

Economic Growth and the Standard of Living of Poland's Population: a Regional Approach

ZBYSZKO CHOJNICKI* and TERESA CZYŻ,* Poznań, Poland

Abstract: This article presents an analysis of the relationship that occurs between the level of economic growth and the standard of living of Poland's population, using a regional approach. As an indicator of the degree of economic development national income is adopted. The social aspect of regional development is characterized by means of an analysis of the structure of the standard of living expressed in terms of two principal components, representative of a set of 34 empirical indicators. Interest is centred on the spatial interdependence between the value of net output in a regional pattern and the structure of the standard of living expressed in terms of the first principal component. This first component includes the main elements which affect the quality of people's lives, but it refers primarily to highly urbanized regions. In the light of the obtained results it can be stated that the influence of economic growth on the standard of living exhibits clear regional variations, with the relation assuming different forms depending on the structure of the standard of living. It seems that, although economic growth is closely connected with the quality of life, its impact is modified by regional conditions and resources, i.e. by the way a combination of socio-economic development factors is fitted into the situation of particular regions.

Introduction

Both economic growth and changes in people's living standards are the main elements contributing to socio-economic development. Generally, development is a sequence of long-term changes in the structure of phenomena comprising consecutive phases of transformations, which can be both progressive and regressive. The concept of social development denotes changes in the socio-economic structure, but it also has an evaluative meaning connected with the concept of progress. Progress implies an evaluation of changes from the point of view of adopted criteria. It reflects a 'human measure of things' rather than objective properties of the world. This allows the creation of different concepts of progress, and, hence, of different concepts of social development.

The traditionally accepted principal criterion of progress is economic development, measured by quantitative categories of material production. Hence, our considerations focus on economic growth understood as the quantitative increase in production in the form of increases in total output or national income.

Such an understanding of development, justified in the phase of initial industrialization, must change now to embrace not only economic growth but also to include social progress, especially the improvement of the population's standard of living.

The concept of the standard of living is particularly difficult to define on account of its normative character and its relativity to a specific social system in which an individual's needs are formed and undergo constant evolution. Attempts to categorize the level or standard of living in a holistic manner demonstrate its complex and relative character and

*Institute of Socio-Economic Geography and Spatial Planning, Adam Mickiewicz University, Poznań, Poland.

the serious difficulties encountered in its investigation.

Our studies adopt a regional approach to the relationship between the level of economic growth and people's living standards. These constituent parts of socio-economic development represent its two extreme aspects which, though interrelated, do not develop parallelly. This may be due to the fact that economic growth determines first of all those elements of the standard of living which concern material production, and only to the extent that it corresponds to the production structure and the distribution of national income. The influence of economic growth on other elements in the quality of life is not direct and takes the form of feedback relations between the two constituents. This especially concerns the satisfaction of such existential needs as health and environmental quality, broadly understood needs appearing in personality development, such as education and access to information, and finally social needs, particularly the need to participate.

Thus, although the level and structure of economic growth define the level and structure of the quality of life, the influence is differentiated according to the elements of each of these constituents and according to the regional pattern of the country.

The formation of these dependences in the regional pattern of the country is the subject of the present study. What we aim to do is to explore the regional variation in the influence of the level of economic development on the standard of living of the inhabitants of Poland at the stage of its development reached by the late 1970s.

Fundamental difficulties were experienced in carrying out such studies due to the lack of proper empirical data, especially on regional indicators of people's standard of living. Studies based on available data reflect those aspects of socio-economic development which have been considered to be important for the analysis of economic development and for which a demand was created for this type of data. Nevertheless we use them, in spite of their limited character, to elucidate the problem, even if only approximately.

Indicators

The level of regional development is a property

inaccessible to direct observation and hence measured by means of empirical indicators.

