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## Endogenous capital of small towns in the Poznań agglomeration

**Abstract:** The aim of this paper is to identify the endogenous capital of small towns in the Poznań agglomeration and to analyse its role in their development. The agglomeration of Poznań (a NUTS 4 unit) is located centrally in the Wielkopolska voivodeship, which lies in the western part of Poland. There are eight small towns in the Poznań agglomeration that vary in size and socio-economic functions they perform. They belong to two size classes. Those with 5–10 thousand inhabitants predominate; those are Buk, Kostrzyn Wielkopolski, Kórnik, Pobiedziska, Puszczykowo, and Stęszew. The class with the population of 10–20 thousand contains Mosina and Murowana Goślina. Their endogenous capital is identified in terms of three types: endogenous social capital, or population, its resources and quality; endogenous economic capital, or local wealth and production base, free lots and investment areas; and endogenous natural capital, or the condition of the environment, natural resources, and landscape attractiveness. In the analysis of the endogenous capital of small towns of the Poznań agglomeration, the following research instruments have been used: the index method, mathematical-statistical methods, and the survey research technique. The final analysis reveals that in the set of eight small towns of the Poznań agglomeration the highest quality of endogenous capital can be found in Puszczykowo, Kórnik, Mosina, and Murowana Goślina, and the lowest, in the peripheral ones: Buk and Kostrzyn.

**Keywords:** endogenous economic capital; endogenous natural capital; endogenous social capital; Poznań agglomeration; small towns

### Introduction

In the contemporary socio-economic conditions, endogenous capital, known also as endogenous potential or endogenous resources, is an important factor in the development of small towns. The significance of endogenous capital for their development is stressed in strategic documents, scientific publications and current theoretical conceptions of regional development (the new theory of endogenous growth – Romer, 1990, 1994; Lucas, 1988; Molle, Cappellin, 1988; Barro, Sala-i-Martin, 2004; Stilianos, Konstantinos 2011).

Following the place-based policy approach (National placed base policies in the Netherlands 2010), emphasis is laid on the specificity of endogenous resources of

areas and their importance for improving the efficiency of development processes. This approach is one of the pillars of the reform of the EU cohesion policy mentioned in Fabrizio Barci's report (2009). It stresses the necessity of breaking with a homogeneous, linear vision of development since each area has its own specific endogenous resources influencing its development trajectory.

The socio-economic development of small towns is determined by various groups of factors, but in the opinion of Parysek (2001: 70), in Poland, "given the situation, the surest chance of development of smaller towns is a local economy based on endogenous [i.e. local] development factors". Local development factors corresponding to local endogenous capital of small towns can be divided into three basic groups: social (endogenous social capital, e.g. population dynamics, social activity), economic (endogenous economic capital, e.g. the wealth possessed and the production base), and natural (endogenous natural capital, e.g. natural resources and landscape attractiveness).

The aim of this paper was to identify the endogenous capital of small towns in the Poznań agglomeration and to analyse its role in their development. The Poznań agglomeration (a NUTS 4 unit) is located centrally in the Wielkopolska voivodeship, which lies in the western part of Poland. The examined towns vary in size and the socio-economic functions they perform. There are eight such towns here that belong to two size classes. Those with 5,000–10,000 inhabitants predominate; they include Buk, Kostrzyn Wielkopolski, Kórnik, Pobiedziska, Puszczykowo, and Sęszew. The class with 10,000–20,000 inhabitants contains only Mosina and Murowana Goślina. Their endogenous capital is identified in terms of three types: endogenous social capital, or the population, its resources and quality; endogenous economic capital, or local wealth and the production base, free lots and investment areas; and endogenous natural capital, or the condition of the environment, natural resources, and landscape attractiveness. To achieve the goal, the research proceeded in three stages.

(1) In the first stage, 8 small towns of the Poznań agglomeration were characterised in terms of their socio-economic development. Published data were used to determine their position against the entire set of 89 small towns of the Wielkopolska voivodeship (2010).

(2) In the second stage, selected aspects of the endogenous capital of these towns were defined on the basis of statistical data (published data, 2012).

