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Transformation of the economic structures in the Opole region in the years 1994-2002

Bulletin of Geography. Socio-Economic Series nr 3, 23-39

2004

Artykuł został opracowany do udostępnienia w internecie przez Muzeum Historii Polski w ramach prac podejmowanych na rzecz zapewnienia otwartego, powszechnego i trwałego dostępu do polskiego dorobku naukowego i kulturalnego. Artykuł jest umieszczony w kolekcji cyfrowej bazhum.muzhp.pl, gromadzącej zawartość polskich czasopism humanistycznych i społecznych.

Tekst jest udostępniony do wykorzystania w ramach dozwolonego użytku.

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TRANSFORMATIONS OF THE ECONOMIC STRUCTURES IN THE OPOLE REGION IN THE YEARS 1994–2002

ABSTRACT. The aim of the present research is to determine whether in the period of transforming economy in the country there followed changes within the economic structure of the Opole region. An attempt was also made to determine the ranking list of towns and communes according to the development level of selected economic categories, as well as to determine their developmental tendencies.

The research procedure that was made use of to analyse the problem was the Perkal method of natural indexes. The following categories of economic development were analysed: the development level of the agricultural sector, the economic potential, the level development of service sector and concentration of foreign capital, the level of economic activity.

KEY WORDS: Opole region, economic structure, development of agriculture sector, economic potential, development of services sector, economic activity.

The current economic structure and level of the economic development of Poland's regions result from the economic policy being implemented in individual areas for many years. Natural, historical and cultural conditionings, as well as instrumental and systemic ones, play a significant role in shaping the economic structure. Particularly, the systemic factors, which are understood as controlling the processes of regions development, have gained especial significance in the times of the socio-political and economic systems transformation. The group of systemic conditionings point to who and in what manner can effectively determine and activate the instruments and factors to shape a rise in the competitiveness of regions and their development (1). In the conditions of the new

territorial organisation of the state which have taken effect since 1989, local governments took over the duty of managing the development of regions. Thus, it is the skills displayed by these subjects of regional policy in the sphere of creating and rational making use of the developmental factors being at their disposal that the economic structure and the level of economic development depend on to a most considerable extent. Following the transition from the model of 'issuing orders and dividing' type to market economy, there has been implemented systematic restructuring of the systemic economy, as well as a fundamental transformation of its structural features, which today aim at forming competitive economies. In the hierarchy of territorial units the level on which economic competition becomes visible is the commune (*gmina*). Despite the fact that the economic space, which took so long to form, is changing slowly, the slowness of the changes does not mean complete 'fossilization – permanence' of the spatial structures. As the research conducted by G. Gorzelak shows (2), being located in unfavorable socio-economic conditions does not ruin the chance of attaining a lasting promotion within the economic hierarchy, although it is obvious that communes that hold a firm economic position have a better chance to transform in a quicker and more effective way. One has to remember, though, that both economically poorly and highly developed units can be affected by economic degradation or can keep being stuck in a 'lull'. The conditions imposed by market economy and local government system on particular levels of territorial hierarchy of the state are an attempt at showing, by individual communes and regions, their ability to adapt to the changing economic conditions, and also the effectiveness of managing the developmental factors which remain at their disposal.

The Opolskie Voivodeship (administrative regions of the 1st order) is relatively small as regards its territory though it shows an internal differentiation with reference to the level of the economic development, as well as its economic structure. The research conducted, among others, by Heffner (3), Mikołajewicz (4), Słodczyk (5), Szafranek (6) and also a series of regional elaborations prove this only too well.

The records found in the *Strategy of Development of Opole region for the years 2000–2015* also refer to the economic differentiation that exists in the region. One of the developmental priorities for the voivodeship was defined as a necessity to level chances for development in the region. The entry treating about the division of the voivodeship into three functional zones, which has been repeatedly made in the documents dealing with the strategic-planning concerning the region, is a truly vital element from the point of view of an analysis of the economic structure transformation. The zones in question are as follows:

- the zone of industrialisation and urbanisation, located in the area between Opole and Kędzierzyn-Koźle;
- the agricultural zone covering the southern and western parts of the voivodeship;

— the agricultural-forestry zone in the northern and north-eastern part of the voivodeship.

