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PhD. THESIS

~ Summary ~

THE DEVELOPMENT OF REGIONAL INTERESTING INFRASTRUCTURE IN COVASNA

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2. KEYWORDS

Infrastructure, technical infrastructure, social infrastructure, regional development strategies, regional disparities, economic competitiveness, efficiency, cost-benefit analysis, advanced multi-criteria analysis, coefficient of importance, aggregate index of infrastructure.

3. INTRODUCTION

Between the infrastructure of a region and its economic and social development is a biunivocal relationship. The development potential of a region is even higher as the region has a more developed infrastructure.

No doubt, infrastructure is among the most important factors of national or regional economic competitiveness, along with macroeconomic stability, goods market efficiency, labor market efficiency, market potential, the level of workforce training (World Economic Forum, Regional Competitiveness Report, 2013).

PhD thesis “The development of regional interesting infrastructure in Covasna County” deals with this current issue, so it fits within the recent concerns of regional socio-economic development.
Besides these issues, choosing this theme was determined by the elaboration of a master dissertation thesis "Strategies Development of Covasna tourist area” focusing on issues of tourism infrastructure development in this county.

In my opinion it is unreasonable that the standard of living is far below the potential that this county has, but only a good infrastructure can give a positive impulse to the development in this regard. In this tesis I tried to draw attention to these issues, providing development solutions, this work can be used as an instrument for the future development strategy of Covasna County.

4. OBJECTIVES AND RESEARCH METHODOLOGY

The **main objective** of the thesis is oriented towards identifying and characterizing changes specific to the current period at the level of infrastructure as well as of the determinant factors of the contributing domain, in a significant proportion to the increasing regional economic and social performance. It emphasises the infrastructure development opportunities of Covasna County, presenting as case study the specific issues of infrastructure development in the study area.

The contribution of the scientific approach can be summarized as follows:

- *At the theoretical and conceptual level:*
  - A presentation of different views from the specialty literature on training and on the infrastructure development concept and the elements of its composition;
  - A presentation of specific concepts related to the issues of regional development, the tools used to develop regional infrastructure;
  - An identification of indicators and methods for assessing the level of infrastructure development;
  - A presentation of the theoretical aspects and methods of measurement and analysis of economic efficiency and social infrastructure improvements.
- *at the operational level:*
  - Designing an aggregate index of infrastructure that combines several indicators considered representative for regional development thus providing a true picture about the overall development of the infrastructure of an area,
  - Strategic analysis of the level of infrastructure development for the period 2002-2011 of Covasna County using SWOT analysis in the diagnosis of the infrastructure of the county,
  - Establishing an empirical study on the evaluation of the degree of dependence of economic activities of infrastructure and identification of ways the issue of infrastructure development is perceived by the business environment, elements that will form the pillars of the evaluation process of infrastructure in Covasna County,

- Economic evaluation of environmental effects (social, environmental, etc..) of an infrastructure investment project using cost-benefit analysis (CBA).

The **methodology of the elaboration of research** includes: Regarding the general issue which it is concerned in, the issue of infrastructure development that have been combined methods of qualitative and quantitative research.

The theoretical perspective takes place by consultation and deeper processing of the relevant literature, by official publications and legislation, by using analysis and synthesis, induction and deduction and empirical analyses, based on specific methods such as advanced multi-criteria analysis, rank correlation method, cost-benefit analysis, strategic analyses and sociological survey based on a questionnaire.

The **references and information base** of investigations were:

- Books published in the country and abroad in the field of infrastructure, regional development, strategic management, investment and investment efficiency;
- Articles in international databases;
- Official Publications of the institutional environment: the European Commission, the Government of Romania, European Institute of Romania, RDAs, county development plans and programs developed,
- Statistical data provided by the National Institute of Statistics, Department of Statistics of Covasna County.

5. THE SYNTHESIS OF DOCTORAL THESIS CHAPTERS

The objective of the research work led to the following structure: seven chapters proceeded by an introduction and followed by a research methodology and conclusions, references and appendices used.

Chapter I. Infrastructure - the basics of economic and social development

In the first chapter of the scientific approach we focused on the presentation of the scientific research in the field of infrastructure and highlight the importance of renowned scientists have given to it.
The notion of infrastructure is very complex both conceptually and scientifically. To highlight the peculiarities were analyzed numerous studies in the field, studies, papers to capture the defining elements in terms of training and development.

A detailed analysis of the concept becomes complicated by the fact that there is no single opinion regarding the definition of general and economic content of infrastructure, of its functions and components. The existence of a large number of differences in this regard is conditioned by the lack of concepts, definitions of local authors. Such analysis is based mainly on primary and international literature.

Generally particular attention to foreign authors focus on the perception that infrastructure is an important subsystem of the economy that needs to be trained and developed comprehensively and proportionally. In this respect the task of economics and management would be to determine the functions and place of infrastructure in the economic and social development, to establish directions and components of development on elements and to make them improve further.

In this context, we intend to contribute to the clarification of various aspects of these concepts while outlining an evaluation in time of directions for research in the domain of infrastructure, underlining the following stages of development:

In 1927 the term of infrastructure was first used for collectively designated roads, bridges, railways, and similar public works that were essential to the operation of industrial economies.

