

THE RELATIONSHIP BETWEEN DIFFERENT TYPES OF MIGRATION IN POLAND

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Résumé — La réalisation des décisions migratoires n'est pas toujours facile. Par conséquent on peut trouver différents types de la mobilité spatiale — mouvements d'origine aux destinations désirées, les migrations pendulaires au lieu de déplacement et la migration vers la localité intermédiaire avec le migration pendulaire simultanément à la destination désirée que n'est pas accessible en ce moment.

Cette article présente les résultats des trois études polonaises sur les relations entre différents types de mobilité. La première confirme l'hypothèse que les flux de migrations permanentes sont liés avec ceux de la circulation temporaire en particulier dans les régions plus avancées de point de vue économique et sociale.

La seconde analyse concerne l'effet de distance sur les migrations permanentes et mouvements temporaires. On a distingué six types des relations (fig. 3).

La troisième étude regarde relations entre différents types de la mobilité dans les centres urbains divers. La proportion entre les coefficients de la mobilité reste la même indépendamment de la dimension des centres urbains (fig. 4). 1 (migration permanente); 2 (migration temporaire); 4 (circulation pendulaire). On peut utiliser la distribution spatiale des types de la mobilité pour délimiter les régions migratoires (fig. 5, tableau 2).

Abstract — Migrants are often restricted in the implementation of their migration decisions. As a result in addition to direct moves from origin to the desired destination two other types of displacement can be envisaged: (a) commuting as a permanent or temporary substitute for migration if the distance involved is not too great and (b) a move to an intermediate place and commuting from there to a desired but inaccessible destination.

The present article reports on three recent Polish studies concerned with relationships between various types of movements. The first one tests a hypothesis that the streams of permanent in-migrations are related to the corresponding streams of commuting. The analysis based on 1968 data seems to confirm close relationship between the two types of movements particularly in areas with the highest level of socio-economic development.

The second analysis dealt with the effect of distance on permanent migration and commuting. Six types of distributions were distinguished (Fig. 3).

The third study focused on relationship between different types of mobility in urban centres of varying size. It appears that the ratios of mobility coefficients remain the same 1:2:4 (permanent migration: temporary migration: commuting) regardless of the size of urban centres (Fig. 4). Spatial distribution of individual forms of mobility can be used as a basis for delimitating the migration regions (Fig. 5, Table 2).

Key words — permanent migration, temporary migration, commuting

Migration studies in Poland have focused on permanent migration and particularly rural-urban flow, which accounted for 25 per cent of the total internal movement in 1976. The importance of migration was indicated by the 1970 census, which showed that 48 per cent of the population lived in places other than that of their birth.

While permanent migration remains a significant factor in the development of the urban network, the importance of other forms of population movement should not be

underestimated. This is consistent with the broad definitions of mobility and/or migration found in Polish (Kosiński, 1967; Stpiczyński, 1971; Jagielski, 1974; Gawryszewski, 1977) as well as foreign literature (Khorev, 1976).

Polish experience has been that city-bound migration tends to occur in an indirect rather than direct way. This may be explained by the role played by the intervening obstacles and the way in which they are perceived. Migration theoreticians tend to see these obstacles as factors reducing migration flow (Lee, 1966). In rapidly industrializing countries the obstacles seem to have what might be called a two-level effect. Overcoming the obstacles will result in the decision to migrate. However, this first level is followed by the second one, when the decision as to the specific form of migration is taken. Decision to migrate as well as the choice of place will probably be considered from at least three points of view: a. the possibilities of moving to the chosen place of residence (difficulties in finding accommodation, overcoming administrative restrictions to limit inflow registration — now existing only in Warsaw); b. the distance to the new place; and c. the cultural, social, and family ties in the present place of residence. As a result, three hypothetical streams of migratory movement are formed:

1. Permanent migration from the origin, A, directly to the chosen destination, B¹. The pattern of this migration is quite simple and the distance involved relatively small.

2. Commuting to work from the place of origin, A, to the chosen place of destination, B.¹ This form of migration is a substitute for permanent migration to B, if B is not too distant from A. It must be regarded as two-phase migration whereby migration distance is rather limited.

