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REVITALIZATION STRATEGIES OF OLD INDUSTRIAL REGIONS IN EU*

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Abstract

The purpose of this study is the analysis of successful revitalization strategies of old industrial regions in EU countries in order to identify the features of their development and build a matrix of investment priorities. Revitalization strategies are a way to achieve long-term sustainable development of territories in the economic, ecological and social subsystems. In the course of the study, successful revitalization strategies of old industrial regions of the following countries have been analyzed: the Netherlands, Italy, Great Britain, Germany, Sweden, Poland. The strengths and weaknesses of the development of old industrial regions were identified, on the basis of which an extended SWOT-analysis was carried out for the first time, the result of which was the construction of a matrix of investment priorities. The results of the study can be used by countries to build programs for the revitalization of depressed areas in order to achieve a high level of sustainable development and overcome crisis phenomena in the economic, environmental and social spheres.

Keywords: EU, old industrial regions, sustainable development, SWOT, revitalization

1. Introduction

At the present stage of human development, there is a transformation of economic activity within the framework of the concept of sustainable development. This model is based on four components: economy, ecology, politics, culture (James, 2014). But a number of scientists (Mensah, 2019), (Allen et al., 2019) distinguish three main subsystems of sustainable development: economic, environmental, and social. However, the issue of research in the field of sustainable development at the regional level remains relevant (Lin, 2019). The main depressive territories in countries where development is skewed into one of the subsystems

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are the old industrial regions (OIR) (Guan et al., 2018). These are territories with a high level of production, but at the same time with a high level of depreciation of fixed assets, environmental problems and a lag in technical development. Industrial sectors that have the potential to increase the science intensity of products in the framework of improving economic relations and the technical condition of fixed assets are historically fixed in the OIR (Orlova et al., 2019). Therefore, the urgent problem is to implement successful strategies for revitalization of depressive regions.

Successful revitalization strategies have been implemented in EU. They had a positive effect on the economic and environmental situation of the regions (Birch et al., 2010). In these conditions, the aim of this research is to study successful examples of revitalization strategies of OIR in EU countries.

Analysis of successful examples of revitalization in the EU countries, identification of the strengths and weaknesses of the OIR as well as the formation of the main investing priorities of revitalization strategies are the main objectives of the study.

The work is divided into 3 parts:

- analysis of successful examples of revitalization strategies in EU;
- highlighting the key features of the OIR;
- extended SWOT-analysis of the main investing priorities of revitalization strategies of OIR.

2. Material and methods

The revitalization strategies of OIR in EU countries are the main object of this research. Despite the fact that the United Kingdom is no longer an active member of EU, it was included in the analysis, since the data are provided for the period when the country was part of the union.

The analysis of the work of scientists in the field of revitalization of OIR in EU (Eckart et al., 2003), (Gabor, 2009), (Tödting and Trippl, 2004), (Müller et al., 2005), (Kruczek and Kruczek, 2016), (Sedláčková and Švecová, 2018) made it possible to reveal the most successful examples: Enschede (the Netherlands), Turin (Italy), Liverpool, Manchester (UK), Ruhr (Germany), Malmö (Sweden), Katowice (Poland). Each of these cities is an important regional center. The level of regions' development after the implementation of the strategies was estimated with the help of the relative indicator of GDP per capita, which was calculated as a ratio to the base level in 2000. Based on the equations of linear trends of the indicator, the rates of economic growth of the regions were estimated with the help of the k coefficient.

The analysis made it possible to highlight the key features of the OIR, with the help of which a matrix of investment priorities using an extended SWOT-analysis has been made. The following pairs of indicators were subjected to pairwise analysis: S-O (strengths-opportunities), S-T (strengths-threats), W-O (weaknesses-opportunities), W-T (weaknesses-threats). The main principle of building the matrix is the formation of elements in such a way as to ensure the growth of indicators that increase the level of sustainable development of the regions with improving the economic, social and environmental component.

