

Relationships of urban agglomerations in the National Settlement System: a Polish case study

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Palabras clave:

Aglomeración urbana; Polonia; sistema de población.

The problem

It is widely accepted in the literature that urban agglomerations, which in the Polish literature are conceptually close to American metropolitan areas, play an important part in the national settlement system. A question, however, arises whether they should be considered in terms of a common subsystem within the national settlement system or as compared within their individual regional settlement systems. Starting from morphology of the agglomerations, especially from their observed sectoral development, as following bands of transportation and communication infrastructure, it was concluded that the development was related to the replacement of neighbouring agglomerations. On this basis, a conclusion was made that the agglomerations must be strongly interrelated. Further on, a hypothesis was put forward that agglomerations form an integrated subsystem within the national settlement system (Korcelli, 1976). A test of whether or not urban agglomerations can be considered in terms of a common subsystem should be, however, supported by an investigation of whether their interrelationships are more important than relationship of each of them with its umland. To answer this question would allow to conclude whether changes in the Polish settle-

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ment system drive at development of one super-agglomeration, as Leszczycki (1973) maintains, or of a system of urban regions with agglomerations being centres of some of them, as Dziewoński (1972, 1973) argues. An analysis of Polish regional structure indicated that agglomerations are entities of a regional rather than national scale; this allowed to hypothesize that relationships of individual agglomerations with their regions are stronger than those between the agglomerations (Rykiel, 1978). To test the hypothesis vectoral, data should be used which would allow to distinguish relationships within the hypothetic subsystem of agglomerations, those between individual agglomerations and their respective regions, and those with the rest of Poland.

Identification of areal units

Nine Polish urban agglomerations were identified for this analysis (Warsaw, Cracow, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, and Bydgoszcz), i.e. those which had been identified in the National Plan of Physical Development till 1990 as developed agglomerations (Plan..., 1974). The developing agglomerations as identified in the Plan are argued here to belong to the future rather than contemporary settlement system and thus not be analyzed herein. The same applies to the potential agglomerations as identified in the Plan which must have been based on rather unclear criteria of identification. As cores of the agglomerations, 7 individual cities were taken while in cases of Katowice and Gdańsk complexes of 13 and 3 cities, respectively, were identified. Outer rings of the 9 agglomerations were ad hoc delimited with towns and communes taken as basic areal units. The proposed delimitation (fig. 1) differs in details from those provided in finer approaches (Iwanicka-Lyra, 1969; Gontarski, 1980), and, like any other, could be criticized as arbitrary. In doing this, it must be kept in mind, however, that it was not the delimitation that was a scope of the analysis; rather, the delimitation was only a means which made possible to measure a spatial scale of interactions of the agglomerations involved.

As a first approach to delimitation of regions of the 9 centres, i.e. the cores of the agglomerations, commuting sheds of the centres were taken as based on 1973 data with modifications concerning changes of basic areal units till 1978. The commuting sheds of each of the centre analyzed comprized spatially contiguous basic units with 10 or more out-commuters to the city. In cases of overlapping sheds they were separated on the basis of the prevalent interaction. Yet any regional delimitation should be based not so on the range of influence of the regional centre in an open space but rather in the space which is relatively closed by influences propagated from competitive regional centres. Region is therefore said to be identified on the basis of relative closure of relationships which are recognized to be characteristic of it (Dziewoński, 1967). The influence of the 30 competitive regional centres, the figure being identified on the empirical ground (Rykiel, Zurkova, 1981), should be therefore taken into account in order to define urban regions of the 9 analyzed cores of agglomerations. Firstly, from the commuting sheds of the cores of agglomerations, those areas should be excluded which were more strongly related to any of the 30 regional centres. Secondly, areas being situated beyond the 39 commuting sheds (i.e. those of both the cores of agglomerations and regional centres) were included to urban regions on the basis of their migratory gravitation. In this way, 39 Polish urban regions were identified of which, however, only 9 are interesting for further analysis (fig. 1). They are somewhat different from the 47 regions identified by Korcelli, Petrykowska and Bodzak (1981), which did not exhaust the national territory.

