Title
The size of national assemblies

Journal
Social Science Research, 1(4)

ISSN
0049-089X

Author
Taagepera, Rein

Publication Date
1972-12-01

DOI
10.1016/0049-089x(72)90084-1

Peer reviewed

SOCIAL SCIENCE RESEARCH 1, 385-401 (1972)

The Size of National Assemblies

REIN TAAGEPERA

University of California, Irvine, California 92664

A simple model is presented, to express the size of national (and provincial) assemblies in terms of the size of the total population and of its degree of social mobilization. The basic assumption is that efficiency is optimized when the number of communication channels within the assembly equals the number of interest aggregation channels in each constituency. Adult literacy is taken as a measure of social mobilization. This leads to the equation

$$A = (2\,LW\,P_0)^{1/3}N$$

where A is the assembly size, LW is the fraction of literate adults in the total population P_0, and N is a term representing the effects of all other factors. For the model to be valid, the world-wide average of $\log N$ should be zero, and its range should be small compared to the range of $\log A$. This is so, indeed.

Possessing a national assembly has become a hallmark of modern nations irrespective of their political structure or level of development. The methods for selecting assembly members vary widely, from popular election to simple appointment. The type and extent of functions served by the assembly also varies.[1] But having some sort of a national assembly is almost a must for any nation. Only Burma, Cuba and a number of Arab countries (Algeria, Iraq, Syria, Saudi Arabia, Yemen) seem to have managed without any assembly throughout the 1960s. Semiautonomous subunits and foreign dependencies also tend to have assemblies similar to the national assemblies.

The size of these assemblies varies widely, from China's 3040 members down to Gambia's 32 members. If one includes the assemblies of autonomous territories, the list would include Nauru's eight-member assembly, and at that point the distinction between the "government" and the "assembly" becomes hazy.

What determines the size of national assemblies? Are nations free to pick any arbitrary size, or do considerations of efficiency impose rather stringent limits on their choice? Some of the factors which may conceivably have an effect on assembly size are the following:

[1] See, e.g., Wheare (1963) and Blondel (1969).

(a) The size of the nation;
(b) The level of economic development;
(c) The degree of social mobilization;
(d) The degree of effective autonomy or independence of the nation;
(e) Method of selection: elected or appointed assembly?
(f) Assembly functions: decision-making, consultative or rubber-stamp?
(g) Example set by the earliest existing national assemblies;
(h) Personal and national idiosyncrasies.

This paper presents a simple model which expresses the mode of action of two major factors in determining the assembly size. These factors are the size of the population and its degree of social mobilization. The effect of other factors is briefly discussed.

Effect of Population Size

Even a casual inspection suggests that assembly size depends strongly on the size of the population the assembly is supposed to represent.[2] Therefore, assembly and population sizes around 1965 were compiled for all formally independent countries, and for a number of formally autonomous subunits.[3] If there were two assemblies, only the "lower house" was considered. If a country had an assembly at any time during the 1960s, it was included in the study. The aforementioned countries with no assembly during the 1960s were excluded; so was Yugoslavia which has a special system of five separate 120-member chambers. Systems with a population of less than 100,000 were included with reservations, because the functions of government and assembly may start to fuse for these small systems.

When the logarithm of assembly size (A) is plotted versus the logarithm of population size (P_0), for all data compiled, a clear positive correlation is evident (Fig. 1).[4] The use of a doubly logarithmic graph is justified here

[2]Blondel (1969, p. 374) notes that countries with less than 2 million inhabitants tend to have assemblies of 50 members or less, while those with 2-20 million inhabitants tend to have assemblies of 100-250 members.

[3]Population data were taken from *The Europa Year Book 1965.* Assembly sizes were taken from the Appendix of Blondel, 1969, or if not given there, from *The Europa Year Book 1965.* For the U.S. state legislatures, data was taken from *The World Almanac 1968.*

[4]In Fig. 1 the "Other" category includes independent states like China, Switzerland, and the two German, Korean and Vietnamese states. It also includes provinces like the West German *Laender,* Nigerian regions, Puerto Rico and Bermuda. For the United Nations membership, the 1969 list was used, although assembly and population data are for an earlier date; it was felt that the nations who joined the U.N. in the late 1960s were already well on their way toward independence by 1965. Out of the 126 U.N. members in 1969, assembly data were available for 116. Of these, the Republic of China was omitted because it was not clear what population size should be used. The data points for the U.S. states are occasionally slightly shifted in Fig. 1, in order to avoid overlapping of points.