3. Case-study

3.1. Enschede, the Netherlands

One of the striking examples of a successful revitalization strategy is Enschede, the Netherlands (Overijssel region). Historically, it was a center for the production of quality textiles, which accounted for the major part of the country's exports. The industrialization of the city has led to an increase in the population and at the same time aggravation of social

problems. In addition, since the 1970s, the production of fabrics was transferred to Asia, due to lower production costs, and this process greatly affected the social and economic situation of the region. However, the successful implementation of revitalization measures contributed to the rapid recovery and growth of the rates of economic development, namely: the formation of a revitalization program at the state level; the territory of the industrial zone was reconstructed into retail space; a pedestrian zone has been created on the remains of factories in the city center; a cultural policy was carried out, within the framework of which the stadium "De Grolsch Veste" was built and the professional football club "Twente" of the top football league of the Netherlands was founded.

For the period from 2000 to 2018 the level of GDP per capita increased from 2595.03 to 38916.2 euros and shows a positive trend (Fig. 1).

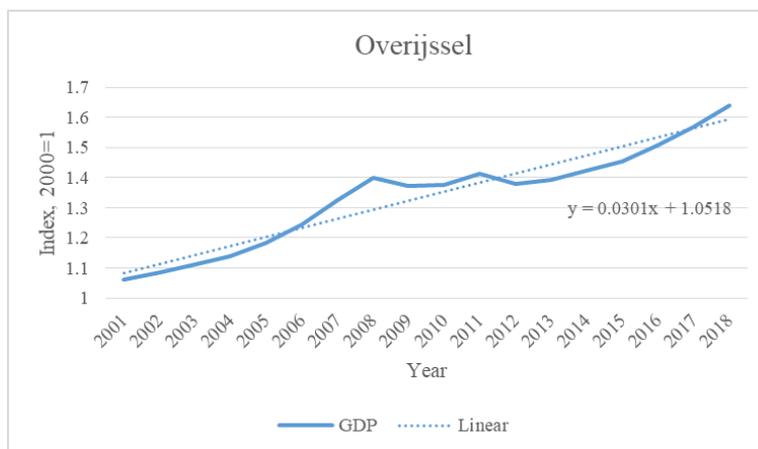


Fig. 1. GDP per capita trend, Overijssel, index 2000=1

3.2. Turin, Italy

Another example is Turin, Italy (Piemonte region). This is the automotive center of the country, which is represented by the FIAT carmaker. The company owned the largest bank in the city, an influential newspaper (La Stampa) and the most popular football club (Juventus). During this period, the population of Turin reached its peak.

However, in 1973 the oil crisis broke out, which caused inflation to rise around the world. Fuel prices have increased in Europe and the USA. At the same time, Japan introduced "economic" cars to foreign and domestic markets, which consumed less gasoline than their American and European counterparts. As a result, the demand for European and American cars fell, including FIAT. Due to the crisis in Turin, about 80% of production was stopped, more than 6 million square meters of industrial zones were empty.

The first stages of the city's transformation began in the 80s-90s of the XX century. The initiative was not expressed by the city administration, but by cultural and scientific institutions working in the field of social and economic sciences: the Giovanni Agnelli Foundation, the Istituto di Ricerche Economico Sociali del Piemonte - IRES, the San Paolo fund (Compagnia di San Paolo). Their programs included the rebranding of the city and active marketing of Turin as a tourism and innovation hub. A program of "internationalization" of the city was carried out under the leadership of Valentin Castelani, which included a number of activities: the establishment of an agency to attract foreign direct investment; foundation of the first European eco-technological park; foundation of a virtual reality technology park; foundation of a bioindustry park.

The level of GDP per capita shows an increase from 23595.5 euros in 2000 to 31364

euros in 2018, with a noticeable drop during the global crisis of 2008-2009. (Fig. 2).

