SHAPING SPATIAL STRUCTURE OF THE NEW MEMBER STATES OF THE EUROPEAN UNION

Introduction

There has been made a comparison of the spatial structure of Poland with four different groups of countries. For the needs of the comparison, two assumptions have been made – the first one concerns the subject of the comparison, whilst the second one concerns the model of reference.

In accordance with the first assumption, we compare spatial structures in a national scale. Spatial structures are formed by centres, or else, junctions formed by big cities of metropolitan functions, infrastructural relations – national and international, nature protection areas, and the regions that a given country is divided into. To make national spatial structures internally coherent, the relations between the division of a country into regions, the number of centres and the length of infrastructural relations have to be taken into consideration. A national spatial structure can be presented in a simplified way - then we call it a spatial structure model. In case of Poland, it is possible to make a spatial structure model with the division into 5, 6 or 9 regions. The division into 5 regions is the one into historical provinces – not very functional nowadays. The division into 6 regions is the one that Poland has suggested to the European Commission as the NUTS1 division. The division into 9 regions is also possible and most functional.

In accordance with the second assumption, the spatial structure model of Poland has been compared with spatial structure models of four other groups of countries. The first of them is a common model of spatial structure for Estonia, Lithuania and Latvia. It has been called the „Baltica" model. The second of them is a common model of spatial structure for the Czech Republic, Slovakia and Hungary. It has been called the „Visehrad" model. The third model of spatial structure is common for Bulgaria and Romania, and it is named „Danuba". Whilst the fourth model of spatial structure, common for Spain and Portugal, has been called „Iberia". The „Iberia" model served for assessment as a model of reference, that is a pattern.

The paper consists of three sections. In the first section, the process of shaping spatial structure and the aim of this shaping have been discussed. In the second section, five models of spatial structure have been presented. In the third section, the comparison and assessment of the five models of spatial structure have been carried out. For the needs of the comparison, quantitative and qualitative measures of performance have been applied. At the end, the conclusions from the comparative assessment of the five models have been presented. For his paper, the author has also enclosed some tables with data and figures containing description of the models.

1. Shaping national spatial structure

The aim of shaping spatial structure is to obtain the pattern called a model. The pattern may serve as the basis to work out a future vision or a concept of national spatial planning. This vision, as the long-term one, may be formulated on the basis of „a selected model of spatial structure"[1]. To select such a model, one must take the action which positively favours such a selection. In order to select a model, one must apply a strategic approach in the selection. This approach consists of four phases. In the first one, a model of spatial structure is worked out. This phase may also be called the phase of a model determination. In the second phase, future forecasted variants of spatial structure are prepared. It is a predictive phase. In the third phase, the assessment and selection of

[1] Quoted after: *The Concept of National Spatial Planning 2008-2033. Theses and Assumptions*, Ministry of Regional Development, Warsaw 2007.

a future variant of spatial structure are carried out. It is a selective phase. The fourth phase determines the vision of spatial structure on the basis of a selected future variant of spatial structure. It is a vision phase. The vision of spatial structure may serve as the basis for determining the concepts of national spatial planning.

Figure 1 presents the application of strategic approach for determining the vision of spatial structure with the use of the model of this structure. In the suggested division into phases, the 0 phase has been omitted, that is the one that concerns the analysis of the current state and serves for working out a model. The current state of national spatial structure is made up of component structures. They are as follows:

– Centers, that is the cities of metropolitan functions,
– Infrastructural relations between these cities, both national and international,
– Valuable nature areas,
– Regions forming a given country.

There is an interrelation between the number of centres, the quantity of regions and the length of infrastructural relations. Therefore, when a tendency for increasing the number of centres and the quantity of regions appears, the length of infrastructural relations should also be increased. Due to the shortage of economic potential able to accomplish these dimensions, there has to exist coherence between the number of the components of spatial structure. Then we say that the national spatial structure model presents the features of coherence. The coherence means that:

– A country is properly divided into regions, and the regions are optimal in relation to the size of the country,
– Each region is supplied with a junction, a city of metropolitan functions,
– The potential is placed in a country in such a way that each region involves the essential minimum of it,
– Junctions, regions and a country are connected with one another with a modern infrastructure,
– Valuable nature areas are protected, both national and those of the Natura 2000 network.

When establishing the existing spatial structure model, the assumed dimensions should correspond with the facts. However, a spatial structure model should also be open for potential changes which may appear in the variants of a future model. Therefore, the future variants ought to be based on such a model in which increasing the number of junctions, the number of regions and the length of infrastructural relations is possible. When comparing the five spatial structure models with one another, the author made also a comparison of the existing models. Simultaneously, when discussing the existing models, the possibilities of their future changes have been pointed out.

The most essential data sources used in establishing and describing the models were:

– ESPON[2] findings concerning selection of the junctions as cities of metropolitan functions,
– Cartographic materials describing the TEN networks, established both by CEMT and by EC of the EU,
– Statistical data of Eurostat concerning the NUTS1 regions,
– Data concerning nature protection areas Natura 2000.

