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THE IMPORTANCE OF THE ECONOMIC BASE THEORY IN URBAN AND REGIONAL RESEARCH

ZNACZENIE KONCEPCJI BAZY EKONOMICZNEJ W BADANIACH MIEJSKICH I REGIONALNYCH

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Abstract: The article aims to identify the problems faced by urban and regional communities and to provide implementable approaches derived from the economic base theory (EBT). This review essay discusses (often critically) the relevance of EBT to urban and regional research. The article seeks to explore the theoretical implications of the limitations and challenges of basic and non-basic sectors development. The author explored how EBT can increase our understanding of economic processes. A presentation of EBT is followed by a description of the functional structures of cities and regions. The study focused on the evaluation and the application of EBT. The results confirm that EBT has longstanding importance in spatial planning. Although EBT is a simplified abstraction of reality, it can be a helpful platform for the effective implementation of regional (urban) strategies. The original contribution of this paper is to open up the perspective for further research on EBT.

Keywords: the economic base theory, urban and regional research, functional structure.

Streszczenie: Celem artykułu jest identyfikacja problemów rozwojowych społeczności miejskich i regionalnych oraz przedstawienie możliwych rozwiązań na gruncie teorii bazy ekonomicznej. Artykuł stanowi teoretyczny esej przeglądowy, spełniający funkcje idiograficzną i eksplanacyjną oraz ukazują-

cy (często krytycznie) znaczenie teorii bazy ekonomicznej dla badań miejskich i regionalnych. Przeprowadzone badania własne miały dać odpowiedź, w jaki sposób teoria bazy ekonomicznej wyjaśnia funkcjonowanie gospodarki regionalnej (miejskiej). Przedstawiony został model bazy ekonomicznej oraz różne metody jej pomiaru, a następnie opisana struktura funkcjonalna miast i regionów. Wyniki badań potwierdziły, że teoria bazy ekonomicznej, chociaż jest uproszczoną abstrakcją rzeczywistości, może być użyteczną platformą dla zrozumienia specyfiki analiz rozwojowych i oceny konkurencyjnych strategii miejskich i regionalnych. Artykuł może stanowić asumpt do dalszych pogłębionych badań nad koncepcją bazy ekonomicznej.

Słowa kluczowe: teoria bazy ekonomicznej, badania miejskie i regionalne, struktura funkcjonalna.

1. Introduction

The complexity of the world means that there is a need justified by practical and cognitive considerations of spatial analysis for the socio-economic structures and processes taking place in the structures to examine their conditions and consequences, especially resulting from the relations of people with their geographic environment (Kuciński, 1997, pp. 5-13). These activities are undertaken on the basis of various theories and models that present the general laws regarding the functioning of cities and/or regions. Among them are theories of regional structure and regional development, which were developed under the influence of the general theory of location and model concepts of Regional Science. These theories refer to the concept of an economic region and that of an open and a closed economy, its character and structure. An example of this type of structural concepts is that of territorial and production complexes, and Anglo-Saxon concepts of functional urban regions based on the closure of the labour market around larger cities and urban agglomerations.

The second type of spatial economy theories are the concepts of regional development. They appear in the form of dynamic theories of spatial economy, containing normative and optimising elements. They present a model of the intensification of socio-economic development of the regions and the levelling interregional and intraregional disparities (e.g. the growth pole theory proposed by F. Perroux). Related to complex theories of spatial economy are the theory of the settlement system and the theory of the settlement network. The concepts of the settlement system refer to the achievements of the general theory of systems and cybernetics, while the basis of the theory of the settlement network rest on two concepts: the central place theory of W. Christaller and the economic base theory of W. Sombart.

This paper sought to derive the theoretical implications and limitations of fundamental characteristics of the economic base theory in regional (urban) analysis. It should be emphasised that during the integration processes of territories (regions, cities, districts…) and the systemic transformation of the economies of Central and Eastern European countries, this theory was quite widely popularised and applied in practice (Korenik, 1999, pp. 51-62), although it has many imperfections and therefore is also often criticised.

2. Main assumptions and limitations of the economic base theory

The economic base theory was first developed at the beginning of the 20th century by the German economist W. Sombart (1928, pp. 399-423). He defined a city as an economic phenomenon and as a territorial community. He also came to the conclusion that in order to function properly and develop dynamically, a city must import both food and other goods from the outside. Hence, the economic base of the city is created by the inhabitants and those activities that allow for the payment of the necessary imports.