3. Permanent migration from the place of origin, A, to a place, C, closer to the chosen terminal place of destination, B, and commuting to work from C to B until B becomes accessible for settlement. This three-phase form of migration is also a substitute for permanent migration to the chosen place B (if it is too far from the place of origin A).²

The migrants participating in the latter two types may after some time reconsider their decisions and either alter them or settle permanently at C. But such alterations of the final destination do not seem to occur very frequently, since it is usually a big city or urban agglomeration.

In addition to commuting, migrants can consider another alternative, that of a temporary stay in a hostel, dormitory, students' residence, or, as most often occurs, in a privately rented room. According to the Central Statistical Office, in 1967 nearly 700,000 people were registered for temporary stays of more than two months in towns (52 per cent of those people had their place of origin in villages); by 1972, this number had grown to 930,000, with the percentage of in-migrants from rural areas unchanged.³

Observations suggest the hypothesis that the more attractive the given town, the more complex (multi-phase) the migrant's road to it. On the other hand, the shorter the road is, the greater the demand for his occupational qualifications in a given town. This applies especially to housing construction and to manufacturing.

The above scheme of migration is hypothetical. No appropriate study has yet been made to check whether temporary migration and commuting indeed lead to permanent migration. This could be answered by a special survey of the in-migrants containing questions on the extent of their participation in commuting to schools and to work and in temporary migrations.

Some attempts to establish the existing relationships by means of partial and indirect analyses have been made on the basis of statistics collected by the Central Statistical Office. The present article reports on results of these studies.

The first study was intended to test the working hypothesis that the streams of permanent in-migrations are related to the corresponding streams of commuting to work

on local scale (Gawryszewski, 1974). This was followed by an attempt to analyze simultaneously the distance distributions of permanent in-migrations and in-commuting, again on local scale, in order to establish the degree of similarity of those distributions.

In another study, the most recent available statistical data in aggregate form were used to establish the relationships of the different forms of spatial mobility of Poland's population according to the size of towns and voivodships.

I. *The Relationship between Streams of Permanent Migration and Commuting to Work*

Polish literature on migration suggests that commuting to work tends to result in permanent migration. This suggestion is based on the surveys of commuters to several factories in different regions of Poland. It appears that 50 to 70 per cent of commuters were willing to migrate and settle permanently; this proportion tended to vary directly with growing distance and inconvenience (Olędzki, 1967; Rajkiewicz, 1971; Cegielski, 1977).

Observations made so far and the hypothetical scheme of the migrant's road can be represented thus:

$$M_{ij} = M_{b,ij} + M_{p,ij}$$

or

$$M_{ij} = M_{b,ij} + f[\zeta(P_{ij}, T_{ij})]$$

where

- M_{ij} – number of migrants from the i^{th} place of origin to the j^{th} place of destination;
- $M_{b,ij}$ – number of in-migrants arriving directly from the i^{th} place of origin to the j^{th} place of destination (while previously living in i they neither commuted to work to j nor migrated temporarily to j);
- $M_{p,ij}$ – number of in-migrants arriving indirectly from the i^{th} place of origin to the j^{th} place of destination (they previously lived in i and had migratory contact with j);
- P_{ij} – number of people commuting to work to j from their place of residence at i ;
- T_{ij} – number of temporary migrants from their place of residence at i to j ;
- $\zeta(P_{ij}, T_{ij})$ – inclination to settle at j among commuters to work and among temporary migrants at j ;
- $f[\zeta(P_{ij}, T_{ij})]$ – permanent in-migration to j by people previously commuting to work to j and/or by temporary migrants at j .

This is not a full scheme, since it does not encompass all substitutes for permanent migration. These substitutes depend very much upon the stage of development of a project. As observed in Poland in the initial stage of development, temporary migration predominates as specialists arrive for specific periods of time. During the following stage of massive construction unskilled commuters become a dominant element. It is during the next stage of stabilization that the increasing availability of housing and services and the rising qualifications of the previously unskilled labour lead to the in-migration of an indispensable labour force, together with their families. At this stage commuters become increasingly more willing to settle permanently. The temporary migration continues concurrently with permanent migration.

It can be said that if housing facilities were readily available everywhere, temporary migration would hardly occur. Temporary migration is now mainly a symptom of the governmental policy of slowing down the growth of the biggest cities in order to alleviate the pressure on housing. Once the housing needs can be met satisfactorily, which is planned for the late eighties, temporary migration will probably be sporadic, or may disappear completely, with the number of commuters declining.