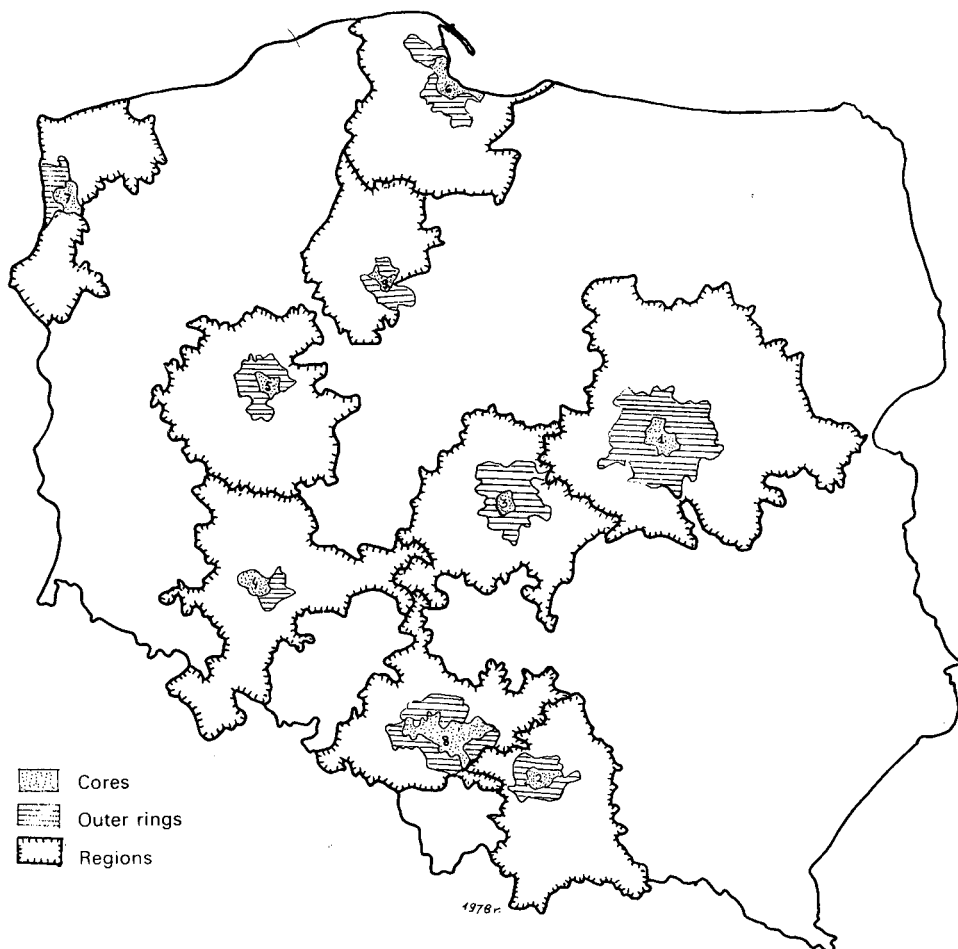


Figura 1. Polish urban agglomeration and their regions. 1, Warsaw; 2, Cracow; 3, Łódź; 4, Wrocław; 5, Poznań; 6, Gdańsk; 7, Szczecin; 8, Katowice; 9, Bydgoszcz.

Relationships of urban agglomerations in the national settlement system were analyzed as based on migration. The latter was defined as crossing of administrative boundary of communal and/or municipal level. The 1978 data were used.

Analysis of relationships

Out of the relationships of urban agglomerations within the national settlement system, it is some 1/8 only that is accounted for by those with other agglomerations, some 1/3 by those of the agglomerations with their respective regions, and over 1/2 with the rest of Poland (the other 38 regions but 8 agglomerations). The share of the hypothetic subsystem of agglomerations in the turnover of individual agglomerations is rather similar (table 1). On the contrary, shares of intra-regional relationships are more

TABLE 1. Spatial pattern of migratory relationships of Polish urban agglomerations, 1978, total

Relationships with % Agglomerations	Other agglomerations	Own region	Rest of Poland
Warsaw	12.1	41.2	46.7
Łódź	12.9	41.1	46.0
Cracow	14.6	42.7	42.7
Wrocław	10.3	35.1	44.6
Poznań	10.5	43.7	45.8
Gdańsk	12.0	31.6	57.0
Szczecin	14.3	22.5	63.2
Bydgoszcz	12.3	34.1	53.6
Katowice	9.4	19.1	71.5
9 agglomerations	12.2	31.9	55.9

differentiated, with especially small proportion in cases of Katowice and Szczecin agglomerations; even there, however, they are responsible for a proportion roughly double as large as that accounted for by relationships with other agglomerations. The strongest relationships of agglomerations apply, however, to the rest of Poland; they comprise 2/3 of relationships of Szczecin agglomeration and nearly 3/4 of Katowice agglomeration; it is only in the case of Cracow that they are equally important as the intra-regional relationships.