In the discussion on the models, the following way of analysis has been applied. The first step is discussing the features of the division into components of a model. The second step is the description of the components of a model. The third step is discussing data contained in the table. The fourth step is discussing the arrangement presented in a figure.

[2] ESPON – an acronym for European Spatial Planning Observation Network.

2. The spatial structure model of Poland

The discussion on the spatial structure model of Poland has been preceded by a comparison of the three models. They have been signed with the symbols: D, N and R.

Features of the division. Three different ways of division are possible in case of a spatial structure model. Model D is the division of the country into 5 regions corresponding with its historical provinces: Masovia (Mazowsze), Lesser Poland (Małopolska), Greater Poland (Wielkopolska), Pomerania (Pomorze) and Silesia (Śląsk). This division can be used, however, nowadays it is rather useless. It is because this division does not take into consideration the existing relations in the central strip of the country, in the N-S direction. It is a historical division and will not be analyzed in detail. Model N is the division of the country into 6 regions. Poland has come forward with it to the European Commission as the division for the NUTS1 level. The description of this division is based on distinguishing three strips in the S-N direction. The western strip has been divided into two regions, the central strip – into three regions, and the eastern strip forms one region. Thus this division discriminates the western and, in particular, the eastern part of the country. This model means the necessary minimum of division of the country into parts. It is the current national spatial structure model.

Model R is the division of the country into 9 regions, three regions in each of the three strips in the N-S direction. It is the most complex model. It can be used both for analysis of the existing state and for forecasting changes of national spatial structure. This model may be called the model of future changes of national spatial structure.

Comparison of the models. Advantages and disadvantages of each model have been assessed. The comparison seems to suggest that Model D is not useful because its disadvantages overbalance the advantages. There is no possibility to apply this model when determining the vision of national spatial structure. Therefore this model has not been further discussed. For further comparative analysis Model D and Model R have been applied. Model N has been used due to the comparability of the data with the four models for other countries. Whilst Model R has been used as a starting point for determining the variants of a future forecasted national spatial structure.[3] In Table 1 the comparison of the three spatial structure models of Poland has been presented. Advantages and disadvantages of each variant of a model have been compared.

Description of the components of the model. Model N, with its division into 6 regions, responds to the current needs. It does not respond to the future needs, because it does not comprise a sufficient number of regions in the west and in the east of the country, which weakens the opportunities of development in the future. The number of metropolises in this model accounts to 9. The complexes of metropolises are placed in the same regions. Thus there is no need to increase the total length of metropolitan relations. There appears a limited opportunity of development when the number of cities of metropolitan functions is over 9. The number and the length of infrastructural relations are not sufficient. Limitations concerning the possibilities of increasing the number of regions, metropolises and the length of infrastructural relations may considerably hinder the opportunities of development for Poland in the future.

Model R is the division into 9 regions, where the number of metropolises increases up to 12. The length of infrastructural relations also increases of one half. As a result, the area of the country is better utilized and there appears an opportunity of development for the underdeveloped regions. Model R, in comparison with Model N, is better developed.

The essential data concerning the models. In Tables 2 and 3, the essential data describing the spatial structures for Poland: Model N and Model R, have been presented.

[3] Fiedorowicz K., Studnicki T., *The Influence of Changes of Spatial Structure on the Convergence of Polish Economy*, International Conference RSA, Lisbon, Portugal, 2-5.04.2007.

These data indicate that the regional spreads of measures are significant. According to the division into 6 regions, the ratio of the spread amounts to 1:1.5. Whilst for the division into 9 regions, the ratio of the spread amounts to 1:1.9. The scale of these spreads is significant, however, a bit smaller than the spreads in the models for other countries (except for the „Baltica" model).

Description of the spatial arrangement. In Figure 2 the three models of spatial structure for Poland: Model D, Model N and Model R, have been presented. Model D does not take into consideration the situation on the joint of the borders of the historical provinces, where some complexes of metropolises and infrastructural relations have developed. This division does not take into consideration that fact and it is not compatible with the arrangement of the cities and relations. Model N, the current one, takes into consideration the situation already found and concerns the complexes of metropolises and shaped infrastructural relations. However, it does not favor new metropolises and new infrastructural relations. Model R, the future one, provides an opportunity for development of both metropolises and infrastructural relations. In particular, it increases the opportunity for development of Eastern Poland.

3. The „Baltica" spatial structure model

As regards the name used and referring to the three countries situated by the Baltic Sea, this abbreviated name has been adopted for determining a spatial structure model. This model comprises the territories of the three countries: Estonia, Latvia and Lithuania. The essential feature of this model is: one country corresponds to one region. These countries encounter difficulties in introducing internal regional divisions.[4]

Features of the division. The analyzed area amounts to 56% of the surface of Poland. Simultaneously, the population of this area constitutes less than 17% of the population of Poland. It means that the intensity of development in this area is threefold less than the intensity in Poland. The feature of the division is simplicity: four junction centres and three regions emerge. In the area of Lithuania the complex of junction centres Kaunas-Vilnius is being developed. As a result, we have to deal with the poorly developed spatial structure for the „Baltica" territory.

