid is below expectations.

**II. LITERARY REVIEW**

The research carried out by (Becker, Egger and Ehrlich 2018) shows, with the help of econometric modeling, performed at macroeconomic level, that the structural and cohesion funds have short-term effects on unemployment and population incomes. In the long term this study suggests that the effects of the funds are conditioned by the development strategy of the respective region.

From the analysis carried out by (Jureviciene and Pileckaitė 2013) we can see that companies tend to have a slightly irrational behavior when it comes to non-repayable financial aid, sometimes implementing overvalued, oversized and not just timely projects.

In the paper "A Model-based Assessment of the Macroeconomic Impact of EU Structural Funds on the New Member States", Janos Varga and Jan in't Veld, following the application of the QUEST III model (model applied at the macroeconomic level), conclude that there is large uncertainties regarding the effect of structural and cohesion funds on productivity, they suggest that further microeconomic analyzes are needed to clarify this. (Varga and Veld 2009)

Another research with important contributions to this field is "The Impact of EU Structural Fund Support and Problems of its Absorption" published in 2013 by Daiva Jureviciene and Jūratė Pileckaitė. This research is conducted at the microeconomic level and analyzes how economic enterprises approach the opportunity of the non-reimbursable financial aid offered through the Regional Development Policy. This research shows that the behavior of the economic agencies is not exactly rational when it comes to these non-reimbursable financial aids,

more precisely the companies prefer to implement secondary projects, which were not a priority, only to benefit from these financial aids, more than, the costs tend to be higher if there is non-refundable financial aid. Also, in this research the authors identified an indirect effect of the absorption of European funds, there is a direct correlation between the European funds attracted and the foreign direct investments. (Jureviciene and Pileckaitė 2013).

We can see the scientific literature is divided about EU’s Structural and Cohesion Fund. The fact that so many authors did not manage to reach a common point proves that further research is needed on this topic.

### III. METHODOLOGY

The present research starts from the hypothesis that the companies that have benefited from non-reimbursable financial aid use the human resource more efficiently. To test this hypothesis, we will analyze the financial statements of the companies that have received non-reimbursable financial assistance at the North East Region of Romania, trying to identify the impact that the reimbursable amounts received have had on the efficiency of the human resource utilization. We chose the North-East Region of Romania because it is one of the poorest regions of the EU in terms of GDP per capita, so at the level of this region the impact of the structural funds should be very easily identified. At the level of this region, we identified 629 companies (group 1) that benefited from non-reimbursable financial aid in the 2007-2013 multiannual program. A control sample (group 2), consisting of 653 companies, was also extracted (quota sampling was used, depending on the territorial distribution of group 1). From the control group were eliminated 7 companies that were also found in the group of companies that received financial aid. For all these enterprises the financial accounting data for the period 2005-2018 were extracted, from the website of the Ministry of Finance of Romania ([www.mfinante.ro](http://www.mfinante.ro)).

To test the hypothesis mentioned above we will analyze the evolution index of the average number of employees and the evolution index of average labor productivity. The values for the two indices will be calculated for each group separately and we will apply statistical tests to see if the intergroup differences are statistically representative.

### IV. TABLES, FIGURES, EQUATIONS

The first factor that we will analyze is the evolution index of the average number of employees. To facilitate the application of statistical tests we proceeded to eliminate the extreme values using the interquartile range method, with a coefficient of 3, thus eliminating the values greater than 1.9786 and less than 0.1274, so we obtain a normal distribution which will allow the application of statistical tests of variation.