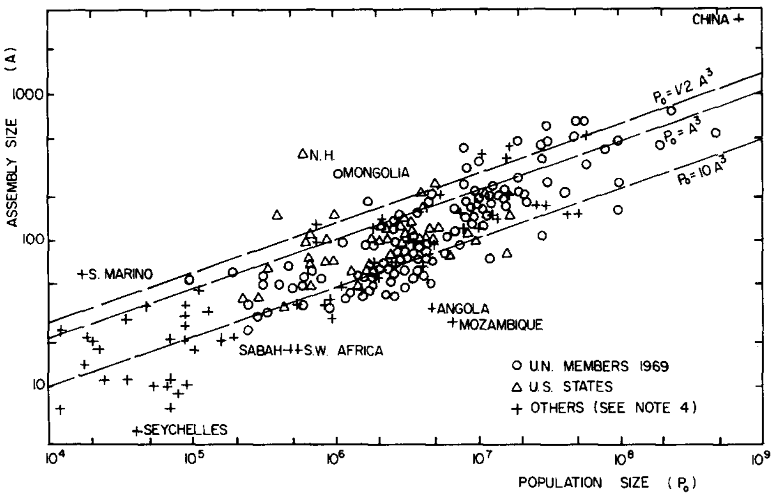

Fig. 1. Assembly and population sizes around 1965. The lines at $P = \frac{1}{2}A^3$ and at $P = 10A^3$ correspond to 100 and 5% social mobilization, respectively, according to the model presented. Data from sources in Note 3.

because this is the only possible way to plot quantities which vary over three and six orders of magnitude, respectively. The notorious ability of doubly logarithmic graphs to yield spurious linear correlations develops only when the slopes obtained exceed 4 (or are below 1/4).[5] In Fig. 1 the best fit is in the neighborhood of a line with slope 1/3 which corresponds to the simple equation

$$A = P_0^{1/3}. \tag{1}$$

The actual best fit of the data to an expression of the form

$$A = a\,P_0^n \tag{2}$$

(which is the general equation for straight lines in Fig. 1) could be worked out, but this would be a dead end. A purely empirical fit to the situation around 1965 is not likely to apply to any other period except approximately. It is more fruitful to look for a plausible theoretical model which would fit the observed general trend. Such a model is proposed in the next section. It applies, strictly speaking, only to those national assemblies which are genuinely representative and are based on one-assemblyman constituencies. Application to other assemblies will be discussed later.

[5]Cf., Mandelbrot (1963, and 1966, p. 356n).

A Model for Assembly Size in Terms of Population Size

The basic question for this model is: what does a "representative" assembly mean in terms of communication channels?[6] Assume that a population P_0 has P politically active members.[7] The number (C) of potential member-to-member communication channels is then

$$C = \tfrac{1}{2}P\,(P - 1). \tag{3}$$

This expression can be visualized in the following way: each of the P members is extending one half of a channel toward each of the remaining $(P - 1)$ members, with those half-channels meeting half-way between every pair of members.[8] If the population is small enough to actually meet, say at the town meeting, then all these $\tfrac{1}{2}P(P - 1)$ channels are operational in the sense that every member could in principle establish contact with every other member.

With increasing active population P, the number of potential communication channels increases approximately as P^2 [according to Eq. (3)], and direct contacts soon become unfeasible. A possible solution is to have an assembly of A representatives who function as interest aggregators for their respective constituencies, and who among themselves maintain the direct communications system of the town meeting.[9] The minimum number of communication channels required by the representational system is determined by the following conditions:

Condition 1. *Every active member of the population must have direct or indirect access to one interest aggregator of the highest level.*

Condition 2. *Every highest-level interest aggregator must have direct access to every other one.*

Condition 2 means that, at the representative assembly, the town meeting situation is preserved. For an assembly of A members, the total number of intraassembly communication channels (C_A) then is

$$C_A = \tfrac{1}{2}A(A - 1). \tag{4}$$

The constituency, however, is not a replica of the town meeting. Due to the special role of the assembly representative as interest aggregator, communication channels between the other constituency members are not essential for

[6]Blondel (1969, p. 470) asserts that "assemblies appear to be more concerned with communication than with any one of their other functions" (such as rule-making and policy initiation).

[7] The implication here is that a person has either one political role or none. The effect of multiple roles will be discussed later in this paper.

[8]Two-way communication channels are considered. If one-way channels are counted, C is obviously doubled. The implications of the latter approach will be discussed later in this paper.

[9]The term "interest aggregator" is used here in the same sense as in Almond and Powell (1966).

the functioning of the system (although some such channels undoubtedly will exist). For the purposes of our simple model, these interconstituent channels will be disregarded. According to Condition 1, there must be one channel left for each member of the population who is not a member of the assembly. This means a total of $(P - A)$ nonassembly communication channels. The average number C_C of channels within each of the A constituencies is then

$$C_C = P/A - 1. \tag{5}$$

While the average membership of a constituency by definition is P/A (including the assemblyman), the model does not require that all constituencies be of equal size. Altering the size of constituencies while maintaining their total number (A) will not alter C_C, according to Eq. (5).

