

CHARACTERISTIC FEATURES OF THE POPULATION GROWTH IN THE CENTRAL SETTLEMENTS OF HUNGARY IN 1960–70

by

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I. Aim, sources, and method

The population growth in Hungary in 1960–1970 was much smaller than in the previous decade (3.6 and 8.2% respectively). Parallely with it the population growth rate of the central settlements also decreased, but to a much smaller measure, and thus their role in the population of the whole of the country grew. This fact, besides other factors, also underlines the importance of their investigation.

The aim of this paper is to elucidate — with the help of investigation of the components and rates of the population growth of central settlements of various grades and analysis of the regional variations — such correlations as may be useful from the point of view of settlement planning and development.

This study involves the 127 settlements that are indicated as at least partially middle-grade centers in the long-term plan for the development of the network of settlements (government decree No. 1007/1971). For the purpose of a regional analysis the most recently published system of districts, the classification on an economic basis according to Krajkó, has been used. The administrative changes (transfer of joining of territories) have been taken into consideration also retrospectively, using our statistical sources.

Investigating the changes in the population of the different settlements, group averages were calculated and used as limit values of typing on the basis of the dynamics of changes. The changes of place of the different settlements in the national order of rank for population number were examined and used in the regional examination for calculating the rank coefficient. This latter can be obtained by the help of the formula:

$$R = \frac{P_1 + P_2 + \dots + P_n}{q_1 + q_2 + \dots + q_n} \text{ where}$$

$P_1 + P_2 + \dots + P_n$ is the sum of the „rank numbers” of the settlements of a given district or group in the national rank order at the beginning of the

period examined, and $q_1 + q_2 + \dots + q_n$ is the same criterion at the end of the period.

Accordingly:

if $R > 1$, the settlements of the given district or group had a greater population growth rate than those just above them in the order of rank and a greater population growth rate than the national average;

if $R < 1$, the settlements of the district or group developed more slowly than the average and fell lower in the national rank order;

if $R = 1$, the settlements of the district or group developed at a rate agreeing with the average and their places in the rank order remained unchanged.

Often the rank coefficient does not give a correct value in the case of one settlement or a small number of settlements owing to the fact that quantitative differences between neighboring members of the rank order are variable. According to our experience, however, it is useful already on the level of subdistricts (4–15 settlements), and on the level of meso- and macrodistricts it gives results which agree well with assessments using other methods. The same can be said of the examination of groups: it is only in the case of the closed group of sharply distinguished top-ranking centers that the rank coefficient does not have the expected value.

Starting from the fact that a certain rate of the population growth of a given settlement in a given district means variable degrees of relative population concentration depending on whether the total population of the district decreases or grows at a smaller or greater rate, an attempt was made to characterize the relative population concentration by a single index. This can be obtained on the basis of the following formula:

$$C = \frac{P_1 \cdot U_2}{P_2 \cdot U_1} \text{ where}$$

P_1 is the population number of the district in 1960,

P_2 is the population number of the district in 1970,

U_1 is the population number of the central settlements of the district in 1960,

U_2 is the population number of the central settlements of the district in 1970.

If $C > 1$, the population number of the central settlements grows faster, if $C < 1$, then slower, than the total population of the district. If $C = 1$, the population of the central settlements and the total population of the district grow at the same rate. Apart from some special cases, in the current period $C > 1$. The variation of its value shows well what the role of the central settlements is in the relative concentration of the population of their districts.

II. Results

During the decade examined the population of Hungary grew by 354.6 thousand. This growth took place so that while the population of the central settlements grew by 511.8 thousand, the population of the rest of the country decreased by 157.2 thousand. Thus migrations had a great role in the population growth of the central settlements. The importance of migration is further emphasized by the fact that the natural population growth of the central settlements is — largely owing to the negative and important value of the capital — lower than the national average, only 2.5%.

Altogether 77.5% of the population growth of the central settlements was due to the positive balance of migration. Their own natural population growth accounted only for 22.5%.

Half of the increase was accounted for by Budapest and the distinguished top-grade centers, a further 30% by the other top-grade centers, and about 20% by the middle-grade centers (Fig. 1).