Description of the components of the model. This structure comprises the features of an extensive structure. The extensiveness has been deepened by the transformations covering 50 years of the Soviet power. The spatial structure for rural areas has been destroyed. The accelerated migration to towns has evoked their excessive territorial development. Thus we can assume that the „Baltica" model has incoherent spatial structure, spatially not very much diversified.

The essential data concerning the model. In Table 4 the essential data describing the spatial structure of the „Baltica" model have been presented – the first data concern different size of regions, the latter ones show diversification of the measures. The smallest Estonia contains the highest measures. The ratio of the summary spread of the measures amounts to 1:1,35.

Description of the spatial arrangement. The distinctive feature of the model, shown in Figure 3, is quite a small number of infrastructural relations. It arises due to the lack of divisions into smaller regions and the lack of significant metropolitan centres. The number of relations would rise if additional junction centres and additional divisions into regions appeared in each of the three regions.

[4] E.g. in Lithuania, Zemajtis wants to separate as an autonomous region with reference to the history of this region. There is a similar problem with Eastern Latvia.

4. The „Visehrad" spatial structure model

For the common model for the Czech Republic, Slovakia and Hungary, the name „Visehrad", derived from the name of the capital of the Great Moravia, has been adopted.

Features of the division. Due to quite a big scale of this region and rich diversification of the area, the division into 8 regions has been carried out: the Czech Republic into 3 regions, Slovakia into 2 regions, and Hungary into 3 regions.

A typical region of „Visehrad" covers the surface area of 27 500 km² and 3.2 million inhabitants. It is the optimal size (for the Polish Model N the dimensions were 6.4 million inhabitants and ca. 52 000 km² accordingly, so twice that much).

Description of the components of the model. The essential feature of the spatial structure of the model is a high level of space exploration. It results from a great intensity in exploring the area. After deducing the decline of the space for inaccessible mountains, the intensity of exploration is ca. 60% higher than in Poland and 5 times higher than in the „Baltica" region. Such a great intensity improves the need to form more junction centres and to increase the length of infrastructural relations. Currently, there exists a very economical network of infrastructural relations, where international and national relations overlap.

The essential data concerning the model. In Table 5 the essential data describing spatial structure of the „Visehrad" model have been presented. There is a large diversity of the summary measure, whose ratio amounts to 1:1.92. Moreover, the three capital regions, in comparison with the other regions, are less developed. The interregional balance has been permanently upset.

Description of the spatial arrangement. A distinctive feature of the arrangement is its dependence on the external junction, which is Vienna. The overall model is formed by autonomous internal models for each of the three countries. They are: for the Czech Republic – a triangle, for Slovakia – a rectangle, and for Hungary – a strip. They are all presented in Figure 4. These features shape the future model of spatial structure. Simultaneously, it is hard to expect the increase in the number of junctions due to the dominant role of the three capital cities.

5. The „Danuba" model of spatial structure

The name of the model is derived from the name of the Danube river. The two countries that are included in the model, are situated on both banks of the lower reaches of the Danube.

Features of the division. It is an extensive structure, with the division into 4 regions for Romania, and 2 regions for Bulgaria. A typical region covers 58,200 km² of the land and population of 4,9 million inhabitants, so it is 50% larger population-wise, and in terms of the surface area it is twice that large in comparison with „Visehrad". Due to a significant share of mountainous lands, the intensity of exploration of the area is similar to the „Visehrad" area.

Description of the components of the model. The regional divisions in this model are not definitely shaped. In case of Romania, this division refers to the historical one. Whilst, in case of Bulgaria, it is a functional division. An additional difficulty for obtaining a reasonable spatial structure is situating the model along the Danube valley. Therefore, one should expect considerable changes of the separate components of the model in the future. It will influence a bit its future shape. The following problems are possible: the future of Moldova, introduction of more regions and junctions in Bulgaria or elimination of the division caused by the impassable Danube valley.

The essential data concerning the model. In Table 5 the essential data describing the spatial structure of the "Danuba" model have been presented. There occurs a low level of development, which amounts to 1/3 of the average level for the EU27. The ratio of the

diversity of the measure amounts to 1:1.5. The diversity is mostly the result of the diversity of the higher education.

Description of the spatial arrangement. The essential feature of the arrangement is quite a reasonable level of separation caused by landform features (mountains, valleys), as well as the ethnic differences. In this arrangement the capital cities dominate. For the area of Romania the circumferential and radiating arrangement has developed. It is characteristic of Bulgaria that the E-W and N-S have developed. The „Danuba" model has been shown in Figure 5. It is not a definite model. It is open for external and internal changes of the countries constituting this model.

6. The „Iberia" model of spatial structure

The „Iberia" model of spatial structure has been compared with the four models (Poland, Baltica, Visehrad, Danuba) as a point of reference. The „Iberia" model is formed by Spain and Portugal with the population of 51.5 million inhabitants, and the surface area of 600,000 km². The level of development is similar to the average one in the EU27.