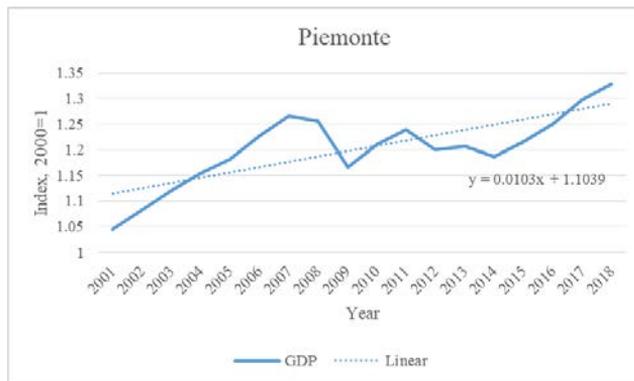


Fig. 2. GDP per capita trend, Piemonte, index 2000=1

3.3. Liverpool, United Kingdom

Another example of revitalization is Liverpool in the UK (Merseyside region). The city was the main port of the British Empire and the world trade center. Thanks to this, the population and the role of the region in the country grew rapidly. However, already in the middle of the twentieth century crisis phenomena appeared: slums, congestion of roads, environmental pollution. The government saw the solution to the problems in pursuing a policy of industrial decentralization and the relocation of most people to social housing in neighboring cities. Factories began to close, which led to a drop in employment. The outflow of the population from the city, the social crisis, the rise in the unemployment rate began.

Since the late 1990s, the principle of partnership between the authorities, business and the local community has begun to play an increasingly important role in the management of the city. Activities were carried out, as a result of which the city was gradually revitalized: starting from the 1980s the region received regular support from EU regional development funds; the priority was the activation of human potential; the city won a project to finance the reconstruction of the city center under the City Challenge project; the role of the principle of partnership between government, business and the local community is increasing; the Liverpool Partnership was created and the Liverpool First Strategy was developed; positioning the culture of the city on the basis of the world famous group "The Beatles".

The level of GDP per capita shows an increase from 23649.9 euros in 2002 to 27574.8 euros in 2018 (Fig. 3).

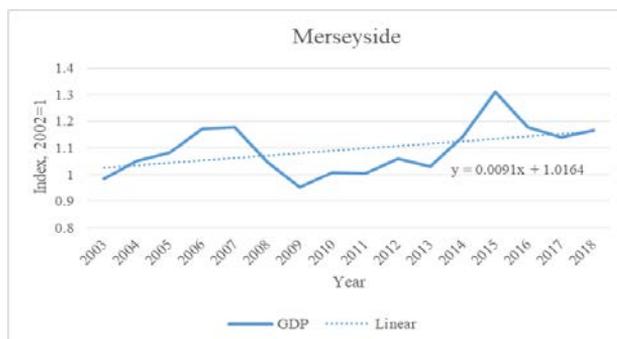


Fig. 3. GDP per capita trend, Merseyside, index 2002=1

3.4. Manchester, United Kingdom

The city of Manchester (Greater Manchester region) has a very similar history of revitalization process. In the XIX century, the basis of industrial development was laid by mechanized production for processing cotton and flax. In 1840, about 90% of the cotton in Great Britain was produced here, and it was one of the most rapidly developing cities in the world.

However, in the period between the two world wars, production decreased 5 times, and employment 2 times. The reasons were a decrease in demand from India and in the cost of products in the world market as well as the emergence of new competitive manufacturers. Over time, a revitalization program was carried out, which included a number of measures: large-scale projects for the reconstruction of the most depressed areas were implemented at the expense of the state budget; partnership "Manchester-Salford", in which economic projects, environmental improvement, social investment, housing policy took place; urban development corporations were created; the city's image has been changed – empty industrial buildings were used as clubs, record companies and rehearsal bases; development of sports culture; modernization of the city's transport structure by creating a “fast tram” connecting the center with suburban areas.

GDP per capita shows an increase from 25993.4 euros in 2000 to 32115.1 euros in 2018 (Fig. 4).