2.1. A review of economic base literature

The economic base concept in geographical typology (M. Arousseau) and in urban planning (F.L. Olmsted, Jr.) was applied in the USA at the beginning of the 1920s, however the full application of the term came much later. In the 1930s this concept was partially used in the Netherlands (G.Th.J. Delfgaauw), and in the Soviet Union it was used during the implementation of the industrialization plan to define the future population of new cities associated with large industrial plants (W. Szałajchowski, W.G. Dawidowicz). In the 1940s, such applications of the economic base model were already common, and after World War II established standard planning methods in the Soviet Union were transferred to other socialist countries, as well as to some other European countries. At the same time, interest in the economic base theory also increased in the United States (Duesennberry, 1950, pp. 63-102; North, 1955, pp. 243-258). However, from the outset, the use of the concept of an economic base was thematically broader and methodologically more complex.

In Europe, the term ‘economic base’ was almost exclusively used to describe the number and structure of city dwellers, while in America it was developed as a tool for the general analysis of urban economics. The development of the methods of calculation and the application of the concept of an economic base meant that eventually attempts were made to present it in the form of a uniform and orderly theory. R.B. Andrews was the first to do this, in a series of twelve articles published in Land Economics, followed by J.W. Alexander (1954, pp. 246-261) who expanded the issue. Andrews (1953, pp. 161-167) discussed the problem of correct terminology of an economic base, the classification of the basic elements of the base, the general and particular difficulties in identifying it, methods of measurement, the issues of delimitation of urban areas, indicators of the size of the base, causes and consequences of changes in characteristic indicators and the relevance of the economic base theory in urban studies. However, the publication of his views revealed hidden dissatisfaction and provoked criticism of both the concept and its practical, often overly simplified activities. The beginning of a stormy polemic between both opponents and supporters of the economic base theory was H. Blumenfeld’s article (1955, pp. 114-132), in which the author strongly opposed, above all, the hitherto

interpretation of the term ’economic base’. The basic objections of the opponents were as follows (Dziewoński, 1971, pp. 53-54):

1. According to the concept, total employment in a given community is divided into basic (primary) related to export, and non-basic (secondary) related to local consumption.
2. The method of export base has two aims: a) focusing attention on the most important industries (workplaces), b) defining all future employment and population on the basis of future employment in the basic group, the ratio of basic activities to non-basic activities and the multiplier.
3. This theory tries to answer two different questions which are not separately interpreted: a) what is the balance of payments of the community? b) what are the ‘critical industries’, i.e. which are the most exposed to external competition and the best suited to expansion into external markets?
4. The confusion of concepts/terms is exacerbated by the widespread double bias: a) ‘mercantilist’ for activities that generate money income at the expense of consumer-driven activities, and b) ‘physiocratic’ for food and raw materials, at the expense of processed products and services.
5. Serious errors are made when trying to establish the basic activities by the widely used proportional division method. Determining it on the basis of a specific market analysis is costly and ends up revealing internal contradictions of the economic base method.
6. The method disregards the import side of the balance sheet, which is as important as the export side, both from a balance of payments and the ‘criticality’ point of view.
7. As a result of these two points of view being confused, the method cannot solve the problem of the indirectly basic activities. If the balance of payments approach was applied consistently, the problem would disappear completely; if the ‘criticality’ approach was applied consistently, such activities would logically be found among other activities.
8. The economic base method does not include payments received from sources other than those related to the work performed.
9. Employment is not a useful measure for balance of payments which has to be based either on product value or other value measures.
10. The volume of the basic sector increases as the division of labour between communities increases, and decreases with the size of the community, as well as the division of labour within that community.
11. The basic activities to non-basic activities ratio is relevant only in small (urban) communities with a simple structure. The larger and more complex the community, i.e. the more metropolitan/supralocal, the less use of this ratio and the whole method.

12. The multiplier changes not only with the ratio, but also with the 'family factor' of those employed, both in the basic and non-basic sectors, and with the unemployment rates.
13. Due to these complex interrelations, the multiplier is not a useful tool for forecasting the population of metropolitan areas.
14. Identification of export (basic) activities for each city can be a useful tool for central institutions planning the location of industry. On the other hand, it is ineffective for determining the directions of development of non-industrial activities by local planning institutions, as it leads to a harmful distortion of location systems on a national scale.
15. A large metropolitan area therefore appears, continues and grows, because its production and consumption services make it possible to substitute new export activities for those that fail as a result of the constant difficulties of economic life. They are permanent and lasting services and are therefore truly basic (primary) elements of a metropolitan economy. On the other hand, export activities are continuously being changed, and this is why they are non-basic (secondary) elements of a metropolitan economy. The relations assumed in the economic base theory are actually the opposite.

