

UDK 338:505

THE PUBLIC INVESTMENTS IN INFRASTRUCTURE

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Key words: *infrastructure investments, indicators, assessment.*

Summary. *Local development is a dynamic process which mainly relies on qualitative and quantitative changes, accordingly to the needs of the local communities. The main problem, in terms of projects of infrastructure is their socio-economic evaluation. The article presents a model for assessing investments in infrastructure, on the basis of four groups of indicators. Results of the research give opportunity to a more detailed analysis and evaluation of investments in infrastructure, furthermore they make a strong foundation for the exploration of cause-and-effect relations between the investments in infrastructure and the quality of life in the region.*

Introduction

Public investments in infrastructure is a major element in local socio-economic development. Helps to create new companies and quality life in local field. In Poland, local infrastructure has developed dynamically in recent years with the use of European funds. Sound investments are credited with a significant positive influence on the quality of life in local communities, as well as an increase in consumer demand (Kryk 2012, p.150). Most infrastructural investments are local, which is mostly due to statutory competences of the municipal authorities. Value-wise, global investments prevail.

Primary municipal investments are those in the road infrastructure, water and sewage networks, housing infrastructure, waste management, as well as heating and renewable energy supply. Structural investment requires significant funding and compliance with rigorous legal requirements, mainly concerning public financing, environmental protection, and land management⁶.

Demand effects go in pace with the increase in consumption in the given territory, due to the growing interest in the infrastructure, thus with the growing number of households, enterprises which results in the increase in sales of goods and services. Supply effects are related mainly to the im-

⁶ The most important laws and regulations include: the Local Self-Government Act of 8 March 1990 (Dz.U. of 1990 No. 16, item 95), the Public Finance Act of 27 August 2009 (Dz.U. of 2009 No. 157, item 1240), the Spatial Planning and Development Act of 27 March 2003 (Dz.U. of 2003 No. 80, item 717).

provement of effectiveness of production, growth of local efficiency and productivity(Kozłowski 2012, p .15)

Infrastructural and commercial investments differ mainly in their goals, and consequently in the methods used for viability evaluation. Infrastructural investments are typically very capital-intensive and pose a high technological risk. The viability of local infrastructural investments, expressed mainly in their economic and social aspects, is difficult to evaluate (Kasiewicz, Rogowski 2009, p.109). Evaluation is done both ex ante and ex post. Ex ante evaluation of infrastructural investments focuses mainly on the planning stage, concerning project preparation and selection of options that best fulfil the local development strategy, as well as meeting investment goals. Ex post evaluation is based on effect verification vis-à-vis the investment plan. The final evaluation consists in a comparison of the effects and the plan.

The purpose and methods of the article.

The subject of this paper is the evaluation of infrastructure investments. According to the research hypothesis, there is a stochastic relationship between structural investment expenses and their socio-economic effects, as expressed by selected socio-economic ratios. The basic research methods used in the study are:

-Ratio analysis based on 6 socio-economic ratios, describing their effects related directly or indirectly to the infrastructure investment expenditure,

– Pearson correlation coefficient, which measures correlations between the socio-economic ratios.

Table 1– Socio-economic ratios of infrastructural investments

No.	Basic ratio	Formula	unit
E1	Amount of investment expenditure	Invested amount	PLN
E2	Amount of investment expenditure per capita	Invested amount / population	PLN
S3	Dynamics of the population in the years in question	Population	%
S4	Dynamics of the working age population ratio	Working age population/ Population	%
S5	Dynamics of the unemployment rate	Number of the unemployed / Population	%
S6	Dynamics of the migration balance	Number of migrants	%

Source: own research

The subject of the research

The subject of the research are infrastructure investments completed in municipalities and communes of the poviát of Olsztyn. The poviát's area is

2840.3 km², which constitutes 11.7% of the Warmińsko-Mazurskie province. It is the largest powiat in the province, and third largest in the country. The powiat is divided into 12 municipalities, including:

- 5 urban-rural municipalities: Barczewo, Biskupiec, Dobre Miasto, Jeziorany, Olsztynek,
- 7 communes: Dywity, Gietrzwałd, Jonkowo, Kolno, Purda, Stawiguda, Świątki. The time scope of the study: years 2010–2016.



Figure 2 – The powiat of Olsztyn and its municipalities and communes

Source: www.mapa-polski.net.pl

Analysis of infrastructural investment expenses by communes of the powiat of Olsztyn

The analysis of infrastructural investment expenses includes their amount and structure. Cluster analysis has also been performed within sets of observations that were deemed to be related. Table 2 shows infrastructural investment expenses from 2010 to 2016.

