The effects of structural funds absorption on the business environment in the north-eastern region of Romania

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Abstract. *To reduce disparities between the members of the European Community, the Commission has allocated significant sums from the European Union's budget to finance the Regional Development Policy. Many authors have analyzed the absorption of European funds, focusing on various key aspects (efficiency of institutions, staff training, the volume of funds absorbed, the impact generated by absorption or GDP growth attributable to these funds). This article examines the effectiveness with which companies in the northeast region of Romania have used Structural Funds. Most papers dealing with this type of research have a macroeconomic perspective, but at that level of aggregation there are multiple factors of influence. This research is done at the micro level, focusing on the comparative analysis of annual financial statements (this analysis has focused on the development of three key indicators: fixed assets, turnover, net income) of a group of businesses that have benefited from financial grants and a control group of businesses that haven't benefited from this instrument. The comparative analysis did not identify significant differences between the two groups, leading to the conclusion that in the short-term, structural funds have had limited effect on the companies.*

Keywords: *Structural Funds; SOP IEC; ROP; microeconomic analysis; comparative analysis; Romania.*

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Introduction

As a member of the European Union (EU), Romania fully benefits from regional development policies financed from the Community budget. The efficiency with which these resources are used by the Romanian authorities, however, is questioned (Hapenciuc, Moroşan and Arionesei (Gaube), 2013).

There are several papers that analyze the absorption process, but the results are very different. Some authors focus on the issue of absorption capacity (especially the efficiency of the institutions involved and the procedures that are being used) claiming that the low absorption is attributed to inefficient procedures and lack of staff training in the system (NEI, 2002; Horvat and Maier, 2004; Horvat 2005; Oprescu, Constantin, Ilie and Pîslaru, 2006; Morovan, 2010; Jaliu and Rădulescu, 2013), other authors address the perspective of the impact that these funds have on economic development (Zaman and Georgescu, 2009; Cace, Cace and Nicolăescu, 2011; Zaman and Cristea, 2011).

This paper falls into the second category, analyzing the impacts of the funds used. A major difference between existing work and this research is the level of aggregation of the analysis, if the mentioned work was carried out at macroeconomic level, in this paper the analysis is performed at the microeconomic level.

The main objective of this work is to determine the impact that structural funds have had on businesses in the North Eastern Region of Romania. Starting from this objective, two hypotheses were stated:

H1: *Non-reimbursable financial aid has contributed, in the short term, to the increase of turnover of the beneficiary company*;

H2: *Non-reimbursable financial aid has contributed, in the short term, to the increase of net result of the beneficiary company*.

The analysis performed focuses on the annual financial statements of companies that have benefited from this support during the period 2007-2012.

Methodology

To test these hypotheses we used a comparative analysis of the two groups of companies: one group consisting of businesses that have received financial grants (group 1) and the second group consisting of a sample of companies that have not received aid (group 2 is the series of control). Through comparative analysis of several key indicators we would be able to quantify the effect that absorbed funds had on businesses.

This approach is not new, professor Edward Altman used a similar analysis in the research "Financial ratios discriminant analysis and the prediction of corporate bankruptcy" published in "The Journal of Finance", September 1968. In that work, the professor of finance analyzed the bankruptcy of several corporations during 1946-1965, focusing on a comparative analysis of two groups of firms (group 1: industrial corporations that went bankrupt and group 2: industrial corporations which maintained their activity). Altman's analysis focused on the financial statements of companies in the two groups (66 companies of various sizes were analyzed, ranging from total assets of 0.7 million U.S. dollars to 25.9 million dollars - the variation is relatively large).

The main method used is the comparison method, both in time ("comparing phenomena in different stages of evolution") and in space ("structures or other companies with similar activities competing")(Mărgulescu and Dumitru, 1994, pp. 38-39).

The group of companies that have received financial grants (group 1) was built on the lists made public by the managing authorities of the Sectoral Operational Programme Increase of Economic Competitiveness (SOP IEC) and the Regional Operational Programme (ROP), which are the only programs that directly finance companies (providing grants for productive investments)(Moroşan, Hapenciuc and Stanciu, 2014; Moroşan, Stanciu and Hapenciuc, 2014). The control group (group 2) was built on random sampling principles of companies from the database of the Recom software (provided by the National Trade Register Office). The construction of the control group was based on the structure of group 1 in terms of three criteria: territorial distribution (distribution among the six counties of North-Eastern Region of Romania), field of activity and business size.