The model does not require either that every constituent be in direct contact with his assemblyman. Having intermediary interest aggregators instead of direct contact does not alter the total number of communication channels required by Condition 1, provided that every person makes use of only one interest aggregator. Thus, a family head, a lawyer or a local leader could serve as an intermediary interest aggregator, without altering Eq. (5).

The model is illustrated in Fig. 2 where a population of P = 55 active members is divided into A = 5 constituencies. One member of each constituency serves as interest aggregator for the constituency and also as member of the five-member representative assembly. Note that every assembly member has a channel to every other one, with C_A = 10, in agreement with Eq. (4). Also the average number of intraconstituency channels is C_C = 10, in agreement with Eq. (5), although constituencies I and II deviate from the

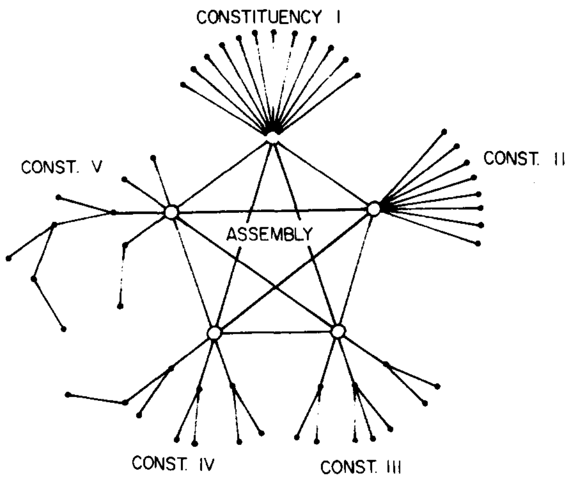

Fig. 2. Representative assembly scheme for a small population.

average constituency size, and constituencies III, IV and V use various schemes of intermediary interest aggregators.

The next question is how many constituencies and interest aggregators should a given population have. If we view the representational system as a means to channel information and to facilitate deliberations, then the assembly size should be chosen so as to optimize the efficiency of these two functions.

The deliberation function is in principle best served when the whole population can participate, i.e., when $A = P$. But this is precisely the situation we are trying to avoid because of the excessive number of communication channels [cf., Eq. (3)].

On the other hand, if we aim at the smallest possible total number of communication channels, the result is an assembly of one or two members, since $d(C_A + AC_c)/dA$ is zero for $A = 3/2$. This result may be an argument for having only one or two political parties as interest aggregators for the whole population, but it does not reflect the size of assemblies.

In both of these extreme cases the function of the assembly member as a transmission point between constituency and assembly breaks down. In the case of an all-population assembly ($A = P$), C_C is zero according to Eq. (5), and there is no constituency from which to transmit information to the assembly. In the case of a one-man assembly ($A = 1$), C_A is zero according to Eq. (4), and there is no assembly to which the information from the constituency can be transmitted.

These considerations lead to the hypothesis that an assemblyman might be the most efficient when he spends his time and effort in equal amounts on the constituency and on the assembly. Within the constituency he is involved with C_C communication channels. Within the assembly he is involved with C_A channels, either as a participant or, more often, as an attentive bystander to the discussion. Assuming that both types of channels require on the average the same time and effort, equality of constituency "input" and assembly "output" of the assemblyman would then require that C_C be equal to C_A. Equations (4) and (5) then can be combined into

$$P = \tfrac{1}{2}A^3 - \tfrac{1}{2}A^2 + A. \tag{6}$$

For $A = 5$, we have $P = 55$; this is the small system shown in Fig. 2. For A larger than 20, the terms A^2 and A contribute less than 5% to the value of P and can be neglected, resulting in

$$A = (2P)^{1/3}. \tag{7}$$

If the politically active population P forms a fraction k of the total population P_0, with k independent of the population size, we have (for $A >$ 20) an expression of the form of Eq. (2), with n equal to 1/3:

$$A = (2k)^{1/3}\, P_0^{\,1/3}. \tag{8}$$

In fact, with the rather reasonable assumption that about one half of the population is politically active (i.e., $P = \frac{1}{2}P_0$), Eq. (8) leads to Eq. (1) which was initially set up on empirical grounds.[10]

The conclusion is that the empirical relation between assembly size and the population size can be expressed in terms of a communication network model consisting essentially of Conditions 1 and 2 already given, plus a third one:

Condition 3. *The number of interest aggregation channels reaching a highest-level aggregator must be equal, on the average, to the number of channels he is participating in or witnessing at the representative assembly.*

Conditions 1-3 are plausible but not self-evident or unique. Therefore, the argument given here cannot be considered as a theoretical "proof" of a cube relationship between assembly and population sizes. Nor does the agreement with observational data fully validate the theoretical model, since there may be other models which could lead to a similar degree of agreement with observational data. Still, having a model and data which agree with it means more than having a model only or an empirical data fit only.