(3) In the third stage, the endogenous capital of the discussed towns was defined on the basis of the results of a field research into selected aspects (in-depth fieldwork, 2012).

Publications on endogenous resources in the development of small towns include those by Heffner (2008), Marszał (2009a, b) and Poczobut (2009); there are also papers devoted to selected small towns, e.g. Barek (2009; Koźmin Wielkopolski), Tkocz et al. (2009; Wisła), Kwiatek-Sołtys (2009; Krzeszowice), Struczyński (2009; Gniew), Slenczek, Sikorski (2009; Kowary), Namyślak (2010; Kamienna Góra), and Kaczmarek and Konecka-Szydłowska (2013; Nowy Tomyśl, Koźmin Wielkopolski, Wolsztyn, Sieraków, Murowana Goślina).

## Study methods

In the analysis of the endogenous capital of the small towns of the Poznań agglomeration, the following research instruments have been used: the index method, mathematical-statistical methods, and the survey research technique.

### The index method

Indices of socio-economic phenomena are necessary to make a correct assessment of processes taking place in the social and economic spheres. In the methodological sense, an index is a feature, occurrence or phenomenon on the basis of which we conclude with certainty, (or with a specified degree of probability), that the phenomenon of interest to us is actually present (Nowak, 1970). The basic classification of indices employed in this study looks as follows:

- structural indices, which present the ratio of the number of units with the given value of a variable to the size of the sample; structural indices are expressed in per cent (%), e.g. the percentage of people connected to a wastewater treatment plant (%);
- intensity indices, which present the number of cases of the phenomenon examined in relation to the total number of units in the statistical population from which the phenomenon derives, e.g. the total number of enterprises per 1,000 population;
- growth indices, which define the relation between figures characterising some quantity (phenomenon) in two periods or moments of time and are expressed in per cent, e.g. total population growth in % against a reference year (2000–2012).

### Mathematical-statistical methods

To obtain a linear arrangement of small towns in terms of their socio-economic development level and endogenous capital, Perkal's synthetic index (Z-score index) was used in the following form (Runge 2007: 214):

$$W_s = \frac{\sum_{j=1}^p z_{ij}}{p}$$

where:

$W_s$  = synthetic index,

$j$  = number of a variable, 1, 2, ...,  $p$ ,

$p$  = total number of variables considered, and

$z_{ij}$  = standardised value of the  $j$ -th variable for the  $i$ -th object.

To use the synthetic index, it was necessary to start with standardising the values of indices describing the intensities of individual variables in poviats. For

variables of a stimulant nature, standardisation was performed on the basis of the formula:

$$z_{ij} = \frac{x_{ij} - \bar{x}}{S_j}$$

where:

$z_{ij}$  = standardised value of the  $j$ -th variable for the  $i$ -th object,

$x_{ij}$  = value of the  $j$ -th variable for the  $i$ -th object,

$\bar{x}$  = arithmetic mean of the values of the  $j$ -th variable,

$S_j$  = standard deviation of the values of the  $j$ -th variable.

For the destimulant type of variables, standardisation followed the formula:

$$z_{ij} = \frac{\bar{x} - x_{ij}}{S_j}$$

## Survey research

The fieldwork using the survey research technique was conducted in June 2012 on a group of 500 inhabitants of 8 small towns. The questionnaire contained both close-ended and open-ended questions. The research sample was proportional to the number of inhabitants of a town and ranged from 37 to 87 questionnaires per town. The research embraced representatives of the local authorities and the remaining population.

## Level of socio-economic development of the small towns of the Poznań agglomeration

The population situation is a basic aspect of the socio-economic development of towns. It is both a conditional factor and a consequence of urban development. In 2012 the number of inhabitants of the small towns of the Poznań agglomeration amounted to 70,983, or 3.7% of the total urban population of the Wielkopolska voivodeship. This was an increase of 6,398 over the year 2000. The dynamics of their population change is high. In the years 2000–2012 the mean dynamics index for this set of towns was 110.0%. Its highest values, over 110.0%, were noted in Kórnik, Stęszew, Pobiedziska and Kostrzyn, and the lowest one, at 100.2%, in Buk (Tab. 1). In the case of Buk, what is readily visible is the outflow of inhabitants from this town to suburban areas (a 'micro-suburbanisation' process), as well as the inflow of new inhabitants in the rural areas of Buk commune. For example, in Wielkawięś, a village directly neighbouring the town of Buk, ten new streets appeared over the years 2002–2012 owing to the development of residential construction, and the population grew by more than 300. Another impulse for the development of Buk commune rural areas was also the location of the Buk Industrial Park in the north-eastern part of this commune, along the A2 motorway (Szwarc, 2014).