Lack of data makes it difficult to assess the relations between the forms of migration provided for in the scheme. Hence, it is also impossible to state to what extent permanent migration is determined by direct migration and to what by indirect migratory movements.

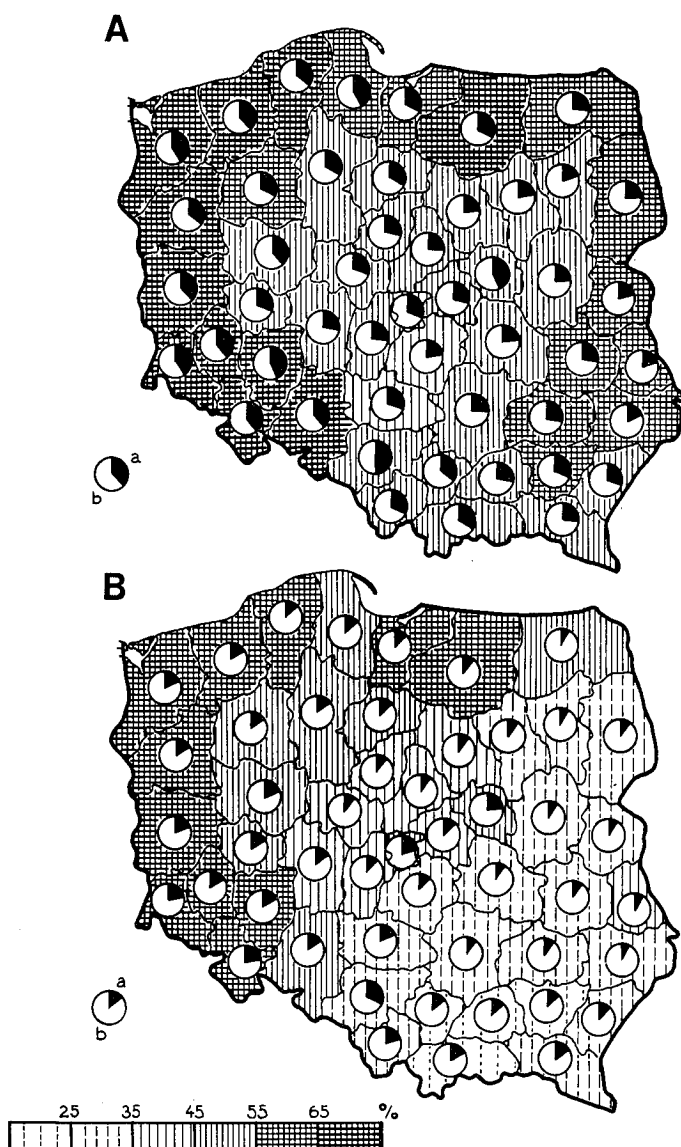
However, statistics are available on inter-poviat migration within the voivodships for the year 1968, as well as data on inter-poviat commuting to work within the same voivodships as of 31 January 1968.⁴ Those statistics allow us to study the relationship between streams of in-migration M_{ij} and streams of commuters to work P_{ij} . The similarity of these values may suggest that commuting to work might be a transitional form of migration and may result from definite cause-and-effect relations between any of these factors (M_{ij} , P_{ij}) and certain common displacement-generating factors.

In view of the possibility that the streams of permanent migration and commuting to work may be quantitatively related to certain unidentified common causative factors, spatial correlation analysis was carried out for selected five (old) voivodships. These included three highly developed and urbanized voivodships with dense urban networks and the highest numbers of commuters (Katowice, Opole, Gdańsk) as well as three less-developed and urbanized voivodships with minimal numbers of commuters (Białystok, Olsztyn). These five units account jointly for 24 per cent of the national territory, 25 per cent of the population, 25 per cent of in-migrants, and 35 per cent of commuters.

A number of correlations were run in order to test the working hypothesis that the streams of in-migrations are related to those of commuting. Different measures of in-migration flow were tested for the way they correlate with different measures of commuting to work and the absolute volumes of the streams of in-migration and commuting. It appears that the relationship between in-migration and commuting was significant at least at one per cent for 105 out of 108 poviats under investigation. This highly significant correlation between M_{ij} and P_{ij} suggests that M_{ij} and M_{bij} may correlate equally highly, which would confirm the hypothesis that those two forms of migration are mutually dependent.