In the analysis which follows we will use the working hypothesis that Eq. (8) is valid for representative assemblies. Furthermore, it will be assumed for the time being that all national and provincial assemblies are representative to such a degree that the model applies. This working assumption is based on the fact that there does not seem to be any clear difference in size (at equal population size) between assemblies which are considered representative and those which are considered to be of the rubber-stamp type. It should be noted that assemblies which are not used for interest aggregation may be used for transmitting government orders to the population; the communication channel pattern may be quite similar in both cases.

Effect of Social Mobilization

Working with a large number of socio-economic indicators which can be used to characterize nations, Russett (1968) has established four main factors to which most of the indicators are highly correlated. The size of assemblies seems to correlate with two of the Russett factors: "Economic Development" and "Communism." Figure 3 shows the assembly size plotted versus the population size for all countries for which the Russett factors were available.

[10]If all channels are considered to be open for two-way communication, it does not matter whether the number of the two-way or the one-way channels is considered: Eq. (6) would result from either approach. However, it could also be argued that the assembly channels are two-way but that the constituency channels are one-way (i.e., demands sent up by the constituents are received by the interest aggregator without any back-talk). In this case, in terms of one-way channels, Eq. (4) becomes $C_A = A(A - 1)$ while C_C in Eq. (5) is unaltered. Equation (6) then becomes $P = A^3 - A^2 + A$, and for large A, $A = P^{1/3}$. Apart from a different value for k, the outcome is not altered.

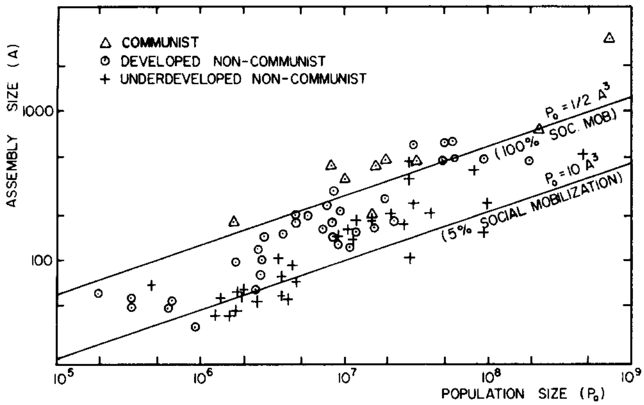

Fig. 3. Assembly and population sizes for countries with different levels of Russett factors. Data from *The Europa Year Book 1965, The World Almanac 1968,* and Russett (1968). Terms are defined in Footnote 11.

Different symbols are used in this plot to indicate communist countries (regardless of their degree of economic development), developed and underdeveloped noncommunist countries.[11] The three groups tend to occupy different zones which correspond to different values of the coefficient k in Eq. (8). Let us recall that, according to the model proposed, k represents the socially mobilized fraction of the population. Lines of 100% mobilization and of 5% mobilization are shown in Fig. 3.

Communist countries as a group lie above the full mobilization line suggested by the model. These points could be written off by saying that our basically representative model of assemblies does not apply to the communist systems or, if it applies, there are ideological idiosyncrasies superimposed on the basic factors. However the model itself can be modified to account for the apparent over-mobilization in communist countries. Instead of politically active physical individuals, the model can be presented in terms of political roles.[12] It is, in fact, realistic to assume that a person who plays several roles would have several access channels to the highest-level interest aggregator. The aggregator would respond to messages from these different channels as if they originated from different persons.

[11]Communist countries are defined as those for which the Russett "Communism" factor ranges from 2.17 to 2.76. Noncommunist countries are those for which this factor ranges from −1.11 to 0.57. All countries Russett dealt with fell into either of these ranges. Developed countries are defined as those for which the Russett "Economic Development" factor ranges from more than −0.1 to 1.9; for underdeveloped countries the range is from more than −2.1 to −0.1; there were no countries outside these ranges.

[12]The term "political role" is used here in the same sense as in Almond and Powell (1966).