Despite these fundamental weaknesses, the export base theory makes it possible to explain the growth mechanisms of individual regions, thus the theory can be considered necessary in regional studies. Additionally, K. Dziewoński believes the significance of this concept is emphasized by the still underestimated fact that it is currently the only alternative concept to the central place theory. Naturally, both theories could be combined into one theory, but so far no such effort has been made. The advantage of the economic base theory over the central place theory is its flexibility and greater compatibility with reality, whereas the central place theory interprets only part of phenomena associated with the formation of the whole socio--economic system (Dziewoński, Jerczyński, & Korcelli, 1984).

It should be stressed that within the economic base theory, numerous recommendations are formulated for public policies. According to its assumptions, most public activities should consist in attracting to the region investors who produce for export. Currently the most competitive are industries based on high technologies and services supporting technological changes. Therefore, companies that are particularly beneficial for the further development of the region should be sought. This will attract investors from industry, which is already a strong point of the regional economy, and thus deepen the region's specialisation. A similar assumption was made in the staple theory (W.A. Mackintosh, H.A. Innis, D.C. North), which regards the significance of export activity in regional development (Grosse, 2002, pp. 26-27). The staple theory has been used in efforts to explain long-term structural changes and the reasons for economic growth. The staple thesis has also been applied to analyses of economies that rely on gradual production specialisation, i.e. focusing on one group of goods that may be the most competitive on external markets. The

effect of these activities should be growing benefits resulting from the reduction of transaction costs, the improvement of the organization of the production process and the quality of manufactured goods (Landes, 2000, p. 332). The staple theory was not designed to predict a particular successful development for regions where staple exports are important, rather, it was developed as an analytical framework to help explain the economic evolution of economies where the exports of raw materials or their processed by-products have been of some consequence, and to determine the conditions under which staple-related economic activity positively contributes to economic development (Malizia & Feser, 1999, pp. 81-84).

Moving on to another concept – the new trade theory (NTT) – export activities may also play a superior role in regional (urban) development. NTT explains why in the global economy the benefits of trade may be gained by countries at different levels of civilization development (Grosse, 2002, p. 27). This is due to production specialisation, in particular focusing on labour-intensive or capital-intensive activities. Regions (cities) with high capital export capital-intensive goods, whereas regions (cities) with cheap labour can specialise in labour-intensive production. NTT shows that in the long run, the exchange between the two types of regions (cities) brings greater benefits to capital-rich regions (cities). The new trade theory also becomes a factor in explaining the growth of globalisation. As in the case of the staple theory, public authorities should undertake a number of activities aimed at deepening production specialisation and, consequently, supporting export activities.

2.2. Why regions (cities) grow: a review of research on the economic base model

According to the main hypothesis of the export base theory, the economic growth of a city or region depends on the level of its export activity, i.e. on effective demand external to the city (or region) for the goods and services produced by its resident population. Based on this model, there is a distinction between revenues from export activities (basic activities) and from activities which meet an internal demand, i.e. supply the resident population (non-basic activities). The basic sector, by providing export functions, creates the foundations of the economic growth of a territorial unit. The non-basic sector depends on the level of activity in the basic sector. The greater the sphere of influence of the city's or region's exogenous functions, the greater the growth level, potential, and role in the regional or national economic system (Krikelas, 1992, pp. 16-29).

A proper model of an export base needs to present the relations and integrations occurring in the region's (or city's) economy. The model clearly shows interrelations between the basic and non-basic groups of activities. For the exogenous sphere to function properly, it is essential that the region (or city) has the right level of development and the right structure of endogenous sphere, i.e. residentiary activities, considering the existing productive capacity, production relations and consumption

model (Segessemann & Crevoisier, 2016, pp. 1388-1403). Hence it is a mistake, for which this theory has been criticized, to favour the basic (export) activity at the expense of non-basic activity, which is frequently the case if the theory is understood too narrowly (Nesse, 2014, pp. 93-108). The residentiary functions performed by the non-basic sector determine the quality of life of the resident population, as well as create infrastructural foundations for export activities, so it is wrong to attach undue importance to the latter group.

Optimal development conditions, according to the economic base theory, are those in which every monetary unit spent in a region has been identified by its origin, and the purpose of its spending is known. All new money reaching the region stimulates – as it circulates – more and more new activities, and this in turn results from the concept of the regional multiplier. It turns out that the more diversified and integrated the economy of the region, and the more distant the regions where supplies can be obtained, the greater the value of the multiplier. It follows from this that the economic-base model puts the accent on two elements (Polése, 1994, p. 131):

- money that flows into a region thanks to the underlying basic (export) activities,
- effects of spreading the money in a region (the multiplier usage).