Features of the division. The „Iberia" model consists of 8 regions with the population of 6.4 million inhabitants, and the surface area of 75,000 km² each. They are large regions with fully developed internal structures. The feature of the division is a large surface area of the regions. Therefore one may encounter difficulties in making comparisons with much smaller regions from the four previous models.

Description of the components of the model. A high level of autonomy of the regions occurs. There are developed infrastructural relations. Polycentrism in the settlement network is rather poorly developed.

The essential data concerning the model. In Table 6 the essential data describing the spatial structure of „Iberia" model have been presented. Despite high level of development, similar to the average level in the EU27, there are large interregional diversities. For the summary measure their ratio amounts to 1:2. The differences will be going rather up than down. It mainly results from the differences at the higher education level.

Description of the spatial arrangement. A distinctive feature of the arrangement is its organization in the shape of a circle. It is formed by a complex ring, the centre with a capital in Madrid and the relations of the ring with the centre. The arrangement has high internal coherence, which results from a high level of development. The „Iberia" model has been displayed in Figure 6. There are some reserves in this model, within which some additional junctions can be developed (e.g. Valencia and Saragossa).

7. Comparison of the spatial structure models

Comparison of the spatial structure models of Poland, „Baltica", „Visehrad", „Danuba" and „Iberia" has been carried out in terms of quantitative and qualitative features. The quantitative comparison has been presented in Table 7. The comparison shows that the difference„s of the index for the four models amount to 59%, 80%, 77% and 51% of the level of the Iberia" model. These differences result from a lower activity and a lower level of higher education and smaller expenditures on research and development. To assess the models in qualitative terms, the separate components of the spatial structures have been compared with one another. The results of the assessment have been presented in Table 8. The qualitative hierarchy of the spatial structures is the following: „Iberia" – „Visehrad" – Poland – „Baltica" – „Danuba". This is the hierarchy which is a bit different from the quantitative hierarchy. In the quantitative hierarchy the „Baltica" model is ahead of Poland.

Summary and conclusions

From the analysis that has been carried out and in which 5 models of spatial structure in Europe have been compared, one can draw general and detailed conclusions. The general conclusions concern all the analyzed models. The detailed conclusions concern each of them individually. The benefit from carrying out a comparative analysis is objectification of assessment. Simultaneously, there are some difficulties in carrying out such an analysis. It is the result of the difficulties with defining the concept of a spatial structure and the difficulties with shaping such a structure. Therefore, each such an a comparative analysis is a valuable attempt.

Conclusions referring to:

a) Model N for Poland:
   – The accepted division into 6 regions is suitable for the analysis of the current state, but it does not correspond to the future needs,
   – The already shaped complexes of metropolises, situated in the central strip in the N-S direction, evoke further concentration, which hinders the development of the areas of Eastern Poland,
   – The system of infrastructural relations is not sufficient for handling with the future needs.

b) The „Baltica" model:
   – There is a need for the division into more regions, but some lacks in the potential hinder such a division,
   – The capital cities of metropolitan functions are the main driving force,
   – The arrangement of infrastructural relations may be sufficient in the future.

c) The „Visehrad" model:
   – The division applied is the consequence of the historical development and has evoked considerable spatial inequalities,
   – These inequalities are intensified by the majority of capital cities, which evoke underdevelopment of the other cities of metropolitan functions,
   – There are already shaped specific arrangements of infrastructural relations, which are currently intensively developed.

d) The „Danuba" model:
   – The division applied is a temporary division; there is a need to modify it significantly,
   – The essential feature are not very well developed functions of metropolises,
   – The current system of infrastructural relations requires modification in adjusting to the current conditions.

e) The „Iberia" model:
   – Large territorial units require introducing additional division into smaller ones,
   – It also means the need to derive additional metropolises,
   – The developed system of infrastructural relations allows to satisfy the future needs from the increase of the number of regions and additional metropolitan centres.

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Table 1. Comparison of variants of the spatial structure models for Poland.

	Variants		
	Model D – 5 regions	Model N – 6 regions	Model R – 9 regions
Advantages	1.It refers to historical division of the country into provinces. 2. It applies the social regional consciousness. 3. It creates the opportunities for separation of large regions.	1. The division is suitable for the current needs. 2. It combines the complexes of metropolises with one another. 3. It creates an economical system of infrastructural relations.	1. The division includes the features of future division. 2. It enables further development of metropolitan functions in the 12 cities. 3. It favors reducing regional differences.
Disadvantages	1. The historical development is inapplicable to current situation. 2. It divides the complexes of metropolises. 3. It creates an impractical arrangement of infrastructural relations.	1. The division does not correspond to the future needs. 2. It reduces the number of metropolises to 9. 3. It hinders reduction of regional differences.	1. There is an excessive quantitative spread of the division into regions. 2. It raises doubts due to great favouring eastern part country. 3. It creates a large number of infrastructural relations.

Source: The author's own study.

Table 2a) Description of the spatial structure of Model N for Poland (for 2004).