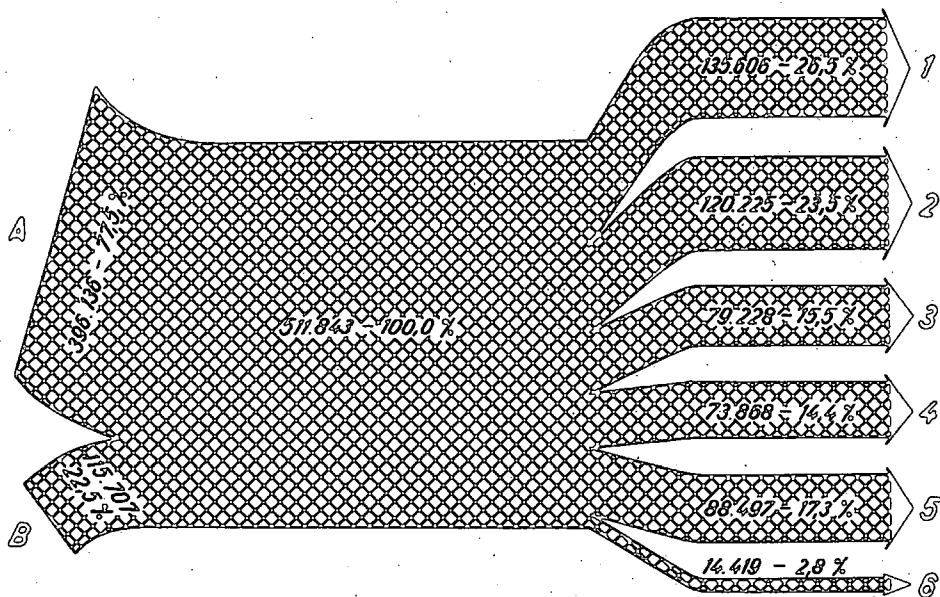


FIG. 1. The components of the population growth of the central settlements and their grades A = migration difference, B = natural population growth, 1 = capital, 2 = distinguished top-grade centers, 3 = top-grade centers, 4 = partially top-grade centers, 5 = middle-grade centers, 6 = partially middle-grade centers.

1. Changes in the number of population according to the hierarchy of settlements

The population growth was different in the various centers representing different grades of the hierarchy of settlements. Aside from Budapest, the general rule that the population growth of ever lower grade centers is ever smaller is true. While, however, there is no essential difference between the three grades of the top centers, there is a great difference in the growth rate of the top- and middle-grade and middle- and partially middle-grade centers (Table 1.).

With ever lower grades of hierarchy the two components of the population growth, the balance of migration and the natural population growth, change reciprocally. With the decrease of the importance of the balance of migration the natural population growth acquires an ever greater role. In absolute value the migration balance in all grades of the top centers is greater than the natural population growth. In the case of the middle-grade centers the situation is reversed; indeed in the last grade examined the migration balance is negative (Fig. 2.).

Even among the settlements of the same grade there is a wide range of variation both as to the rate of population growth and its components, and their characteristics. For the purpose of the designation and survey of the specific fea-

TABLE 1.
Changes in the Population of Centers

Hierarchical Grade	Number of Centers	Population 1960	Population (1000 persons) 1970	Increase %
I. Capital	1	1.804,6	1.940,2	7,5
1. Distinguished top-grade centers	5	571,7	691,9	21,0
2. Top-grade centers	7	381,1	460,3	20,8
3. Partially top-grade centers	11	388,0	461,8	19,0
II. Top-grade centers together (1+2+3)	23	1.340,8	1.614,0	20,4
4. Middle-grade centers	65	1.078,2	1.166,7	8,2
5. Partially middle-grade centers	38	467,3	481,7	3,1
III. Middle-grade centers together (4+5)	103	1.545,5	1.648,4	6,7
IV. Provincial centers together (II+III)	126	2.886,3	3.262,4	13,0
Total (I+IV)	127	4.690,8	5.202,6	11,0

