The authors gratefully acknowledge that work on this paper was partly supported by the Leverhulme Trust (Grant F/07-004/AJ).

The QM Rule in the Nice and EU Reform Treaties: Future Projections

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October 2007

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*Supported by Voting Power in Practice Grant F/07 004/AJ from the Leverhulme Trust, which the authors gratefully acknowledge.

ABSTRACT

We analyse the projected future evolution of the distribution of voting power and related quantities under the qualified majority (QM) decision rule for the Council of Ministers of the EU, prescribed by the forthcoming EU Reform Treaty. Our projections are based on the demographic changes forecast by EUROSTAT [4] for the period stretching from the present to the middle of the 21st Century. We use a method similar to the one we used in [6], [7], [8] and [9].

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1 Introductory remarks

The EU Reform Treaty, which is expected to be concluded before the end of 2007, incorporates a new qualified majority (QM) decision rule for the EU Council of Ministers (CM).[1] This rule is due to take effect not earlier than 1 November 2014 and not later than 31 March 2017.[2] Until then, the QM rule contained in the Nice Treaty [1] will remain in force. The new rule states:

> **Article I-24**
>
> 1. A qualified majority shall be defined as **at least 55%** of the members of the Council, **comprising at least fifteen of them** and representing Member States comprising at least **65%** of the population of the Union.
>
> **A blocking minority must include at least four Council members, failing which the qualified majority shall be deemed attained.**
>
> 2. **By derogation from paragraph 1,** when the Council is not acting on a proposal from the Commission or from the Union Minister for Foreign Affairs, the qualified majority shall be defined as **72%** of the members of the Council, representing Member States comprising at least **65%** of the population of the Union.[3]

This decision rule depends *explicitly* on the size of population of the member-states. Thus, the number and composition of coalitions able to pass or block a decision of the CM, as well as the voting powers of the member-states (and other related quantities) will be affected by demographic changes. Strictly speaking, it is not a single fixed rule, but a variable rule that depends not only on the number of member-states but also on their changing populations.

[1] This rule was first adopted at the Brussels IGC, 17–18 June 2004, and was included in the proposed EU Constitution, which failed to be ratified and was abandoned. Subsequently, the same rule was confirmed on 23 June 2007 by the Council of the European Union (the 'EU Summit'), also held in Brussels.

[2] See [3, Annex I, Article 13, p. 18].

[3] See [2, p. 7].

Formally, the same holds also for the Nice QM rule, which is currently in force. However, as we showed in [6], the effect of the population clause in the latter rule is rather insignificant if not negligible.[4] So the new QM rule is the the first in the history of the EU whose functioning can be affected *significantly* by changes in population size.[5]

In the present report we describe and analyse the effects on the distribution of voting powers and related quantities that would result from the demographic changes forecast by EUROSTAT [4] for the period stretching from the present to the middle of the century.

We have made the computations of voting powers for the latest (2006) population figures available to us; and for the years 2010–50, at five-year intervals, using EUROSTAT [4] population forecasts. Our calculations for 2006 and 2010 are done under the Nice QM rule, whereas from 2015 we assume the new Reform Treaty rule.

We ignore the last 'derogation' paragraph (see p. 1) in the new rule, which applies in certain exceptional circumstances.

Also, for simplicity we assume that the current EU membership of 27 states will be unchanged throughout this period.

We find that the clause excluding blocking coalitions with less than four members rules out in 2015 and 2020 just ten coalitions of three member-states, whose populations comprise more than 35% of the total, and therefore would otherwise be able to block, namely:

{Germany, France, UK},
{Germany, France, Italy},
{Germany, France, Spain},
{Germany, France, Poland},
{Germany, UK, Italy},
{Germany, UK, Spain},
{Germany, UK, Poland},
{Germany, Italy, Spain},
{Germany, Italy, Poland},
{France, UK, Italy}.

From 2025 on there is an additional such coalition: {France, UK, Spain}. We have taken these exceptional coalitions into account in our calculations; but in any case their effect on voting powers and related quantities is negligible.