To check whether the strength of the link between in-migration and commuting is connected with the level of development of the poviat of destination, Spearman's correlation coefficients were calculated for three different measures of level of development of poviats.⁵ The analysis showed that the coefficients were 0.44, 0.39, and 0.46, respectively. Only poviats with the highest level of socio-economic development displayed highly continuous spatial patterns of migratory movements. This in turn means that in those poviats in-migration flows were closely related to in-commuting.

To summarize the results of the analysis presented here, let us add that for a number of poviats we could use the volumes of streams of commuting to work to anticipate the quantitative volume of streams of permanent migration by developing the postdictive regression model $M_{ij} = a + b P_{ij}$. Since the link between the two forms of migration is sometimes very strong (almost functional) this model could well fit the reality it describes. But, because the problem is viewed too mechanistically here — for instance, the time lag between commuting and migration is not provided for — this model cannot be recognized as a very efficient tool.



A. In-migrants from a. urban and b. rural areas

B. In-migrants in rural areas (percentage of the total) originating from a. urban and b. rural areas.

FIGURE 1. IN-MIGRANTS BY VOIVODSHIPS (NEW) IN 1970. SHADING REPRESENTS PERCENTAGE OF THE MIGRANT POPULATION IN URBAN (A) AND RURAL (B) PLACES, RESPECTIVELY

II. *The Effect of Distance on Permanent Migration and Commuting to Work*

If there are significant relationship between the volumes of permanent migration and commuting, we may expect the distance — as one of the most important factors — to be similar in nature and influence in both cases.

In the present study three functions were used to approximate the real distributions of the distance of both n — in-migration flows and commuting:

a power function

$$y = \frac{M_{ij}}{M_j} = a \cdot d_{ij}^b$$

an exponential function

$$y = \frac{M_{ij}}{M_j} = a \cdot e^{-b \cdot d_{ij}}$$

and a combined function

$$y = \frac{M_{ij}}{M_j} = a \cdot d_{ij}^b \cdot e^{c \cdot d_{ij}}$$

where

M_{ij} - migration from i to d

M_j - migration from all origins to j

d_{ij} - distance between i and j

These functions were tested for three different measures of distance between central towns of poviats: the straight-line distance in kilometers, the traffic distance in kilometers along the shortest railway or bus routes, and the time distance in minutes for the quickest route.

In effect, for each of the 108 poviats, nine models of in-migration and commuting streams were developed. On the basis of the standard errors of the estimates and the correlation coefficients (between the actual values of y and those of y from the models) it has been recognized that the best fits of permanent migration and commuting streams to the model were most often obtained when using the combined function and the traffic distance.

However, by using the power-function model for both forms of migration and employing the same measure of traffic distance, the values of the power exponents can be compared with each other. Though distance seems obviously much more powerful a factor in the case of commuting than in that of permanent migration, we have so far failed to establish the relationships between the parameters b for different forms of migration in the same areas and for the same time intervals.

It turns out that the power exponents of commuting distance and permanent migration distance display a characteristic relationship: it is very close for the urban poviats (the power exponents b_p for commuting correlate with b_n for permanent migration at 0.85) and significant for the other poviats ($r = 0.47$). This relationship is shown in Figure 2.

The power exponents of commuting distance are 2.2 times as high as those of permanent migration distance. On the one hand, the b_p/b_n relations are lower for urban than for rural poviats, and, on the other, they are lower for highly developed poviats and higher for poviats situated in less-developed areas of the country.