**Tab. 1.** Population of small towns in the Poznań agglomeration

Town	Population number		Population dynamics index (in %)	Type of population development, after Webb, in 2012
	2000	2012		
Buk	6,209	6,220	100.2	H
Kostrzyn	8,313	9,426	113.4	A
Kórnik	6,266	7,351	117.3	C
Mosina	11,969	12,941	108.1	C
Murowana Goślina	9,856	10,437	105.9	B
Pobiedziska	7,903	8,997	113.8	C
Puszczykowo	8,983	9,787	109.0	E
Stęszew	5,086	5,824	114.5	C

Source: own compilation on the basis of the Local Data Bank and the Central Statistical Office

The structure of the population change of small towns is determined by population types. In 2012 the small towns of the Poznań agglomeration mostly belonged to population increase types A-C in Webb's (1963) classification (Tab. 1). In 2012, type A, characterised by natural increase exceeding emigration, was represented by Kostrzyn; type B, with natural increase exceeding immigration – by Murowana Goślina; and type C, with immigration over the natural increase – by Kórnik, Mosina, Pobiedziska and Stęszew. Only in the towns of Buk (a great outflow of residents to the rural commune area) and Puszczykowo (an ageing community, a negative natural increase) a slight decrease in the population number was noted (types H and E, respectively).

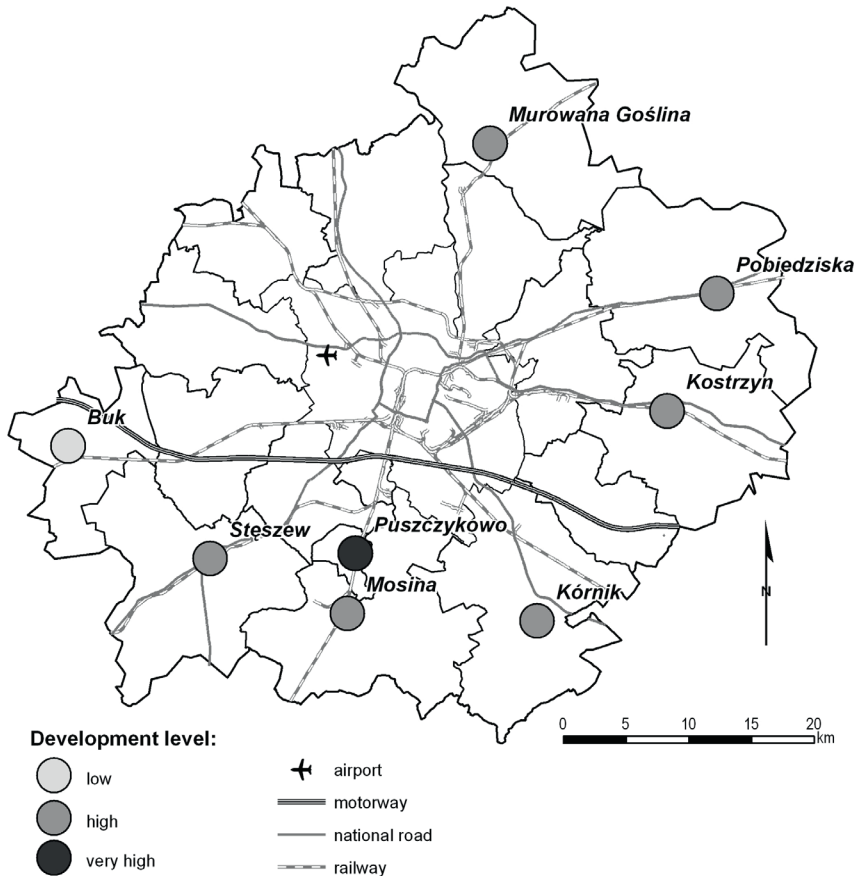
Economy of the Poznań agglomeration small towns shows a mixed structure, with a high proportion of services (due to the tertiarisation). What is important for the development of a small-town economy is the diversification of its structure (Domański 2000, Małuszyńska 2000), both in terms of the economy as a whole and in its components, i.e. industry and services. A diversified structure is one of the features that give a competitive advantage to an economy (a town). In 2010, the small towns of the Poznań agglomeration showed average and high diversification of their economic structures. The group with its high level (diversification index  $W_D \geq 4.1$ ) included five towns: Kórnik, Mosina, Murowana Goślina, Pobiedziska, and Puszczykowo. In the remaining towns the diversification was average ( $2.1 \geq W_D \leq 4.0$ ).