TABLE 1

Average Social Mobilization Coefficients Suggested by National Assembly Sizes, for Countries at Different Economic Development Levels

Socio-economic type of countries	Range of Russett "Development Factor"[a]	Number of countries	Average social mobilization coefficient (k, in %)
Nondeveloped	−2.09 to −1.10	8	6
Underdeveloped	−1.09 to −0.10	23	11
Moderately developed	−0.09 to 0.90	17	26
Highly developed	0.91 to 1.90	18	44
Communist, regardless of development	−1.83 to 1.02	9	215

[a]Development factors from Russett (1968). Coefficients k calculated using Eq. (8) from population and assembly data in sources listed in footnote 3. Averages are geometric averages.

No estimate of the number of part-time and of almost-full-time roles in various countries could be made at this stage, but their weighted sum could conceivably surpass the number of physical individuals in developed political systems. In communist countries a basic doubling of roles could be caused by what Barghoorn (1966) has called the "participatory-subject culture," or by the existence of two distinct administrative networks (party and government).

Taking the geometric averages of the k values for the communist countries, and for the noncommunist countries at various development levels, the model suggests the average levels of social mobilization shown in Table 1. Qualitatively these figures suggest that communist countries are socially fully mobilized, with a high incidence of multiple roles (provided that the model applies to them). In noncommunist developed countries the majority of adults are socially mobilized, while in economically underdeveloped countries the population is largely nonmobilized.

The values of the social mobilization coefficient k obtained from the model should preferably be compared to some more direct indicator of social mobilization. General indices of socio-economic development do not express adequately the special emphasis on social mobilization in communist countries.[13] Out of the various indicators tabulated by Russett (1964), government revenues as percentages of GNP and private consumption as percentage of GNP were considered. For both indicators percentages of GNP would have to be transformed into percentages of people mobilized. At our

[13]In addition to Russett's Economic Development factor, consideration was given to the "General Development Index" presented in McGranahan, 1971. Its correlations with Russett's factor and with the logarithm of per capita GNP are good and almost linear. McGranahan gives no values for Communist countries, but low-GNP Communist countries would seem to be low on most factors he takes into account.

present state of knowledge this could be done only empirically. What is needed is an indicator which is already in percentage of the total population.

A Model for Assembly Size in Terms of Literate Adult Population

Equation (7) gives assembly size in terms of the size of the politically active population. The political activity in question could be of a participatory or of a participatory-subject type, and was in the preceding section equated with social mobilization. The need for a simple (even if imperfect) criterion of the degree of social mobilization (in percentage of total population) became apparent. The following gross approximation is now made:

Condition 4. *The socially mobilized population is approximately equal to the literate adult population.*

Adult literacy is an admittedly imperfect measure of social mobilization. Literacy may not always be a prerequisite for social and political activity (although it usually is), and all literate adults need not be socially mobilized. Furthermore, in highly mobilized societies, possession of multiple roles is not reflected by literacy. Yet, literacy seemed to be the best measure of social mobilization, for which extensive numerical data were available.

Even these data were available only in an indirect form. Russett (1964) has tabulations of percent literacy for the population of 15 years and older, and of the percentage of total population which is of working age (about 16 to 64).[14] If there are relatively few people above the working age, then the product of these indicators gives the percentage of literate adults among the total population. This approximation will be made here. In terms of quantities for which numerical data are available, the model based on Conditions 1-4 finally gives

$$A = (2\,L\,WP_0)^{1/3}N. \tag{9}$$

In this equation, A stands for assembly size, P_0 for total population, W for working age people as a fraction of total population, and L for fraction of adults who are literate. The quantity N represents the effects on assembly size of all other factors besides population size and its degree of social mobilization (plus the effect of error on social mobilization due to approximations discussed above). Thus, N is the assembly size normalized with respect to population size and mobilization. The values of N for particular countries can be calculated from Eq. (9). If the model applies, the world-wide average N should be close to one.

Table 2 lists the 120 countries and dependencies for which data were available for calculating N from Eq. (9). Countries are listed in the order of

[14]Russett (1964), Tables 64 and 2. Most of the literacy figures date back to the early 1950s, and a single figure is given for the African nations which grew out of the French Equatorial and West Africa.