No.	NUTS1 regions	Population 000	GDP per capita in %	GDP per worker in %	Higher education in %	Activity in %	R+D share in GDP in %	Loss Index Lisb. in %	Σ (2+3+ 4+5+6+7) in %
1.	Central	7.733	66.7	34.2	92.4	88.9	55.5	70.6	67.6
2.	Southern	7.964	51.4	30.6	71.4	62.0	27.8	47.1	48.4
3.	Eastern	6.779	36.5	21.8	71.4	85.5	16.7	52.9	47.5
4.	North-Western	6.067	51.0	30.3	69.2	82.1	16.7	47.1	49.4
5.	South-Western	3.949	49.5	32.1	74.1	79.1	16.7	41.2	48.8
6.	Northern	3.688	45.5	29.7	66.1	79.9	16.7	39.2	46.2
7.	Poland	38.180	50.7	29.9	75.0	83.4	33.3	52.9	54.2
8.	UE27	489.671	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: The author's own study based on the data of Central Statistical Office and Eurostat.

Table 2b) Description of the spatial structure of Model R for Poland (for 2004).

No.	Regions	1	2	3	4	5	6	7	8	9	10
1.	Central	105	152	116	127	120	113	186	111	111	127
2.	Southern	109	171	97	95	118	105	96	85	97	109
3.	North-Eastern	97	84	91	74	93	84	39	92	61	80
4.	Eastern	75	77	120	70	81	68	57	89	54	75

5.	South-Eastern	66	36	93	67	78	75	52	78	62	67
6.	North-Western	115	115	87	90	101	108	30	118	145	101
7.	Western	96	87	105	96	102	98	64	98	102	95
8.	South-Western	108	92	91	92	100	107	51	117	145	101
9.	Northern	105	148	93	90	92	100	68	100	101	100
10.	Poland	100	100	100	100	100	100	100	100	100	100

Source: The author's own study based on the data of Central Statistical Office.

1 – urbanization; 2 – metropolisation; 3 – activity; 4 – generated income; 5 – distributed income; 6 – productivity; 7 – R+D; 8 – areas not protected; 9 – EU help; 10 – synthetic indicator.

Table 3. Description of the spatial structure of the „Baltica" model (for 2004).

No.	NUTS1 regions	Population 000	GDP per capita in %	GDP per worker in %	Higher education in %	Activity in %	R+D share in GDP %	Loss index Lisb. in %	Σ (2+3+ 4+5+6+7) in %
1.	Estonia	1.356	55.7	31.9	148.7	101.9	50.0	105.9	82.3
2.	Latvia	2.313	45.5	22.3	91.5	100.0	22.2	88.2	61.6
3.	Lithuania	3.436	51.1	25.7	117.4	98.9	44.4	98.0	72.6
4.	„Baltica"	7.105	50.2	26.2	121.4	99.7	38.9	102.	73.1
5.	EU27	489.671	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: The author's own study based on the data of Eurostat.

Table 4. Description of the spatial structure of the „Visehrad" model (for 2004).

No.	NUTS1 regions	Population 000	GDP per capita in %	GDP per worker in %	Higher education in %	Activity in %	R+D share in GDP %	Loss index Lisb. in %	Σ (2+3+ 4+5+6+7) in %
1.	Central (CZ)	3.431	96.6	40.2	61.6	107.4	83.3	121.6	85.1
2.	Middle (CZ)	4.292	66.7	31.8	46.0	104.1	50.0	94.1	65.4
3.	Eastern (CZ)	2.484	60.5	32.1	50.0	97.2	44.4	86.2	61.7
4.	Western (S)	2.464	71.4	40.3	81.2	99.5	33.3	84.3	68.3
5.	Eastern (S)	2.918	44.3	28.9	54.9	84.0	16.7	37.3	44.3
6.	Western (H)	3.094	58.0	39.0	58.0	92.7	11.1	82.4	56.7
7.	Middle (H)	2.835	101.6	56.8	118.7	100.0	33.3	119.6	88.3
8.	Eastern (H)	4.178	42.8	33.1	59.4	80.7	11.1	43.1	45.0
9.	„Visehrad"	25.696	66.9	38.1	67.9	98.4	50.0	100.0	70.2
10.	EU27	489.671	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: The author's own study based on the data of Eurostat.

Table 5. Description of the spatial structure of the „Danuba" model (for 2004).

No.	NUTS1 regions	Population 000	GDP per capita in %	GDP per worker in %	Higher education in %	Activity in %	R+D share in GDP %	Loss index Lisb. in %	Σ (2+3+ 4+5+6+7) in %
1.	North-Central (RO)	5.279	34.2	14.0	42.0	86.9	5.6	49.0	38.6
2.	North-Eastern (RO)	6.588	26.7	12.7	40.2	92.3	5.6	58.8	39.4

3.	Southern (RO)	5.550	42.8	18.1	67.9	92.4	33.3	66.7	53.5
4.	South-Eastern (RO)	4.258	33.4	14.1	48.2	92.3	11.1	58.8	43.0
5.	Northern (BG)	2.950	27.9	10.4	84.4	88.2	11.1	31.4	42.2
6.	Southern (BG)	4.831	39.0	13.3	103.6	91.1	38.9	62.7	58.1
7.	„Danuba”	29.454	34.2	14.2	63.4	90.2	22.2	54.9	46.5
8.	UE27	489.671	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: The author’s own study based on the data of Eurostat.