[4]The main – and dominant – clause in the Nice QM rule assigned voting weights to the member-states; these weights took account of population sizes as they were at the time (2000), but were to remain fixed henceforth.

[5]In view of this fact it is rather strange that – as far as we know – the EU does not have a uniform definition of the 'population' of each member-state, and a legally binding procedure ascertaining its size at synchronized regular intervals.

The results of our calculations are presented in a separate Appendix (attached), consisting of tables and charts. The general structure of these tables and charts is described in Section 2. The meaning of the various measures and parameters presented in the tables is outlined in Section 3. Our conclusions are presented in Section 4.

2 Presentation of results

The results of our calculations, presented in the Appendix, are organized as follows.

All our results are in the form of 10-term time series, consisting of data for the year 2006 and then for 2010–2050 at five-year intervals: 2010, 2015, ..., 2050. The values for 2006 and 2010 are calculated under the Nice QM rule; those from 2015 on are calculated under the QM rule of the Reform Treaty.

Tables 1–27 present extensive data, separately for each member-state, listed in alphabetic order. The table for each member-state contains the values of four series: ψ (psi), β (beta), γ (gamma) and Quotient. The meaning of these quantities is the same as in our previous papers ([6], [7], [8] and [9]). We recapitulate their explanation below, in Section 3.

The data presented in each table are also shown graphically in two charts. The numbering of the charts corresponds to that of the tables. Thus, for example, Table 1 contains data for Austria (the first member-state in alphabetic order); so the charts for Austria are Fig. 1a and Fig. 1b. Charts with label 'a' show the graphs of ψ, β and γ (but not of the Quotient); those with label 'b' show the graphs of all four series.[6]

Table 28 presents a synoptic comparison of various global properties – equitability, conformity to majority rule, sensitivity, efficiency – of the decision rules operating at each of the ten dates. For a brief explanation of the parameters used for this comparison, see Section 3.

Table 29 presents the EUROSTAT population data and forecasts. This table is copied from `http://tinyurl.com/3aqcwe`. Note that instead of the data for 2006 that we have used for Tables 1–27, this table gives the data for 2005.

Finally, Table 30 – derived directly from Table 29 – gives the rank-order of the member-states according to population size for each of the ten dates of the latter table.

[6]The reason for having two charts per member-state is that in most cases the graphs of ψ, β and γ are much better spaced when they are shown without the graph of the Quotient.

3 Explanations

In this section we explain the meaning of the measures used in the present report and the criteria used in our assessment of QM decision rules. Our method here is largely the same as in [7], where the reader can find some further explanatory details.

3.1 Voting power: absolute, relative and negative

Each of the three series of values ψ, β and γ conveys information on a different aspect of voting power.

Penrose's measure ψ is an objective measure of *absolute* a priori voting power; its value for a given voter quantifies the amount of influence over the outcomes of divisions that the voter derives from the decision rule itself.

Thus, if the value of ψ for a member-state is higher under decision rule $\mathcal{U}$ than under $\mathcal{V}$, it follows that the position of that member-state is objectively better – in the sense of having more influence – under $\mathcal{U}$ than under $\mathcal{V}$. The importance of ψ for comparing the position of a given voter under different decision rules is not sufficiently appreciated even by some academic commentators.

Politicians are obviously interested in comparing the *relative* position of their country with those of other member-states, especially ones whose populations are close in size to their own. As far as we know, they do not employ the precise scientific measure of a priori relative voting power, the Banzhaf index β, which is obtained from ψ by normalization. Instead, they look at the voting weights, which can give a rough – and often quite imprecise – idea about relative voting power.

Another aspect of voting power in which politicians are keenly interested is negative or blocking power – the ability to help block an act that they oppose. Of course, this does not mean that they have more than a vague notion as to how to quantify this power.