The aim of the present research is to determine whether in the period of transforming economy in the country there followed changes within the economic structure of the Opole region. An attempt was also made to determine the ranking list of towns and communes according to the development level of selected economic categories, as well as to determine their developmental tendencies.

The research procedure that was made use of to analyse the problem was the Perkal method of natural indexes (7). It is one of the taxonomic methods which allows aggregation of a set of output features into a common vector called magnitude index (W_i) (8).

The temporal range of the research covers nine years from 1994 until 2002. The research units were cities and communes of the Opolskie Voivodeship in a total number amounting to 102. For the needs of the analysis the number of the units was unified for the whole research period, although the administrative borders of the Opolskie Voivodeship were altered considerably in 1999. All the administrative units found in the territory of the Opolskie Voivodeship were included in the research.

The selection of variables was made primarily on the basis of their logical connection with the problem area under the investigation, and moreover – due to their explicitness, *e.g.* visible changeability. The scope of available statistical data provided by GUS (Central Statistical Office) for this regional system during the temporal space under analysis made for a significant criterion of selection of measurements.

The accepted list of the features, according to the applied taxonomic procedure, allowed dividing them into the following categories of economic development (Table 1).

The magnitude index (W_i) was calculated for each research unit (102 altogether) with reference to each economic category (4) and for each year (9). Consequently, four sets of ‘magnitude indexes’ were obtained (including 9 values), which describe the research units. This procedure allowed following the development of the indexes (W_i) in time, as well as their spatial differentiation. The values determined the tendency of undergoing changes and also made it possible to order the units, beginning with the best and ending with the weakest according to the level of development of a given features set. In order to determine the positions of particular towns and communes a mean value of magnitude indexes was calculated for the whole research period. In this way each unit obtained four global and mean values of the index, which allowed their linear ordering. The spatial differentiation of the index values W_i created a basis for classification of the towns and communes as regards each of the selected economic categories.

This consisted in establishing the number of classes and lengths of class ranges. For each of the four categories there were differentiated five classes of varied level of development:

1. very high
2. high
3. average
4. low
5. very low.

The principle of preserving equal length for each class range was observed.

Another phase in the research procedures was to determine the development trend of individual units. The changing course of the W_i indexes over time allowed separating groups of voivodships which showed a tendency towards progression, stagnation or regression.

Table 1. Categories of economic development selected on the basis of a set of features accepted for the research

MAGNITUDE INDEX	FEATURES	NAME OF CATEGORY
$W_i 1$	share of the employed population in agriculture number of economic units registered in REGON system in the sector of agriculture, fishing, hunting per 1,000 inhabitants	level of development of agriculture sector
$W_i 2$	professional activity share of the employed in industry share of economic units registered in REGON system in the voivodship share of private economic enterprises registered in REGON system among all the units	economic potential
$W_i 3$	share of the employed in services participation of companies with foreign capital among all the economic units registered in REGON system	level of development of services sector and concentration of foreign capital
$W_i 4$	number of economic units registered in REGON system per 1,000 inhabitants in the sectors: mining, excavating, and manufacturing activity in the sector of civil construction in the sectors: wholesale and retail trading, repairs of mechanical vehicles and transport, warehouse management and communications in the sector of hotels and restaurants in the sectors: financial services, estate agency services, rental services and business activity related to the sectors other activity: providing communal, social, individual services, households employing workers, organizations and international groups in the sectors of healthcare and social care	level of economic activity

Source: own elaboration

The particular trends were established on the basis of regression equation. Calculating the parameters of inclination of regression line was made possible by the determination of the angle of its inclination, followed by defining the emerging trend (9). For the needs of the research the following boundaries of parameter β were accepted, which determine individual trends:

- if $\beta > 3$, the occurrence has a progressive character,
- if $-3 < \beta < 3$, the occurrence has a stagnant character,
- if $\beta < -3$, the occurrence has a regressive character.

The basis of the analysis is established by ordering research units both according to the level of development and its trends. A simultaneous dealing with voivodeships in terms of the both criteria allows carrying out a dynamic classification of units within the range of fifteen multi-dimensional types.

While analysing the level of development of the agriculture sector, as well as the spatial tendencies of its development, it can be noticed that the decisive majority of research units are characterized by a low and very low development level within the voivodeship (Table 2).

As regards developmental trends, a dichotomy of division of all the units has appeared, which means that almost on an equal level (about 43% in each group) towns and communes are characterized by either progression or regression of development.