To establish the position of small towns of the Poznań agglomeration against those of Wielkopolska voivodeship, the socio-economic development of the entire set of the Wielkopolska voivodeship's 89 small towns was examined. To this end, a set of 27 indicators in five categories was used: (1) population, (2) economy, (3) social infrastructure, (4) physical infrastructure and housing, and (5) social and human capital. Each category was described by a set of 3 to 7 indicators (Konecka-Szydłowska 2014). It should be stressed that most of the analysed indicators are stimulants of socio-economic development that show a positive correlation with the development level of small towns. For a linear arrangement of the small towns in terms of their level of socio-economic development, Perkal's synthetic index (z-score index) was employed.

**Tab. 2.** Ranks of the small towns of the Poznań agglomeration

Small towns in the Poznań agglomeration	Z-score ( $W_s$ ) index	Population	Economy	Social infrastructure	Physical infrastructure and housing	Human and social capital	
	value						position in the set of 89 small towns of the Wielkopolska voivodeship
Puszczykowo	0.63	3	40	4	80	8	2
Kórnik	0.46	10	24	8	55	11	8
Murowana Goślina	0.43	12	3	13	52	19	40
Pobiedziska	0.30	14	11	40	46	5	23
Stęszew	0.21	21	6	30	41	7	72
Mosina	0.16	29	39	16	74	10	27
Kostrzyn Wlkp.	0.12	33	12	31	84	3	88
Buk	-0.16	58	76	22	76	71	67