Annual financial statements for the two groups were obtained from the database of the Ministry of Public Finance (www.mfinante.ro). The analysis focused on three periods: the project implementation period, the first year of operation compared to the start of implementation and the first year of operation compared to the year of completion of implementation (Moroşan, Hapenciuc and Stanciu, 2014; Moroşan, Stanciu and Hapenciuc, 2014).

Research results

To test the two hypotheses stated, the evolution of three key indicators was analyzed, namely: absolute change in fixed assets, absolute change in turnover and absolute change in net income during the three periods defined above.

Comparative analysis of fixed assets

The first analyzed variable is the change in fixed assets. The analysis of this variable is divided into three sections, namely: analysis of histograms, comparative analysis of descriptive statistics and statistical t-tests on means.

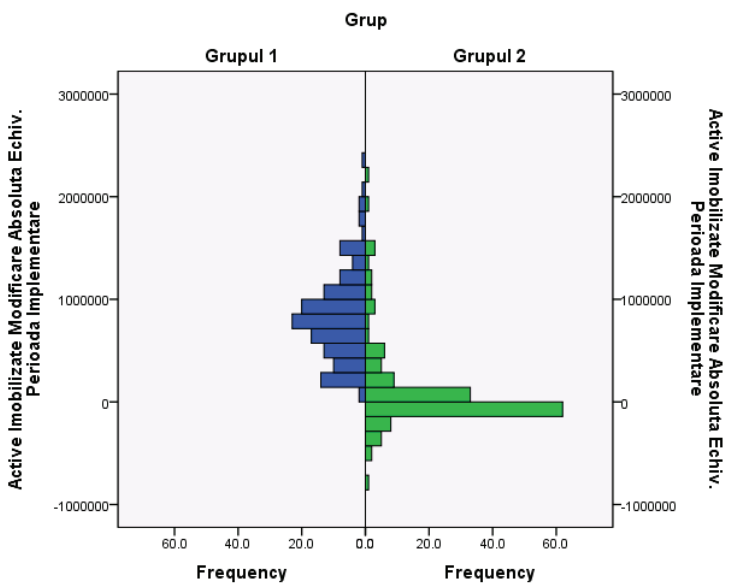

Figure 1. Graphical representation of absolute change of fixed assets pre-post implementation group 1 and group 2. Source of data: SOP IEC MA and ROP MA databases consultation in July 2013 and Ministry of Finance July-September 2013

Analyzing the distributions shown in Figure 1 we can establish the existence of differences between the group of companies that have received financial grants (group 1) and the control group (group 2 - group with a similar structure built on random sampling principles). We see that in the first group changes close to the value to 1 million lei are predominant, while in the second group two changes close to 0 are predominant (for a large number of enterprises fixed assets decline).

Table 1. Fixed Assets Absolute Variation – Implementation Period

Group	Group 1	Group 2	Total
Mean	831516,19	126348,83	470272,56
Median	808241,00	-1725,00	307511,00
Std. Deviation	441364,365	444509,771	565877,152
Range	2200066	3104942	3119419
Minimum	91556	-827797	-827797
Maximum	2291622	2277145	2291622
Number of records	139	146	285
Source: Calculations using SPSS version 20			

Analyzing the data in Table 1, we can appreciate that the difference between indicators of central tendency of the two groups is very large. The two groups have a similar standard deviation, which supports comparisons between groups. We appreciate that companies that have received financial assistance (grants) had undertaken larger investments, which is otherwise expected. Another aspect to note is that the maximum value is approximately equal, indicating that there are companies that have not received financial aid and managed to implement major investment.

Table 2. Comparison between means – Fixed Assets – Absolute Variation

Variable	Group	N	Mean	Std. Deviation	Std. Error Mean
Implementation Period	Group 1	139	831516.19	441364.365	37436.037
	Group 2	146	126348.83	444509.771	36787.890

First operating year compared to the start of implementation	Group 1	60	924221.05	777317.737	100351.288
	Group 2	64	167675.47	655692.790	81961.599
First operating year compared to the year of completion of implementation	Group 1	53	-61983.58	131227.223	18025.445
	Group 2	53	-35418.70	104720.030	14384.402

Source: Calculations using SPSS version 20

Analyzing the data in Table 2 we note that in the operating period, the differences between the means of the two groups are still large. In order to establish if the differences are statistically representative, t-test (Table 3) were applied for each of the three periods.