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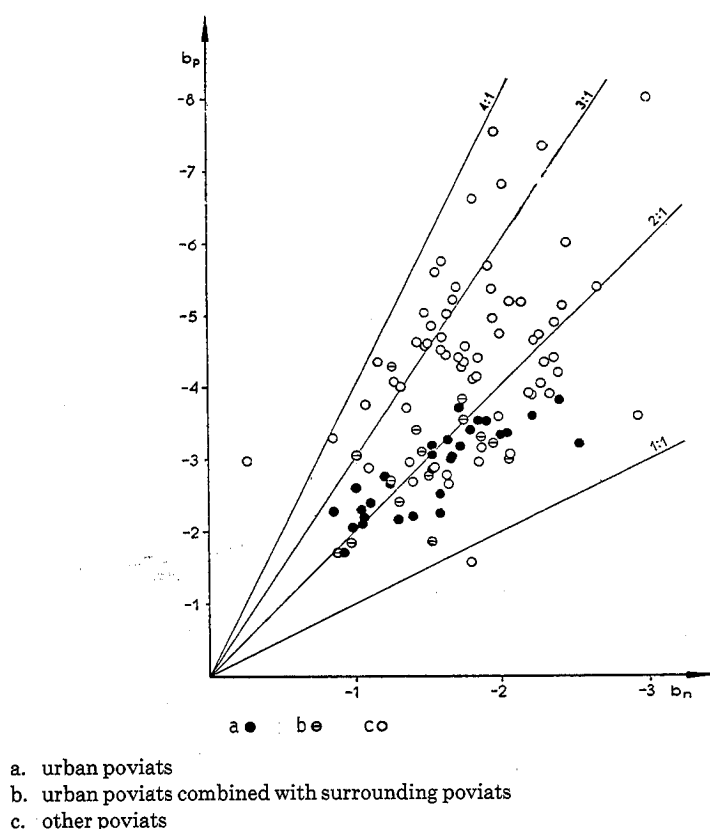


FIGURE 2. CORRELATION BETWEEN POWER EXPONENTS FOR COMMUTING (b_p) AND PERMANENT MIGRATION (b_n) IN 1968

Distance models in the form of the combined function were used to define the types of effect of distance on the two forms of migration. The distributions were classified on the basis of the relationships between the decline rates of both forms of migration — in the function of distance and according to the shape of the curves — to each other in the actual scope of traffic distance. As a result, six types of distributions were obtained (Figure 3). Type A is the most frequent, accounting for 79 per cent of all units. The relative volumes of commuting to work over the entire range of distance decline more than those of permanent migration. The diagram represents the way in which distance typically affects the volume of migration: the predominance of the relative volume of commuting over permanent migration on small distances up to some theoretical point of critical distance beyond which the converse is true.

Of course, the above results do not prove that commuting to work leads to permanent migration. By displaying similarities in spatial distributions they indicate that the effect of distance is the most important single factor in the high dependence between the stream of permanent migration and commuting.

The main results of the analysis described here exhaust all possibilities for establishing relations on the basis of intra-voivodship, inter-poviat migration flows. However, the above estimates of the parameters of the effect of distance on migration