The generalized pattern pointed to above differs for different categories of migrants analyzed. In this paper, four education categories of migrants were analyzed, as existent in the Polish education system, viz. primary, post-primary skilled, secondary, and tertiary. When flows of the primary educated are concerned the importance of the system of agglomerations decreases to 1/13, and it is only in cases of Cracow and Szczecin

TABLE 2. Spatial pattern of migratory relationships of Polish urban agglomerations, 1978, the primary educated

Relationships with % Agglomerations	Other agglomerations	Own region	Rest of Poland
Warsaw	7.2	48.9	43.9
Łódź	7.3	48.6	44.1
Cracow	10.6	47.4	42.0
Wrocław	7.8	36.5	55.7
Poznań	6.7	50.4	42.9
Gdańsk	7.6	36.1	56.3
Szczecin	10.4	21.3	68.3
Bydgoszcz	8.1	39.5	52.4
Katowice	6.3	18.5	75.2
9 agglomerations	7.6	36.7	55.7

TABLE 3. Spatial pattern of migratory relationships of Polish urban agglomerations, 1978, the post-primary educated skilled

Relationships with % Agglomerations	Other agglomerations	Own region	Rest of Poland
Warsaw	7.6	50.9	41.5
Lódź	9.9	43.9	46.2
Cracow	10.2	53.3	36.5
Wrocław	7.3	41.7	51.0
Poznań	7.0	54.4	38.6
Gdańsk	8.9	33.6	57.5
Szczecin	10.2	25.2	64.6
Bydgoszcz	8.5	43.7	47.8
Katowice	6.7	17.9	75.4
9 agglomerations	8.1	36.4	55.5

cin agglomerations that it exceeds 1/10. The share of intra-regional relationships slightly increases in general, yet in cases of Szczecin and Katowice agglomerations it decreases. It is to this spatial scale that majority of relationships fall in cases of Cracow, Lódź and Warsaw agglomerations, as well as of Poznań for which it makes an absolute majority (table 2).

As far as the post-primary educated skilled are concerned the share of relationships between agglomerations increases to 1/12 while in cases of Cracow and Szczecin agglomerations the higher proportion maintains (table 3). In cases of Poznań, Cracow and Warsaw agglomerations, it is by the respective regions that absolute majority of migration is accounted for; in cases of the other agglomerations, it is the rest of Poland that accounts for the majority, although it is relative majority in cases of Bydgoszcz and Lódź agglomerations.

TABLE 4. Spatial pattern of migratory relationships of Polish urban agglomerations, 1978, the secondary educated

Relationships with % Agglomerations	Other agglomerations	Own region	Rest of Poland
Warsaw	14.0	37.0	49.0
Lódź	5.1	40.6	54.3
Cracow	14.5	38.3	47.2
Wrocław	12.0	31.3	56.7
Poznań	12.5	37.4	50.1
Gdańsk	15.2	23.6	61.2
Szczecin	16.9	21.8	61.3
Bydgoszcz	15.4	25.8	58.8
Katowice	12.4	19.0	68.6
9 agglomerations	11.9	27.5	60.6

In the case of the secondary educated, the share of migration between agglomerations increases to 1/8 but decreases to 1/20 in the Łódź case. The share of intra-regional relationships decreases so that it does not exceed 2/5 of the total, Łódź being the only exception, yet in any single agglomeration it is considerably greater than that of migration between agglomerations. What prevails in this category of migrants are relationships with the rest of Poland which merely in the Warsaw and Cracow cases do not reach 1/2 of interactions (table 4).

When the tertiary educated concerned (table 5), the share of relationships between agglomerations increases to 1/6, but in the Katowice case decreases to 1/14. It is for this category of migrants that relationships between agglomerations play a relatively most important part, although in no single case comprise they 1/5 of the respective total. Intra-regional links are more important, yet it is relationships with the rest of Poland that dominate; in the case of Katowice agglomeration they account for over 4/5 of migration.