Absolute voting power, as measured by ψ, is the voter's ability to help secure a favourable outcome in a division. This can be resolved into two component parts: the power to help secure a positive outcome, approval of an act that the voter supports; and the power to help secure a negative outcome, blocking of an act that the voter opposes. These two components are quantified by the Coleman measures γ^* and γ, respectively. From a purely objective, disinterested viewpoint, both are equally important; and indeed

ψ is a symmetric combination of γ^* and γ.[7] However, for rather obvious political reasons, EU practitioners are much more concerned about negative voting power than about its positive counterpart.[8]

So in this report we present all three sets of data about the QM rules under consideration: ψ as an objective measure of absolute voting power; as well as β and γ, which quantify aspects of voting power that are of particular concern to practitioners.

3.2 Democratic legitimacy

The CM can be regarded as the upper tier of a two-tier decision-making structure: if we assume that each minister votes in the CM according to the majority opinion in his or her country, then the citizens of the EU are seen as indirect voters, voting via their respective representatives at the CM. The criteria considered under the present heading are *equitability* and *adherence to majority rule*. These address different aspects of the functioning of the CM as the upper tier of the two-tier structure.

As explained elsewhere (see [5]), a perfectly equitable decision rule for the CM – in the sense of equalizing the indirect a priori voting powers of all EU citizens across all member-states – would give each member-state voting power proportional to the square root of its population size. (This is Penrose's Square-Root Rule.) So under such a decision rule the value β_i of β for member-state i would equal

$$\hat{\beta}_i =: \frac{\sqrt{p_i}}{\sum_{j=1}^{27} \sqrt{p_j}},$$

where p_i is the population of member-state i. The Quotient is defined as the actual value of β divided by the 'equitable ideal' $\hat{\beta}$. In other words, the value Q_i of the Quotient for member-state i is

$$Q_i =: \frac{\beta_i \sum_{j=1}^{27} \sqrt{p_j}}{\sqrt{p_i}}.$$

[7] In fact, ψ is their *harmonic mean*. For further details see [5, pp. 49–51].

[8] For reasons of internal national politics, a government normally considers it more important to be able to block a CM act that it opposes than to secure approval of an act it favours. Also, a government that finds itself in a position where it would be able to block a CM act may use this as a bargaining chip: agree to vote for the act in exchange for concession on matters that may or may not be related to that act.

The amount by which the Quotient for a given member-state exceeds or falls short of 1 indicates the amount by which the voting power of this member-state exceeds or falls short of what it should have got under an equitable distribution of the same amount of total voting power.

In order to assess the degree to which a given rule is equitable, we therefore gauge how close its 27 β values are to the ideal presented by the corresponding $\hat{\beta}$ values. For this purpose we use three synoptic parameters. All three are given in percentage terms – hence the coefficient 100 in their definitions:

D This is the widely used *index of distortion*. It is defined as:

$$\mathrm{D} =: 100 \sum_{i=1}^{27} \frac{|\beta_i - \hat{\beta}_i|}{2}.$$

The smallest possible value of D is 0 and its greatest possible value is 100. The *smaller* the value of D, the closer the overall fit between the β_i and $\hat{\beta}_i$.

$\max|\mathrm{d}|$ *Maximal relative deviation*. It is defined as:

$$\max|\mathrm{d}| =: 100 \max_i |Q_i - 1|.$$

$\mathrm{ran(d)}$ *Range of relative deviations*. It is defined as:

$$\mathrm{ran(d)} =: 100(\max_i Q_i - \min_i Q_i).$$

D is a measure of the *overall* discrepancy between the 27 β values and the corresponding $\hat{\beta}$ values. Thus it can serve as a measure of the overall equitability of the decision rule in question. On the other hand $\max|\mathrm{d}|$ and $\mathrm{ran(d)}$ quantify the most extreme *individual* deviations of the given rule from equitability.