As an indicator of the degree of economic development (economic welfare) national income is accepted. It is an unambiguous measure, generally taken to be a relevant one, defining the value of net product in a given period. The regional distribution of national income generated depends on the spatial distribution of production and on the degree of utilization of factors of production in each region. Hence, the important thing here is not only the general volume of manufacture but also its branch structure and the productivity of labour in the sphere of material production. In the present study we use the indicator of the value of net output per inhabitant of a region (voivodeship).

The characterization of the social aspect of regional development is given in the form of an analysis of social welfare, or the population's standard of living. Indicators of living standards are grouped in classes, with the indicators of particular classes measuring different aspects of the standard. On the basis of the present output of social pretheory, the following constituents (dimensions) of the standard of living can be distinguished [cf. SMITH (1977)]: (1) nutrition, (2) housing, (3) health, (4) education, (5) leisure and recreation, (6) social security, (7) social stability, (8) natural environment, and (9) surplus income. The particular dimensions of the standard of living are identified by means of empirical indicators.

An indicator is understood here as information about a phenomenon whose occurrence either implies the occurrence of another phenomenon, called an indicatum, or merely increases its probability. The problem of an unequivocal assignment of empirical indicators to particular aspects of the quality of life has not yet been solved and poses numerous difficulties. Its solution may be attempted in two ways. The first approach assumes that the indicators should follow directly from a sociological-economic theory determining their significance. However, no concrete proposal has been put forward so far concerning a system of indicators for the standard of living based on theory. Therefore, a different approach is taken in practice, namely a set of indicators are put forward based on the common perception of their significance. Frequently, though, this approach is determined by the availability of statistical data. Thus, the question of the significance of indicators of the

standard of living is still left open. For instance, it is hard to determine whether the saturation of households with TV sets is a better indicator of participation in cultural pursuits than press readership or any other measure which is related to the concept of participation in culture.

In this situation the most convenient procedure is to define the indicatum by means of a cluster of indicators. As a result, a large set of data is produced, which necessitates a choice of representative indicators, and here again a search is started for a theory that would justify the choice. If there is no theory to be found, the representativeness of the indicators is determined by statistical methods.

The study of statistical representativeness in turn concerns two situations. In the first it is assumed that if indicators pertaining to an aspect of the standard of living (e.g. wealth) are highly intercorrelated, it means that they duplicate information and their number should be reduced. In the other situation, a large variety of indicators is chosen indicating completely different phenomena. If the indicators are highly intercorrelated, they must be parts of a pattern of regional development common to most regions and form a pattern representative of the standard of living [cf. TABIN (1983)].

In the present work the algorithm for the choice of indicators for the standard of living in the regions of Poland is a two-step one and is based on two criteria: their subject and their statistical significance. The indicators have been chosen to characterize, in the most exhaustive way possible, all those aspects of living standards in Poland which are currently taken to be significant and measurable. Thus we have obtained a set of 34 indicators in 49 regions (voivodeships) for eight constituents of the standard of living (Table 1 and Figure 1). However, because of the limited scope of data by regions in official Polish statistics, which were the sole source of information, the set of indicators and constituents is not complete.

The following drawbacks in the measurement of the standard of living resulting from lack of data should be pointed out:

- (1) such constituents of the standard of living as leisure and recreation or social security have not been considered;
- (2) the analysis does not cover purely sociological

indicators, e.g. those describing the state of regional awareness, satisfaction with interpersonal relationships etc.;

- (3) particular elements of the quality of life are described by indicators with varying degrees of precision. Thus, housing is described by means of eight indicators, while health or social stability are indicated by only three. This variation has got nothing to do with an attempt to weight particular elements, but merely results from data availability.
- (4) the subset of indicators describing constituents of the standard of living most frequently include those that concern certain inputs (e.g. hospital maintenance) rather than social outputs (e.g. the population's health).

As a result, the set of data characterizes some rather isolated fragments of the multi-faceted social life of the regions, allowing no transition from one fragment to another. Naturally, this will cause the measurement and analysis of interdependences among elements of the standard of living to be fairly complex.