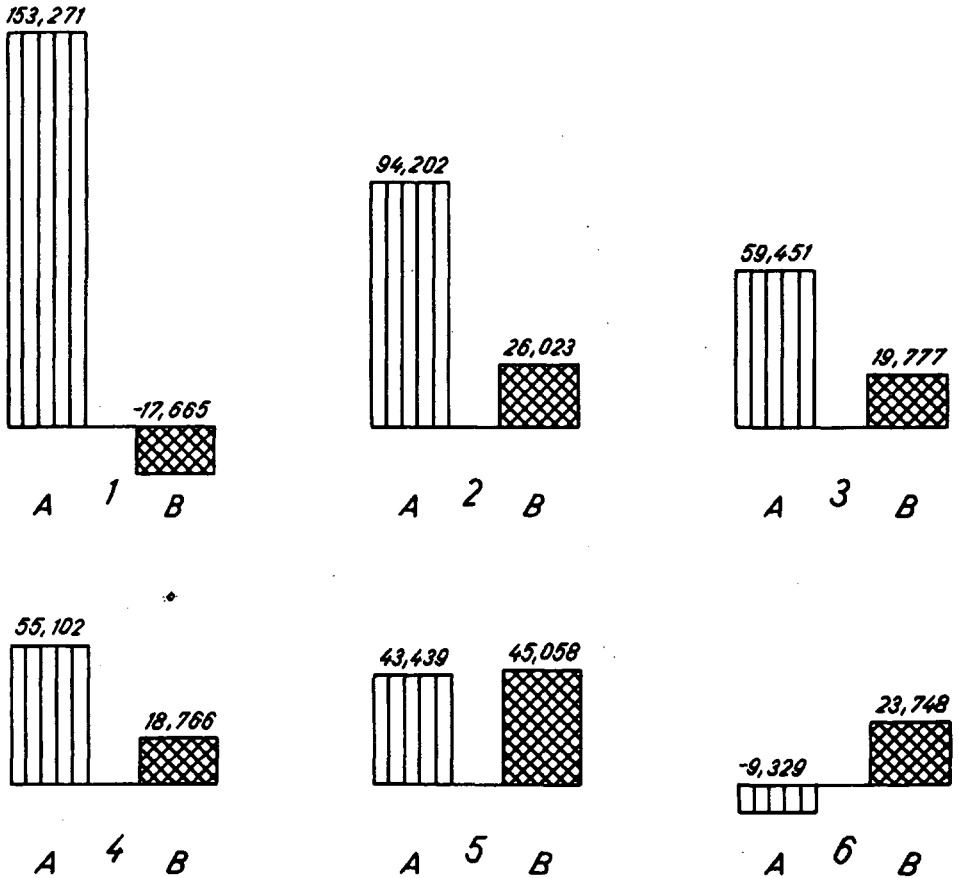


FIG. 2. The migration difference and the natural population growth in the population growth of centers of different grades. A = migration difference, B = natural population growth, 1 = capital, 2 = distinguished top-grade centers, 3 = top-grade centers, 4 = partially top-grade centers, 5 = middle-grade centers, 6 = partially middle-grade centers.