Table 3. Independent Samples Test - Fixed Assets – Absolute Variation

		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
Implementation Period	eq. var. assumed	1,923	0,167	13,433	283	0,000	705.167	52.495	601.836	808.498
	eq. var. not assumed			13,435	283	0,000	705.167	52.486	601.854	808.481
First operating year compared to the start of implementation	eq. var. assumed	4,675	0,033	5,871	122	0,000	756.546	12.8861	501.453	1.011.638
	eq. var. not assumed			5,839	116	0,000	756.546	129.569	499.912	1.013.179
First operating year compared to the year of completion of implementation	eq. var. assumed	1,357	0,247	-1,152	104	0,252	-26.565	23.061	-72.296	19.167
	eq. var. not assumed			-1,152	99	0,252	-26.565	23.061	-72.323	19.193

Source: Calculations using SPSS version 20

In the first analyzed period (implementation period) following Levene's test of equal variance it was found that the variation between the two groups is not similar, thus the results in the second row of the table ("eq. var. not assumed"- equal variances not assumed) were interpreted. T-test indicates that the difference between the means of the two groups (705,167 lei) is statistically significant, it can not be attributed to the sampling process. It can be appreciated with a 95% probability that the difference between the means will be within the range of 601,836 lei and 808,498 lei.

Analyzing the difference between the average changes of fixed assets in the first operating year, compared to the start of the project in the two groups we find a positive result for Levene's test (Sig. <0.05) the variance in the two groups is equal (in these circumstances we analyze row 3 of the table 'eq. var. assumed "-" equal variances assumed "). The difference between the means 756.546 lei, appears to be statistically significant, but considering the confidence interval generated by the software which is slightly wider (501,453 lei – 1,011,638 lei), which indicates the fact that the maximum error is higher than in the previous case.

Analyzing the last period in table 3, the first year of operation compared to the year of completion of implementation, we find that the variation recorded in the two groups is different, therefore we will analyze the results given in the last row ("Equal variances not assumed "). The results of this last test indicates that the difference between groups is not statistically significant (t-test for Sig. is greater than 0.05).

As a result of these tests we can say that the main difference in terms fixed assets between group 1 (group of companies which have received grant funding) and group 2 (control group consisting of companies chosen by random sampling) is generated by the project. In the implementation period it is found that group 1 recorded the largest changes compared with group 2, these differences being statistically significant.

Differences found in the case of other variables (turnover, net income) can be attributed to the financial aid received (the difference between the means of the two groups is close to the average value of the grant 667.406 lei - the value obtained after eliminating outliers).

Comparative analysis of turnover

The first result indicator analyzed is turnover. This indicator represents the total revenues from the sale of products or services. The analysis will be carried out similar to that of fixed assets.

The two distributions plotted in Figure 2 shows some differences, but they are much smaller than in the case of fixed assets. In the first group

there are fewer enterprises that recorded a decrease in turnover in the implementation period, compared with the control group (group 2).

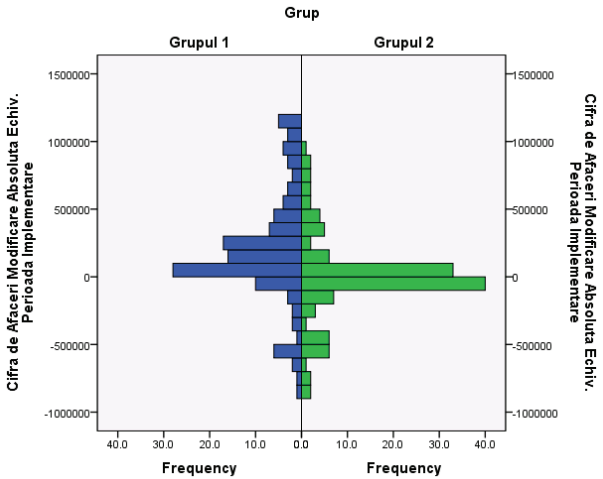

Figure 2. Graphical representation of absolute change of turnover pre-post implementation group 1 and group 2

Source of data: SOP IEC MA and ROP MA databases consultation in July 2013 and Ministry of Finance July-September 2013