TABLE 5. Spatial pattern of migratory relationships of Polish urban agglomerations, 1978, the tertiary educated

Agglomerations \ Relationships with %	Other agglomerations	Own region	Rest of Poland
Warsaw	16.5	34.1	49.4
Łódź	17.0	35.7	47.3
Cracow	19.2	37.7	43.1
Wrocław	12.3	33.7	54.0
Poznań	13.4	39.4	47.2
Gdańsk	14.8	33.6	51.6
Szczecin	18.2	22.7	59.1
Bydgoszcz	15.9	28.2	55.9
Katowice	7.0	12.2	80.8
9 agglomerations	18.5	29.4	52.1

Conclusions

The present analysis indicated that in migratory relationships of urban agglomerations, a dominant part is played by extra-regional links directed to areas outside the 9 agglomerations. The second position is occupied by intra-regional links while inter-relationships of the agglomerations occupy the third place. The role of flows between agglomerations increases, in general terms, when the education level of migrants involved increases although individual agglomerations possess regularities of their own, e.g. exceptionally small role of flows between agglomerations for the tertiary educated in the Katowice case, and for secondary educated in the Łódź case.

In table 6 categories of migrants were shown as most characteristic of individual spatial scales of interactions of agglomerations. Of migration between agglomerations the tertiary and secondary educated are characteristic; of flows between agglomerations and their respective regions — the post-primary skilled and primary educated; of those between agglomeration and the rest of Poland —, the secondary and tertiary educated.

TABLE 6. The categories of migrants, as defined by education levels, prevailing in individual spatial scales of migratory relationships of Polish urban agglomerations, 1978. 1. The primary educated; 1a. the post-primary skilled; 2. the secondary educated; 3. the tertiary educated

Relationships with % Agglomerations	Other agglomerations	Own region	Rest of Poland
Warsaw	3	1a	3, 2
Łódź	3	1	2
Cracow	3	1a	2
Wrocław	3, 2	1a	2
Poznań	3	1a	2
Gdańsk	2	1	2
Szczecin	3	1a	1
Bydgoszcz	3, 2	1a	2
Katowice	2	1	3
9 agglomerations	3	1, 1a	2

Generally therefore, in intra-regional migration the lower educated prevail; and in extra-regional migration, the higher educated. Of individual agglomerations, however, distinctive particularities are characteristic in this respect. This, and even more the fact that interrelationships of agglomerations account for a slight proportion of migration concerning the agglomerations imply that urban agglomerations could be hardly said to form an integrated subsystem within the national settlement system; rather, they are strong regionally rooted, it can be therefore argued they are comprised in their respective regional settlement systems. Additionally, a considerable share of their relationships with the rest of Poland implies their considerable integration with the national system as a whole.

Results of the analysis have significant plannistic implications. Planning on the scale of agglomerations, although desirable, seems insufficient; what seems necessary is to relate this scale of planning with that on the regional scale. It is especially important in case of planning of social infrastructure and capacity of respective networks, which should be balanced with demand on the regional scale rather than merely those within agglomeration.

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Resumen: Relación de las aglomeraciones urbanas en un sistema de asentamiento nacional. El caso de Polonia.

Se han previsto hipótesis sobre aglomeraciones urbanas dentro de un sistema de asentamiento nacional. En el trabajo se ha planteado la hipótesis de que las aglomeraciones forman un subsistema integrado dentro del sistema de asentamiento nacional polaco.

Los resultados indican que las aglomeraciones individuales están fuertemente arraigadas en sus respectivas regiones y, adicionalmente, integradas con el sistema nacional, como un todo. Las interrelaciones de las aglomeraciones son demasiado difíciles para confirmar las hipótesis.

Resumé: Rapport des agglomérations urbaines dans un système d'emplacement national. Le cas de la Pologne.

On a prévu des hypothèses sur des agglomérations urbaines dans un système d'emplacement national. Dans le travail on a pensé l'hypothèse qui formule la formation d'un sousystème intégré par les agglomérations, dans le système d'emplacement national polonais.

Les résultats indiquent que les agglomérations individuelles sont fortement enracinées dans leurs régions respectives et additionnellement, intégrées avec le système national, à mode d'un tout. Les interrelations des agglomérations sont trop difficiles pour confirmer les hypothèses.