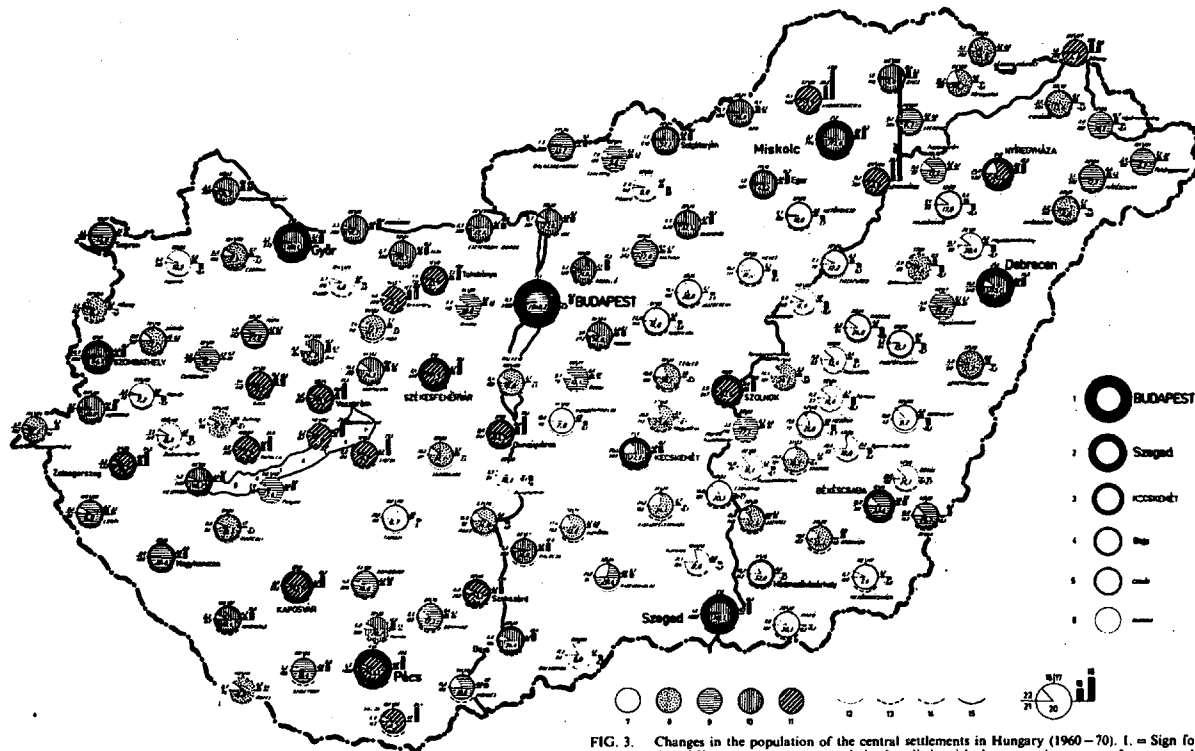


FIG. 3. Changes in the population of the central settlements in Hungary (1960-70). I. = Sign for the different centers: 1 = capital, 2 = distinguished top-grade center, 3 = top-grade center, 4 = partially top-grade center, 5 = middle-grade center, 6 = partially middle-grade center. II. = The population growth rate: 7 = decrease, 8 = increase below the average of the middle-grade centers, 9 = increase between the average of all the provincial centers and that of the middle-grade centers, 10 = increase between the average of all the top-grade centers and that of all the provincial centers, 11 = increase above the average of the top-grade centers, 12 = below the national average, 13 = between the national average and the average of the provincial centers, 14 = between the average of the provincial centers and the average of the top-grade centers, 15 = above the average of the top-grade centers. IV. = Characteristics of the different centers: 16 = place of center in the national rank order of centers according to population number in 1960, 17 = place of center in the national rank order of centers according to population number in 1970, 18 = migration difference (1960-69, %), 19 = natural population growth (1960-69, %), 20 = population number (1000 persons, 1970), 21 = population density (persons per sq km, 1970), 22 = ratio of suburban population (% 1970).

tures and the demonstration of the territorial location of the different types the author has prepared a cartodiagram of the settlements examined (Fig. 3.).

In connection with the settlements of different hierarchical grades the following statements can be made:

a) *Budapest*

Its territory (525.2 km²) in only half a per cent of the area of the country, in which 18.8% of the population of Hungary (1,940,212 persons) lives. This is about 37.3% of the population of the central settlements.

For decades there have been systematic efforts to control the excessive population growth of the capital. Besides the nationwide decrease of the population it is mainly due to this fact that the growth rate of the period examined is scarcely more than half of that of the previous decade. However, even this not too high value (7.5%) is double the national average, and in absolute numbers it covers considerable concentration: Budapest accounts for 26.5% of the population growth of the central settlements, 38.7% of its migration difference and 38.3% of the population growth of the whole country. The population of the agglomeration ring around the capital grew at a considerably greater rate, and so the overweight of the agglomeration of Budapest grew further.

b) *Distinguished top-grade centers*

Large towns with populations over 100,000. There are five of them. Their combined area (1,102.3 km²) is 1.2% of the area of the whole country, their total population (691,936) is 6.7% of the population of the whole country, and 13.3% of the population of the central settlements. Their natural population growth (4.5%) agrees with the mean value of the provincial centers, their migration difference (16.5%) and actual population growth (21.0%) are the greatest among all the grades. Their population density is high, their suburban population is negligible. (Debrecen is an exception in both respects). The distinguished top-grade centers account for 23.5% of the population growth of the settlements examined, 32.0% of that of the provincial centers, 23.8% of their migration difference, 38.8% of that of the provincial centers, and 33.9% of the population growth of the whole country.

Their quick development is our aim also in the future. By virtue of the fact that they are becoming more and more real centers of the areas with populations of 1–1.5 million, they are the most important factors of relieving the burden of the capital.

As regards the rate of population growth over the decade, there is no essential difference between them. (18.7 and 26.6% respectively being the two extreme values). It is remarkable that Szeged whose natural population growth in the previous period had been slow on account of the slow development of the town came up in the period examined to the population growth level of the other distinguished top-grade centers through its great migration difference.

The rank coefficient of the group is 1,00.

c) *Top-grade centers*

These are towns with a populations of 60–80 000, all of them highly developed country towns. They are seven in number. Four of them are in the Great Plain and three in Transdanubia. Their total area (1140.5 sq km) is 1.2% of the area of the country, their population (460.284) 4.4% of the population of the whole country, and 8.8% of the population of the central settlements.

Their natural population growth (5.2%) is greater, their migration difference (15.6%) lower than the that of the distinguished top-grade centers. Their natural population growth (20.8%) is only 0.2% below that of the distinguished top-grade centers. This category accounts for 15.5% of the population growth of all the settlements examined, 21.1% of that of the provincial centers, 15.0% of their migration difference, 24.5% of that of the provincial centers, and 22.3% of the population growth of the whole country.

Within this group the differences are greater than in the first group as regards the rate of population growth and other characteristics. It is the population of the two dynamically developing industrial and traffic centers, Székesfehérvár and Szolnok, that has grown most rapidly (27.8 and 26.2% respectively). Among the centers of the Great Plain Kecskemét and especially Békéscsaba have population growth rates well below the average (16.7 and 10.5% respectively). In these towns, as well as in Nyíregyháza whose natural population growth rate is high (8.2%), the population of the outskirts is also important.

The average population density of the settlements of this group is 404 persons per sq km. The proportion of the population of their outskirts is 9.4%. Their rank coefficient reflects their faster-than-average growth. Its value is 1.03.

d) *Partially top-grade centers*

These are generally towns with a population of 30–50 000. There are eleven of them. Six of them are seats of county administration, the others are settlements with similar roles.

Their total area (1.416.2 sq km) is 1.5% of the area of the whole country, their total population (461.824) is 4.4% of the population of the whole country, and 8.9% of the population of the central settlements.