The other 14% are units preserving a stable level of development. In dependence on the tendency the given unit can qualify to the upper group, stay in the same or drop to the lower one. The latter option does not mean that the achievements to date in the field of development of agriculture have been lost or wasted, but that the current position of the unit is becoming weaker. Evidently, the most favourable situation as regards the development of the agriculture is experienced by the communes of Domaszowice and Kietrz, since they both show a progressive trend and are characterised by a high and very high levels of development. A negative phenomenon, though, is the lowering of the development level of the agriculture sector in over half of all the units which display a higher than average level of development. On the other hand, among the units which are characterised by a low and very low level of development, the majority display a growing tendency. It must be underlined that, primarily, this concerns the towns and communes of the Opole region which are situated in urbanised and industrialised zones. The growth in the significance of the agriculture sector noticed in these areas in the recent years can imply that there are changes undergoing in the economic structure of the region. The areas of so far poor agricultural function continue to have a very little say in the economic profile discussed here, yet with time they are getting richer in economic enterprises related to agriculture. The spatial differentiation of the dynamics of development of the agriculture sector in the Opolskie Voivodeship is shown in Figure 1.

Table 2. Dynamic classification of towns and communes of the Opole region
in the years 1994–2002 according to the development level of agriculture sector

DEVELOPMENT LEVEL DEVELOPMENT TREND	VERY HIGH	HIGH	AVERAGE	LOW	VERY LOW
Progressive	Domaszowice	Kietrz – c	Biała – c	Walce	Tarnów Opolski
			Kietrz – t	Leśnica – c	Gogolin – t
			Cisek	Reńska Wieś	Namysłów – t
			Gorzów Śląski – c	Olesno – c	Zawadzkie – c
			Polska Cerekiew	Turawa	Strzelce Opolskie – c
			Głogówek – c	Dobrodzień – c	Brzeg – t
			Ujazd – c	Gorzów Śląski – t	Zawadzkie – t
			Jemielnica	Biała – t	Nysa – t
			Głogówek – t	Kędzierzyn-Koźle	Strzelce Opolskie – t
			Kolonowskie – c	Krapkowice – c	
			Kolonowskie – t	Opole	
			Bierawa	Krapkowice – t	
			Otmuchów – t		
			Chrzastowice		
			Wołczyn – t		
			Paczków – t		
			Głucholazy – t		
Dobrzeń Wielki					
Gogolin – c					
Olesno – t					
Stagnant	Lubrza	Radłów	Grodków – c	Ujazd – t	
	Baborów – c	Rudniki	Lasowice Wielkie	Leśnica – t	
	Baborów – t	Pokój	Zębowice	Prudnik – t	
			Korfantów – t	Dobrodzień – t	
				Byczyna – t	
				Głubczyce – t	
Regressive	Świerczów	Skoroszyce	Byczyna – c	Łubniany	Nysa – c
	Pakosławice	Lubsza	Otmuchów – c	Prudnik – c	Grodków – t
	Kamiennik	Olszanka	Branice	Namysłów – c	Kluczbork – t
	Wilków	Brzeg – c	Strzeleczy	Lewin Brzeski – t	Praszka – t
		Pawłowiczki	Niemodlin – c	Dąbrowa	Ozimek – c
		Korfantów – t	Wołczyn – c	Paczków – c	Zdzieszowice – c
			Prószków	Głucholazy – c	Ozimek – t
			Popielów	Niemodlin – t	Zdzieszowice – t
			Łambinowice	Kluczbork – c	
			Murów	Komprachcice	
			Lewin Brzeski – c	Praszka – c	
			Głubczyce – c		
			Izbicko		
		Tułowice			