Source: own compilation



**Fig. 1.** Ranks of the small towns of the Poznań agglomeration by their development level

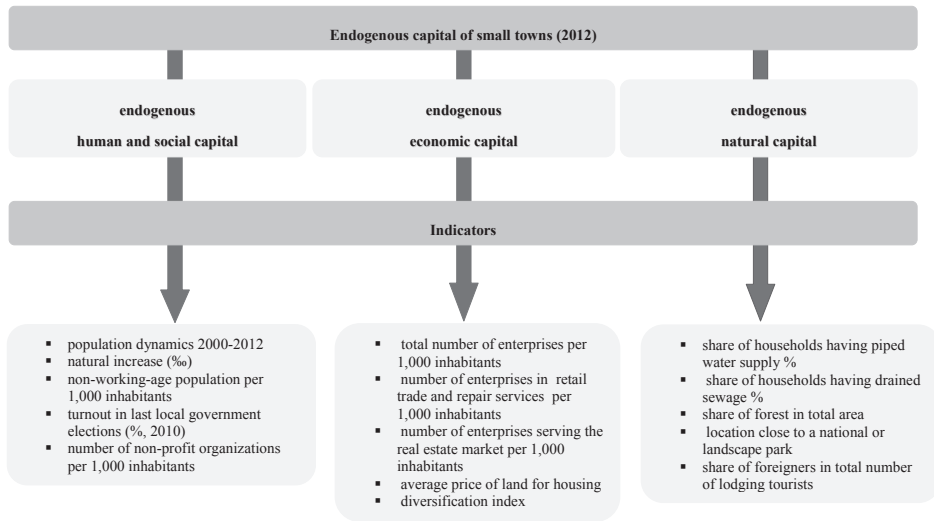
Source: own compilation

On the basis of the distribution of the values of this index ( $W_s$ ), the small towns of Wielkopolska voivodeship were arranged in a linear order (their rank was established) and then classified into spatial units with similar values of the index. The towns were divided into relatively uniform classes in a subjective way considering differences in the index. Five classes were obtained: of a very high, high, average, low, and very low level of socio-economic development in terms of the five categories of input variables. The analysis showed that, against the 89 small towns of the Wielkopolska voivodeship, those of the Poznań agglomeration were at a relatively higher level of socio-economic development. Most of them (6) belong to the class at a high development level. The highest position (3rd) among the small towns of the Poznań agglomeration is occupied by Puszczykowo, which belongs to the class of a very high level of development. Buk is the only town belonging to the class at a low development level (58th position – Tab. 2, Fig. 1). Against all the small towns of the voivodeship, those of the Poznań agglomeration stand out for their high level of development of the economy, physical infrastructure and housing. Their social infrastructure is rather underdeveloped, which is an indirect consequence of the availability of a variety of this type of services in Poznań city. a broader analysis of the socio-economic situation of the small towns of the Poznań agglomeration can be found, among others, in Konecka-Szydłowska (2006a, 2006b, 2014), Zuzanska-Zyśko (2007), Churski et al. (2009), Kaczmarek (2010), Męczyński et al. (2010), and Korzeniak (2014).

### Endogenous capital of small towns in the light of published data

In the second stage of the analysis, that on the endogenous capital of the small towns of the Poznań agglomeration, published data were used, mostly from the Central Statistical Office. On this basis indicators were constructed that were assigned to the three kinds of endogenous capital studied: social, economic and natural. Each kind was described by five indicators (including stimulants and destimulants) which characterised, whether directly or indirectly, the level of endogenous capital in the towns examined. a full list of the indicators by type of endogenous capital is presented in Fig. 2. Within each type, Perkal's synthetic index was calculated for each town on the basis of the partial indicators adopted. Its values allowed a linear ordering of the towns and selecting those that differed in their levels of endogenous capital in each of its aspects. After averaging the results, a town's ultimate position was established in terms of the three aspects of endogenous capital (Tab. 3).

In terms of endogenous social capital, Kórnik is the most outstanding town for its high dynamics of the population number over the years 2000–2012, a high natural increase, and a large number of registered associations per 1,000 inhabitants. The highest level of endogenous economic capital was recorded in Puszczykowo, which follows from its large number of economic entities, including retail outlets, and the highest prices of land for housing construction (Maćkiewicz, 2007). As to endogenous natural capital, Mosina came first owing to its tourist-recreational assets (a location in direct contact with the Wielkopolski National Park) and good pro-ecological physical infrastructure.



**Fig. 2.** Endogenous capital indicators by type

Source: own compilation

**Tab. 3.** Endogenous capital of the Poznań agglomeration’s small towns on the basis of published data

Town	Z-score ( $W_s$ ) index		Endogenous social capital (position)	Endogenous economic capital (position)	Endogenous natural capital (position)
	value	position in the set of 8 small towns in the Poznań agglomeration			
Buk	-0.57	8	8	5	8
Kostrzyn	-0.50	7	7	4	7
Kórnik	0.54	1	1	2	2
Mosina	0.24	3	5	3	1
Murowana Goślina	0.06	4	2	6	6
Pobiedziska	-0.08	5	3	8	5
Puszczykowo	0.41	2	6	1	4
Stęszew	-0.09	6	4	7	3