Their natural population growth (4.8%) is intermediate between that of the two former groups, and their migration difference (14.2%) is smaller than that of the former. This group accounts for 14.4% of the total population growth of the central settlements, 19.6% of the population growth of the central settlements, 19.6% of the population growth of the provincial centers, 13.9% of their migration difference, and 22.7% of that of the provincial centers. This population growth of nearly 74.000 people makes up about 20.8% of the population growth of the whole country.

Within this group the differences are greater than in the former. Besides Dunaújváros (42.7%) Veszprém (38.1%) and Zalaegerszeg (33.9%) also had extraordinary population growth rates. On the other hand, the population growth of Sopron on the state border (9.3%) is far below the average of all the centers examined (11%), while the population growth rates of Nagykanizsa (11.7%) and Baja (13.6%) scarcely exceed it. It is in this group that we can find the most populous Hungarian town whose population decreased in the period examined: Hódmezővásárhely. It was only in the 1960's that this town was industrialized to any considerable extent.

Its natural population growth is small, and its migration balance negative. Though the population of its inner area grew, this could not counterbalance the decrease in the population of its extensive farm area.

The combined population density of the settlements of the group is 326 persons per sq km. The population of the outskirts of 6 different towns is below 2%, and even combined only 4.2%. Owing to the fact that the great population growth in the spheres of several, nearly equally large, settlements may have led to considerable changes in rank order, their rank coefficient is very high: 1.17.

e) *Middle-grade centers*

These are district-seat-like settlements. Their population number varies from 7000 (Lenti) to 38 000 (Cegléd). There are 65 such settlements. Their total area (7420.2 sq km) is considerable, 8.0% of the area of the whole country. In this area live 11.3% of the population of the whole country and 22.4% (1.166.708 persons) of the population of the central settlements. The average density of the population is one and one half that of the whole country (157 persons per sq km). The proportion of the population of the outskirts is relatively high: 8.9%.

Natural population growth (4.2%) and the migration difference (4.0%) have played nearly equal roles in their population increase. In spite of their large number they account only for about 17.3% of the total population growth. They have an even smaller share in the migration difference: 11.0%. Referred to the provincial centers the values of these are 23.5 and 17.9% respectively). In absolute numbers, the population increase (88.497) is equal to one-fourth of the population growth of the whole country in 10 years.

The population number of 15 middle-grade centers out of 65 decreased in the period examined. The decrease was the greatest in Mezőtúr (7.1%), Karcag (5.4%) and Szeghalom (5.4%). Negative natural population growth can be found in five, negative migration difference in 26, and both only in two middle-grade centers. (Makó, Csongrád). In contrast to these, extreme values can also be found among the 50 centers with growing populations: the population of Leninváros grew by 219.9%, that of Kazincbarcika by 70.1%. The extremely great natural population growth of these towns is also remarkable: 30.1% and 22.3% respectively. Besides them it was Tapolca, Siófok, Siklós, and Ajka whose population grew rapidly.

Owing to their lower growth rate, the middle-grade centers came down in the rank order of settlements according to population numbers. Their rank coefficient is: 0.99.

f) *Partially middle-grade centers*

These are settlements that function only partially as centers of district-size areas. Their population numbers vary between wide limits (Záhony: 4258 persons, Hajdúböszörmény: 30 448 persons). There are 38 such settlements.

Their total area is 4580.3 sq km, 4.9% of the whole country with only 4.7% of the population of the whole country and 9.3% of the population of the centers (481 730 persons). Their population density (105 persons per sq km) is lower than the national average, and the proportion of the suburban population, 9.5%, is greatest here among all the categories of settlements. Their loss of population through migration (9329 persons, 2.0%) is compensated only by the

relatively great natural population growth (5.1%, 23 748 persons). This category accounts only for about 2.8% of the total population growth of the centers. Even referred to the provincial centers this ratio is only 3.8%.

The population of 24 of the partially middle-grade centers grew and the population of 14 decreased. While the natural population growth is negative in the case of only three settlements, the migration difference is negative in as many as 22 settlements. The populations of Békés and Dunaföldvár regarding both sources decreased in the period examined. Here, too, the differences are considerable. The population of Abádszalók decreased by 11.8%, that of Gyoma and Endrőd by 9%, that of Túrkeve by 8.6%, while that of Oroszlány grew by 32.2%, that of Balatonfüred by 25.2%, that of Záhony by 25.0%.

On the whole the growth of this group is the slowest. This is shown also in the change in their place on the national rank scale. Their rank coefficient, 0.98 is the lowest among the groups examined.

g) The changes in the importance of the centers of different grades in the total population of the centers.