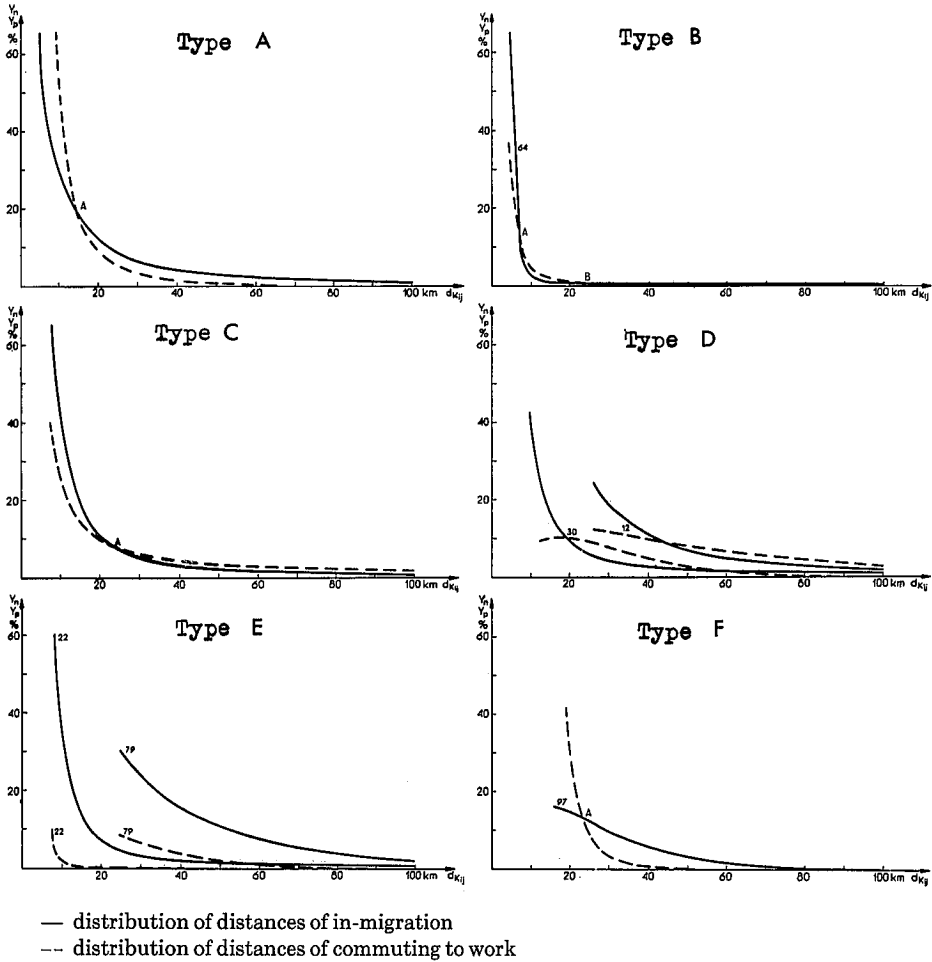


FIGURE 3. EXAMPLES OF CLASSIFICATION OF POVIATS BY TYPES OF DISTANCE DISTRIBUTION OF MIGRATION IN 1968

will probably not change, even when account is taken of in-migration from more remote areas as suggested by the results of a more extensive study of commuting (Gawryszewski, 1974).

III *The Relationships Between Various Forms of Population Mobility*

The amount of statistical information on migration is limited, and only a preliminary assessment of the mobility patterns is possible. It will aim at establishing relationships between various types of mobility by the size of urban centres (into and out of towns) and by (new) voivodships.

It appears that mobility tends to vary according to town size (Table 1). The highest mobility coefficient occurs in towns with between 5,000 and 50,000 inhabitants and the lowest in the largest cities. While the high mobility for the medium-size and small towns

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TABLE 1. TYPES OF MIGRATION BY SIZE OF URBAN PLACES, 1974

Size of Urban places	No of towns 1974	Pop as of 31 Dec 1974 (in thousands)	Employment by place of work, 1973	TYPES OF MIGRATION									Mobility coefficients ³		
				1974			1974			Commuting to work, 1973			I _N - I-P 1000	I _T - T-P 1000	I _C - C-P 1000
				Permanent migration ²			Temporary migration								
				In /I/	Out /E/	Net	In /I/	Out /O/	Net	Arri- vals /D/	Depart- tures /W/	Balance			
				(in thousands)											
TOTAL (Urban +Rural)		33,845	10,558	798	798	x	-	-	-	2,845	2,845	x			
Total urban	814	18,605	8,853	477	294	183	891	795	96	2,382	994	1,388	42	91	182
less than 5,000	294	910	8,307	29	23	6	40	44	- 4	115	72	42	57	93	206
5,000- 10,000	194	1,379	606	53	39	14	71	76	- 5	224	110	114	67	107	243
10,000- 20,000	161	2,266	1,023	82	58	25	121	126	- 5	358	179	179	62	109	237
20,000- 50,000	102	3,109	1,514	110	67	43	173	167	6	523	239	285	57	109	245
50,000-100,000	36	2,544	1,248	58	33	25	122	102	20	350	144	206	36	88	194
100,000 and more	27	8,398	4,155	145	74	71	363	279	83	812	250	562	26	75	126
Rural areas		15,240	1,705	321	504	-183	-	-	-	463	1,851	-1,388			

Notes: ¹Employment in state-controlled institutions and firms only

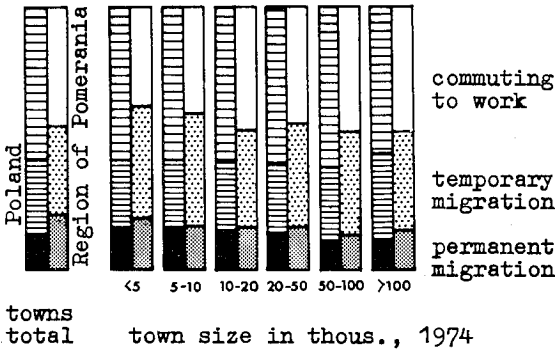
²Excluding intra-urban migration

³Explanation of symbols: coefficients of gross migration:permanent (I_N), temporary (I_T) and commuting (I_C); I, E, N, O, D, W - see headings of individual columns in this table. F -- mid 1974 population

Sources: Own calculations based on data from the Central Statistical Office, Rocznik Demograficzny 1975 and Wybrane dane... 1976.

is due to the processes of industrialization, the lower mobility found for the largest cities is mainly due to the administrative restrictions on in-migration.