In 1943 it was used for the first time in the economic term "overhead capital," meaning infrastructure.

The literature of the fifties, an increase of the role of infrastructure in the organization of production processes and infrastructure components was established. Between 1960 - 1989 the treatment of the term of infrastructure was extended, examining infrastructure as separate and independent object of research, the development of methods and techniques for assessing the level of development and infrastructure.

In the nineties new concepts about the essential components and functions of infrastructure , regarding its classification appear. It studies the processes of formation and development of infrastructure in economic reforms.

An up-dated research presents the role of infrastructure in fields like:

- Economic policy,
- Regional development strategies,
- Organizing economic circuit,
- Reducing poverty and regional inequalities,
- Economic competitiveness of regions.

Although in time, in the economic literature a multitude of methodological concepts defining the essence of infrastructure have been formed, the approach is always only a limited one, tackling one aspect of the concept of infrastructure.

Therefore, we consider that in Romania in the first instance is needed the examination of the theoretical concepts defining the infrastructure as an integrated system composed of several elements and creates conditions for local and regional economic development. Therefore in this paper we present and analyze infrastructure through its complex character with a focus on territorial characteristics - it’s spatial.

Chapter II. Strategies and financial tools for regional infrastructure development

This chapter deals with the issue of regional development in Romania and funding opportunities of the specific programs induced by the status of the EU membership.

In this chapter literature review was combined with the official documents of the institutional environment on regional infrastructure development strategies, addressing issues such as strategies, mission, objectives, priorities and financial instruments of strategies of regional development of infrastructure.

Chapter III. The place and role of different types of infrastructure in regional development strategies

The development of a region heavily depends on the status tipology, rank and level of infrastructure development. From this perspective, in the regional development strategies and in the guidance for investment funds, as a priority the different types of infrastructure investments must be placed..
The priorities of regional development strategies in infrastructure are mainly related to the development of two types of infrastructure (Central Region Development Strategy for the period between 2014-2020):

- A *technical infrastructure* oriented on the different types and forms of transport, public utilities, energy, communications;
- A *social infrastructure* which includes areas such as education, health, and other social services provided by the company.

In the first part of the chapter the main quantitative and qualitative indicators of evaluation of significant impacts were shown, that may arise from the implementation of development policies of the technical and social infrastructure.

Multi-criteria analyses of the development level of infrastructure at the level of territorial administrative units from Romania

In this part of the paper a multi-criteria analysis was performed using 18 indicators relevant for regional development of infrastructure. The goal was to create a global indicator characterizing the infrastructure that will be used both for determining the rank and level of infrastructure development and for a comparison between territorial units analyzed.

The premises which we started our research from were to gain an insight into:
- Infrastructure development level of different counties in Romania
- Delevelling between counties in terms of infrastructure,
- And not least, the general hypothesis testing that "infrastructure plays an important role in regional economic development of a county."

Regional differences in the level of infrastructure development are quite significant. Some counties, especially in a predominantly rural area are still disadvantaged in terms of physical infrastructure, public utilities, housing and access to basic social services. Concern for regional development still remains a necessity.

Equally, there are variations of indicators for the same county, meaning that some indicators register high values indicating a high potential for development, while for other indicators the same county shows low values.

In order to obtain a comprehensive view it was necessary to employ a hierarchic method in which each indicator receive a coefficient of importance, since each indicator represents a different degree of importance in determining the performance of the infrastructure. For this reason we chose an advanced multi-criteria analysis method.

In the application of an advanced multi-criteria analysis in this paper,the following stages are necessary:

1. Identification of the criteria (of qualitative and quantitative indicators and their grouping in infrastructure sectors)

Depending on the objectives mentioned in the research methodology, and statistical data available in each county, a number of 18 indicators have been selected, which were grouped into six infrastructure sectors as follows:

Table 1. **The system indicators used**

Infrastructure sectors	**Symbol and name of indicators/criteria**
Houses and public utilities	C1. Number of inhabitants per housing 100, C2. Share the places in which natural gas (%) C3. Share settlements with drinking water facility (%) C4. Share localities with public sewerage (%)
Transport and telecommunications infrastructure	C5. Rate modernized public roads; C6. Public roads (km/100 km^2); C7. Density of railway lines in operation (km/1000 km^2); C8. Total number of telephone connections per thousand (public and private telephone network in minutes);
Health infrastructure	C9. Number of doctors per 10,000 inhabitants; C10. Number of care beds per 1,000 inhabitants;
School infrastructure, education	C11. The number of students enrolled in secondary and vocational education per 1000 inhabitants; C12. Number of students per 1000 inhabitants;
Cultural-artistic infrastructure	C13 cultural and artistic infrastructure. Number of volumes (books, pamphlets, newspaper collections) per 1,000 inhabitants; C14. Relationship between the number of people who attended during the year (viewers), performances by theater, opera, philharmonic, orchestra, popular, etc. and population; C15. Number of museums and public collections 100000 inhabitants
Trade and tourism infrastructure	C16. The number of active commercial 1000 inhabitants; C17. The number of tourist per 1,000 inhabitants; C18. Existing accommodation capacity in operation.