Owing to differences in the population growth, changes took place also in the ratio of the population of the different hierarchical grades within the total population of the centers. In spite of the relatively short period, these changes in ratio are quantitatively perceptible, and, as regards their trends, they are indicative of a long-term tendency.

Budapest's ratio fell from 38.5% to 37.3%, the ratio of all three types of top-grade centers grew altogether from 28.6% to 31.0%, that of the middle-grade centers from 32.9% to 31.7% (Fig. 4).

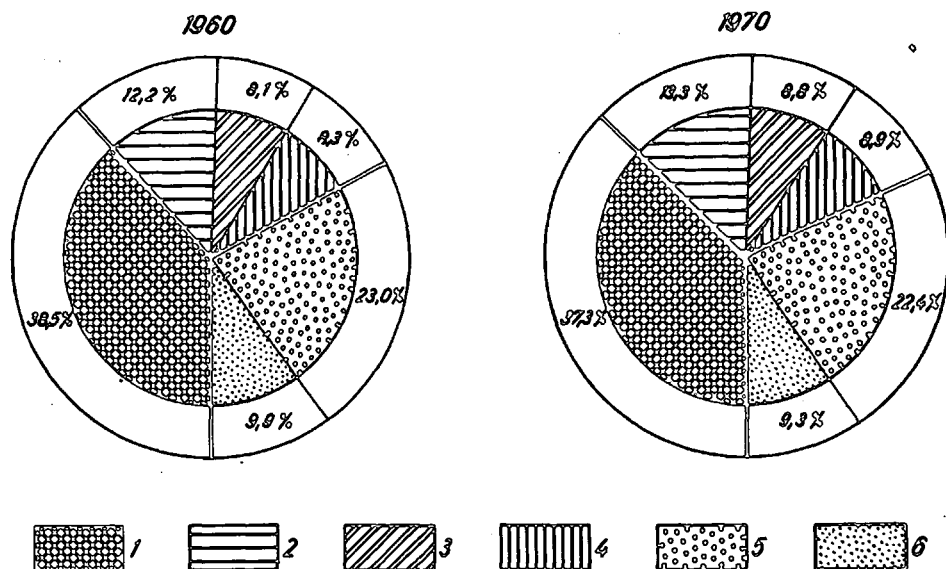


FIG. 4. The population of the central settlements according to grades in 1960 and 1970. 1 = capital, 2 = distinguished top-grade centers, 3 = top-grade centers, 4 = partially top-grade centers, 5 = middle-grade centers, 6 = partially middle-grade centers.

2. Changes in the population number of the centers according to economic districts

The centers differ considerably in their number, density, ratio to the total population, and role in the population growth of the districts already on the level of macrodistricts. These differences are still greater on the level of the sub-districts.

The number and density of the centers is lowest in the Central District and in North Hungary. Here there are 1.18 or 1.28 centers for each 1000 sq km. In the largest district, in the Great Plain, this index is 1.35, i. e. it is scarcely smaller than the national average (1.37). The density of centers is greatest in Transdanubia: 1.45.

In 1970, 50.4% of the population of Hungary lived in the centers examined. Among the macrodistricts a higher ratio is found only in the Central District, where — owing to the great attraction of the capital — nearly threequarters of the population live in centers. In spite of the higher-than-average ratio of the suburban population, the relatively high value of the Great Plain (43.4%) is remarkable. The ratios of Transdanubia and especially of North Hungary are lower (41.3 and 36.3% respectively).

The population growth of the centers is most considerable just in the macrodistricts where the ratio of their population to the population of the whole country is low (North Hungary and Transdanubia). Owing to the influence of Budapest, the population growth in the Central District is smaller than the average. It is the central population of the economically least developed macrodistrict, the Great Plain, that grew least.

If the changes in the total population of the different macrodistricts are also considered and compared with the growth rate of the population of the centers, the dynamics of the centers in relation to their environments can be appreciated. In the case of the Central District, where first of all on account of the rapid population growth of the agglomeration ring surrounding Budapest the population outside the centers grew faster than the population of the centers, the value of the coefficient C used by us for measuring this relation remained under 1.00 (0.99). The centers of North Hungary, Transdanubia, and the Great Plain are more similar to each other as regards the coefficient C .

The settlements of the Great Plain came down in the national population rank order in the decade examined ($R = 0.95$). The positions of the centers of the other three macrodistricts became better at their expense (Table 2).