t – town; c – commune

Source: own elaboration

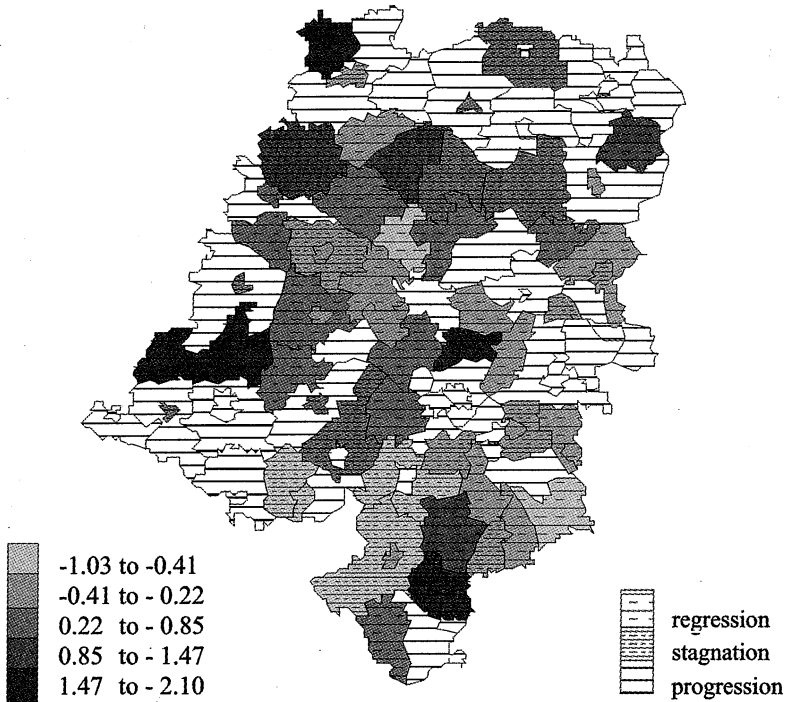


Fig. 1. The development level of agriculture sector in the Opolskie Voivodeship in the years 1994–2002

Source: own elaboration

Another category being examined is the economic potential, with a special inclusion of the industry sector. The distribution of units with reference to this feature is clearly symmetrical (Table 3 and Fig. 2).

Over 60% of the towns and communes in the region are characterized by a lower than average economic potential, and merely 5% can be distinguished for a high and very high level. As regards the economic potential being developed in the region a progressive trend dominates, still a considerable part – about 40% – is made from units whose potential is becoming lower.

The City of Opole is the only unit that is characterised by a very high index as regards the discussed feature. Three other units also belong to the class of a high potential (Zdzieszowice, Kędzierzyn-Koźle, Nysa), among which only Zdzieszowice has maintained the same magnitude of potential, whereas the others display a regressive trend. The above-mentioned units belong to the strongest industrial centres in the region. The lowering of their development rate points to a drop in the significance of industry in the economy of the voivodeship. A measurable confirmation of this fact are the values of residual indexes calculated for particular features of this economic category.

Table 3. Dynamic classification of towns and communes of the Opole region in the years 1994–2002 according to the economic and industrial potential

DEVELOPMENT LEVEL DEVELOPMENT TREND	VERY HIGH	HIGH	AVERAGE	LOW	VERY LOW	
Progressive			Zdzieszowice-c Dobrodzień-t Ozimek - c Grodków-t Korfantów-t Otmuchów-t Dobrodzień-c Lewin Brzeski t Wolczyn-t	Namysłów - c Olesno - c Gogolin - c Bierawa Grodków - c	Lewin Brzeski-c Murów Byczyna - t Otmuchów - c Łubniany Wolczyn - c Brzeg - c Biała - t Rudniki Kolonowskie - t Polska Cerkiew Olszanka Byczyna - c Lubsza Korfantów - c Łambinowice Kolonowskie - c Komprachcice Turawa Biała - c	Ujazd - t Skoroszyce Dąbrowa Prószków Lubrza Jemielnica Strzeleczy Pawłowiczki Gogolin - t Cisek Branice Pakosławice Lasowice Wlk. Ujazd - c Wilków Świerczów Domaszowice Izbicko Kamienik Popielów
	Stagnant	Zdzieszowice	Namysłów	Gorzów Śl. - c Pokój Reńska Wieś Leśnica - t Leśnica - c Radłów Walce Zębowice		
	Regressive	Opole	Kędzierzyn- Kozle Nysa - c Nysa - t	Praszka - t Dobrzeń Wielki Ozimek - t Brzeg - t Krapkowice - t Strzelce Op. - t Praszka - c Prudnik - t Kluczbork - t Krapkowice - c Prudnik - c Zawadzkie - t Olesno - t Głuchołazy - t Tułowice Strzelce Op. - c Kluczbork - c Głuchołazy - c Zawadzkie - c Gorzów Śl. - t Paczków - t Tarnów Op.	Głubczyce - t Niemodlin - t Głogówek - t Niemodlin - c Kietrz - t Paczków - c Głubczyce - c	Baborów - t Głogówek - c Kietrz - c Baborów - c Chrząstowice