Table 6. Description of the spatial structure of the „Iberia” model (for 2004).

No.	NUTS1 regions	Population 000	GDP per capita in %	GDP per worker in %	Higher education in %	Activity in %	R+D share in GDP %	Loss index Lisb. in %	Σ (2+3+ 4+5+6+7) in %
1.	North-Western (H)	4.317	84.6	86.3	126.8	94.6	38.9	94.1	87.6
2.	Northern (E)	4.204	119.2	96.6	162.9	105.8	50.0	129.4	110.8
3.	Madrid (E)	5.763	132.1	102.5	163.4	108.2	88.9	133.3	121.4
4.	Central (E)	5.373	83.9	83.6	107.6	95.7	38.9	88.2	83.0
5.	Eastern (E)	12.115	110.2	92.8	122.8	106.5	61.1	113.7	101.2
6.	Southern (E)	9.033	78.7	85.5	101.3	89.1	38.9	70.6	77.3
7.	Northern (P)	4.488	60.8	52.0	48.2	104.9	33.3	70.6	61.6
8.	Southern (P)	6.014	79.0	68.1	72.3	107.7	44.7	88.2	76.6
9.	„Iberia“	51.307	95.0	87.5	112.9	101.4	55.6	94.1	91.1
10.	EU27	489.671	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: The author’s own study based on the data of Eurostat.

Table 7. Quantitative comparison of the spatial structure models (for 2004).

No.	Models	Share in population of EU27 %	GDP per capita in %	GDP per worker in %	Higher education in %	Activity in %	R+D share in GDP %	Loss Index Lisb. in %	Σ (2+3+ 4+5+6+7) in %
1.	Poland	7.8	50.7	29.9	75.0	83.4	33.3	52.9	54.2
2.	„Baltica”	1.5	50.2	26.2	121.4	99.7	38.9	102.0	73.1
3.	„Visehrad”	5.2	66.9	38.1	67.9	98.4	50.0	100.0	70.2
4.	„Danuba”	6.0	34.2	14.2	63.4	90.2	22.2	54.9	46.5
5.	„Iberia”	10.5	95.0	87.5	112.9	101.4	55.6	94.1	91.1
6.	Σ of the models	31.0	65.2	46.6	77.7	92.0	42.0	79.1	67.1
7.	EU27	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: The author’s own calculations based on the data from Tables 2, 3, 4, 5 and 6.

Table 8. Qualitative assessment of the spatial structure models (in points).

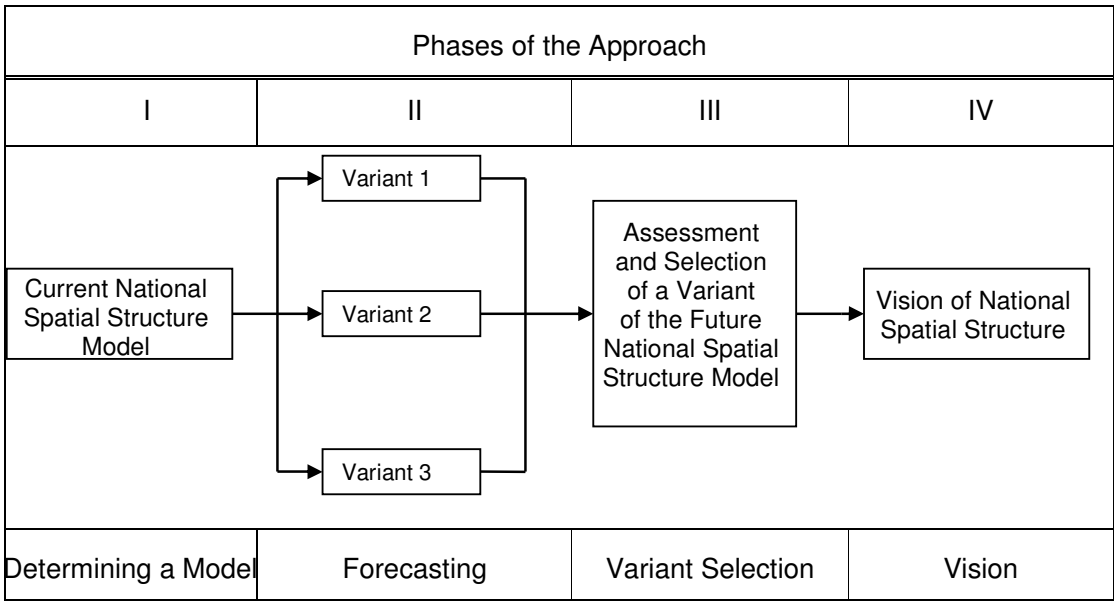
No.	Components of spatial structure	Models				
		Poland	„Baltica”	„Visehrad”	„Danuba”	„Iberia”

1.	Regions	1pts	1pts	2pts	1pts	3pts
2.	Junctions/centres	3pts	2pts	2pts	1pts	3pts
3.	Relations	1pts	1pts	2pts	1pts	3pts
4.	Protected areas	1pts	1pts	1pts	1pts	2pts
Total		6pts	5pts	7pts	4pts	11pts

Source: The author's own calculations.