The long-term discussion around the proper understanding and the use of the concept of economic base resulted in major changes in the very definition of the subject under dispute, and thus in urban development. However, for W. Sombart the concept of economic base referred to the definition of a separate character of a city as an economic phenomenon, today using this concept simply means that a city may be recognized as an economic region. It follows from the definition of a city, although it often covers a small area, that it is connected with various types of bonds with a much larger area than the built-up area of the city itself. One may call this area a sphere of influence or a hinterland of a city or region. This region is a nodal region, because the city as the main centre is the focus of the region's life. The region is determined by analysing the impact of the most important functions of a city in an area with a various range of actions, and by their size determine the zones of the city's impact on the region. With this in mind, the city becomes a constitutive factor of the region that develops around it and grows as its potential increases. This means the emergence of a new type of city, described as a city-region (Korcelli, 1981, p. 195), in which the opposition between a town and a village disappears. In terms of specialised functions, a city-region performs not only its current functions, but also the functions of its entire surroundings. It is therefore correct to extend the research to entire regions which, as larger geographic areas, support the city's development due to its diverse economic, social and cultural ties.

At present, every big city/metropolis, due to its connections with other urban entities, can no longer constitute an isolated unit in a socio-economic space. Together they form an interconnected system of city-regions (Jonas & Ward, 2007, pp. 169-178). The city supplies goods and services to a smaller or larger

area. These connections, which are an expression of complementarity and spatial interactions, result in the fact that the main settlement forms of the contemporary urbanisation – agglomeration, conurbation and megalopolis – are in a state of permanent development and constant change. Nevertheless, urban development takes place in three ways (Liszewski & Maik, 2000, p. 273):

- by agglutination, that is 'sticking' new spatial units onto the existing settlement structures in a dispersed manner;
- by the emergence of various types of new cities;
- through the formal incorporation of, often previously organised, new areas within the boundaries of municipalities.

Yet, regardless of the mode of transformations occurring in the settlement network, one thing is certain – each urban unit is a system of interacting elements, with an in-built growth mechanism. According to the economic base theory, this system consists of two complementary types of activity. The first group encompasses those activities which are driven by the need for external contacts. The second type is necessary for the functioning of the city itself (Illeris, 1996, p. 267-285). Some inhabitants of a given area are engaged in the production of goods and delivering services to both the local population and to external areas. This means that they also work for export (hence the term 'export base' used in the literature), and their work results in an inflow of money into the city/region. This group constitutes the basic sector (exogenous, export sector) in the city's or region's economy. The revenues generated by the exogenous functions of the settlement unit are used to import those goods and services which are not produced or delivered internally, but are essential for the functioning of urban or regional organisms. Thus, activities oriented to external market are the *raison d'être* of a city-region, the source of its revenues and the basis for growth – its economic base (Vollet, Aubert, Frère, Lépicier, & Truchet, 2018, pp. 203-222). Another group, equally important for the existence of a city, comprises activities providing goods and services for internal consumption, but as they do not generate inflow of external capital, they belong to the non-basic sector (endogenous, local sector).

The economic base model is also used to make economic growth forecasts for settlement units and their structure of labour resources. According to the model, the potential of the region, its development and position in the national economic system is greater, the greater range of its exogenous functions. It also showed a certain regularity in the relations between the basic sector and non-basic sector as well as the relation of total employment to total population. This regularity turns out to be so unchanged that on its basis it is possible to forecast not only with regard to the employment structure, but also in regard to the population development of a territorial unit; Andrews even formulated average relations among the following quantities of basic: non-basic: total employment: total population as a ratio of 1:2:3:6.

Analysing the above examples of concepts and activities related to the economic base theory, it can be concluded that this theory, despite its weaknesses and research difficulties, still occupies a significant place in modern applied science and is used by urban and regional stakeholders in the optimal implementation of their activities (Wang & Hofe, 2007).

3. Methodological problems of applying of the economic base concept

Numerous difficulties in the economic base analysis are unfortunately created by not sufficiently precise measures that would allow to divide the activities into basic (export, exogenous) ones and non-basic (local, endogenous) ones. The direct quantification of the size of both groups in the case of larger units is very labour--intensive, and the obtained results are either not at all or not very comparable. In fact, the possibility of making a forecast about the economic base depends on the relative stability of the prevailing conditions, and more specifically on the state of equilibrium or recovery (even delayed in time) between the two groups.

Many have suggested that the economic base theory, its analytical and methodological techniques, and the public policies that it promotes should be abandoned in favour of other, more comprehensive theories of regional (urban) growth and development. Nevertheless, economic base research continues. Most notably, J.P. Lesage (1990, pp. 307-323) and J.D. Reed (Lesage & Reed, 1989, pp. 615-636) provided empirical evidence in support of the economic base hypothesis as both a short and long-term theory of regional growth. These authors suggest that their models could be used both for the short-term forecasting of regional employment, income, and product and for longer-range regional economic planning and policy analysis.