Table 2 – Amounts of infrastructural investment expenses (PLN thousand) (E1)

Municipality/ Commune	2010	2011	2012	2013	2014	2015	2016	Total	Mean
Barczewo	9468	15320	6507	5887	6826	4560	4462	53030	13258
Biskupiec	24833	15201	4635	3145	11387	5155	7012	71368	17842
Dobre Miasto	6490	5316	3271	4262	12800	1771	2238	36148	9037
Dywity	9068	7327	5994	6084	7931	7354	4279	48037	12009
Gietrzwałd	2614	2221	7763	8407	7211	3360	2850	34426	8607
Jeziorany	3963	3048	6507	3856	4334	2286	1692	25686	6422
Jonkowo	13229	3577	6759	2567	5065	2949	2668	36814	9204
Kolno	3658	2165	276	271	1277	4742	1801	14190	3548
Olsztynek	10983	11929	6651	6238	9427	6150	5274	56652	14163
Purda	5650	3545	3002	2803	4123	2284	2055	23462	5866
Stawiguda	9808	10601	8036	7056	9477	9219	5807	60004	15001
Świątki	1214	2151	1736	2425	1721	574	915	10736	2684
Total	100976	82402	61136	53001	81579	50405	41054	470553	117638

Source: own research

In years 2010–2016, the greatest nominal amounts were expended for infrastructure investments in the municipalities and communes of Biskupiec (PLN 71.4 million), Stawiguda (PLN 60.0 million), and Barczewo (PLN 53.0 million). The least expenses were made in the communes of Świątki (PLN 10.7 million) and Kolno (PLN 14.2 million). The greatest total infrastructural investments were completed by the municipalities and communes in 2010, amounting to about PLN 100.9 million (Table 2). Another analytical ratio was the amount of investment expenditure per capita (Table 3).

Table 3 – Amount of investment expenditure per capita (PLN) (E2)

Municipality/ Commune	2010	2011	2012	2013	2014	2015	2016	Mean
Barczewo	561	898	379	340	393	261	254	441
Biskupiec	1317	784	239	163	593	269	367	533
Dobre Miasto	411	328	202	263	791	110	139	321
Dywity	898	705	563	564	720	663	380	642
Gietrzwałd	456	371	1280	1358	1136	518	437	794
Jeziorany	496	377	809	481	542	287	213	458
Jonkowo	2083	538	994	373	722	416	375	786
Kolno	1096	632	81	80	383	1440	546	608
Olsztynek	801	855	477	447	674	439	380	582
Purda	732	437	364	336	487	269	240	409
Stawiguda	1604	1667	1186	993	1281	1204	728	1238
Świątki	291	509	412	576	409	137	219	365

Source: own research

The analysis of investment expenditure per capita reveals that the highest ratios were recorded in the communes of Stawiguda (PLN 1238 per capita) and Gietrzwałd (PLN 794 per capita). The lowest ratios were those of Świątki (PLN 365 per capita), Purda (PLN 409 per capita) and Dobre Miasto (PLN 321 per capita).

This research has also investigated the relationships between infrastructure investment expenditures in the municipalities and communes in question and the ratios characterising their socio-economic effects. The correlations confirmed the existence of causal relationships which, in turn, may become a driving force behind growth, creating a synergistic feedback loop. The correlations between ratios under investigation show dependencies existing between them, which can aid in planning infrastructure investments with specific socio-economic goals in mind (Table 5).

Table 5 Pearson linear correlation coefficient at $p < 0.05$

	E1	E2	S1	S2	S3	S5
E1	1	0.368	0.228	-0.084	-0.060	-0.146
E2		1	0.782	-0.064	0.691	-0.382
S1			1	0.039	0.671	0.101
S2				1	-0.310	-0.025
S3					1	-0.107
S5						1

Source: own research.

The analysis suggests a number of significant correlations between the ratios under investigation:

- There is a positive correlation between investment amount per capita (E2) and: population growth (S1) at $p=0.782$, and employment increase (S3) at $p=0.691$.

– There is a positive correlation between the population growth (S1) and employment increase (S3) at $p=0.671$.

Conclusions

Following the analysis, it may be concluded that the research hypothesis has been partly confirmed and that stochastic relationships do exist between the levels of expenditure and the selected socio-economic ratios.

The municipalities and communes under investigation were characterised by different infrastructure investment amounts. In the years 2010–2016. The greatest absolute amounts were spent by the municipalities and communes of Biskupiec, Stawiguda, Olsztynek and Barczewo. The smallest amounts were expended by the communes of Świątki and Kolno. The highest socio-economic ratios were achieved by the commune of Stawiguda. The lowest levels were recorded in the communes of Kolno and Świątki. There was a positive correlation between the level of investment per capita and the municipality or commune's own income, its number of economic operators, its population and the level of employment. This testifies to the existence of a causal relationship between the ratios under investigation.

Evaluating investments through the lens of socio-economic ratios allows for a broader look both at municipal investment expenditures and their effects. The diagnosed dependencies enable decision-makers to plan expenses more effectively and to expect more realistic outcomes. Ratio analysis may become one of the tools which will ensure an optimal and realistic evaluation of the expenses by local authorities. It is therefore advisable for municipalities and communes to analyse economic ratios pertinent to their development strategies and translate them into investment procedures.

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