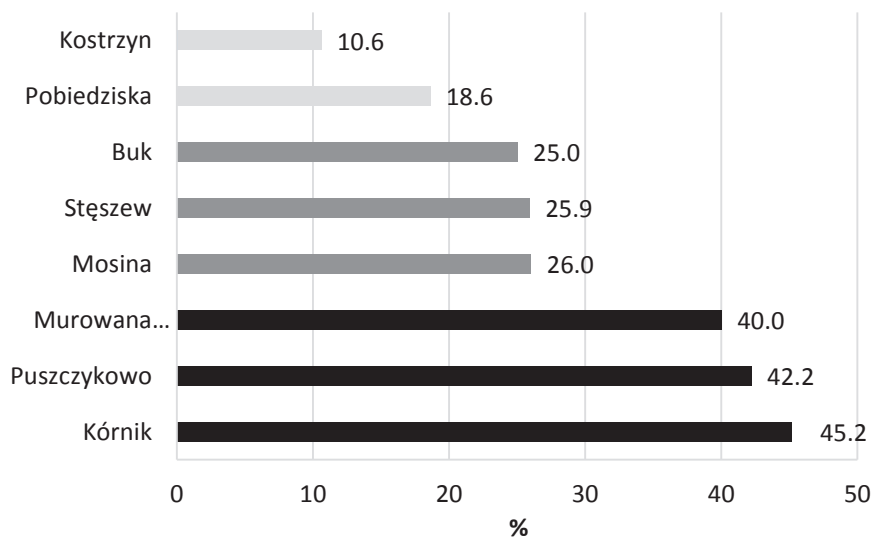
Source: own compilation

Summing up the analysis of endogenous capital according to the published data, it can be stated that in the set of the eight small towns of the Poznań agglomeration, Kórnik shows the highest level of endogenous capital in terms of all three aspects investigated. The high level can also concern towns of Puszczykowo (especially the economic one) and Mosina (the natural one). The lowest level of endogenous capital (social and natural) is observed in Buk and Kostrzyn.



### Endogenous capital of the small towns in the light of fieldwork

The survey research conducted among residents of the small towns of the Poznań agglomeration revealed a high and a very high level of their satisfaction with living in their towns (49% and 31%, respectively). The highest, (i.e. a very high) level of satisfaction was declared by the residents of Kórnik, Puszczykowo and Murowana Goślina (over 40%), the towns which also show the highest level of their socio-economic development (Fig. 3).