Table 4. Turnover Absolute Variation – Implementation Period

Group	Group 1	Group 2	Total
Mean	199326,29	-7876,06	95315,62
Median	136228,00	-5961,00	37590,00
Std. Deviation	421289,322	325045,736	389411,138
Range	1970108	1807993	1981793
Minimum	-803949	-815634	-815634
Maximum	1166159	992359	1166159
Number of records	126	127	253
Source: Calculations using SPSS version 20			

Analyzing the indicators of central tendency (Table 4) calculated for the two groups (mean and median) we observe that there are important differences. For group 1 these indicators have positive values (between 100,000 lei

and 200,000 lei) while for group 2 they have negative values (they do not exceed -10,000 lei). Taking into account the fact that the indicators describe the same period, it can be appreciated that the Structural Funds have had a short-term effect on the activity of the beneficiary enterprises. In terms of range, maximum and minimum values there is no significant difference between the two groups.

Table 5. Comparison between means – Turnover – Absolute Variation

	Group	N	Mean	Std. Deviation	Std. Error Mean
Implementation Period	Group 1	126	199326.29	421289.322	37531.436
	Group 2	127	-7876.06	325045.736	28843.145
First operating year compared to the start of implementation	Group 1	61	384852.07	1057135.817	135352.372
	Group 2	56	106968.09	808674.053	108063.616
First operating year compared to the year of completion of implementation	Group 1	54	60012.63	299822.705	40800.702
	Group 2	54	434.39	289466.930	39391.460

Source: Calculations using SPSS version 20

Analyzing the absolute change in turnover over the other two reference periods (Table 5), it is found that Group 1 recorded higher values in each case that group 2.

To determine whether the differences between averages are statistically significant, t-test was applied in each analyzed period (Table 6). Before applying the t-test, the SPSS software tests whether the variation in the two groups (group 1 and group 2) are similar or not (for this Levene's test of equal variance is used). In the first analyzed period (implementation period) the results show a similar variation between the groups (Sig. <0.05), while the last two test show a different variation in the two groups (Sig.> 0.05)

In the implementation period, the differences between absolute changes in turnover between the two groups are statistically representative. In the

two groups the difference between the means is 207,202 lei, but taking into account the possible errors, the mean difference will be with a 95% probability between 114,073 lei and 300,331 lei.

Table 6. Independent Samples Test - Turnover – Absolute Variation

		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
Implementation Period	eq. var. assumed	8.664	.004	4.382	251	.000	207202.349	47286.668	114073.136	300331.561
	eq. var. not assumed			4.377	234.949	.000	207202.349	47334.297	113948.470	300456.228
First operating year compared to the start of implementation	eq. var. assumed	3.468	.065	1.586	115	.115	277883.976	175164.082	-69082.358	624850.311
	eq. var. not assumed			1.604	111.464	.111	277883.976	173199.335	-65306.341	621074.293
First operating year compared to the year of completion of implementation	eq. var. assumed	.188	.665	1.051	106	.296	59578.241	56713.177	-52861.148	172017.630
	eq. var. not assumed			1.051	105.869	.296	59578.241	56713.177	-52862.751	172019.232

Source: Calculations using SPSS version 20

In the other two analyzed periods the difference of the means are not statistically significant (test-t Sig.> 0.05). These results suggest that the Structural Funds have had an impact only during the implementation period, development of the turnover in the first year of operation did not produce a different pattern from that of the control group.

Comparative analysis of net profit (net result)

The second result indicator analyzed is the net result. This indicator can be considered an indicator of the efficiency of the company, showing the difference between total revenues and total expenses.

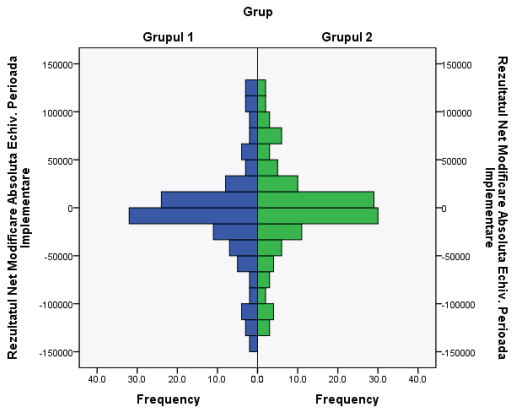

Figure 3. Graphical representation of absolute change of net profit pre-post implementation group 1 and group 2

Source of data: SOP IEC MA and ROP MA databases consultation in July 2013 and Ministry of Finance July-September 2013

Looking at Figure 3, we can state that between the two distributions there are no significant differences. The evolution of the absolute change in net profit during the period of implementation is similar for the two groups.