Starting an empirical study of the economic base requires prior resolution of three main problems:

- the choice of a spatial reference unit,
- the selection of the measurement unit,
- the selection of the measurement method.

When examining the size of the economic base of a small territorial unit (city), the so-called direct measurement methods (monographic) carried out mainly in the field (surveys, questionnaires) are used, and therefore they are costly and time--consuming. With regard to large territorial units (districts, regions), the so-called indirect methods are applied to the economic base analysis. However, these methods do not explain in detail the economic and social dimension of an individual centre, but provide a basis for the analysis of the differences in these values between centres. These methods assume that the area forms a relatively homogeneous whole of a similar consumption and production model and similar features of economic development.

The measurement units may be in various forms: income and expenses of urban population, sales volume, value of pure production, wages, etc. However, these measurements in relation to the regional level are very difficult and sometimes even impossible to perform. Hence a measure commonly adopted by various scientists is a measure expressing the number of people employed in particular types of activity in a given area. Yet, there is no one universal method of dividing the total number of employees into the basic and non-basic groups. The best-known methods of measuring the economic base of a city or region include: the residual method (employee surplus index), the macrocosmic method, the sales – employment conversion method, the representative method, and the location coefficient method.

The residual method (employee surplus index)

This consists in determining the economic base (the basic group) as the remainder, after subtracting from the total number of employed people engaged in non-basic activities. The disadvantage of the method is that there is a certain constant dependence between the size of two groups. Meanwhile, as it turns out, this relation is variable and depends on the specifics of the city or region, and determining the relationship becomes, in fact, the subject of analysis of the regional (urban) economic base. Within the residual method, the employee surplus index (ESI) is used as follows:

$$ESI = E_aC - (EC \times E_aR / ER),$$

where: E_aC – employment in activities "a" in a city (region),
EC – total employment in a city (region),
E_aR – employment in activities "a" in a region (country),
ER – total employment in a region (country),

- if employment in activities "a" in a city (region) is greater than the second part of the above formula, it means that activities "a" are basic,
- while a negative value of the ESI indicates deficiencies in activities "a", it means that activities "a" are non-basic.

The macrocosmic method

This method was suggested by G. Alexandersson, and it consists in determining the basic group by the comparison of employment in a city (region) with the employment structure in a group of cities (regions) located in a larger area. For each of the surveyed cities (regions), it is determined what percentage of activity corresponds to the intra-city (intra-region) needs (the non-basic, endogenous activities), and then the obtained results are compared. The smallest percentage of employees in the non--basic activities in a group of analysed cities (regions) is considered the necessary minimum. As regards the remaining cities of the research collection, it is assumed that such a percentage is the amount necessary to supply a city (region), and any surplus over this percentage can be classified as basic (export, exogenous) activities.

However, this method can be only used when dealing with territorial units of a more or less similar level of development and type. The disadvantage of the method is also its excessive schematism, while its advantage is its simplicity and the possibility of making a comparative analysis.

The sales–employment conversion method

The method enables the division of employees in individual workplaces into basic (exogenous) and non-basic (endogenous) groups. The key here is the sales distribution ratio of goods or services made in a workplace in a city (region) and outside (for export). The division into basic and non-basic groups is made precisely in proportion to the volume of sales inside and outside the urban (regional) organism.

The representative method

The method can be used in monographic research, however, according to Andrews, it should be used within a particular group of workplaces, and not when selecting only a part of them.

The location coefficient method

The method is based on measuring the deviations from average values for a specific area (city, region or country). If the share of employees in a given type of activity in the city does not exceed the share of employees in this activity in the region (country), then they are included into the non-basic group. On the other hand, if the share of employees in the given type of activity in the city is greater than the share of employees in this activity in the region (country), then this surplus can be included into the basic group (they create the economic base). Within this method the location coefficient (LC), also called Florence's coefficient, is used as follows:

$$LC = [(E_aC) / (EC)] / [(E_aR) / (ER)],$$

where: E_aC – employment in activities "a" in a city (region),
EC – total employment in a city (region),
E_aR – employment in activities "a" in a region (country),
ER – total employment in a region (country),

- value of the LC greater than 1 means that a city (region) produces goods and makes services beyond local (regional) needs, i.e. it performs exogenous (basic) functions,
- in practice, it is assumed that only a value of 1.5 allows a given activity to be considered exogenous (basic) one.