t – town; c – commune

Source: own elaboration

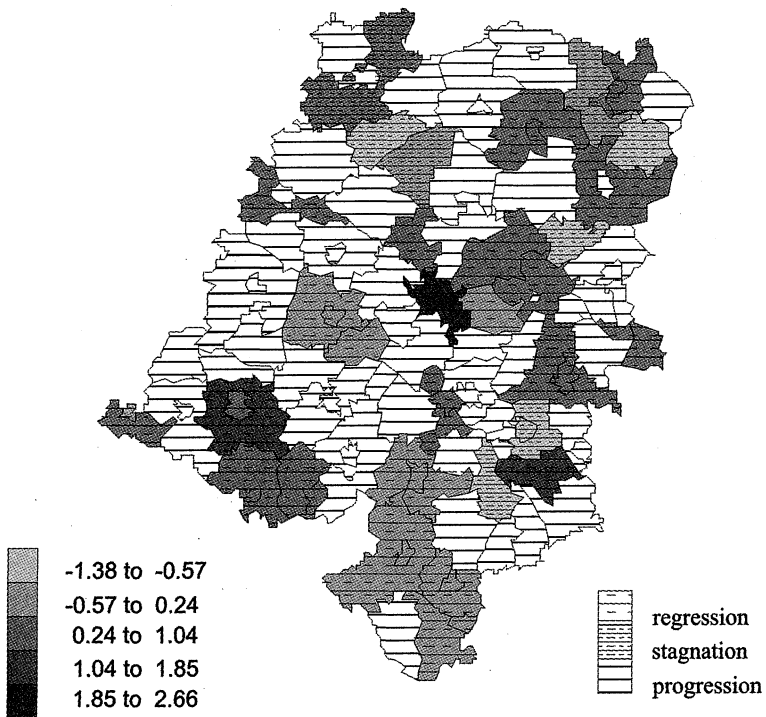


Fig. 2. The economic potential in the Opolskie Voivodeship in the years 1994–2002
 Source: own elaboration

The above-listed units show a shortage in the magnitude of their economic potential with reference to the employment in industry. Only a few towns and communes in the voivodeship can record an average economic potential, among which as many as 70% displaying a tendency toward regression in this field. This occurrence is particularly unfavourable, since in the case of this development tendency being stable, the units will add to the already numerous class of a low and very low potential. This is bound to lower the competitive ability of the whole voivodeship.

The group of towns and communes of the weakest possibility to develop is characterised, in turn, by a rise in their potential. The majority of those units are located outside the industrial zone, which allows concluding that in this area a slow process of economic development is occurring. This is, foremost, expressed by a growth in the professional activity of the inhabitants, as well as through the number of economic units registered in individual towns and communes.

A similar distribution of units, as far as quantitative proportions in individual classes are concerned, is typical of the development level of services providing and share of foreign capital in economic units (Table 4).

Table 4. Dynamic classification of towns and communes of the Opole region in the years 1994–2002 according to the level of development of the services sector and share of foreign capital