Table 7. Net profit - Absolute Variation – Implementation Period

Group	Group 1	Group 2	Total
Mean	-6104,88	-2096,44	-4050,55
Median	-2324,00	-596,00	-1762,00
Std. Deviation	53579,968	49192,388	51309,401
Range	277431	256484	277431
Minimum	-144726	-132813	-144726
Maximum	132705	123671	132705
Number of records	117	123	240
Source: Calculations using SPSS version 20			

Analyzing the indicators presented in table 7, we can state that between the two groups there are no significant differences. Between the means there is a difference of less than 4.000 lei and between the medians there is a difference of less than 2.000 lei.

What is interesting is that the central tendency indicators of net profit present negative values, implying that most businesses have recorded a decrease in net earnings during the implementation process. Moreover, group 1 (the group of companies that have benefited from structural funds) declined more than group 2 (control group). This can be explained by the evolution of the debt, firms in group 1 contracted more credit during the implementation period than those from group 2.

Table 8. Comparison between means – Net profit – Absolute Variation

	Group	N	Mean	Std. Deviation	Std. Error Mean
Implementation Period	Group 1	117	-6104.88	53579.968	4953.470
	Group 2	123	-2096.44	49192.388	4435.528
First operating year compared to the start of implementation	Group 1	53	-3007.83	93024.417	12777.886
	Group 2	53	-176.49	61207.405	8407.484
First operating year compared to the year of completion of implementation	Group 1	51	-15906.76	64171.157	8985.759
	Group 2	52	-6935.69	55760.945	7732.652

Source: Calculations using SPSS version 20

Analyzing the reported net profit for the other reference periods (Table 8) we see that the situation is similar to the period of implementation. In all three analyzed periods, average changes of the net result are negative, and the values recorded for group 1 are lower than those for group 2.

Table 9. Independent Samples Test – Net profit – Absolute Variation

		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
Implementation Period	eq. var. assumed	.326	.569	-.604	238	.546	-4008.441	6634.906	-17079.084	9062.202
	eq. var. not assumed			-.603	233.725	.547	-4008.441	6649.118	-17108.306	9091.423
First operating year compared to the start of implementation	eq. var. assumed	6.050	.016	-.185	104	.854	-2831.340	15295.756	-33163.398	27500.719
	eq. var. not assumed			-.185	89.918	.854	-2831.340	15295.756	-33219.409	27556.729
First operating year compared to the year of completion of implementation	eq. var. assumed	2.257	.136	-.758	101	.450	-8971.072	11838.652	-32455.772	14513.628
	eq. var. not assumed			-.757	98.510	.451	-8971.072	11854.863	-32495.139	14552.994

Source: Calculations using SPSS version 20

Based on the results presented in table 9 we can say that the differences between the two groups are not statistically representative (test-t Sig.> 0.05 for all periods analyzed). We appreciate that the Structural Funds have had no effect on net profit of enterprises.

Conclusions

Following the analysis we estimate that the effect on short-term of structural funds is low. In terms of change of fixed assets, the difference between the two groups is large, which suggests that non-reimbursable financial aid contributed to the accumulation of capital in enterprises (exogenous and endogenous growth models consider this as a prerequisite for economic growth)(Hapenciuc, Moroşan and Arionesei (Gaube), 2013). However, the difference in turnover variation between the two groups is much smaller, being significant only in the period of implementation, which involves partial acceptance of the first hypothesis. The hypothesis is partially accepted because in the first year of operation there is no significant increase in turnover of businesses that have benefited from financial aid grant (as one might expect).

Regarding the evolution of the net result, the Structural Funds have had no effect. Between the two analyzed groups there are small differences,

statistically unrepresentative, which leads to the rejection of the second hypothesis of the study.

We can appreciate that the impact of structural funds offered by the EU is low in the short term. This is mainly caused by the poor quality of projects, proposing unrealistic financial forecasts, and by the evaluators who do not pay enough attention to the financial evaluation (Moroşan, 2013).

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References

Cace, C., Cace, S., and Nicolăescu, V. (2011). Absorption of The Structural Funds in Romania. *Romanian Journal of Economic Forecasting*, 15(2), 84-106.