The disadvantage of the location coefficient is that all the variables are given the same weight. Comparing urban employment structure to regional (national) employment structure, the LC ignores the absolute amounts of employment which

indicate the importance of a specific activity in a city's economy. The derivative of the location coefficient is the employee surplus index (presented above in the description of the residual method).

It is worth noting that in order to eliminate the values related to the city of a typical employment structure (e.g. highly specialised single-functional centres), Alexandersson adopted a percentage slightly higher than the absolute minimum. These are the percentages of employment that correspond to the fifth percentile cities, relative to the lowest value (the K coefficient).

Therefore, it can be concluded that the study of the economic base of a city or region in order to determine the relation between the basic group and the non--basic group is complicated and requires taking into account several conditions (Ullman & Dacey, 1960, pp. 175-194). First of all, this proportion varies over time and depends on the size of a city (region) and on the specific situation of a given country. Generally speaking, the larger the city (region), the bigger its economic base. The larger city, the more employment it requires in terms of its services (the non-basic, local group is growing). The decline in the size of the basic (export) group in a large city does not mean that its economic base is weakening. On the contrary, the economic base may even be strengthened as a result of qualitative changes in exogenous activity. This is because labour productivity growth allows to maintain and even increase production while decreasing employment.

Additionally, there are strategic significant activities with a large spatial range, which reinforce the economic base of big cities and decide about their dominant role in the socio-economic system of regions and states.

It should also be stressed that the popular model of regional growth was based on the idea of the economic base. The assumption of the model states that the rate of regional growth is a function of what a region exports, i.e. regional export (Domański, 2000, p. 200):

$$y_i = f(x_i),$$

where: y_i – production growth rate in region "i", x_i – regional export growth rate.

The value of the model, showing the openness of the region and the role played by supra-regional (domestic) demand in the regional growth, is reduced by a number of weaknesses. First of all, it ignores the importance of: technical progress, autonomous investments, accumulation of wealth in the region, and migration. Second, the ratio x: y is inversely proportional to the size of the region, as the export growth rate decreases as the size of the region increases. Small regions would have a higher export growth rate, which could increase artificially by shrinking the geographic area without changing actual exports. Thus, the model does not adequately reflect the situation of the regions.

Obviously, modern regions are becoming elements of the macrostructure, functioning in complex and constantly developing systems of mutual dependencies,

connections and flows. The dimension of interregional flows depends primarily on the specificity of exogenous functions of regional units. A region actually lives off the external demand, so the essence of its development is a problem of the absorption of exogenous money. A region's ability to keep external money in its territory is determined by the value of the regional multiplier (Z).

$$Z = NB/T$$

where: NB – level of activity in the non-basic sector of a region (measures: employment or monetary units), T – level of total activity in a region (measures: employment or monetary units).

The B/T ratio (or 1 – NB/T), i.e. the inverse of the regional multiplier, shows the level of money outflow from a region. The NB/T ratio can be also replaced by the Regional Spending Propensity (RSP). In order to correctly estimate the RSP, the outflow of money that is possible at every stage of the production and consumption process should be taken into account. Thus, not only money that flows into a region is important, but also, and perhaps above all, the spread effects of money in a region (the multiplier effect). The spread both of money and other intangible goods is supported by intense networking and accelerated by the diffusion of innovation (Czornik & Wrana, 2000, p. 28).

4. The economic base and functional structure of city (region)

The development of a free market economy in countries undergoing transformation and the deepening process of globalization have both created a new situation in the functioning of the whole settlement system. Even today, one can clearly see the ongoing changes and their effects on the functional structure of cities and regions. The systems operating in areas of intense industrialization undergo complete transformations, both in terms of functionality and space. The speed and range of these changes depend, among others, on factors such as (Liszewski & Maik, 2000, p. 313):

- the specificity of the old functional and spatial structure of an area;
- the type of new development functions;
- the size and location of raw material resources;
- the adopted concept of local and regional development.

However, the functional sphere is changing fastest. The emerging accumulation of functions means that, apart from the activities that have occurred so far, there are also new, traditional or completely original activities. In many large regions and old cities, a process referred to as function succession is also observed – the phenomenon of replacing subsequently dominant functions. Sometimes older central functions (e.g. agricultural or industrial) are completely replaced by more modern

ones, adapted to the requirements of a new economy (Batten & Johansson, 1989, pp. 1-44). This process, called process of functions mutation, may occur in two cases:

- when old functions completely disappear and new ones appear in their place (for example, unused resources of a given place or location conditions created by previously developed industry in this area are used);
- when old functions (types of activities) still exist, but have lost their original meaning in favour of new production areas, becoming basic (exogenous) functions or even transforming into non-basic (endogenous) functions.