TABLE 2

Normalized Assembly Sizes and Data used to Calculate It[a]

Country	Assembly size A	Population P_0 (millions)	Adult literacy L (%)	Working age population W (%)	Normalized assembly size N
Barbados	24	0.24	91	60	0.37
Philippines	104	28	75	51	0.37
Taiwan Province	74	12	54	52	0.39
Jamaica	45	1.7	77	54	0.40
Trinidad and Tobago	36	0.89	74	54	0.40
Netherlands Antilles	22	0.20	72	51	0.42
Panama	42	1.2	66	53	0.44
Nicaragua	42	1.5	38	52	0.49
El Salvador	52	2.5	39	56	0.50
Guatemala	55	4.0	29	55	0.50
Ecuador	72	4.6	56	54	0.51
Puerto Rico	64	2.4	81	52	0.51
Singapore	51	1.8	50	55	0.51
Australia	124	11	98	61	0.52
Costa Rica	57	1.4	79	51	0.55
New Zealand	80	2.6	98	58	0.56
Dominican Republic	74	3.6	60	53	0.56
Paraguay	60	1.8	66	51	0.56
South Korea	175	26	77	55	0.62
Netherlands	150	12	98	61	0.62
Sarawak	36	0.82	21	52	0.64
Mozambique	27	6.6	1	57	0.64
Angola	34	4.8	2.5	58	0.66
Argentina	192	22	86	65	0.66
Malawi	55	3.5	16	52	0.66
Cyprus	50	0.59	60	59	0.67
Guyana	53	0.62	74	52	0.67
Honduras	64	2.0	44	49	0.67
Pakistan	156	94	13	52	0.67
Cameroon	50	4.5	7	64	0.68
Liberia	41	2.5	7.5	56	0.69
Portugal	130	9.1	56	63	0.70
Uganda	92	7.2	28	56	0.70
Uruguay	99	2.6	81	67	0.70
USA	435	191	98	60	0.72
Rhodesia	65	4.2	16	52	0.73
Luxembourg	56	0.33	96	70	0.73
Chile	147	8.2	80	58	0.74
Laos	59	2.6	18	57	0.74
Rwanda	47	3.0	7.5	56	0.74
Haiti	58	3.7	10	58	0.76
Mexico	210	40	50	52	0.76
Czechoslovakia	200	14	98	64	0.77
Congo (Kinsasha)	137	14	38	54	0.77
Austria	165	7.0	98	67	0.79

Table 2 (Continued)

Country	Assembly size A	Population P_0 (millions)	Adult literacy L (%)	Working age population W (%)	Normalized assembly size N
Cambodia	82	5.9	18	53	0.80
Ceylon	157	11	63	57	0.80
Chad	75	2.8	2.5	56	0.81
Madagascar	107	6.0	34	57	0.81
Malta	50	0.33	58	56	0.84
Thailand	240	30	68	55	0.85
Israel	120	2.5	94	59	0.85
South Africa	170	16	42	58	0.85
Colombia	190	15	62	54	0.87
Indonesia	238	97	18	60	0.87
Jordan	60	1.9	18	49	0.88
Norway	150	3.7	98	63	0.90
Kuwait	50	0.40	30	62	0.91
Malay(si)a	144	9.1	38	53	0.93
Zambia	79	3.6	16	54	0.93
Belgium	212	9.3	97	64	0.94
Canada	264	19	98	59	0.94
Bolivia	102	3.5	32	56	0.94
Japan	467	94	98	64	0.95
Tunisia	90	4.3	17	55	0.96
Ireland	144	2.8	98	59	0.97
Ghana	114	6.7	23	52	0.98
Denmark	179	4.6	98	64	1.00
Iceland	60	0.19	98	57	1.00
Peru	182	12	47	53	1.00
Switzerland	200	5.6	98	66	1.03
Lebanon	99	1.8	48	57	1.04
Dahomey	42	2.2	2.5	61	1.06
Venezuela	179	8.4	52	55	1.06
India	510	461	19	59	1.08
Sweden	231	7.6	98	66	1.08
Burundi	64	2.4	7.5	56	1.09
Togo	56	1.5	7.5	56	1.11
Mauritius	70	0.46	52	53	1.11
Finland	200	4.6	98	63	1.12
Brazil	404	79	49	56	1.15
Sierra Leone	66	2.2	7.5	56	1.16
West Germany	500	58	98	68	1.17
Mauritania	40	1.2	2.5	64	1.18
USSR	750	226	95	57	1.20
Morocco	144	12	13	55	1.23
France	480	48	96	62	1.24
Central African Republic	50	1.8	2.5	60	1.32
Iran	200	21	15	54	1.34
Niger	60	3.1	2.5	56	1.35

Table 2 (Continued)