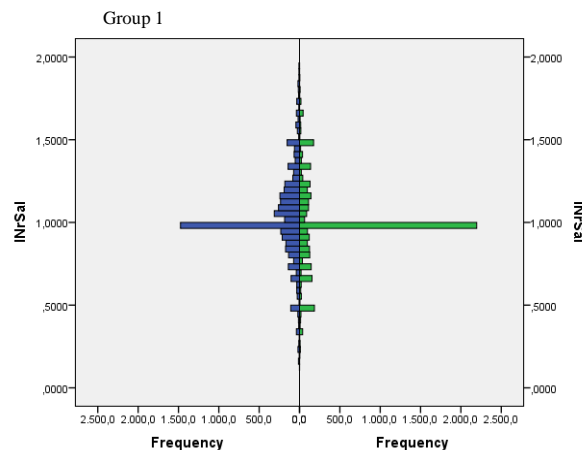


Figure 6 - Distribution of the Index of evolution of the number of employees: Group 1 vs Group 2

Source: Data processed by the author ([www.fonduri-ue.ro](http://www.fonduri-ue.ro) and [www.mfinante.ro](http://www.mfinante.ro))

Analyzing the shape of the distributions in figure 1, we find that the central tendency of the two groups tends to be around 1, but we can easily observe that within the group of companies that have benefited from non-reimbursable financial aid the evolution index has a slightly higher variation, thus in this group there is a slight increase of the human resource used, compared to the control group. Within group 2 most companies have an evolution index of about 1, which implies that many of them worked, at the level of the period analyzed with a constant average number of employees.

**Table 1. Group Statistics**

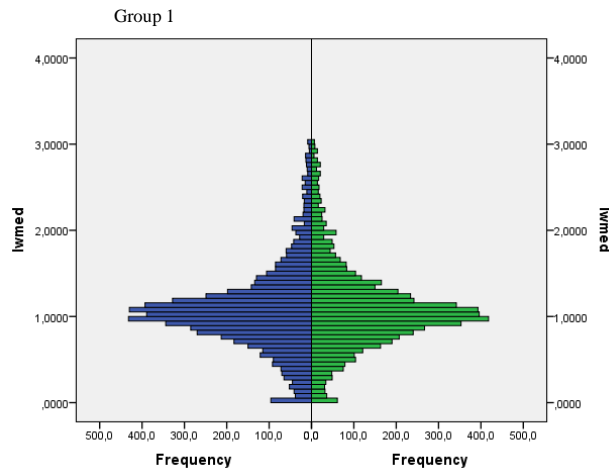
	GRUP	N	Mean	Std. Deviation	Std. Error Mean
Index Nr.	Group 1	5596	1,038081	,2660909	,0035571
Employees	Group 2	4789	1,000974	,2494576	,0036047

Source: Data processed by the author ([www.fonduri-ue.ro](http://www.fonduri-ue.ro) and [www.mfinante.ro](http://www.mfinante.ro))

Determining the averages of the two groups we find that the companies that benefited from non-reimbursable financial aid, registered an average annual growth of 3.8% during the analyzed period 2005-2018 while the companies that did not receive non-reimbursable financial aid did not register any changes, the value of the evolution index being approximately 1.

The value of the average annual growth of 3.8% seems small but we must consider the fact that the analyzed period is a relatively large one of 13 years, so the value of the average annual growth is noticeable.

The second factor on which we will stop in the present analysis is the evolution index of average labor productivity. This derived indicator is very representative to describe the efficiency with which the human resource is used in the economic activity. The average labor productivity was determined by reporting the turnover achieved during a financial year to the average number of employees in the respective fiscal year. To facilitate the application of statistical tests we proceeded to eliminate the extreme values using the interquartile range method, with a coefficient of 3, thus eliminating the values greater than 3.04695 and lower than -0.83585, thus we obtain a normal distribution which will allow the application of statistical tests of variation.



*Figure 7 - Distribution of the evolution index of average labor productivity: Group 1 vs. Group 2*

Source: Data processed by the author ([www.fonduri-ue.ro](http://www.fonduri-ue.ro) and [www.mfinante.ro](http://www.mfinante.ro))

Following the graphical analysis of the distribution of the evolution index of average labor productivity at the level of the analyzed group, respectively of the control group, we find that we cannot identify notable differences between the two. Similar to the evolution index previously analyzed, the central tendency of the two distributions is 1, which indicates that during the analyzed period there were no major variations in the average labor productivity.