1 (cities, towns, villages)

(Source: Bogdan & Moga 2013)

The selection of indicators was pursued to emphasize elements of both quantitative and qualitative measurements to ensure a more complex level of infrastructure development, their role in regional development strategies and the possibility of tracing the evolution in time and of comparisons more relevant at an inter-county level.

2.The determining of the weight factor for each criterion

In a table having the 18 criteria both in rows and columns (C) selected, each criterion is compared with the other one .In the case in which a criterion for a line is considered more important than a criterion for a column, the value –one- is attributed, when the criterion for the line is as important as the criterion of the column 0, 5 is attributed and when the line criterion is considered less important, 0 is assigned.

Lines are summed up by the points granted to each criterion (p), thus establishing a criterion level with the other. Rank value level coincides with the ranking criteria. If 2 or more criteria receive the same number of points, the position will be the same and is calculated as the arithmetic average of the positions corresponding to these criteria.

Later, in order to determine the weight of each criterion, the FRISCO formula (Bobancu rev., 2008b) is applied:

$$Y_i = \frac{p + \Delta p + m + 0.5}{-\Delta p' + \frac{N}{2}} \quad (1)$$

Where:

Y_i - weight coefficient of criterion "I",

p - sum of points obtained,

Δp - the difference between the item score and the score considered as the element at the top level,

m - number outranked criteria of the criteria taken into account,

N - number of criteria taken into account,

Δp '- the difference between the item score and the score considered the first element.

Individual comparison results of the criteria and the results of calculation of the weight (Y_i), to the criteria set are given in Table 2.

Table 2. **Weight coefficients of the criteria**

Symbol criteria	p	Y_i	Level (place)
C1	5.5	0.68	12
C2	7.5	1.08	10
C3	8.5	1.35	9
C4	6.5	0.87	11
C5	11.5	2.1	7.5
C6	16.5	1.47	2
C7	13.5	2.96	5
C8	14.5	3.47	4
C9	2.5	0.23	14.5
C10	0.5	0.039	15
C11	2.5	0.23	14.5
C12	9.5	1.57	8
C13	3.5	0.37	13.5
C14	3.5	0.37	13.5
C15	15	3.81	3
C16	17	5.33	1
C17	11.5	2.27	7.5
C18	12.5	2.51	6

(Source: own calculations)

Following the calculation results the most important criterion is C16 - The number of active commercial 1,000 inhabitants, followed by C15 - Number of museums and public collections in 100000 and C8 - total number of telephone connections per thousand (by the public and privte telephone- in minutes).

3. Giving notes corresponding to each variable in relation to the comparison criteria considered

At this stage of the analysis important notes are assigned (N_{ji}) for each variant analyzed (V_j), in our case for the 42 counties and Bucharest against the 18 criteria (C_i). Marks are given from 1 to 10.

4. The calculation of performance index of the variants analyzed

For each county according to each criterion the performance factor (F_{JI}) as follows: is calculated:

$$F_{ji} = Nj_i \times Y_i \qquad (2.)$$

Then for each county the sum of these factors obtaining a total value F_{VJ} factor is calculated , which we will call infrastructure aggregated index for each county, given by:

$$FVj = \sum_{i=1}^{i=18} F_{ji} \qquad (3.)$$

5. Ranking, the complex ranking of the administrative units after the aggregate index of infrastructure

The final rank is determined based on the performance index of infrastructure (FVJ). On the first place we shall rank that county that has the highest aggregate index of infrastructure.

Table 3. **Rank of the counties by the aggregate index of infrastructure**

Place	County	Total value coefficient (FV_j)	The average gap
1	Brashov	273.78	1.27
2	Constanta	269.19	1.25
3	Town Bucharest	268.9	1.25
4	Bihor	263.35	1.23
5	Cluj	260.71	1.21
6	Ilfov	249.91	1.16
7	Timis	246.89	1.15
8	Mures	242.5	1.13
9	Arad	237.61	1.11
10	Vâlcea	236.82	1.10
11	Harghita	234.23	1.09
12	Sibiu	233.55	1.09
13	Covasna	232.76	1.08
14	Hunedoara	231.7	1.08
15	Prahova	230.17	1.07
16	Maramureș	228.67	1.06
17	Argeș	227.77	1.06
18	Alba	227.46	1.06
19	Caras-Severin	226.55	1.05
20	Iassy	223.7	1.04
21	Satu Mare	222.58	1.04
22	Galati	218.76	1.02
23	Gorj	218.23	1.02
24	Bistrita-Năsăud	213.98	1.00
25	Suceava	212.72	0.99
26	Brăila	206.44	0.96
27	Bacău	202.27	0.94
28	Dolj	201.58	0.94
29	Neamt	199.55	0.93
30	Dâmbovita	191.76	0.89
31	Sălaj	190.59	0.89
32	Vrancea	190.05	0.88
33	Buzău	189.67	0.88
34	Tulcea	187.94	0.87
35	Ialomita	185.42	0.86
36	Mehedinti	178.93	0.83
37	Olt	173.41	0.81
38	Vaslui	167.12	0.78
39	Călărași	166.85	0.78
40	Giurgiu	162.52	0.76
41	Botosani	153.49	0.71
42	Teleorman	148.16	0.69

Descriptive Statistics

	N	Min.	Max.	Mean	Std. Deviation
VAR00002	42	148.16	273.78	214.95	32.51
Valid N (listwise)	42				

Analyzing the resulting ranking on the first place we note that the best result according to the complex infrastructure development is that of Brasov County with a performance coefficient of infrastructure of 273.78 surpassing by 58.53 units the average of the counties, followed by Constanta (269.19) and Bucharest (268.9).