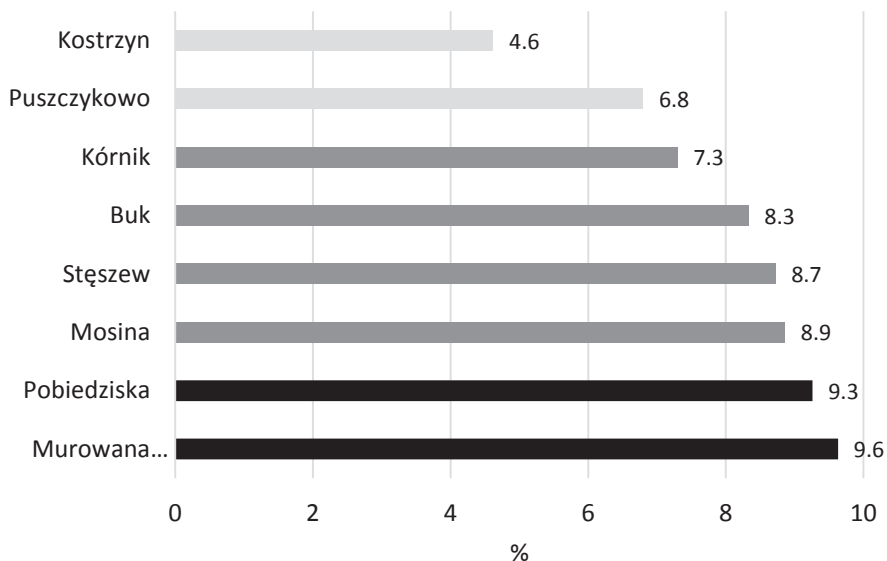


**Fig. 3.** Share of residents declaring very high satisfaction with living in their small towns

Source: own compilation

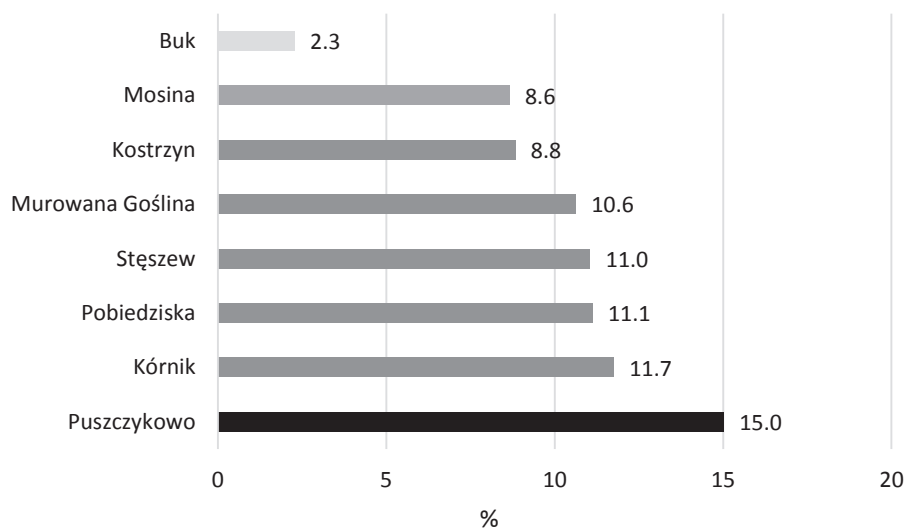
As regards three aspects of endogenous capital: social, economic and natural ones, the situation of the particular towns differs. Thus, in terms of endogenous social capital, measured by efficient activity of the local self-government, Murowana Goślina and Pobiedziska are the leaders: here, over 9% of respondents decided that the activity of the local authorities was a significant endogenous factor of the development of these towns. This factor was the least significant in Kostrzyn (Fig. 4). The case of Murowana Goślina Cittaslow proves that the role of endogenous social capital is extremely important for its development (Kaczmarek, Konecka-Szydłowska, 2013).

In terms of endogenous economic capital, measured by free lots for economic and housing investment, the town that stands out is Buk, and (more precisely) its immediate surroundings. Over 11% of Buk respondents stated that this was an important component of the endogenous economic capital (Fig. 5). This factor plays the least important role in Puszczykowo, where there is limited possibility of constructing new buildings and the few building lots belong to the most expensive ones in the entire Poznań agglomeration (Kaczmarek, 2010).



**Fig. 4.** Activity of the local self-government authorities as an endogenous development factor in the opinion of the small town inhabitants (%)

Source: own compilation

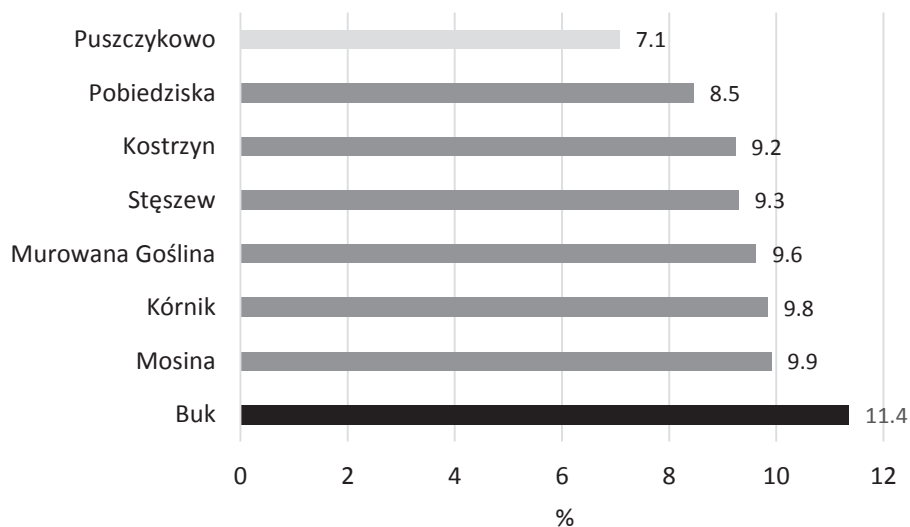


**Fig. 5.** Land lots for economic and housing investment as an endogenous development factor in the opinion of the small town inhabitants (%)

Source: own compilation

The leader in terms of natural endogenous capital as measured by landscape and natural assets as well as a good environmental condition is Puszczykowo, located close to the Wielkopolski National Park. The Park, situated between Puszczykowo, Mosina and Stęszew, has a high natural and landscape value, rich fauna and flora, and is the great attraction for the agglomeration residents in tourist and recreational terms. In the case of Puszczykowo, half of its area is covered by forest, mostly that of the Park. It is the greenest town of the Poznań agglomeration, a garden town with villas, today performing residential and tourist functions (Przybysz, 2009, Kaczmarek, 2010). The residents' opinion are shown on Fig. 6.