In order to demonstrate the essential differences within each macrodistrict at the level of subdistricts we constructed a cartodiagram (Fig. 5). Of the characteristics represented on it we mention here only the most important ones according to meso- and subdistricts:

a) *Central district*. It is uniform in the system of districts used. Besides the characterization given with the macrodistricts it is worth mentioning that the value of the only unit where the natural population growth is negative, Budapest, cannot be counterbalanced by the other centers.

b) *Transdanubia*. Of its three mesodistricts it is Central Transdanubia where the population of the centers grew most (19.9%). Both the migration difference and the natural population growth were high. The ratio of the population of the centers compared with the total can be regarded as high only in the subdistrict of Komárom (49.5%). In the same place the density of the centers is also the highest in the nation (2.46 centers per 1000 sq km). High values are found also in the sub-

TABLE 2.
Some data of the centers according to macrodistricts

Macrodistrict	Area sq km	Popula- tion 1970 (1000 persons)	Change 1960— 1969 %	Number of centers	Density of centers no/1000 sq km.	Population number of centers in 1970 1000 persons	Ratio of central pop. in 1970 %	Growth of centr. pop. 1960—69 %	Dyn. co- eff. of relat. conc. of centers 1960—70	Rank coeff. of centers 1960—70
Central District	6 787,4	2 797,8	+9,6	8	1,18	2085,8	74,5	+8,3	0,99	1,05
North Hungary	12 462,8	1 296,4	+5,0	16	1,28	474,2	36,6	+17,4	1,12	1,02
Transdanubia	35 920,6	3 001,3	+2,7	52	1,45	1243,4	41,3	+17,3	1,14	1,03
Great Plain	37 860,9	3 220,3	-1,0	51	1,35	1399,3	43,4	+7,6	1,09	0,95
Total	93 031,7	10 315,8	+3,6	127	1,37	5202,7	50,4	+11,0	1,07	1,00