Regardin the inter-county disparities in development of infrastructure by the county average we mention that half of the counties are above this level with a gap of 1 to 1.27 points, other counties falling below the average with a gap of 1 to 0.68, resulting in an amplitude of 0.58 units as the difference between the maximum value and the minimum (see Table 3). It is also noted that the gap of the last counties from the average is much higher than that of those above the average.

Depending on the overall index of development we can consider thus areas including zones with low values and very low values of it. Counties that fall under this category are: Botosani, Giurgiu, Calarasi, Vaslui, Olt county; Mehedinti, Tulcea, Buzau, Vrancea county, Dâmboviţa, Neamt, Suceava, Nasaud, Braila. The fact that these counties have low values may result from natural factors, as anthropogenic, cultural ones and the absence of a powerful policy towards regional infrastructure development.

In the future it is necessary that the development strategies and the resources allocated to these counties infrastructure investments.should be paid attention to.

Analysis of correlations between infrastructure development and economic growth at the level of territorial administrative units from Romania.

Following the theoretical approach on the role of infrastructure in regional economic development, the following general assumption has been developed "there is a direct and strong correlation between the level of development of infrastructure and the economic development in the municipalities of Romania".

A verification of this link (interdependence) was performed using a rank correlation coefficient, that of Spearman and Kendall, performed by using the SPSS.

The calculation of rank correlation coefficients reveals the interdependence between the level of infrastructure development reflected by the aggregate index of infrastructure calculated using advanced multi-criteria analysis and overall the level of economic development in all counties, expressed as GDP / capita in 2010.

After application of the test by using the SPPS system the following results were obtained:

Table 4. **Rank correlation Infrastructure and GDP / capita**

			Infrastructure	PIB/loc
Kendall's tau_b	Infrastructure	Correlation Coefficient	1.000	.744(**)
		Sig. (2-tailed)	.	.000
		N	42	42
	GDP	Correlation Coefficient	.744(**)	1.000
		Sig. (2-tailed)	.000	.
		N	42	42
Spearman's rho	Infrastructure	Correlation Coefficient	1.000	.905(**)
		Sig. (2-tailed)	.	.000
		N	42	42
	GDP	Correlation Coefficient	.905(**)	1.000
		Sig. (2-tailed)	.000	.
		N	42	42

**Correlation is significant for a significance level $\alpha = 0.01$ which means a probability of 99% results guarantee.

Source: Data obtained using SPSS statistical analysis program

From the analysis table we can extract the values of the two nonparametric coefficients calculated: Kendall's coefficient: 0.744, Spearman's coefficient: 0.905. Both coefficients are positive and the values close to 1, which means a high intensity direct link between the two indicators.

Graphical representation of the relationship between the two variables is given by fig. 1, where on the OX axis the variable GDP / capita is positioned and on the OY axis the global index of infrastructure development is pointed.

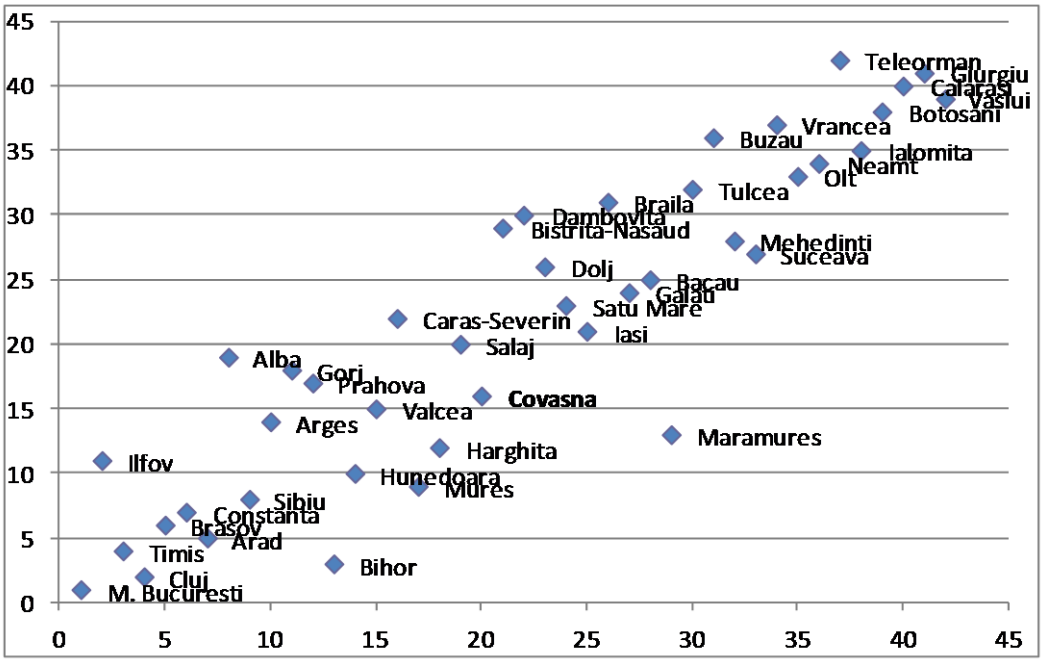

Figure 1. **Rank correlation of infrastructure and GDP / capita - graphical representation**