In order to determine the representativeness of the proposed indicators of the standard of living in statistical terms, correlation analysis and principal components analysis are used to reduce the multi-indicator pattern into a set of representative indicators. The reduction of the set of indicators to a subset of representative indicators means defining the structure of phenomena constituting the standard of living in terms of significant dependences.

The principal components analysis carried out for the set of 34 indicators of the standard of living for 49 voivodeships (according to 1979 data) allows a reduction of this set to a pattern of the first two components accounting between them for 56% of the total variance of the indicators. The first component (V_1) takes 42.93%, while the second (V_2) accounts for 13.11% of the variance. On the basis of the analysis of coefficients of correlation between the components and the indicators, a close association of the first component with the greatest number, 21, of elements of the standard of living can be established. These are as follows (the leftmost number is that of the indicator, the number in brackets gives the value of the correlation coefficient) (see List 1).

The character of the first component is very diverse: it contains indicators representing all the con-

Table 1. Constituents and indicators of the standard of living

Access to services	
(1) Total area of retail outlets in socialized market trade per 1000 population (in m ²)	
(2) Services rendered to the population per inhabitant (in zlotys)	
(3) Area per post- and telegraph office (in km ²)	
Housing	
(4) Habitable rooms completed per 1000 population	
(5) Dwellings completed per 1000 marriages	
(6) Members of housing co-operatives waiting for dwellings	
(7) Households per 1000 urban dwellings	
(8) % of urban population provided with water-supply installations	
(9) Urban dwellings provided with bathrooms (% of total number of dwellings)	
(10) Electric power consumption in urban households per consumer (in kWh)	
(11) Electric power consumption in rural households per consumer (in kWh)	
Health	
(12) Physicians per 10,000 population	
(13) Beds in general hospitals per 10,000 population	
(14) Infant deaths per 1000 live births	
Education	
(15) Pupils per teacher in primary schools	
(16) Pupils of vocational schools per 1000 population	
(17) Pupils of general secondary schools per 1000 population	
(18) Population 15 years old and over with higher education (% of total population)	
Culture	
(19) Public library readers per 1000 inhabitants	
(20) Sales of newspapers and periodicals per inhabitant (in copies)	
(21) Seats in stationary cinemas per 1000 population	
(22) TV sets per 1000 population	
Wealth	
(23) Retail sale of goods in socialized shops per inhabitant (in thousand zlotys)	
(24) Privately owned cars per 1000 population	
(25) Telephones per 1000 population	
(26) Savings deposits in the Polish Savings Bank (PKO) and co-operative banks per inhabitant (in zlotys)	
Social stability	
(27) Divorces per 10,000 population	
(28) Live extramarital births	
(29) Adults sentenced by common courts	
Ecological conditions	
(30) Population density per km ²	
(31) Industrial and communal sewage discharged into surface waters, untreated though requiring treatment (in million m ³)	
(32) Emission of gas pollution (in thousand t)	
(33) Accumulated industrial wastes harmful to the environment (in thousand t)	
(34) % of afforestation	

Sources: Central Statistical Office, Warsaw (1980): *Rocznik Statystyczny 1980 (Statistical Yearbook 1980)*, *Rocznik Statystyczny Województw 1980 (Statistical Yearbook of Voivodeships 1980)*, and *Rocznik Demograficzny 1980 (Demographical Yearbook 1980)*.

**Figure 1.** The regional (voivodeship) pattern.**List 1.**

(20) Sales of newspapers and periodicals	[-0.94]
(23) Retail sale of goods	[-0.91]
(18) Persons with higher education	[-0.88]
(2) Services rendered to the population	[-0.88]
(24) Privately owned cars	[-0.87]
(25) Telephones	[-0.86]
(12) Physicians	[-0.85]
(27) Divorces	[-0.85]
(29) Adults sentenced by common courts	[-0.85]
(28) Extramarital births	[-0.82]
(22) TV sets	[-0.81]
(26) Savings deposits	[-0.79]
(13) Hospital beds	[-0.78]
(31) Industrial and communal sewage	[-0.77]
(30) Population density	[-0.73]
(6) Members of housing co-operatives waiting for dwellings	[-0.66]
(15) Pupils per teacher	[-0.62]
(8) Urban population provided with water-supply installations	[-0.62]
(17) Pupils of general secondary schools	[-0.56]
(3) Area per post-office	[+0.56]
(9) Urban dwellings provided with bathrooms	[-0.47]

stituents of the standard of living. The indicators, however, are characteristic first of all of the living standards of the populations in the highly urbanized regions of Poland. Thus the first component selects a subset of indicators that is highly representative of

the population's standard of living.