Country	Assembly size A	Population P_0 (millions)	Adult literacy L (%)	Working age population W (%)	Normalized assembly size N
Kenya	170	8.6	22	50	1.36
Poland	460	31	95	62	1.38
Greece	300	8.4	80	66	1.45
Libya	91	1.6	13	56	1.48
Hungary	349	10	97	66	1.50
Upper Volta	75	4.4	2.5	56	1.51
Nepal	125	9.5	5	58	1.52
East Germany	434	17	98	65	1.55
United Kingdom	630	52	98	65	1.55
Mali	80	4.3	2.5	63	1.56
Italy	630	52	88	66	1.61
Romania	465	19	89	66	1.65
Guinea	75	3.1	2.5	54	1.71
Nigeria	312	56	10	52	1.73
Albania	182	1.7	60	55	1.75
Ivory Coast	85	3.8	2.5	55	1.81
Gabon	47	0.50	2.5	68	1.82
Spain	600	30	87	64	1.86
Egypt	350	28	20	59	1.87
Senegal	80	3.0	2.5	52	1.87
Congo (Brazzaville)	55	0.80	2.5	59	1.92
Turkey	450	29	39	57	1.92
Bulgaria	416	8.1	85	66	1.99
Tanzania	189	10	7.5	56	2.00
Aden-South Yemen	94	1.2	5	64	2.2
Sudan	233	13	9	51	2.2
Ethiopia	210	20	2.5	56	2.5
Afghanistan	217	15	2.5	56	2.9
Mongolia	287	1.0	58	64	3.1
China	3040	705	47	60	4.1

[a]Data from sources listed in footnotes 3 (for A and P_0) and 14 (for L and W). N calculated using Eq. (9).

increasing values of N. The largest and the smallest values of N differ by a factor of 11, while in the case of the nonnormalized assembly size A they differ by a factor of 138 (from China to Netherlands Antilles). The distribution of A and of N is close to the normal on the logarithmic scale. The average of log N is -0.0163 which corresponds to a 0.963 geometric average for N. The observed values of N are rather equally spread on both sides of the average value 1 suggested by the simple model.

The distribution of A, $A/(2P_0)^{1/3}$, and N are all approximately log-normal. Standard deviations on logarithms are 0.35, 0.23 and 0.19, respectively. Normalization with respect to the total population only, through $A/(2P_0)^{1/3}$, is thus the main factor in reducing the spread. Further normalization with respect to literacy reduces the standard deviation only from 0.23 to 0.19; but this normalization also brings the average value close to the theoretical value. For log N, the standard deviation of the average (or the standard error) is about 0.018. Thus, the observed average of log N (-0.0163) is within one standard deviation from the zero average predicted for log N by the model.[15]

Effect of Other Factors

The model presented seems to account rather well for the effect of the size and of the degree of social mobilization of the population on the assembly size. The remaining deviations of the normalized assembly size N from unity should be explained in terms of the remaining factors listed in the introduction, and possibly some others.

The degree of effective autonomy, though difficult to assess numerically, does not seem to influence the normalized assembly size in a major way. This is seen by inspection of Table 2. Furthermore, when colonies have reached independence, their national assemblies usually have maintained the size of the previous provincial assemblies. The sample of present formally nonsovereign countries is too small (four) to draw any conclusions.

An unexpected geographical factor emerges from inspection of Table 2: island nations tend to have small assemblies. The median N for the 22 island nations is 0.65. Only 12 continental nations are below that figure.

The effect of assembly functions and its selection methods were investigated according to the classification of regimes by Blondel.[16] Three features were considered: the present norms of the regime, the techniques of regime maintenance, and the party system. Blondel distinguishes six to eight different types within each category. Table 3 shows the distribution of normalized assembly size N according to the norms of the regime. Except for the markedly high values for the leftist-authoritarian group, there is considerable overlap. A similar picture emerges from regime maintenance techniques, with constitutional-legitimate regimes having the lowest N values (average: 0.81) and the bureaucratic party "apparat" regimes having the highest (average: 1.34). When the number of effective parties is considered, clear-cut two-party systems have an average N of 0.70, while one-party systems have an average of 1.32. The ways to classify regimes are to some extent subjective; no generally accepted method to measure regimes exists. Therefore, no more detailed analysis of these factors is presented here.

[15]Standard deviations were calculated using the inefficient statistics formuli in Evans (1955, p. 903).

[16]Blondel (1969), appendix, columns 10, 11 and 20.

TABLE 3

Normalized Assembly Size for Various Political Systems

Norms	Number of countries	Geometric average N^a	Range of N
Liberal-democrat	40	0.83	0.37-2.2
Authoritarian and traditional conservative	42	0.97	0.39-2.9
Right and center populist	20	1.00	0.50-2.0
Left populist and radical authoritarian	14	1.68	0.77-4.1

[a]Values of N from Table 2. Norms as given by Blondel (1969), appendix, columns 10, 11 and 20.