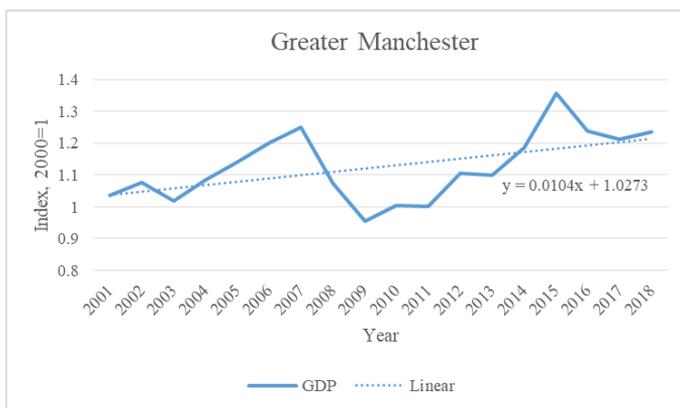


Fig. 4. GDP per capita trend, Greater Manchester, index 2000=1

3.5. Ruhr, Germany

Another world-renowned example of the revitalization of the OIR is Ruhr (the Nordrhein-Westfalen region) in Germany. In 1850, coal and metal mining began in this area, which led to the emergence of interconnected industries and the rapid growth of the region's economy. At the beginning of the twentieth century, enterprises for the redistribution of energy appear, in turn, this has become an impetus for the emergence of new energy-intensive enterprises. Subsequently, by-products of the coal and steel industries began to be used in the chemical industry, which became the main reason for attracting chemical enterprises in the region.

The first manifestations of the crisis occurred in the 1920s, when the Ruhr region was occupied by France. Most of the reparations France received as coal. The next impetus was the coal crisis of 1958, and then the steel crisis of 1975. Starting in 1968, the state began active programs to revitalize the Ruhr Basin. The implementation of these programs resulted in less dependence on the coal and steel industries, the emergence of new industrial clusters,

especially high environmental technologies, and an increase in the share of the service sector of new firms. This was the result of the following measures: the destruction of rigid relationships between enterprises; economic restructuring programs were carried out – the Ruhr Development Program, the North Rhine-Westphalia Land Development Strategy, the Ruhr Action Program (reducing unemployment, developing new technologies, building housing and sports facilities, protecting the environment, maintaining the status of an energy center, stimulating investment activity, development of culture); creation of a cluster of environmental technologies; holding an international construction exhibition "Emscher Park".

GDP per capita shows an increase from 25950.3 euros in 2000 to 38916.2 euros in 2018 (Fig. 5).

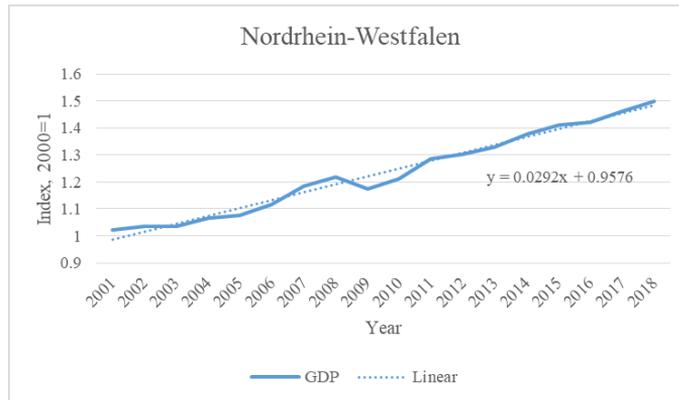


Fig. 5. GDP per capita trend, Nordrhein-Westfalen, index 2000=1

3.6. Malmö, Sweden

The city of Malmö in Sweden (Sydsverige region) is another example of successful revitalization strategies. It is the third largest city in Sweden and one of the most innovative cities in Europe. However, twenty years ago the city was in a state of crisis. The successful transformation into an academic and technological center was the result of a series of measures.

During the industrial era, the city specialized in shipbuilding, but the crisis in this area undermined the strength of the economy. As a result, a large number of the population migrated, the city lost not only its labor force, but also its economic base. In addition, the city did not have its own university, which led to an outflow of young people and a shortage of highly qualified personnel. Construction and academic projects have become elements of a successful revitalization strategy: the Oresund Bridge was built, which turned Malmö into a major transport hub in Sweden; the creation of a university, which led to an influx of students and an increase in the level of qualifications of the local population, as well as the development of scientific schools; creation and development of innovative business models of cooperation between the private and public sectors.

The level of GDP per capita shows an increase from 25012.6 euros in 2000 to 39611.3 euros in 2018. (Fig. 6).