The second component is significantly correlated with only six indicators describing four constituents of living standards (see List 2).

List. 2.

Housing		
(4) Habitable rooms completed		[+0.62]
(5) Number of dwellings completed in relation to number of marriages		[+0.74]
Culture		
(21) Seats in cinemas		[-0.51]
Ecological conditions		
(32) Emission of gas pollution		[+0.65]
(33) Accumulated industrial wastes harmful to the environment		[+0.61]
Access to services		
(1) Area of retail outlets		[-0.55]

The character of the second component is mainly determined by four indicators (4, 5, 32 and 33). This component accounts for 38–55% of the variance of each of the four indicators. It is a component of residential construction development (indicators 4 and 5) and of environmental pollution as measured by gaseous emissions and industrial waste (indicators 32 and 33). With its positive correlation with both the indicators of residential construction development (symptoms of a rising standard of living) and those of environmental pollution (symptoms of a deteriorating quality of life), the second component has a composite, dichotomic structure, which, however, cannot be split into elementary constituents.

Taking into account the fact that the second component contains opposing phenomena connected with high and low living standards it cannot be treated as a criterion of a dichotomic classification of regions by their standards of living.

It should be pointed out, however, that the patterns of the co-occurrence of phenomena covered by the second component, affecting the quality of life positively (residential construction development) and negatively (environmental pollution), find reflection in the socio-economic reality of Poland. The coincidence of these phenomena is characteristic of some industrialized areas and those undergoing industrialization (e.g. the Katowice, Cracow, Konin or Tarnobrzeg voivodeships), because the government's economic policy gives clear priority to directing residential construction to those regions with industrial investments.

In this situation, only the first component, accounting for 43% of the variance of the whole set of indicators, should be recognized as the basic

measure of the regional differentiation of Poland as far as the standard of living is concerned.

Economic Growth as a Factor Determining the Level of Living

In order to verify the hypothesis that the economic development of a region is the most important factor affecting people's standard of living, the spatial relationship between per capita net output in the regional pattern and the structure of the standard of living as expressed by the first component is investigated. The spatial distribution of the indicator of net output per inhabitant of a region is given in Figure 2. The indicator values differ widely and range from 79,000 zlotys (the Plock voivodeship) to 23,000 zlotys (the Nowy Sącz voivodeship). The highest values (60,000–80,000 zlotys per person) are characteristic of two complexes of voivodeships: (1) Warsaw, Plock and Łódź; and (2) Katowice and Bielsko Biala. High values of the indicator are found in the voivodeships of Cracow, Gdańsk, Poznań, Szczecin, Zielona Góra and Wrocław. Middle values (40,000–50,000 zlotys) occur in only nine voivodeships, those constituting a compact belt in south-western Poland (the Jelenia Góra, Legnica, Wałbrzych, Opole and Częstochowa voivodeships) as well as those of Bydgoszcz, Olsztyn, Białystok and Rzeszów. From among the remaining 29 voivodeships in which per capita net income is below the regional average, the lowest values characterize those of Nowy Sącz, Ciechanów, Biała Podlaska, Ostrołęka, Łomża, Suwałki and Skierniewice. The distribution of the values of per capita net output shows a highly significant correlation with all the 21 indicators forming the structure of the standard of living in the pattern of the first component (see Table 2). However, in a spatial approach one can notice both close similar-

Table 2. Coefficients of the correlation of net output with empirical indicators of the standard of living