In the case of Kórnik, its tourist-recreational functions are determined by its cultural heritage. The town has an interesting neo-Gothic castle belonging formerly to the Działyński family, with an adjacent arboretum, one of the oldest and richest in terms of species number dendrological parks in Central Europe (Kaczmarek, 2010). Tourist-recreational assets were decidedly the least important for endogenous development in Buk.



**Fig. 6.** Tourist-recreational assets as an endogenous development factor in the opinion of the small town inhabitants (%)

Source: own compilation

### Synthetic analysis of the endogenous capital of the small towns

In order to establish the final position of the small towns of the Poznań agglomeration in terms of endogenous capital, a synthetic analysis was made of the results obtained at each of the three research stages (Tab. 4). This led to distinguishing three classes of small towns: those at a high, an average and a low level of endogenous capital, in terms of all the aspects studied. The highest level of endogenous capital can

be found in Puszczykowo, Kórnik, Mosina and Murowana Goślina, and the lowest, in the peripheral towns of the Poznań agglomeration; these of Buk and Kostrzyn. An average level is that of Pobiedziska and Stęszew.

There are notable differences and lack of cohesion between the results obtained from the published data and from fieldwork. This was the situation recorded in Buk, Kostrzyn, Pobiedziska, and Stęszew.

**Tab. 4.** Level of the endogenous capital of the Poznań agglomeration small towns: a synthetic analysis

Towns	First stage	Second stage	Third stage	Total
Buk	-	--	+	low
Kostrzyn	+	--	-	low
Kórnik	+	++	+	high
Mosina	+	++	+	high
Murowana Goślina	+	+	++	high
Pobiedziska	+	-	+	average
Puszczykowo	++	++	+	high
Stęszew	+	-	+	average

Source: own compilation

## Conclusion

The analysis of the endogenous capital of the small towns of the Poznań agglomeration carried out on the basis of official statistical data and the results of fieldwork leads to the following conclusions:

- Due to their specific position in Wielkopolska, these small towns demonstrate a higher level of socio-economic development than other small towns of the voivodeship.
- The small towns of the Poznań agglomeration accumulate population and investment potential: economic (industry, services) and housing (suburbanisation processes).
- These small towns differ in their endogenous capital; what contributes to it in particular are strictly territorial factors: site in the agglomeration, transport accessibility, free land for investment, landscape and tourist assets as well as social capital (cf. also Zaucha, Komornicki, 2013).
- Interviewed residents perceive the endogenous capital of their towns in a positive light as a significant factor of their development.
- The analysis of endogenous capital on the basis of statistical data is not fully consistent with the fieldwork results in the aspects studied.
- The final analysis reveals that in the set of the eight small towns of the Poznań agglomeration, endogenous capital has the highest quality in Puszczykowo, Kórnik, Mosina, and Murowana Goślina, and the lowest in the peripheral ones: Buk and Kostrzyn.

According to Korcelli (2007), Poland's spatial policy should recognise the role of small towns, especially the powiat centres (Benedyk, 2014), and the significance

of keeping up and strengthening their function in the spatial organisation of social life. The reconstruction and maintenance of the small towns economic potential should rest primarily on their endogenous resources. It is also necessary to support voivodeship self-government in its efforts to encourage local communities and local development institutions to take initiatives for the development of their towns and cooperation with large urban units. Promoting small towns as local growth/sustainable development centres using their endogenous potential has also been emphasised by ESPON in one of its three scenarios of Europe's development until 2050 (ESPON 2014).

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