**Table 2. Group Statistics**

	GRUP	N	Mean	Std. Deviation	Std. Error Mean
Index average prod.	Group 1	6134	1,078858	,5016248	,0064048
	Group 2	5852	1,106990	,5102271	,0066698

Source: Data processed by the author ([www.fonduri-ue.ro](http://www.fonduri-ue.ro) and [www.mfinante.ro](http://www.mfinante.ro))

By determining the average for the two groups we find that there is a difference of 2.8132% but the results do not support the stated hypothesis, for the control group the average value is 1.106990, which indicates that on average the labor productivity increased by 10.699% per year for the whole analyzed period, for the group of companies that have received non-reimbursable financial aid, the average annual growth is only 7.8858%.

If we look at the calculation methodology of this indicator, that is the ratio between turnover and the average number of employees and previously we found that the denominator of the report increased in the case of the analyzed group (increase of 3.8081%) and in the case of the control group remained almost constant (increase of 0.0974%), and the difference between the averages of the index of increase of the average number of employees is similar to the difference between the averages of the evolution indices of the productivity of the human resource we can conclude that the indices of evolution of the turnover for the two groups had similar

values. Thus, the increase in the number of employees in the first group led to a decrease in average labor productivity.

In order to determine if the difference between the averages of the two groups is a statistically representative one, with the help of SPSS we applied a T-test.

**Table 3. Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Index No. Employees	Equal variances assumed	68,052	,000	7,291	10383	,000	,0371078	,0050897	,0271310	,0470846
	Equal variances not assumed			7,327	10297,139	,000	,0371078	,0050643	,0271809	,0470348

Source: Data processed by the author ([www.fonduri-ue.ro](http://www.fonduri-ue.ro) and [www.mfinante.ro](http://www.mfinante.ro))

In the case of the index of evolution of the number of employees, the results of the test indicate that the difference between group averages is statistically representative (Sig. <0.05) and the difference between groups is 3.71%.

**Table 4. Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Index average productivity	Equal variances assumed	2,268	,132	-3,044	11984	,002	-,0281328	,0092433	-,0462512	-,0100144
	Equal variances not assumed			-3,042	11935,019	,002	-,0281328	,0092470	-,0462585	-,0100071

Source: Data processed by the author ([www.fonduri-ue.ro](http://www.fonduri-ue.ro) and [www.mfinante.ro](http://www.mfinante.ro))

In the case of the evolution index of average labor productivity, the test results also indicate that the difference between the averages is statistically representative (Sig. <0.05) and the difference between groups is 2.81%.

In previous research I have shown that the degree of development of the region / county influences the volume of funds absorbed by the respective region / county, a similar effect has the number of active enterprises in the respective region / county. Considering the available data, as well as the previous findings, we can test whether the efficiency of the human resources is influenced by the degree of economic development of the beneficiary county or by the competition existing at the county level. To test this possible influence we will apply two ANOVA tests in which the dependent variables will be the index of the evolution of the average number of employees respectively the index of evolution of average labor productivity, and the variable factor will be the county in which the company operates.

**Table 5. ANOVA**

Index No. Employees					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,527	5	,105	1,568	,165
Within Groups	697,130	10379	,067		
Total	697,657	10384			

Source: Data processed by the author ([www.fonduri-ue.ro](http://www.fonduri-ue.ro) and [www.mfinante.ro](http://www.mfinante.ro))

In the case of the evolution index of the average number of employees, it is found that this does not vary significantly at the level of the six counties analyzed, the result of the ANOVA test being not statistically representative (Sig.> 0.05).

**Table 6. ANOVA**

Index average productivity					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,853	5	,171	,666	,649
Within Groups	3067,949	11980	,256		
Total	3068,802	11985			

Source: Data processed by the author ([www.fonduri-ue.ro](http://www.fonduri-ue.ro) and [www.mfinante.ro](http://www.mfinante.ro))

A similar result is obtained in the case of the evolution index of the average labor productivity, the result of the ANOVA test being not statistically representative (Sig.> 0.05).