The emerging new exogenous functions integrate the set of settlement units into one coherent, efficiently operating system (Poinsot & Ruault, 2019). To date, stabilised and homogeneous communities are transforming into heterogeneous communities with a strong share of an immigrant population. Changes in the morphology of territorial units and the spatial structure of settlement networks and systems are taking place with a certain delay. According to the assumptions of the economic base theory, employment in an exogenous (basic, export) group determines the functions of a city-region. The functions performed by this group are of fundamental importance for the open economy of the region. The identification of the proportions between the exogenous and endogenous functions and the comparison of the results to the selected basic quantities makes it possible to determine the degree of openness and closure of a region (Fajferek, 1990, p. 16).

The degree of openness is related to the size of the area and the regional community. The smaller the area and the community, the higher the degree of openness and employment in the exogenous sector. On the other hand, the internal division of labour usually increases, and the number of people working in non-basic activities increases, which means increasingly closing trade within the region. It is also believed that on average in a city with a million inhabitants, there are two employees from the endogenous (non-basic) group per one employee of the exogenous (basic) group (Słodczyk, 2001, p. 66). It is also assumed that ten new jobs in the basic sector generate twenty non-basic workplaces and an even greater increase in the urban population. Hence, the development of the basic functions determines a significant growth of the population and economic activity in a region. Thus, the determination of the size of the basic and non-basic groups in particular settlement units enables the characterisation of their functional structure and means that the importance of the economic base theory in this aspect is twofold:

- it determines the causations and relations occurring in urban and/or regional development, giving the basis for the claim that the functions of a city and/or region provided outside contribute to the emergence and development of a city--region;
- it is useful for the analysis of the functional structure of a city-region.

An interesting issue related to the functional structure of settlement units is the range of impact of individual functions. On the basis of this criterion, three sectors were distinguished in the open economy of regions (Domański, 1972, p. 72): the exogenous specialised sector (central economy), the exogenous standard sector (regional land management), and the endogenous sector (local land management and service activities of the central economy). The first sector consists of two parts: the basic one, whose functions are centrally divided (e.g. distribution of water resources or of qualified staff) and the complementary one, including plants cooperating in the production of primary products, and the plants processing these products or using them for more complex production. The functions of the exogenous standard sector are closely related to the needs of the economy and population of a region, hence the sector is egalitarian. Thus, the real development of a city-region is provided by exogenous functions, however, these must be distinguished from the dominant functions. Dominant features determine the importance of a given type of activity in the economic structure of a city-region, while the city-forming functions define the specialisation of a given unit in the socio-economic structure of a region or country. Such functions are only indirectly related to the city itself. They directly relate to the production or service activities of plants and institutions with their seat in the city. The third one, the endogenous sector, is characterised by a very high degree of internal differentiation and a small variability among cities. The reverse is true for the structure of the economic base. It was also determined by a high degree of internal diversity, although a high degree of variability among cities was observed. The model of socio-economic space is characterised by an evolution from less to more integrated structures. Cities with different types of functional specialisations not only have a various spatial structure, but also formulate diverse settlement systems on the meso scale and the macro scale. The identification of these dependencies in terms of dynamics is an open research problem.

It should be pointed out that city-regions with a diversified economic base, based on a greater number of city-forming functions and not merely on one, present a greater resistance to changes in the economic situation, and therefore are not as prone to stagnation as regions or cities dominated only by one leading function. The functional structure of a territorial unit significantly reflects its location in geographical space, i.e. its relations with the closer and further surroundings. The greatest threat to development resulting from the economic base theory may be the decline of the dominant industry or the withdrawal of strategic investment on which the economic development of a region is based. Therefore, the diversification of the economic base is recommended. Support for this process, as well as for the earlier restructuring of the regional economic base is aimed both at increasing the productivity and profitability of the existing branches of the regional economy, and also at promoting new forms of activity conducive to changing the economic image and enhancing employment in the region. The new activities are very often determined by innovative initiatives, whose significance in urban, and regional

development is growing. Innovative activities favour the diversification of the export base, a reduction of production costs, an increase of economic efficiency and the introduction of new products creating new demand. The correct relation in these processes also intensifies the economic base of cities and regions.