It is remarkable that the partial mobility coefficients for various forms of migration retain almost constant proportion to one another regardless of the class of town size and that, with insignificant deviations, the mobility coefficients display a ratio of 1:2:4



- a. all urban places
- b. urban places by size in thousands, 1974
- c. commuting to work
- d. temporary migration
- e. permanent migration

FIGURE 4. THE STRUCTURE OF SPATIAL MOBILITY OF POPULATION BY FORMS OF MIGRATION AND THE SIZE OF URBAN PLACES. COMPARISON BETWEEN POLAND AND THE REGION OF POMERANIA [INCL VOIVODSHIPS (NEW) GDAŃSK, KOSZALIN, ŚLĄPSK AND SZCZECIN]

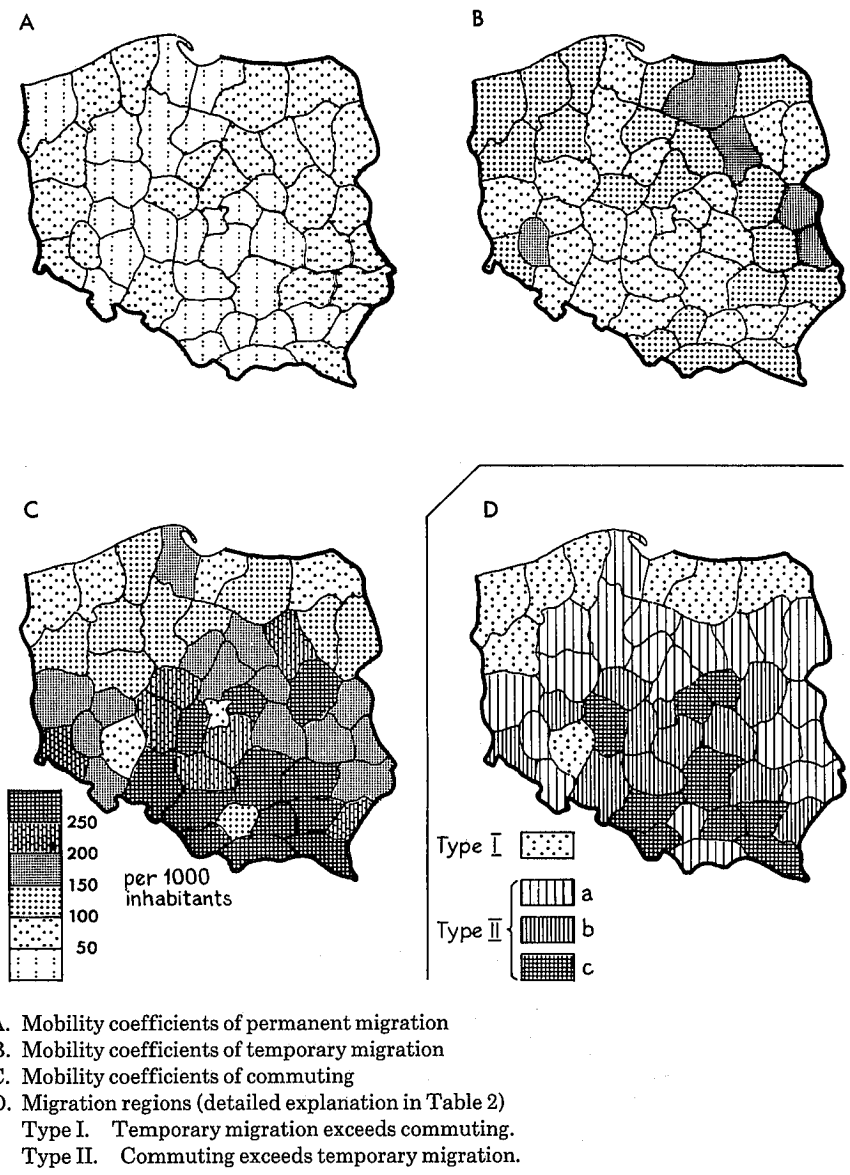


FIGURE 5. MOBILITY COEFFICIENTS BY FORMS OF MIGRATION AND MIGRATION REGIONS, 1974

(permanent migration: temporary migration: commuting to work). It seems that these relationships reflect the actual pattern of spatial mobility for Polish urban centres.