DEVELOPMENT LEVEL DEVELOPMENT TREND	VERY HIGH	HIGH	AVERAGE	LOW	VERY LOW	
Progressive	Domaszowice Lubrza	Kietrz – c	Kietrz – t	Gorzów Śląski – c	Paczków – c	
				Głogówek – c	Kolonowskie – c	Strzelce Opolskie – c
				Rudniki	Biała – t	Brzeg – m
				Korfantów – t	Olesno – t	Otmuchów – t
				Tułowice	Głuchołazy – c	Krapkowice – c
				Gorzów Śląski – t	Kluczbork – c	Ozimek – t
				Jemielnica	Namysłów – t	Opole
				Byczyna – t	Gogolin – t	Wołczyn – t
					Praszka – t	Głuchołazy – t
					Praszka – c	Kluczbork – t
					Nysa – c	Kędzierzyn-Koźle
					Zawadzkie – t	Krapkowice – t
					Tarnów Opolski	Strzelce Opolskie – t
					Grodków – t	Paczków – t
					Zawadzkie – c	Zdzieszowice – c
	Gogolin – c	Nysa – t				
	Ozimek – c	Zdzieszowice – t				
Stagnant	Baborów – c Baborów – t	Lubsza Pokój	Grodków – c	Ujazd – t	Prudnik – c	
			Murów	Namysłów – c	Głogówek – t	
			Lasowice Wielkie	Dobrodzień – c	Głubczyce – t	
			Byczyna – c	Lewin Brzeski – t	Prudnik – t	
			Biała	Leśnica – t		
			Kolonowskie – t			
Regressive	Pakosławice Wilków Kamiennik Skoroszyce Świerczów	Radłów Pawłowi – czki	Niemodlin – c	Cisek	Bierawa	
			Olszanka	Głubczyce – c	Dobrzeń Wielki	
			Prószków	Niemodlin – t		
			Popielów	Turawa		
			Brzeg – c	Izbicko		
			Branice	Walce		
			Zębowice	Ujazd – c		
			Otmuchów – c	Dobrodzień – t		
			Łambinowice	Lewin Brzeski – c		
			Wołczyn – c	Dąbrowa		
			Korfantów – c	Reńska Wieś		
			Strzeleczki	Olesno – c		
			Łubniany	Komprachcice		
				Chrzastowice		
				Leśnica – c		
	Polska Cerkiew					

t – town; c – commune

Source: own elaboration

Only 5% of the examined units display a higher than the average level of development of the economic category being discussed. Of the others, as many as 60% range between a low and very low level. The spatial distribution of this phenomenon differs from the previously analysed problem (Fig. 3).

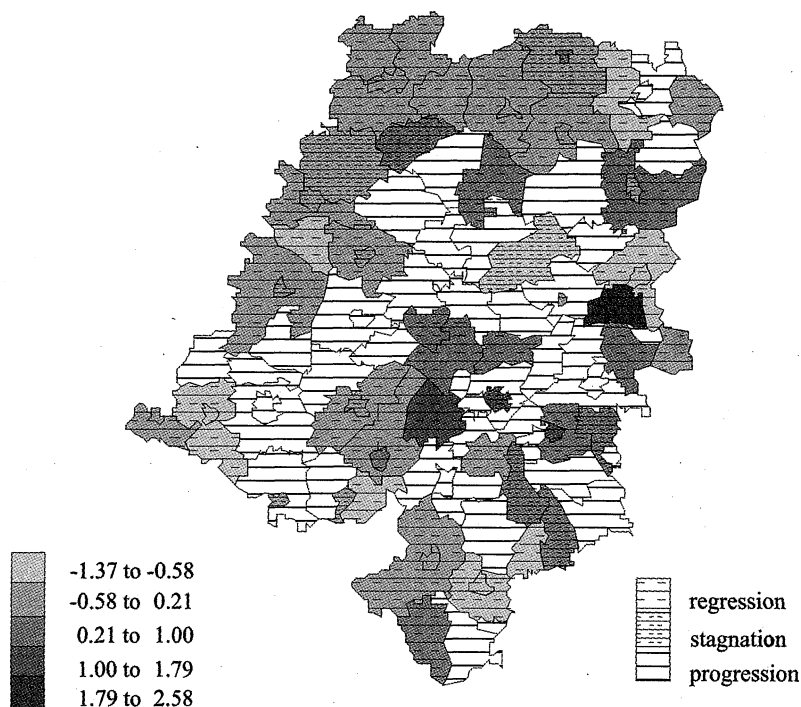


Fig. 3. The development level of service sector and foreign capital in the Opolskie Voivodeship in the years 1994–2002

Source: own elaboration

All the towns and communes that make themselves distinct because of their level of development of services are located in the urban-industrial functional zone of the Opole region. They are small settlement units, in the area of which the industrial function had not been very strongly developed earlier and as a result of introducing market economy it has been losing against that of providing services. As regards the whole voivodeship the differentiation in the phenomenon is clearly seen. The areas which make themselves distinct again for their level of developing services and share of foreign capital take on a compact form and are located in the eastern part of the region – in the urban-industrial zone and also in the southern part of the agricultural-forestry zone. They are recognised also through a progressive tendency toward development of services and foreign investments. The size of the share of the economic units with foreign

capital plays a vital role in strengthening the position of all the units situated in the eastern part of the Opole region as regards the scope of the problem under analysis. Their excessive number should most evidently be linked to the ethnic group inhabiting the area, that is autochthonous population who enjoy the rights of double citizenship. It can be thus supposed that the connections between the local population and the German State have a strong influence on the localisation of the foreign capital in this part of the region. A relatively lower level, as far as developing the problem area under analysis is concerned, is characteristic of the western part of the voivodeship. In this area progression in development is noticed in places with once developed industry (Nysa, Otmuchów, Niemodlin, Prudnik) and in cities.