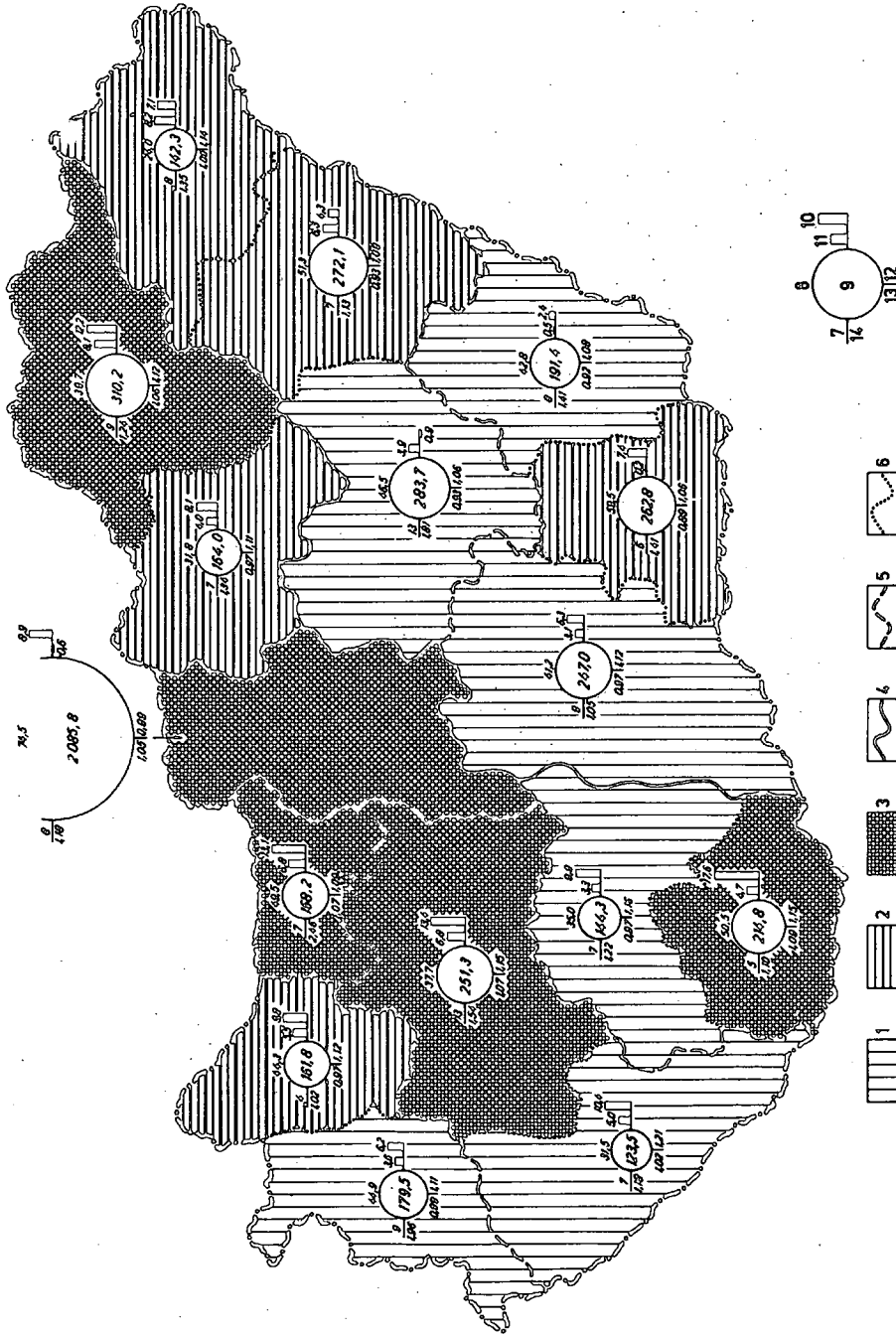


FIG. 5. Changes in population number according to economic districts. 1 = decrease in total population, 2 = population growth below national average (0-3.5%), 3 = population growth above national average (3.6%), 4 = boundary of macrodistrict, 5 = boundary of mesodistrict, 6 = boundary of subdistrict, 7 = number of centers, 8 = ratio of the population of the centers to the total population of the district (%), 1970, 9 = total population of centers (1000 persons, 1970), 10 = migration difference (1960-69%), 11 = natural population growth (1960-69, %), 12 = value of index for relative concentration (C), 13 = value of rank coefficient (R), 14 = average density of centers (centers per 1000 sq km).

district of Fejér—Veszprém, while the ratios of the subdistrict of Zala are lower.

The population growth of the centers of southern Transdanubia is 18.5%. Between its two subdistricts, Tolna and Baranya, there is an essential difference of rate due mainly to the difference in their migration factors.

In the two subdistricts of the Smaller Plain (12.4%) the greatest population growth is found in the centers of the subdistrict of Győr (15.3%). Both the natural population growth and migration difference of western Transdanubia are smaller.

c) *North Hungary* can be divided into two subdistricts, one of them being the subdistrict of Borsod whose central population growth rate (20.3%) ranks third in the country after that of Baranya (22.3%) and that of Fejér—Veszprém (22.2%). The percentage value of the subdistrict of Heves is much lower. In North Hungary the natural population growth, besides the great migration difference, plays an important role in the population growth of the centers.

d) *The Great Plain* can be divided into two mesodistricts. In these it is the centers of the northern Great Plain, that grew most dynamically (8.2%) in spite of the fact that their migration difference is smaller than that of the southern part of the Great Plain. (Among the other subdistricts it is only the subdistrict of Szolnok where the migration difference is negative.) On the other hand the natural population growth is relatively great in the subdistricts of Szabolcs (8.2%) and Debrecen (6.3%).

The population growth rate of the centers of the southern part of the Great Plain is 6.9%. It is here among the mesodistricts that the natural population growth is least important (subdistrict of Szeged: 0.2%, subdistrict of Békés: 0.5%).

The migration difference in the district between the Danube and the Tisza and in the subdistrict of Szeged is considerable as conditions go in the Great Plain, but in the subdistrict of Békés it is very low. The population number of the centers of the subdistrict of Békés grew the least (2.9%) even on the national scale.

III. Conclusions

In presenting the results of the investigations the author confined himself to the recording of the facts. Population growth is the result of complicated economic-social processes the analysis of which would require special study and could not be dealt with here. Since, however, the grade and regional differences in the population growth rate of the centers, in the components of the increase and in other characteristics indicate the economic-functional development of these centers, these investigations permit us to draw a few conclusions:

1. In spite of the undoubtedly slowed down growth rate of Budapest, it still takes up too great a proportion of the population increase of the centers. The existence and rapid population growth of the agglomeration ring also indicates that the preponderance of the capital should be reduced not by hindering the growth of the population of Budapest, but by really distinguished development of the distinguished top-grade centers.

2. The population growth of the top-grade centers is on the whole satisfactory and suitable to our long-term objectives. However, the conditions of a the quicker development of certain less dynamic centers (Békéscsaba, Baja, etc.) within the group by concentrated development. Attention should be given also to the quicker development of certain less dynamic centers (Békéscsaba, Baja, etc.).

3. The problems of the middle-grade centers are manifold. The development of smaller centers playing such a role and thereby the growth of their population should be accelerated. It is important to take care that the regional differences in the growth rate should not go beyond this point, and the not very dynamic centers should also keep and even increase the role that they play as foci of urbanization of their immediate surroundings.

4. The roles of the settlements examined as centers, their hierarchy, and their administrative — legal status cover each other only partially. The administrative-legal status of Budapest and the distinguished top-grade centers (the capital and the county towns) is adequately settled. In many respects, however, it is desirable that the role of the other top-grade centers be expressed in an administrative-legal status between the present level of county towns and that of towns. Furthermore it is absolutely necessary that the large villages that play the role of middle-grade or partially middle-grade centers should gain legal town status.

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 - b) 1970. évi népszámlálás 1. a. Előzetes adatok. (1970. census 1. a. Preliminary Data.) Központi Statisztikai Hivatal, Budapest, 1970.