Note: 3 points – good quality of a component
2 points – average quality of a component
1 point – poor quality of a component

Figure 1. Application of strategic approach for determining a vision of spatial structure.



Source: The author's own study.

Legend for figures 2-6:

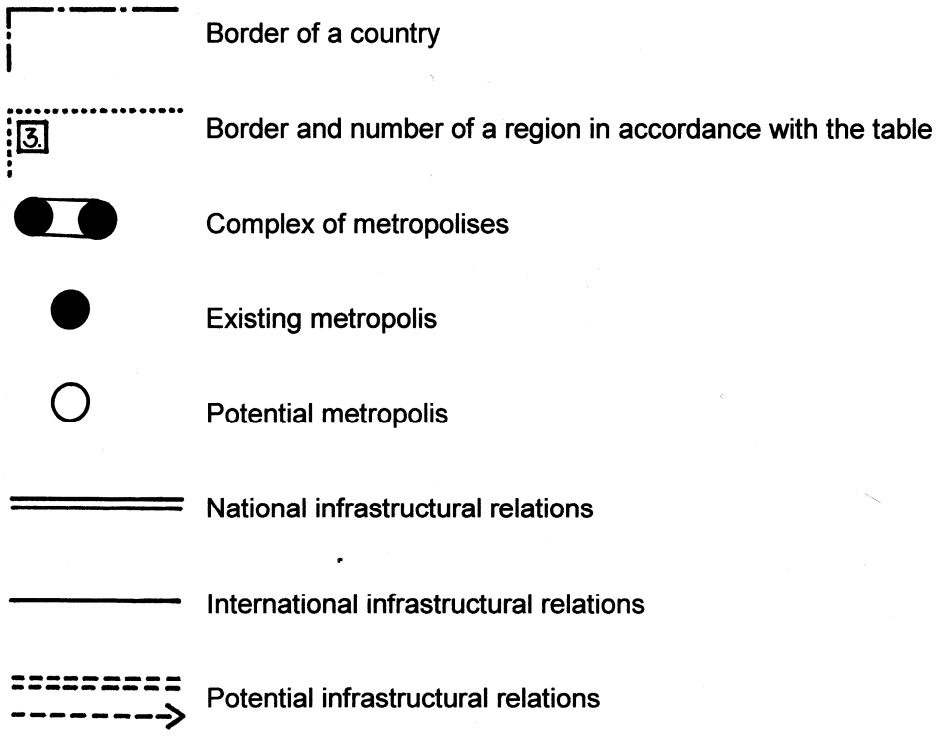
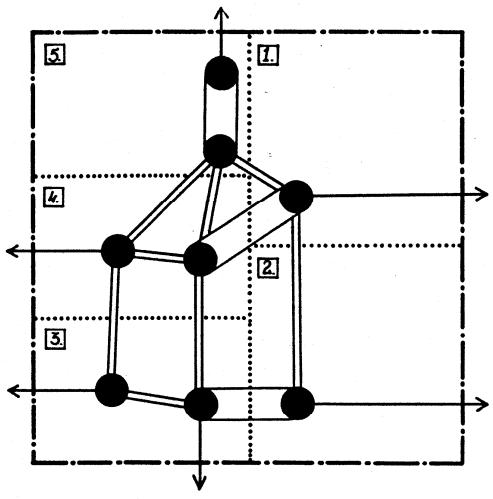
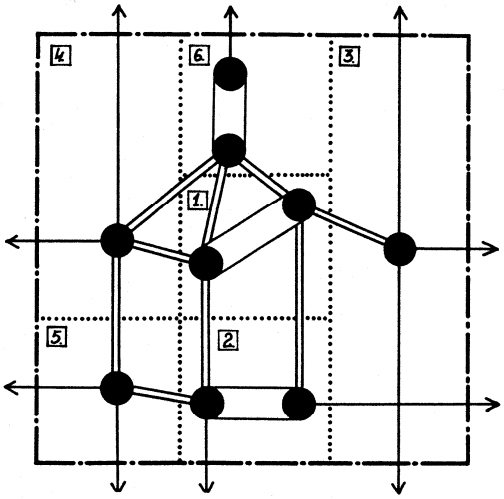