To check this hypothesis we have made a similar analysis for a group of towns in Pomerania (consisting of voivodships of Gdańsk, Koszalin, Słupsk, and Szczecin) where migration patterns differ from those found in the remaining voivodships, with temporary migration being connected with higher mobility. Though the relationships here are

somewhat different from those for Poland as a whole, they do persist on about the same level irrespective of the size of a given town (Figure 4.)

It appears that the structures of the spatial mobility of the population as well as the models of the mobility are regionally differentiated. Thus, any study of the relationships between the different forms of migration on a macroscale should be preceded by a typology and a regionalization of migration phenomena to delimit relatively homogeneous areas of migration.

A preliminary typology could perhaps be made on the basis of the spatial distributions of individual forms of mobility by voivodships (Figures 5A, 5B, and 5C). Since the mobility of permanent migrants (IM_p) is lowest and least differentiated, we can take the relationships between the mobility coefficients for commuters (IM_c) and temporary migrants (IM_t) as the criterion for delimiting the migration regions. The differences in the size of those relationships permit the delimitation of four types of regions (Table 2). A characteristic feature of the first type is that the mobility of people migrating temporarily is slightly higher than that of commuters. In the remaining three types, the mobility of commuters is once to twice (type 11a), twice to three times (type 11b), or more than three times (type 11c) as high as the mobility of temporary migrants.

The above delimitation of regions (Figure 5D) is a fairly good representation of the otherwise conspicuous differences in migration behaviour, especially in the south-eastern part of Poland. It can be considered as a first step in the enquiry into the relationships between the different forms of migration.

TABLE 2. TYPES OF VOIVODSHIPS (NEW) BASED ON RELATIONSHIP OF MOBILITY COEFFICIENTS
(All population figures in thousands)

Population, employment, immigration and commuting	TYPE I Temporary migration (IM_t) higher than commuting (IM_c)	TYPE II		
		Commuting (IM_c) higher than temporary migration (IM_t)		
		II a. 1-2 times	II b. 2-3 times	II c. More than 3 times
	$0.5 < \frac{IM_c}{IM_t} < 1.0$	$1.01 < \frac{IM_c}{IM_t} < 2.00$	$2.01 < \frac{IM_c}{IM_t} < 3.00$	$3.01 < \frac{IM_c}{IM_t}$
Urban population	2398	6495	3224	6320
Employment in state sector	1060	2969	1611	3214
Migration to/from urban places				
Permanent in-migration	71	174	79	155
Permanent out-migration	47	109	51	90
Temporary in-migration	154	358	124	253
Temporary out-migration	137	328	126	202
Commuting to/from urban places				
Arrivals	142	702	441	1097
Departures	66	272	163	494

Note: Symbols explained in Table 1 and in text.

Sources: as in Table 1.

Footnotes

1. Two principal forms of commuting include journey to work and school. The latter are very frequent in Poland particularly insofar as students in vocational schools are concerned. The present article deals with the former type of commuting only.
2. The distinction between direct and indirect migration as defined above is maintained throughout the article. The appropriate symbols are $M_{n,ij}$ (direct) and $M_{p,ij}$ (indirect).
3. Data on migration are based on current registration of change of address. Tabulations on permanent migration are made available every year, those on temporary migration every few years. Data on commuting are provided by periodic surveys of employment (Spis Kadrowy) in the socialist sector, which includes all state-owned institutions and companies accounting for nearly all major place of employment outside agriculture. These surveys were carried out October 1, 1964; January 31, 1968; October 31, 1973.
4. Prior to 1 June, 1975, Poland was divided into 22 first-order administrative units, including 5 largest cities (voivodships) and 391 second-order units, including 74 urban ones (poviats). Following major reform the country is now divided into 49 first-order units (voivodships) and 2,345 second-order units (communities). The Polish equivalent terms are: województwo, powiat and gmina (all in singular). The present essay refers to both old and new administrative division.
5. The three measures derived from the Polish literature include:
 - a) comprehensive index of economic development (based on factor analysis carried out by the Central Statistical Office, 1971);
 - b) comprehensive index of industrialization calculated by S. Róg in 1969;
 - c) index of living standards (based on factor analysis carried out by the Central Statistical Office in 1971). Detailed information is provided in Gawryszewski (1974: 39-43).

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