(Source: Prepared by the author based on data processed)

From the graph the positive correlation between these two variables is shown , increasing values of the GDP / capita pairing the increasing values of the aggregate index of infrastructure.

Thus the general hypothesis that "infrastructure plays an important role in regional economic development of a county" and " the existence or lack of infrastructure shows us the development level of a region" is checked by the result of this study, concluding that between the level of development of infrastructure and the level of economic development there is a positive relationship of high intensity.

Chapter IV. Strategic analysis of different types of infrastructure in Covasna county in the context of economic development

Chapter IV. of the thesis is granted to own contributions includes economic, social, infrastructural data or of other kind, collected at Covasna county level in the period during 2001 - 2011. The data are summarized and analyzed using research methods specified in research methodology so that a determination on this basis of a county development strategy is possible that best suits the reality of this area, but it shdoul be in accordance with plans of national and regional development in the following years.

A diagnostic analysis of the infrastructure development in Covasna County was performed in several steps, namely:

- The definition of Covasna county territory as space interference
- The analysis of Covasna county resources (analysis of natural resources, human resources, situation);
- The global analysis of statistical indicators of Covasna County which includes the analysis of indicators for the demographic environment, analysis of indicators for economic environment for habitation and technical equipment of municipalities and indicators of tourism activity.

After the diagnostic analysis synthetic conclusions were presented in a SWOT matrix, highlighting strengths and weaknesses, opportunities and threats faced by the infrastructure in Covasna County we currently provide a tool for the structure responsible for developing and implementing the plans of local development.

Chapter V. Empirical study on evaluation of the degree of dependence of economic activities of infrastructures in Covasna county

The aim of this study is to identify the degree of dependence of economic activities in Covasna county an approach to infrastructure and outlining the way the issue of infrastructure development is perceived by local businesses. Furthermore the results of the research will be the pillars of the evaluation process regarding the identification of weak points of infrastructure in Covasna county.

Starting from a clear definition of the investigation purpose we come to the establishingof the research objectives, namely:

- Identifying the role of infrastructure in the site selection for various economic activities
- Determining the influence of the level of infrastructure development on economic performance of firms,
- Determining how public infrastructure contributes to the productivity of the private sector,
- Identifying the infrastructure development by local businesses,
- Hierarchy directions of action to develop the infrastructure of a county.

From the main purpose and the specific research objectives **seven assumptions** were formulated, each targeting distinct issues within research approach that will be presented later.

Research Methodology

To identify the perception of businesses to the level of infrastructure development in Covasna County, a quantitative research based on a questionnaire technique has been applied.

The questionnaire contains 35 questions and it is divided into four sections. The first section is the introduction containing general questions about the organization that

respondents lead and its work. In the second section questions are formulated that are meant to directly demonstrate the proportional relationship between the economic activity and the level of infrastructure development.
The third section contains opinions about the current economic development of public infrastructure and its role and importance in Covasna county's economy.
Finally some framing questions were formulated that group respondents in different demographic and socio-economic categories as: age, position in the organization that they represent, as well as their educational level, gender and address of residence.

Due to financial limitation a random sample was conceived as representative for the whole population. The sampling required to form probabilistic sample is the complete list of all businesses in Covasna county. Given that the sample has to follow the structure of the population regarding the relevant characteristics as well as the hypothesis due to which the answer of the respondents show differences comparing with the field of activity of economic units that they lead, the validation of the sample was carried out by using the activity field as the control variable (Table 5, $z_{calc}<1,96$).

Table 5. **Representation on fields of activity of economic agents at the level of the sample**

Activity sector	Sample		$z_{calc.}$
	Absolute frequencies	Relative frequencies	
Agriculture,forestry and fishing	4	3.17	1,28
Industry	16	12.70	0,98
Building industry	12	9.52	0,11
Trading	38	30.16	1,79
Transport, storage and communication	20	15.87	1,77
Hotels and restaurants	8	6.35	0,18
Financial intermediation,inssurnacies, real estate, services for companies	18	14.29	1,31
Other activities and services	10	7.94	0,69
TOTAL	126	100	

As shown in the above table, the sample includes 126 companies from Covasna county. From the point of view of the main activities carried out by firms, we find the following:

- 3.17% are active in agriculture,

- 12.70% are present in production,
- 9.52 % iwork in the building industry,
- 30.16% are commercial establishments
- 6.35% have touristic activity and restaurants
- 14.29% are represented by financial intermediation, insurance and professional activities,
- 15.87% have transport and communication activity and 7.94% have other service activities.