An economic category which includes the broadest set of variables is the level of development of economic activity. It expresses the number of economic units in relation to the number of population almost in all the sectors of EKD. The numeral distribution of the units in individual classes is less differentiated than in the categories of economic development discussed before (Table 5).

Around 20% of the examined units reach an above-average level of development of economic activity. Nevertheless, among them as few as 2 display development progression and a half is characterized by stagnation. 40% of the units are in danger of dropping to classes of lower development level since there occurs regression in their areas. Towns and communes which are characterised by booming economic activity are concentrated – in the first place – in the southern part of the region and a few ‘islands’ of individual towns or communes strewn in the remaining area. It is in the south of the region where there is a marked increase in the number of economic units, especially dealing in manufacture activity and hotel trading, as well as transport and trading (Fig. 4).

The towns and communes which lie in the central part of the voivodeship, forming a ‘wreath’ surrounding the City of Opole, are characterized by an average level of development of economic activity. This area shows a regressive trend in its development, which can be a result of concentration of investments in the voivodeship’s capital. It is a valuable fact, though, for the further development of the region that a dominance of a progressive trend is noticed in the area with the lowest level of development of economic activity. Such units occur in various parts of the voivodeship, still are the most numerous in its eastern territory. A shortage in the proportionality of development of these towns and communes results, chiefly, from a low saturation with economic units active within the sphere of manufacturing and services rendered to business environment (financial agencies, servicing and rental of estates, public administration).

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Table 5. Dynamic classification of towns and communes of the Opole region in the years 1994–2002 according to the level of development of economic activity

DEVELOPMENT LEVEL DEVELOPMENT TREND	VERY HIGH	HIGH	AVERAGE	LOW	VERY LOW
Progressive		Kluczbork	Krapkowice – t	Lewin Brzeski – c	Ozimek – c
		Korfantów	Lewin Brzeski – t	Wołczyn – c	Strzeleczy
			Paczków – t	Pakosławice	Łambinowice
				Byczyna – c	Skoroszyce
					Świerczów
					Izbicko
					Gogolin – c
					Jemielnica
					Lubrza
					Domaszowice
					Zawadzkie – c
					Branice
					Kolonowskie – c
				Korfantów – c	
				Lasowice Wielkie	
				Zębowice	
				Ujazd – c	
Stagnant	Opole	Nysa – t	Gorzów Śląski – t	Leśnica – t	Olszanka
		Otmuchów – t	Wołczyn – t	Ozimek – t	Zdzieszowice – c
		Byczyna – t	Kietrz – t	Gogolin – t	Kolonowskie – t
		Namysłów – t	Strzelce Opolskie – t	Zdzieszowice – t	Kamiennik
		Brzeg – t	Ujazd – t	Murów	Baborów – c
		Głubczyce – t	Kluczbork – c	Brzeg – c	Cisek
		Głogówek – t	Namysłów – c	Paczków – c	Walce
		Grodków – t	Baborów – t	Lubsza	Polska Cerekiew
		Nysa – c		Zawadzkie – t	Pawłowiczki
Regressive	Miasto Dobrodzień	Niemodlin – t	Olesno – c	Chrzastowice	Biała – c
		Głucholazy – t	Głucholazy – c	Dąbrowa	Radłów
		Biała – t	Praszka – c	Głubczyce – c	Leśnica – c
	Miasto Olesno	Kędzierzyn- Kozłe	Komprachcice	Krapkowice – c	Gorzów Śląski – c
		Praszka – t	Prudnik – c	Strzelce Opolskie – c	
		Prudnik – t	Dobrodzień – c	Tułowice	
			Łubniany	Prószków	
			Niemodlin – c	Rudniki	
			Dobrzeń Wielki	Tarnów Opolski	
			Turawa	Otmuchów – c	
				Głogówek – c	
				Grodków – c	
				Popielów	
			Kietrz – c		
			Reńska Wieś		
			Bierawa		