Indicator	Correlation coefficient*
1	
2	0.6440
3	-0.6050
4	
5	
6	0.6475
7	
8	0.4471
9	0.4502
10	
11	
12	0.6666
13	0.5532
14	
15	0.5079
16	
17	0.3954
18	0.6771
19	
20	0.6322
21	
22	0.6181
23	0.5929
24	0.6228
25	0.5821
26	0.5081
27	0.6874
28	0.5782
29	0.6246
30	0.7024
30	0.6096
32	
33	
34	

*Significant at $\alpha=0.05$ level.

ities and marked differences in the income distribution in comparison with the spatial variation in the standard of living as measured on the scale of the first component (see Figures 2–4).¹ Distinct differences in the positions on the scale of net output and that of the standard of living (the first component) can be noticed in the case of the following voivodeships:

- (1) the voivodeships of Bielsko Biala and Plock belong to those with the highest incomes and only medium (Bielsko Biala) or below-medium (Plock) standards of living;
- (2) the voivodeships of Koszalin, Słupsk, Leszno and Elbląg with low incomes move markedly up the scale of the standard of living (on account of service development) to reach a medium

- (3) the voivodeships of Krosno, Tarnobrzeg, Tarnów and Piotrków Trybunalski are even lower on the scale of living standards (which corresponds to their low values) than on the scale of net output (in the below-medium class of values).

There is an almost exact correspondence between the positions on the scale of living standards and that of economic development in the case of the following voivodeships:

- (1) in the group of highly developed areas: the Łódź, Warsaw, Katowice, Cracow, Gdańsk, Poznań, Szczecin and Wrocław voivodeships;
- (2) in the group of those at a medium level of development: the Legnica, Wałbrzych and Opole voivodeships;
- (3) in the group of poorly developed areas: the Biała Podlaska and Łomża voivodeships.

The above comparative analysis shows that the ordering of the regions on the scale of economic development results primarily from the degree of their industrialization, while the ordering on the scale of the standard of living (the first component) is closely connected with the degree of their urbanization. The shifts on the social development scale as compared with the economic development scale characterize first of all those voivodeships in which there is a distinct divergence between the degree of urbanization and that of industrialization [cf. KUKLIŃSKI and NAJGRADOWSKI (1979)]. The group includes voivodeships more intensively industrialized than urbanized: Plock, Bielsko Biala, Krosno and Tarnów (shifts down the scale), as well as those in which there is a relative dominance of urbanization over industrialization: Koszalin, Elbląg, Leszno and Słupsk (shifts up the scale). Thus, in Poland higher living standards are associated first of all with a higher level of urbanization rather than industrialization. Since the process of a region's industrialization is accompanied by a relatively retarded process of urbanization, there is quite a considerable divergence in their spatial patterns.

Thus, as the obtained results prove, the influence of economic growth measured by the value of national income on the living standards of the population is subject to clear regional variation, with the relationship assuming different forms depending on the