The survey was sent to subjects mostly by electronic mail (email), but the questionnaire was processed personally as well at the headquarters of the economic agents, filled out in an auto administrative mode.

All raw data obtained after the questionnaires were processed using SPSS version 15.0. and Microsoft Office Excel 2007.

The results of the research

What we intend to present further is the synthesis of hypotheses that have been made on the basis of validating or invalidating responses by the 126 operators in Covasna county, as follows:

Assumption no. 1. A large number of traders believe that the infrastructure and accessibility of the location is a very important factor in the site selection for carrying out various economic activities.

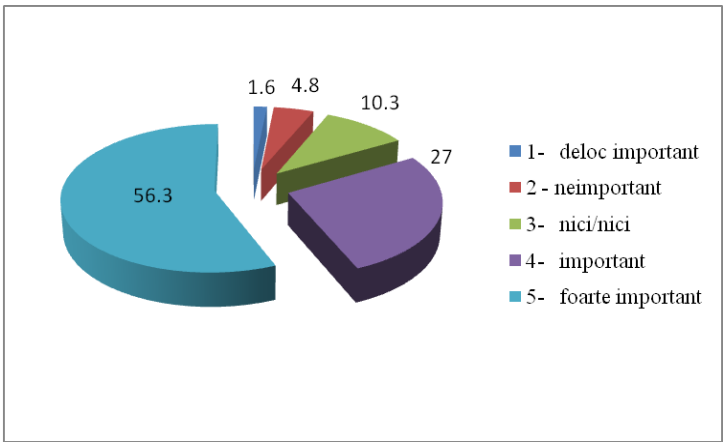

Figure 1. **The importance of infrastructure in site selection**

Following analysis of the responses given by the respondents results that 56.3% of businesses believe that infrastructure and its availability is a very important factor in the choice of location. Still a large proportion, 27% of the economic agents believes, that this factor is important in terms of selecting of location for economic activity that it carries. Therefore the first assumption is validated.

Hypothesis no. 2. Most companies believe that the quality of any infrastructure is an important factor in increasing the economic performance of organizations.

Table 6. **Descriptive statistics to evaluate the importance that economic agents attach to different types of infrastructure in raising economic performance**

		Utilities	Transport	Twlepho ne services	Internet	Cultural infrastruc ture	Healthc are	Educatio n	Touris m
N	Valid	126	126	126	126	124	126	126	126
	Missing	0	0	0	0	2	0	0	0
Mean		4,76	4,49	4,87	4,55	3,42	3,76	3,52	3,56
Std. Error of Mean		,055	,068	,034	,052	,070	,080	,074	,093
Median		5,00	5,00	5,00	5,00	3,00	4,00	3,00	3,00
Mode		5	5	5	5	3	3	3	3
Std. Deviation		,612	,767	,379	,588	,777	,898	,827	1,047
Variance		,375	,588	,144	,346	,603	,807	,683	1,097

The elements of technical infrastructure are considered most important in increasing the economic performance of firms, these answers have obtained the highest scores, namely: infrastructure, utilities, transportation, and telecommunications.
Social infrastructure components are represented by the "whatever" option, meaning that according to the respondents the existence or absence of such facilities does not affect in any way the performance of firms. Thus the second assumption is validated only partially, not all categories of infrastructure have the same importance in enhancing economic performance.

Assumption no. 3. The majority of respondents believes that after the development of public infrastructure, the activity of the economic entities that they lead would register a substantial increase.

To highlight the link between improving of the level of public infrastructure development and increasing economic performance of entities from Covasna county 2 test 2 was applied. (Constantin, 2006)

Testing will start from the statistical hypotheses:

H_0: There is no significant difference between the frequencies obtained on the statement "After the development of public infrastructure the activities of economic entities would register a significant growth" and expected frequencies.
H_1: There are significant differences between the frequencies obtained on the statement "After the development of public infrastructure the activities of economic entities would register a significant growth" and expected frequencies.

We continue with the table of frequencies in which are compared the observed frequencies with the expected ones according to the null hypothesis for each category. According to null hypothesis for each category should be at least 42 people. The last column gives the differences from the expected values for each category.

Table 7. **Do you feel that afte the development of public infrastructure the activity of your company would register.....**

	Noted variables	Expected frequencies	Differences
Slight increase	44	42.0	2.0
Considerable increase	74	42.0	32.0
It will have no impact	8	42.0	-34.0
Total	126		

Tabelul 8. **Values calculate pentru testul χ^2 (Chi- Square)**

Chi-Square(a)	52.000
df	2
Asymp. Sig.	.000

a 0 cells (.0%) have expected frequencies less than 5.
The minimum expected cell frequency is 42.0.

From 126 economic agents 74, representing 58.7% believe that from development of infrastructure the activity of firms would register a significant increase, while 44 (34.9%) predicts a slight increase.

The result of x^2 test validates as well the hypothesis ((x^2 calc = 52.00)> (x^2 0.05, 2 = 4.30)), therefore the null hypothesis is rejected and the alternative hypothesis is accepted.

In conclusion we can guarantee with a 95% probability that there are significant differences between the response options, with a focus on responses " a significant growth" and therefore we accept as well the general hypothesis after which the development of public infrastructure the activity of firms would register a significant growth.

