The Council of Ministers should consider a compromise between the Nice and constitutional treaties to get its votes right, say Werner Kirsch, Wojciech Słomczyński and Karol Życzkowski

Traditionally, the voting weights in the EU's Council of Ministers were not determined by a formula, they were the result of late-night bargaining between government representatives behind closed doors. The current voting system, introduced by the 2000 Treaty of Nice, is based on voting weights and has two additional components: for a decision to be taken, a simple majority of states is required and the supporters of the decision must represent at least 62% of the EU population.

The constitutional treaty proposed a voting system of 'double majority', under which supporters of a decision must comprise 55% of states and must represent at least 65% of the Union's population. In what we call the 'population rule', the voting weight of a country is in proportion to the number of its citizens. The double majority reflects the idea that the EU is both a union of states and a union of people (the latter represented by the population rule).

At first glance this double majority system may look like a substantial improvement: it is a simple formula to determine the voting weights rather than a non-transparent deal between governments. But is this assignment of voting weights a fair one?

To analyse voting systems and to quantify the notion of voting power, mathematicians created the game theory concept of power indices. It measures the probability that a member's vote will be decisive in a hypothetical ballot; should this country decide to change its vote, the winning coalition would fail to satisfy the qualified majority condition. It is assumed that all potential coalitions are equally likely. This assumption leads to the concept of the Penrose-Banzhaf index, named after a British psychiatrist and mathematician, Lionel S. Penrose, who introduced the theory of indirect voting in 1946, and John F. Banzhaf III, an American attorney, who introduced this index independently in 1965.

Voting weights do not directly give the voting power of a country. A system with two members: A having 51 votes and B having 49 votes. If the assembly takes decisions by a simple majority vote, then A will win any voting and so his power is 100%. Although B has almost the same voting weight, his power is 0%.

The idea of a union of people requires that all citizens of the EU have the same influence on decisions regardless of their home country. This should be true at least in the simple majority rule, which supporters of a decision must represent at least 65% of the Union's population. The double majority reflects the idea that the EU is both a union of states and a union of people (the latter represented by the population rule).

As a consequence of the square root law, the population rule of the constitution gives big states much more power than they should have. In combination with the first rule (simple majority of states), which favours small states, the voting rules introduced in the constitutional treaty give big states much more power than they deserve.

Penrose wrote in 1952: ‘Two votings were required for every decision, one on a per capita basis and the other upon the basis of a simple vote for each country, this system would be inaccurate in that it would tend to favour large countries. Comparing the voting power according to the Nice treaty with the square root rule, it is clear that under the current treaty Germany is under-represented, while Spain and Poland are over-represented. A voting system based on the square root rule, it is reasonable to start with voting weights proportional to the square root of population (Penrose-Root weights). This compromise solution may be combined with the idea of a union of states, i.e., with a simple majority of states. Such a modified double majority voting system based on the Penrose law is determined by the following two rules:

A: The voting weight attributed to each member state is proportional to the square root of its population.

B: The decision of the voting body is taken if:

- the sum of the weights of members of a coalition exceeds the 63.6% quota (e.g. 222 out of 360 votes);
- the coalition consists of at least 50% of member states (34 out of 27).

The second criterion does not introduce a considerable shift of power, nor does it reduce the advantages of the single criterion Penrose system. The modified double majority system would be a compromise: Germany, for instance, gains under this system considerable power compared to the Nice treaty, while Spain and Poland benefit with respect to the constitutional treaty.

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