3.7. Katowice, Poland

As a result of the OIR revitalization strategy, Poland was able to transform the mining city of Katowice (Slaskie region) into a modern IT-hub. Historically, the city specialized in coal mining, but the decline in the number of workers in the mines and the crisis in the

dynamics of the industry's development turned the industrial center of the country into a depressive region.

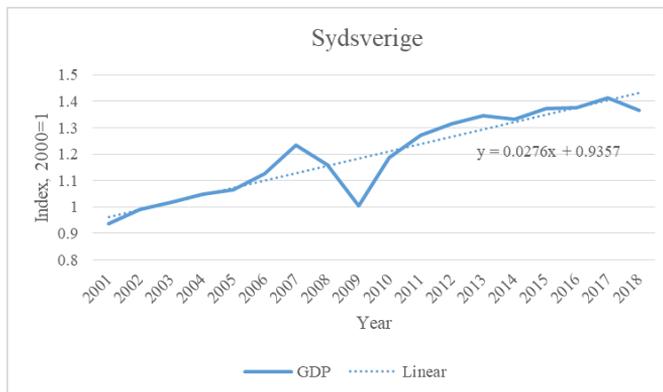


Fig. 6. GDP per capita trend, Sydsverige, index 2000=1

The territory development strategy included active urban planning, which led to the construction of offices, which were subsequently leased to international companies: Ericsson, Mentor Graphics, Rockwell Automation, Oracle, PwC. The influx of foreign investment contributed to the economic development of the city. The reason for the attractiveness of the territory for foreign companies is the relatively inexpensive rental price and the local free economic zone: companies that create new jobs in the city operate under special loyal tax laws. Thus, the key elements of the revitalization strategy are: construction projects; active attraction of foreign investment; loyal tax legislation; use of closed mines premises for warehouses, laboratories and cultural centers; attracting young and highly qualified specialists.

GDP per capita shows an increase from 5166.5 euros in 2000 to 13552.7 euros in 2018 (Fig. 7).

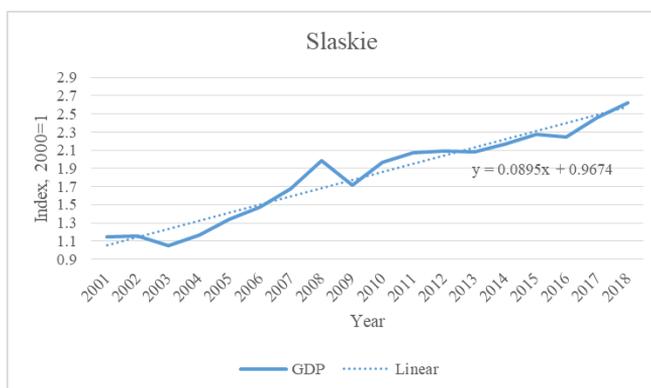


Fig. 7. GDP per capita trend, Slaskie, index 2000=1

4. Results and Discussion

Based on the results of the analysis of successful revitalization strategies of the OIR in EU countries, it can be argued that the OIR have a number of strengths, namely, they can act as a basis for the development of new service sectors: financial, consulting, engineering,

communication services and others. Secondly, the territories and areas of industrial buildings can be used to create hubs, lofts, rent for offices of high-tech companies. Also, the territory can be transformed into eco-friendly housing with the creation of a number of eco-settlements, the inhabitants of which can be workers of new areas of the region. And, thirdly, the presence of a high scientific and technological level of personnel makes it possible to make the high-tech products.

These components of the development potential of OIR give the opportunity to assert that such territories are the most promising in terms of modernization and further development, because they already have a fairly significant base and potential for transformation. However, at the same time, OIR have a large number of problems: structural imbalances among industries; depletion of raw materials and technical base; narrow specialization of labor resources, lack of qualified personnel for new sectors of the economy; the predominance of large enterprises producing a limited range of products; high degree of environmental pollution; specialization in the production of low-tech products; low innovative activity; low mobility of labor and capital.

Within the framework of revitalization programs, each region had investment priorities. Based on the value of the coefficient k of the equations of linear trends in the change in the growth rate of GDP per capita as a ratio to the base year, it is possible to compare the growth rates of regions (Table 1).