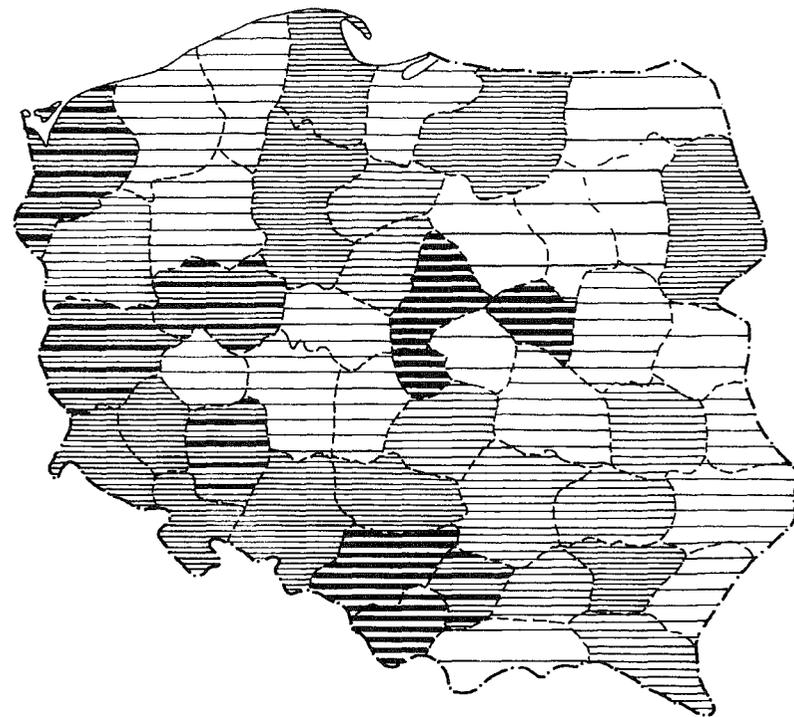


Figure 2. Per capita net output (in thousands zlotys).

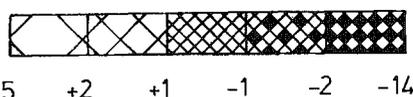
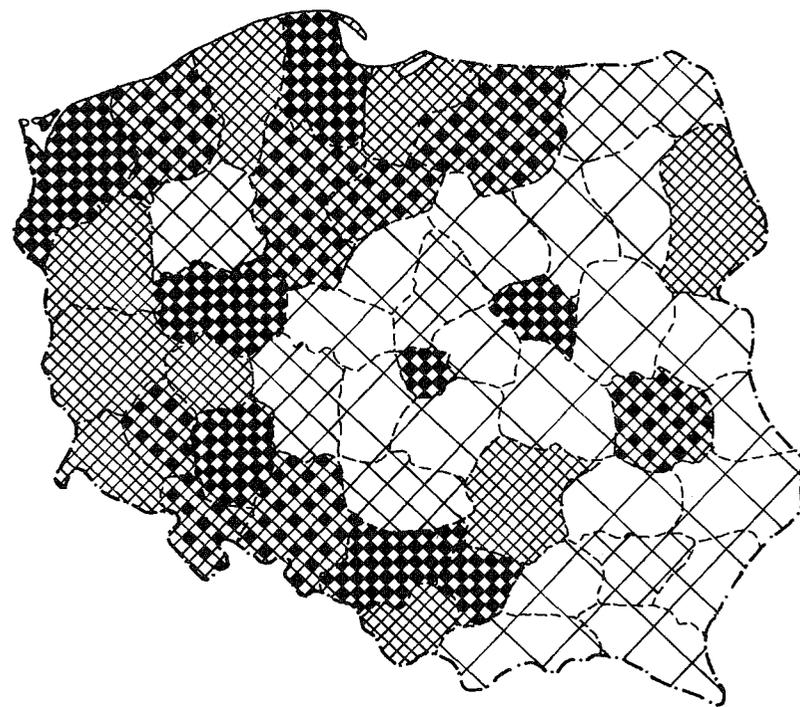


Figure 3. Voivodeship differentiation in terms of the first principal component of the standard of living.

ranking of voivodeships
by per capita net output

ranking of voivodeships
by standard of living
(first principal component)