Assuming that the model presented here yields the most efficient assembly size, the question remains how the majority of nations have picked sizes in the optimum range, without knowing about the model. Most likely they have used a trial-and-error method, often based on imitation of preexisting nations. If a nation chooses an assembly size which is drastically above or below the optimum, the assembly will eventually prove inefficient, but the process may take a long time. People may keep traditional assembly sizes in spite of some inconvenience. However, new nations may adjust their assembly size by observing the older ones. While France and the United Kingdom have high normalized assembly sizes, their ex-colonies have adopted sizes covering the whole normalized range observed. On the other hand, most communist countries have normalized assembly sizes even larger than that of the Soviet Union which is presumably their model.

A quick check of the intuitive feelings people have about assembly sizes was carried out with the help of 27 social science undergraduates. These students were asked to recommend an assembly size for a new nation in the following cases: the country is "developed" or "backward," and has 1, 10 or 100 million inhabitants. Individual answers varied widely. Geometrical averages for the group are shown in Table 4, and indicate a general feeling that larger and more developed countries should have larger assemblies. Normalized values in Table 4 are based on the assumption that in a typical developed country 60% of the population is of working age, and that the adult literacy is close to 100%, while the backward cliché evokes 50% working age population and 10% adult literacy (cf., values in Table 2). Values recommended in the six cases proposed range from the lowest N value actually observed to the observed median (cf., Table 2). Since the students were basing their recommendations on an American background, it should be noted that the United

TABLE 4

Averages of Assembly Sizes Proposed by 27 Students[a]

Presumed population (millions)	Assembly sizes proposed for		Corresponding normalized size N for	
	Developed	Backward	Developed	Backward
1	39	28	0.37	0.60
10	135	81	0.59	0.81
100	362	209	0.73	0.97

[a]Averages are geometric averages. N was calculated from Eq. (9), using $L = 1.00$ and $W = 0.60$ for developed countries, and $L = 0.10$ and $W = 0.50$ for backward countries.

States Congress itself has a rather low value of N (0.72). The specially low value recommended for small developed countries could result from a refusal to believe that a country with only one million inhabitants could be truly developed.

Prospective Size of a "World Assembly"

If a world representative assembly should ever be formed, what approximate size would the model suggest for it? Assume a world population of 4 billion, about one half of whom are adults. If a 50% world-wide adult literacy is assumed, Eq. (9) with $N = 1$ leads to an assembly of about 1300 members. Alternatively, with 70% adults and 100% adult literacy, a 1700 member assembly would result.

These figures are considerably higher than those for any actual national assembly, with the exception of China. Such an assembly would also be physically larger than the present United Nations General Assembly where each of the hundred-odd nations can have five delegates at most.[17]

CONCLUSIONS

A simple model based on communication channels has been presented, to express the size of national (and provincial) assemblies in terms of the total population and of its degree of social mobilization. The degree of social mobilization itself has been approximated by the fraction of literate adults in the total population. The distribution of assembly sizes, normalized with respect to the model-predicted size, is lognormal. The average value on the logarithmic scale is within one standard error from the value predicted by the model. While actual assembly sizes differ by up to a factor of 138,

[17]United Nations (1964, p. 9).

normalization with respect to the literate-population model reduces the residual unaccounted variation to a factor of 11. It is concluded that the model proposed may express some basic features of the national assembly sizes.

REFERENCES

Almond, G. A., and Powell, G. B., Jr. (1966), "Comparative Politics: A Developmental Approach." Little, Brown & Co., Boston, MA.

Barghoorn, F. C. (1966), "Politics in the USSR." Little, Brown & Co., Boston, MA.

Blondel, J. (1969), "Introduction to Comparative Government." Praeger, New York.

Europa Publications, Inc. (1965), "The Europa Year Book 1965." London.

Evans, R. D. (1955), "The Atomic Nucleus." McGraw-Hill, New York.

Long, L. H. (1967), "The World Almanac 1968." Newspaper Enterprise Association, New York.

Mandelbrot, B. (1963), New methods in statistical economics, *J. Political Economy* 71, 421-440; (1966), Information theory and psycholinguistics, *in* P. F. Lazarsfeld and N. W. Henry (Eds.), "Readings in Mathematical Social Science," pp. 350-368, M.I.T. Press, Cambridge, MA.

McGranahan, D. V. (1971), Analysis of socio-economic development through a system of indicators, *Ann. AAPSS* 393, 65-81.

Russett, B. M., Alker, H. R., Deutsch, K. W., and Laswell, H. (1964), "World Handbook of Political and Social Indicators." Yale University Press, New Haven, CT.

Russett, B. M. (1968), Delineating international regions, *in* J. D. Singer (Ed.), "Quantitative International Politics," pp. 317-352, Free Press, New York.

United Nations (1964), "Everyman's United Nations." United Nations Publication 64.I.9, New York.

Wheare, K. C. (1963), "Legislatures." Oxford University Press, New York.