t – town; c – commune

Source: own elaboration

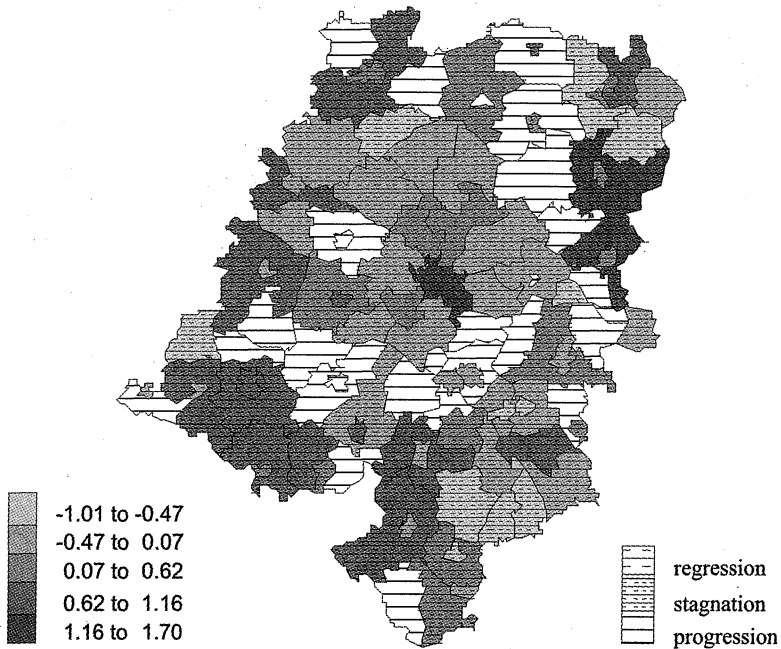


Fig. 4. The development level of economic activity in the Opolskie Voivodeship in the years 1994–2002

Source: own elaboration

Analysing the changes undergoing in individually selected categories of the economic activity in the Opolskie Voivodeship, it can be concluded that in this area a transformation of the economic structure is taking place. The fixed, decades-long division of the Opole region into three functional zones has not been valid any longer: the area which was designated as industrial to date has been dominated by services-providing units. The latter are entering the area of the whole voivodeship in a more and more expansive manner, still attaining the strongest position in its eastern part. The spatial concentration of companies with foreign capital, which are a phenomenon of the former decade of transformation, takes on a similar form. At the same time it must be underlined that the industrial function is losing its significance in the Opolskie Voivodeship. It is difficult today to conduct a delimitation of the industrial zone in the region. The economic activity within the sphere of agriculture has also lost its importance yet only in some areas of the agriculture and agriculture-forestry zone, still in the area of these functional zones there have appeared units providing services instead. They are localised, first of all, in the south-western part of the Voivodeship, in the area that has suitable conditions to develop tourism. Consequently,

economic units dealing in the spheres of hotel trading and entrepreneurship, as well as transport, warehouse management and communications dominate here. The space of the southern part of the agriculture-forestry zone that neighbours on the urban-industrial one has been developing in a similar manner. A levelling of the development levels of individual areas is also noticed in the region, among others, through weak dynamics of formation of the development axis of the region. At the moment it is Opole – the capital of the region that aspires to this function. However, the rate of the city's economic development suggests that this position may be attained but only in a longer run.

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- (7) A detailed description of the calculating procedure is contained in the following work: Kostrubiec, B. 1965: Klasyfikacja dynamiczna i wielocechowa województw Polski (A dynamic and multi-feature classification of Poland's provinces). *Z badań nad strukturą przestrzenną Gospodarki Narodowej Polski (Of the Research Into the Spatial Structure of the National Economy of Poland)*, Biuletyn KPZK PAN, vol. 35. pp. 28–49.
- (8) Its value is equal to the arithmetic mean of normalized values of research unit features. This index determines the highest level of development (intensity) of the

analyzed phenomenon as a unit of the highest value W_i , while the lowest level is referred to as the lowest W_i . The benefit of the method is a possibility to determine the degree of proportionality in the development of individual research units through calculation of residue values (C_i). Particular values C_i tell about the magnitude of the feature in relation to the other ones of the given unit. A positive value testifies to an excessive development of the given feature, whereas a negative one – to a shortage of a given feature in the harmonious development of the unit.

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