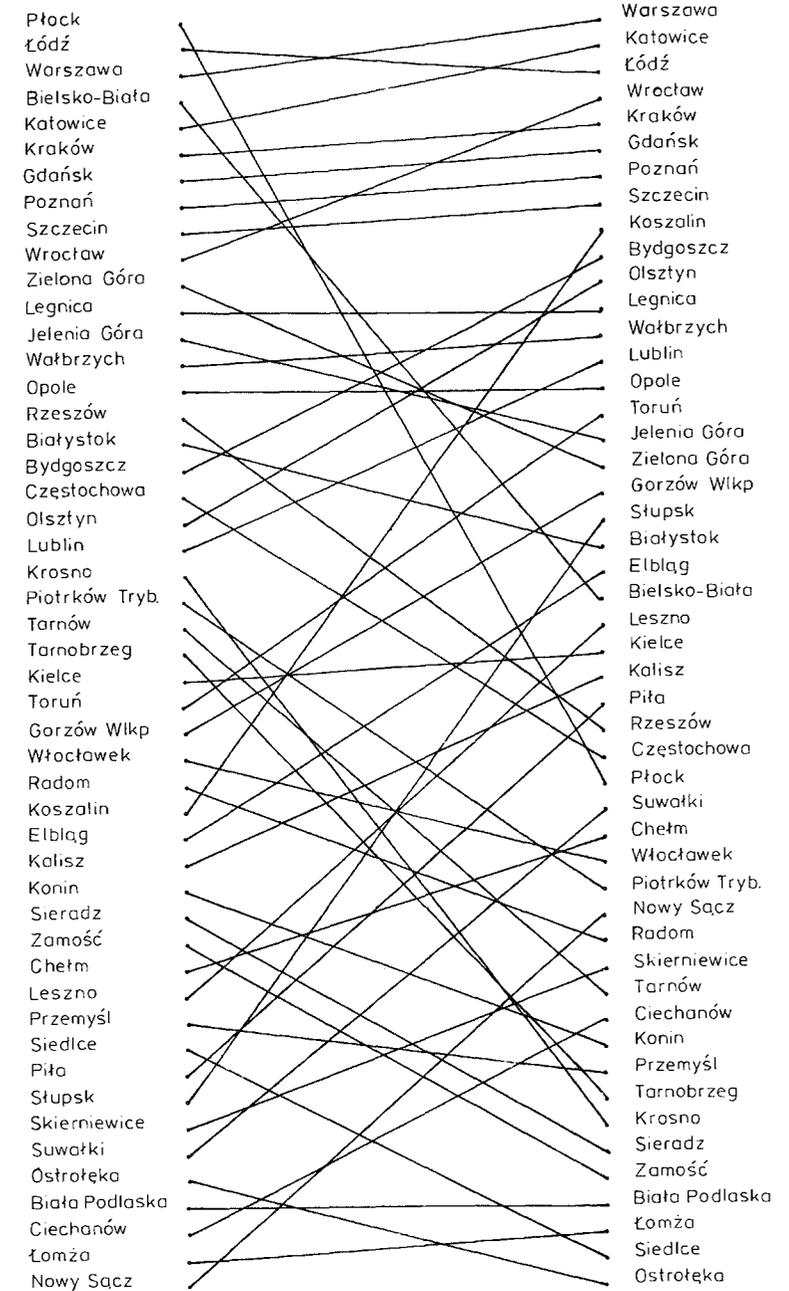


Figure 4. Shifts of voivodeships on the scale of the standard of living (first component) against their positions on the scale of net output.

structure of the population's standard of living. Its variation takes the form of the first component, which is highly representative of the main elements of people's living conditions, though it primarily concerns highly urbanized regions. It seems that, although economic growth markedly affects the

standard of living, the influence is modified by the conditions and resources of regional subsystems, i.e. by the way a combination of socio-economic development factors is fitted into the situation of particular regions. Both, explanation and practical control of these relationships require the under-

standing of those conditions or properties of the regional subsystems which affect them, positively or negatively. Only then is a response to undesirable tendencies made possible.

Note

1. In the procedure of linear ordering of the voivodeships by the values of the first component, it is assumed that the direction of the scores on the component scale is such that high (positive) scores will indicate low living standards.

References

- KUKLIŃSKI, A. and NAJGRAKOWSKI, M. (1979) Industrializacja, urbanizacja i rozwój regionalny w Polsce (Industrialization, urbanization and regional development in Poland), *Miasto*, **1-2**, 4-16.
- SMITH, D. M. (1977) *Human Geography. A Welfare Approach*. Edward Arnold, London.
- TABIN, M. (1983) Wskaźniki społeczne (Social indicators), *PAN Komitet Badań i Prognoz Polska* 2000, **1**, 9-25.