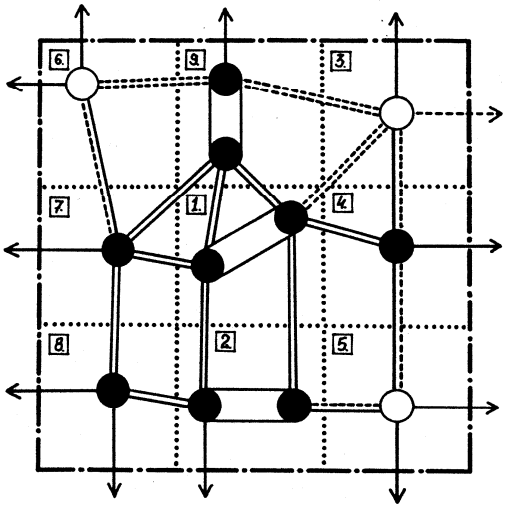
Figure 2. The spatial structure models of Poland.
a) Model D



b) Model N



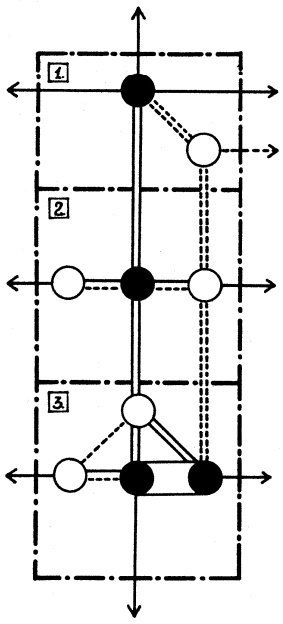
c) Model R



Source: The author's own study.

Figure 3. The „Baltica” spatial structure model.

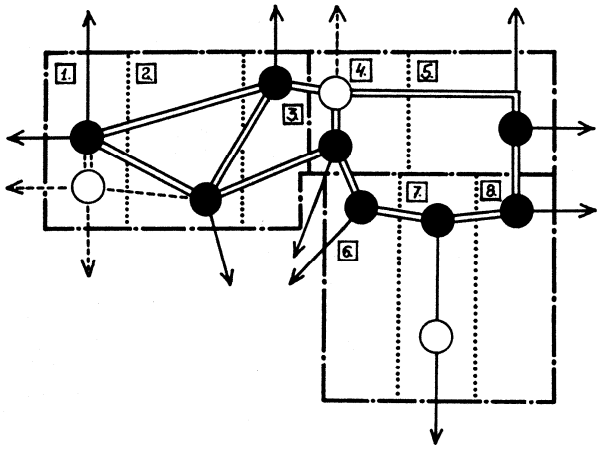
1 - Estonia; 2 – Latvia; 3 – Lithuania



Source: The author’s own study.

Figure 4. The „Visehrad” spatial structure model.

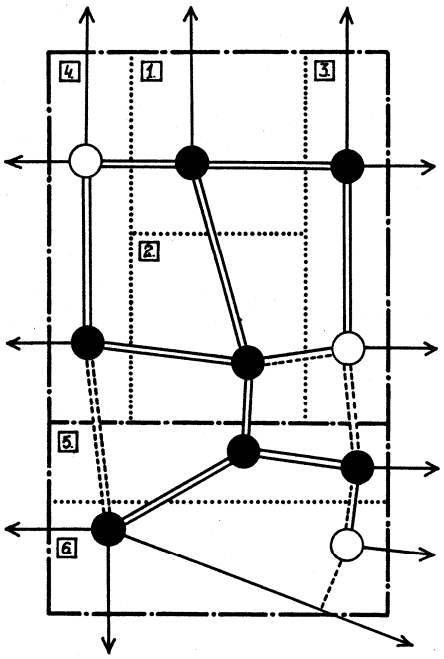
1+2+3 – Czech Republic; 4+5 – Slovakia; 6+7+8 – Hungary



Source: The author’s own study

Figure 5. The „Danuba" spatial structure model.

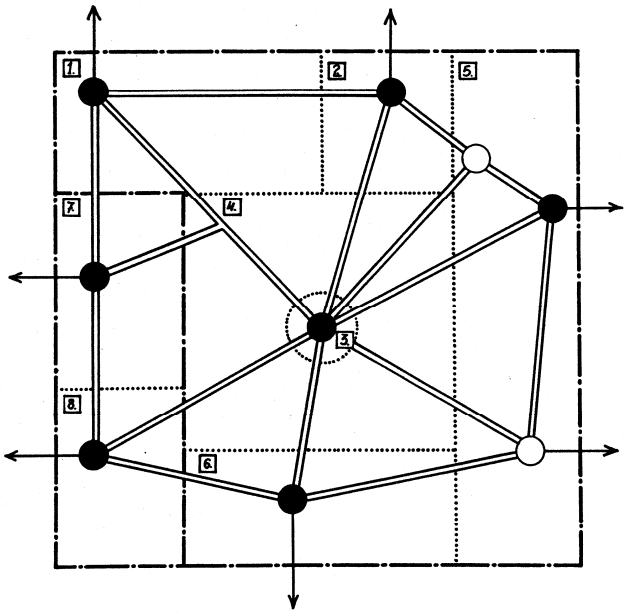
1+2+3+4 – Romania; 5+6 – Bulgaria



Source: The author's own study.

Figure 6. The „Iberia" spatial structure model.

1+2+3+4+5+6 – Spain; 7+8 – Portugal



Source: The author's own study

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