Thus, the results of research carried by the author prove that only this basic sector of a territorial unit in which key branches of high techniques, scientific researches and specialised services have been concentrated, keeps or increases its competitive advantage, and due to its strength and dynamics means that the territorial unit becomes a growth pole. In addition, exports make city-region more economically compacted and as a result its wealth is growing. It also plays an important role of basic activities generating regional total revenue and per capita revenue. If the region's revenues grow, incremental austerities create effects of spill-over on new kinds of activities, which first satisfy local demand but also irrevocably lead to an evolution of new export industries. Consequently, the regions' export base becomes more differentiated and loses its regional separateness. Yet, transformations in the basic sector do not occur too often and do not take a drastic course (based on the author's research study dedicated to districts in Lower Silesia). Undoubtedly, this simplifies the situation for local and regional authorities when making future decisions in relation to the directions and scale of changes taking place in the economy.

Additionally, the economic base analysis can be useful not only for big cities and their outskirts but also for small and poorly developed regions, especially if the following problems are taken into consideration (Illeris, 1996, pp. 267-285):

1. Degree of benefits resulting from the interaction of demand and supply.
2. Internal structure developing together with the region's growth.

Small markets enable development of some industries and a few enterprises merely during the period when modern, benefits-bringing technology requires the existence of many big companies in order to create benefits of the economy of scale and the acceleration of growth. Exports can be just a stimulus for increasing production in conditions of insufficient internal demand.

It is important to note that the biggest investments will be performed in high technology sectors. Then, in poor areas the high levels of exports of less developed sectors generating considerable profits will mean that, due to reinvestments, their production will grow but the traditional structure of the economy will be solidified. Such an approach to interregional (international) cooperation indicates that the benefits resulting from the change lead to the systems' petrifaction, and in long term to their polarisation.

The certain regularities established for big cities which suggest that their export base is dominated by the service sector not find confirmation for regions, sub-regions or administrative districts. The Lower Silesia case study showed that the basic sector of territorial units of NTS 3 and NTS 4 level has not yet been completely formed. The scale, dynamics and character of the changes of the basic sector of Polish regions

will be determined by the progressing process of globalization, internationalisation and integration. On the basis of these spatial processes of transformation of human needs and socio-economic structures, their gradual accumulation and periodical acceleration will take place.

5. Summary and conclusions

Growing competition and progressing glocalization have forced almost all territorial units to adopt a new model of operation based on networking, new technologies, creative branches and sustainability. As a result of the complex transformation in intensively industrialised areas, a new type of regional structures is being created, in which horizontal network connections play a dominant role. The exogenous (basic) potential, according to the economic base theory, improves the attractiveness of the entire region or city. The ability to cooperate, enabling the inclusion of specialised production structures of cities and regions in a global production network, increasingly determines sustainability in territorial units.

The contemporary openness of cities and regions quickly takes on universal dimension. The implications of globalization are also noticeable in shaping elements of the economic base. The economic base will begin to develop intensively, and its elements will work more effectively when the economy of a region/city is more open. Market leaders encourage other entities and branches to join a network, the principle of which is to maximise the benefits for network members from the entire set of locations in which they run their business. At present, transnational corporations are the strongest, and thus the most desirable entities of the global economy. They emerge stronger and stronger from all financial crises. They are the leaders of economic transformation, and break down barriers to international exchange. Their annual turnover is worth multi-billion dollars. Transnational corporations make possible the movement of resources and production and trade capacities, stimulate growth and economic efficiency, activate local markets by transferring new methods and models of operation, become carriers of progress, and to a large extent stimulate the development of science and technology, in other words integrate economies/markets of various countries or individual regions. Naturally, the benefits of their functioning are contrasted with the costs they bring for their host countries. In terms of the considered issues, it seems necessary not to evaluate the activities of transnational corporations in detail and to present the advantages and disadvantages, but rather to show their impact on the structure and dynamics of the economic base of city-regions. Undoubtedly, transnational corporations invest in a city or region, and contribute to changing the economic base of territorial units, especially in terms of quality. Nowadays the changes are mostly qualitative and rapid, while their interpretation so far by means of a continuous function is impossible. They should be considered in intervals, by formulating separately a different function for each dimension of the economic base.

The relations between the economic base of a city/region and spatial economic networks is clearly visible. The very assumption that the development of the basic (exogenous) sector of a city or region is possible thanks to dynamic exports proves that such development is not possible in an environment without the features of a network economy. The basic sector, in order to become a driver of urban or regional development, should be dominated by horizontal connections among stakeholders of a given territorial unit. It also results from the nature of the modern knowledge--based economy, in which intensively developing groups operating in accordance with the 'global mandate' policy are not oriented towards satisfying the needs of the internal market, i.e. they do not directly affect the non-basic (endogenous) group. Owing to high specialisation and cooperation with other urban (regional) groups they strive for global profit by focusing on the basic (exogenous) group, i.e. their economic base. With this in mind, the economic base theory still provides a powerful tool for identifying short-term local development factors, regional specificities, and ultimately helping to shape development policies.

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