Assumptin no. 4. A relatively large part of economic agents invest in their own infrastructure predominantly from foreign sources (credits).

Most companies (73%) in the last 5 years have invested in its own infrastructure, but the source of these in the majority of the cases (64.1%) were their own and this hypothesis is invalidated.

Even though economic agents do not have benefited so far from the opportunities offered by joint projects of public interest, 74.6% of them claim that public - private partnership would still mean a way forward for infrastructure development.

Assumption no. 5. A relatively small proportion of respondents consider that in the last 10 years the development of public infrastructure in Covasna County has improved substantially.

Responses focused strongly to "improved" (72.85%) in all types of infrastructure. A substantial improvement was indicated by 14.28% of respondents. Substantial decay of infrastructure has not been selected.

How unquestionably infrastructure development leads to economic and social development **assumption no. 6** was formulated: A relatively small part of economic agents believe that in the last 10 years the economic and social situation has improved substantially in Covasna county.

The economic agents were asked to evaluate changes in the last 10 years in the social and economic development of the county. The results are shown in the following table.

Table 9. **Table of frequencies concerning changes in the last 10 years in the economic and social development of Covasna county**

		Absolute frequency	Relatice frequency	Valid percentage	Summed up percentage
Valid	Substantially increased	2	1.6	1.6	1.6
	Improvement	78	61.9	61.9	63.5
	Not modified	36	28.6	28.6	92.1
	Has downgraded	8	6.3	6.3	98.4
	Substantially downgraded	2	1.6	1.6	100.0
	Total	126	100.0	100.0	

Contrary to the hypothesis the majority of the economic agents (61.9%) feel an improvement in the economic and social situation of the county. An unchanged situation was indicated by 28.6% of economic agents, while only a small percentage 3.2% of the respondents believe that the changes that have occurred are negative.

Assumption no. 7. Most respondents identified business infrastructure as the most important factor in economic development, therefore from the measures and actions considered in development strategies should be given priority to the development of such infrastructures.

After evaluating the quality of infrastructure and the economic and social development level, the economic agents were asked to prioritize theri targets in local development strategies to develop infrastructure of the county.

Table 10. Ordering directions of action for infrastructure development - Descriptive statistics

		Houses and public utilities	Transport	Telecommunications	Healthcare	Education	Cultural artistical domain	Business and tourism
N	Valid	124	124	124	124	124	124	124
	Missing	2	2	2	2	2	2	2
Mean		2,92	3,10	4,73	2,98	3,74	5,40	5,10

Priority number 1 will mean the type of infrastructure achieving the lowest priority number, priority number 2 will mean the next in size and so on.

From the tablewe can note that contrary to the expectations the final rank of priorities in infrastructure development based on the responses of local economic agents are:

1. Housing and utilities infrastructure
2. Health infrastructure
3. Transport infrastructure
4. Educational infrastructure
5. Telecommunications infrastructure
6. Business and tourism infrastructure
7. Cultural artistic infrastructure.

Business infrastructure only occupies the penultimate place in the ranking.

In formulating this last assumption we based on the results of the multi-criteria analysis (Bogdan & Moga, 2013) carried out by the authors, with its help the importance of various types of infrastructure in determining the overall performance of the infrastructure was stated, consequently the following hierarchy results:

1. Business and tourism infrastructure
2. Telecommunications infrastructure
3. Transport infrastructure
4. Housing and utilities infrastructure
5. Cultural artistic infrastructure.
6. Educational infrastructure
7. Health infrastructure.

Other directions of action which in the opinion of economic agents would help raise the economic competitiveness of the county are:
- development of agriculture,
- supporting SMEs,
- improved quality of products and services,
- attracting foreign investors,
- use of renewable energy,
- completion of construction of highways and airport building Ghimbav,
- collaborations, partnerships and exchange with counties having similar character in other European countries.

As a conclusion to the research we can say that, contrary to expectations, assumptions made, the economic agents are pleased both with the investment efforts of local authorities in terms of infrastructure development as well as with the economic and social development in Covasna county.

Chapter VI. Economic and social efficiency of the infrastructure development

The concept of efficiency is closely related, both theoretically and practically to the the investment process. The first chapter presents how to define the concept of efficiency by measuring the effects in relation to the efforts, and general forms of efficiency, focusing on economic efficiency and social forms.

Then considering the possibilities for measurement and analysis of economic efficiency and social infrastructure improvements at the macroeconomic level, at program and project level.

In the end the cost-benefit analysis is presented, a method based on the relevant reporting efforts and economic and financial effects, social and environmental impact effects (pollution, depletion of resources, aesthetic and cultural values) for

infrastructure investment projects. Given the magnitude of the social and environmental impact of infrastructure projects financed by the European Union, the results of a financial analysis can be significant only if they are supported and complemented by the socio- economic analysis.

Chapter VII. Cost-benefit analysis of the project for the rehabilitation of the recreational infrastructure of Sugaş Băi, Covasna

The chapter has conducted a study case substantiating the need and opportunity of creation , modernization and development of a tourism infrastructure in the Sugas - Spa, Covasna using the method of evaluating the economic efficiency of the investment cost -benefit method.