## **V. CONCLUSIONS**

Following the tests, we can conclude that between the two groups of companies there are statistically representative differences in the use of human resources. The structural funds absorbed by the companies in the North-East Region of Romania contributed to the creation of jobs, the companies benefiting from structural funds registering an average annual increase in the number of jobs, while the companies in the control group kept their jobs. , on average, the number of employees remained constantly.

Regarding the evolution of average labor productivity, we find that the group of companies that benefited from non-reimbursable financial aid registered an increase lower than the control group, so our hypothesis is not validated. This situation is explained by the increase of the average number of employees, implicitly this increase has the effect of lowering the average productivity of the human resource.

Analyzing the evolution of the average number of employees and the average labor productivity, we find that the turnover has registered similar increases for both groups.

Under these conditions we can conclude that the main effects that the structural funds have on the North-East Region of Romania are the accumulation of capital (by supporting investments in companies) and the stimulation of the creation of new jobs (fact found in the present research).

## **VI. ACKNOWLEDGMENT**

This work is supported by project POCU 125040, entitled "Development of the tertiary university education to support the economic growth - PROGRESSIO", co-financed by the European Social Fund under the Human Capital Operational Program 2014-2020

## **VII. REFERENCES**

1. Bachtler, J., & Taylor, S. (2003). The added value of the Structural Funds: A regional perspective. IQ-Net Report on the Reform of Structural Funds. Glasgow.
2. Barry, F., Bradley, J., & Hannan, A. (2001). The Single Market, The Structural Funds and Ireland's Recent Economic Growth. *Journal of Common Market Studies*, Vol. 39, nr. 3, 537 - 552.
3. Crane, A., Matten, D., & Moon, J. (2008). *Corporations and citizenship*. Cambridge: Cambridge University Press.
4. Dall'erba, S., Guillaïn, R., & Gallo, J. L. (2009). IMPACT OF STRUCTURAL FUNDS ON REGIONAL GROWTH: HOW TO RECONSIDER A 7 YEAR-OLD BLACK-BOX. *Région et Développement* nr 30, 77 - 99.
5. Dumčiuvienė, D., & Adomynienė, I. (2014). The Evaluation of European Union Structural Support. *Procedia - Social and Behavioral Sciences* 156, 382 – 387.
6. Ederveen, S., Groot, L. H., & Nahuis, R. (2002). Fertile Soil for Structural Funds? Tinbergen Institute Discussion Paper TI 2002-096/3.
7. Gazzola, P., Vătămănescu, E.-M., Andrei, A.G., & Marrapodi, C. (2018). Users' motivations to participate in the sharing economy: Moving from profits toward sustainable development. *Corporate Social Responsibility and Environmental Management*, 1(1), 1-11. DOI: 10.1002/csr.1715.
8. Palevičienė, A., & Dumčiuvienė, D. (2015). Socio-Economic Diversity of European Regions: Finding The Impact for Regional Performance. *Procedia Economics and Finance* 23, 1096 – 1101.
9. Reiner, M. (2003). The Impact of the EU's Structural and Cohesion Funds on Real Convergence in the EU. NBP CONFERENCE POTENTIAL OUTPUT AND BARRIERS TO GROWTH ZALESIE GÓRNE.
10. Wostner, P. (2008). Micro-efficiency of the EU Cohesion Policy. European Policies Research Center, Glasgow.
11. Wostner, P., & Šlander, S. (2009). The effectiveness of EU cohesion policy revisited: are EU funds really additional? European Policies Research Centre - Research Paper Number 69.
12. Sites:
13. Romanian Ministry of European Funds ([www.fonduri-ue.ro](http://www.fonduri-ue.ro))
14. Romanian Ministry of Finance ([www.mfinante.ro](http://www.mfinante.ro))