Table 1. Ranking of regions by economic growth rate based on the coefficient k

<i>Nº</i>	<i>Region</i>	<i>k</i>	<i>Mean k</i>	<i>Investment priority (ecology-1, economy-2, society-3)</i>
1	Slaskie	0.0895	0.0295	Enhancing human potential, attracting foreign direct investment, environmental modernization of production (1, 2, 3)
2	Overijssel	0.0301		Cultural policy, rental of industrial areas, sustainable housing (1, 2, 3)
3	Nordhein-Westfalen	0.0292		Clustering of environmental technologies, cultural policy (1, 3)
4	Sydsverige	0.0276		Activation of human potential, reconstruction of the transport system (2, 3)
5	Greater Manchester	0.0104		Eco-friendly housing, cultural policy, reconstruction of the transport system (1, 3)
6	Piemonte	0.0103		Eco-technological park, attracting foreign direct investment (1, 2)
7	Merseyside	0.0091		Cultural policy, activation of human capital (2, 3)

The Slaskie and Overijssel regions are showing above average growth rates. Analysis of investment priorities made it possible to conclude that the regions that introduced revitalization measures simultaneously at three levels of the sustainable development paradigm: ecological, economic and social had the highest rates of economic development.

The revealed features of the OIR allow us to proceed to the formation of matrix of investment priorities based on an extended SWOT-analysis (Table 2).

Table 2. Matrix of investment priorities of the revitalization strategy of OIR

Strategic priorities in the intersection of fields: "Strengths-Opportunities" "Strengths-Threats" "Weaknesses-Opportunities" "Weaknesses-Threats"	Strengths	Weaknesses
	-high industry potential -resource base -availability of human resources -the interest of the authorities	-the crisis of public welfare - outdated industrial base and technologies, high material consumption of production -high level of negative

		environmental impact -low level of production diversification -high level of migration and population aging
<p>Opportunities</p> <ul style="list-style-type: none"> -the ability to attract funds from international organizations -implementation of energy-saving technologies and green building - expansion of product markets - opportunities for raising the level and changing the qualifications of the population -use of scientific developments and transformation of the production base 	<ol style="list-style-type: none"> 1. Modernization of the existing industrial and production base with an emphasis on green technologies. 2. Organization of courses for improvement and retraining for the population. 3. Implementation of green building standards. 4. Formation of resource-saving programs based on the environmental scientific developments. 	<ol style="list-style-type: none"> 1. Investments in "high technologies". 2. Modernization of obsolete equipment. 3. Raising standards in the housing construction sector (green building). 4. Implementation of the principles of circular economy.
<p>Threats</p> <ul style="list-style-type: none"> -increased level of migration -increased social and environmental crisis - losses in the ecosystem and increased negative consequences for the environment -low funding level 	<ol style="list-style-type: none"> 1. Creation of new jobs through industrial diversification. 2. Introduction of eco-technologies. 3. Secondary production, development of the service sector. 4. Introduction of educational "eco" programs. 	<ol style="list-style-type: none"> 1. Capital investment in the decentralization of energy production. 2. Investment in green building. 3. Investments in modernization and reconstruction of fixed assets of industrial enterprises.

The outlined investment priorities, which were formed at the intersection of the fields of the SWOT-matrix, can be a guideline for implementing successful revitalization strategies of OIR. This will result not only at the macro, but also at the micro level: creating jobs specifically for local personnel, preventing a decrease in the level of income of the population and developing social infrastructure. The result of the revitalization strategy of OIR is an increase in the level of all three subsystems of sustainable development: economic, social and environmental.

5. Conclusions

The revitalization strategy of OIR in the context of sustainable development is a system of management measures with correctly selected long-term goals and an assessment of resources and capabilities. A number of strengths and weaknesses that were identified in the process of analyzing successful revitalization strategies in EU countries make it possible to create a comprehensive strategy. The results of the SWOT-matrix allow to choose the investment priorities for the development of the territory to achieve the alignment of the main subsystems of sustainable development.

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