The analysis of the " Creation and modernization of the leisure Sugas Spa " in terms of the most significant indicators to assess the economic efficiency of the projects that it has a benefit cost effectiveness ratios higher than one, generating positive effects both at local government level, as well as at the level of the economy of the county Covasna

The project looked at ways to increase the economic efficiency in the local tourism and aimed at:

- Better use of natural and human resources and competitive products (increasing the quality of services);
- Mitigate the seasonality curve in creating the conditions for business travel uninterrupted;
- Reducing maintenance and operating costs;
- Development and modernization of the entire material basis of interest in relation to the requirements of competitive tourism;
- The increase of additional services on the basis of average daily collection of tourist.

6. FINDING OF THE THEORETICAL AND PRACTICAL RESEARCH

The research undertaken in this paper aims to identify and present in a synthetic manner, the *theoretical and conceptual* on infrastructure development.

Studying literature of the EU regional policy and local experience in identifying the current state of infrastructure and make recommendations for future development opportunities we can draw the following conclusions:

There is no single methodological concept for understanding the content infrastructure and its functions in a market economy , but both the national and foreign researchers agree on one thing, namely , that the existence or lack of infrastructure development level shows a region, directly affects economic development sectors, both the primary sector, secondary and tertiary sector.

From our point of view, the infrastructure in market economy can be presented in various forms: complex enterprises and institutions, all positions and economic instruments, including transportation systems, telecommunications, electric power, water, gas and other essential services economic activity in general. Therefore, we consider more just applying complex concept to define the contents of the infrastructure.

In national and international literature there are found many classifications, groupings of infrastructure. We distinguish the following types of infrastructure: physical, institutional, personal, social, informational, production, consumption, regular special critical local, micro-regional, regional, inter-regional, national, continental, intercontinental and global.

Among the findings and results of *empirical research* are:

Creating and aggregate infrastructure index using multi-criteria analysis upon which to determine the level of infrastructure development in the counties of Romania (top

counties) were identified and measured disparities in infrastructure in the territory.

We identified areas with low and very low values of the index value of infrastructure performance.

The diagnostic analysis of Covasna infrastructure reveals a low level of infrastructure development, so can not make full contribution to economic and social development of the county.

However the findings of the quantitative research based on a questionnaire conducted among businesses in the county proves otherwise, the respondents are satisfied with the efforts of both local government investment in infrastructure development as well as with the economic and social development in Covasna county.

7. LIMITATIONS AND FUTURE RESEARCH

The research topic is of particular importance, especially now, when we face a new era in EU programs, the results of the impact assessment carried out in infrastructure projects may be useful in the preparation of new plans, programs and projects.

The present paper attempts to analyze the economic and social infrastructure improvements at the macroeconomic level, regional and project level to verify that they produce the expected effects:

- Multi-criteria analysis was performed in all counties of Romania;
- Strategic analysis and empirical research was conducted at the county Covasna;
- Cost-benefit analysis was performed at project level.

A limit of advanced multi-criteria analysis, conducted with the aim to create a global indicator characterizing the infrastructure that will be used to determine the rank and level of infrastructure development is that the importance of a criterion (type of infrastructure) in relation to other established in consultation with stakeholders in Covasna county's economic development we have communicated preferences for different criteria. These can be subject appreciation and therefore

still necessary analysis and debate on the indicators that are used in its on, establishing objective criteria, and not least on its functionality.

Besides this another limit is that the method fails to take into account the differences that occur in the counties regarding the potential presence of natural and anthropogenic factors, cultural and historical, which may influence the ranking obtained .

We appreciate, however, that the analysis undertaken capture existing territorial disparities in infrastructure, the indicator can be used as a tool to assess the level of infrastructure development as well as comparisons between territorial units analyzed.

Given the aim of creating a tool for assessing the level of infrastructure development it is proposed as future research for improving the methodology, research and the application of other methods , or even building an own method of assessing the level of iterritorial infrastructure development.

In another study we aimed to identify the dependence of economic activities in Covasna approach to infrastructure and shaping the way the issue of infrastructure development is perceived by local businesses. The results of research will be the pillars of the evaluation process regarding identification of the infrastructure in Covasna.

As a research method was used in a quantitative research technique based on questionnaire among economic agents in Covasna. Some limitations of this method can recall the degree of subjectivity and the low number of responses to the questionnaires, although the number of persons contacted reported response rate is good and relevant information obtained.

To obtain a more complete and relevant information on the level of infrastructure development and to contribute to a better orientation of priorities and action on economic and social development Covasna believe that this research should be

extended, it would be useful to undertake a study and the population.

We believe that the development of regional infrastructure remains both an open research topic and a high -field practice perspective.

In this context, we can forward some recommendations:

- To increase financial allocations to infrastructure development;
- To grant further attention to infrastructure in county development plans;
- To promote regional economic policy compatible with the European Union aimed at the legal and institutional deepening and embedding its principles administrative and financial decentralization;
- Development of regional statistics county by using performance indicators as the infrastructure that would better guide sectoral and regional actions.

So, without solving these problems in infrastructure development strategies we cannot expect the aimed results.

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