Altman, E. (1968). Financial ratios discriminant analysis and the prediction of corporate bankruptcy. *The Journal of Finance*, XXIII(4), 589-609.

Arionesei, G., and Moroşan, A.A. (2013). Influence of EU Funds on Sustainable Development in the Young Members of the European Union. In Proceedings of *STRATEGICA International Academic Conference. Strategic Thinking in a Changing World* (pp. 153-166). București: Comunicare.ro.

Hapenciuc, C.V., Moroşan, A.A., and Arionesei (Gaube), G. (2013). Absorption of Structural Funds International Comparisons and Correlations. *Procedia Economics and Finance*, 6, 259–272.

Horvat A. (2005). Why does Nobody Care About the Absorption? Some Aspects Regarding Administrative Absorption Capacity for the EU Structural Funds in the Czech Republic, Estonia, Hungary, Slovakia and Slovenia before Accession. *WIFO Working Papers*, No. 258 August 2005.

Horvat, A., and Maier, G. (2004). Regional development, Absorption problems and the EU Structural Funds; Some aspects regarding administrative absorption capacity in the Czech Republic, Estonia, Hungary, Slovakia and Slovenia. *ERSA Conference*, Austria, Viena.

Jaliu, D., and Rădulescu, C. (2013). Six Years In Managing Structural Funds In Romania. Lessons learned. *Transylvanian Review of Administrative Sciences*, 38 E/2013, 79-95.

Margulescu, D. (1994). *Analiza economico-financiară a întreprinderii: Metode și tehnici.* Bucharest: Tribuna Economică.

Mikesell, R.F. (2009). *The Economics of Foregin Aid*. Rutgers, New Jersey: Transaction Publishers.

Moroşan, A.A. (2013). The Territorial Distribution of Structural Funds in The North-East Region of Romania. *ECOFORUM Journal*, 2(2). Retrieved from http://www.ecoforumjournal.ro/index.php/eco/article/view/60.

Moroşan, A.A., Hapenciuc, C.V., and Stanciu P. (2014). The Impact of European Funds on Regional Development and Resource Consumption-The Case of The North East Region of Romania. *Quality-Access to Success*, 15(139), 328.

Moroşan, A.A., Stanciu, P., and Hapenciuc, C.V. (2014). The Absorption of European Funds and The Romanian Miraj of Sustainable Development. *Quality-Access to Success*, 15(139).

Morovan, I. (2010). *Suntem în grafic? 2010: primul bilanţ – Utilizarea fondurilor structurale (Are we on schedule? 2010: the first audit – The usage of Structural Funds)*. Bucharest: Centrul Român de Politici Europene.

NEI Regional and Urban Development (2002). *Key indicators for Candidate Countries to Effectively Manage the Structural Funds*. Rotterdam.

Oprescu, Gh., Constantin, D.L., Ilie, F., and Pîslaru, D. (2006). *Analysis of Absorption Capacity of The EU Funds in Romania*. European Institute of Romania – Pre-accession impact studies III, Bucharest.

Zaman, Gh., and Cristea, A. (2011). EU Structural Funds Absorption in Romania: Obstacles and Issues. *Romanian Journal of Economics*, 32(XXI), 60-77.

Zaman, Gh., and Georgescu, G. (2009). Structural Fund Absorption: A New Challenge for Romania?. *Romanian Journal of Economic Forecasting*, 1/2009, 135-154.

Managing Authority for the Regional Operational Programme - http://www.mdrt.ro/dezvoltare-regionala/.

Managing Authority for Sectoral Operational Programme Increase of Economic Competitiveness - http://amposcce.minind.ro/.

Government of Romania - Framework Document for the Implementation of the Sectoral Operational Programme "Increase of Economic Competitiveness" - http://amposcce.minind.ro/pdf2/DCI_POS_CCE_150211.pdf.

Government of Romania - Regional Operational Programme 2007-2013, June 2007 - http://www.mdrl.ro/_documente/POR/POR_august_07.pdf.

Government of Romania - Sectoral Operational Programme "Increase of Economic Competitiveness", June 2007 - http://amposcce.minind.ro/fonduri_structurale/SOP_IEC_Revised_Official_Proposal_June28.pdf.

Ministry of European Affairs - http://www.maeur.ro.

Ministry of Finance - www.mfinante.ro.

Romanian Web Portal for Community Funds - http://www.fonduri-ue.ro/.