We now turn to our criterion of adherence to majority rule. In any non-trivial two-tier decision-making structure it can happen that the decision at the upper tier (in our case: the CM) goes against the majority view of the lower-tier indirect voters (in our case: the citizens of the EU at large). In a case where this happens – that is, the CM approves an act that is opposed by a majority of EU citizens, or blocks an act that is supported by a majority of the citizens – the margin by which the majority that opposes the decision exceeds the minority that supports it is the *majority deficit* of this decision. In a case where the majority of citizens support the CM decision the majority

deficit is 0. The majority deficit can be regarded as a random variable (taking only non-negative integer values), whose distribution depends on the decision rule of the CM. The mean value (mathematical expectation) of this random variable is the *mean majority deficit* (MMD).[9] The larger the MMD, the further the CM decision rule is from the majoritarian ideal.

3.3 Efficiency

The criteria we consider under this heading address the functioning of the CM as a decision-making body in its own right rather than as part of a two-tier structure.

The [absolute] sensitivity of a decision rule is the sum of the voting powers (as measured by ψ) of all members of the CM. It measures the degree to which the CM collectively is empowered as a decision-making body, the ease with which an average member can make a difference to the outcome of a division. It is thus a good indicator of efficiency.

The *relative sensitivity index*, denoted by S, measures the sensitivity of the given rule on a logarithmic scale, on which $S = 0$ holds for the least sensitive rule (unanimity) with the same number of voters, and $S = 1$ holds for the most sensitive rule (the ordinary majority rule) with that number of voters.[10]

The second criterion under the present heading is that of *compliance*. A direct measure of this is Coleman's 'power of the collectivity to act', which is simply the a priori probability A of an act being approved rather than blocked.

A measures the compliance of a decision rule, the ease with which a positive outcome is approved. But it is often instructive to look at its reverse, so to speak: the resistance of a decision rule to approving an act. A convenient measure of this is the *resistance coefficient* R.[11] For proper decision rules, the least value of R is 0 (attained for a simple majority rule with an odd number of voters) and its maximal value is 1 (attained by the unanimity rule).

Finally, we also present for each of the three decision rules under consideration the a priori betting odds against an act being approved by the CM. These odds are just a modified form of A.

Note that A, R and the betting odds should not be interpreted too literally. Clearly, the CM does not vote on acts at random. Before an act is

[9] For details, see [5, pp. 60–61].

[10] For further details see [5, p. 61].

[11] For further details see [5, p. 62].

tabled for a formal vote at the CM, it goes through a preparatory process of bargaining and successive modification, until a point is reached where its approval is normally a foregone conclusion. What A, R and the betting odds actually measure is the average ease or difficulty of the preparatory process and the brevity or length of the time it may be expected to take.

4 Conclusions

Not surprisingly, our computations show that the main changes in voting power and related quantities will occur in the change-over from the Nice QM rule to the QM rule of the Reform Treaty, which in our projection will have taken place between 2010 and 2015. From 2015 on the changes – due entirely to demographic trends – are relatively small.

First let us address the changes between 2010 and 2015. These are essentially the same as those described in our report [9] in which we compared the Nice rule with the rule that is now incorporated in the Reform Treaty. Although in [9] we assumed the 2006 population data for both rules – rather than the 2010 forecast for the former and the 2015 forecast for the latter – the overall picture is the same. Let us summarize these changes.

Our projections show that all member-states will have in 2015 under the Reform rule more absolute voting power (as measured by ψ) than in 2010 under the Nice rule, but the increase is very uneven, not to say erratic.

The *relative* position (as measured by β) of the four largest and six smallest member-states will improve considerably, and that of Denmark and Finland will improve very slightly. The relative position of all other member-states will be worsened; the greatest loss of relative power will be sustained by Hungary, followed by the Czech Republic and Romania. The smallest loss will be experienced by Slovakia.[12]

As for blocking power, γ, Malta will gain slightly; all other member-states will lose blocking power, but the extent of loss is again very uneven.

From Table 28 we can see that, by the yardstick of Penrose's Square-Root Rule, the voting-power distribution in 2015 will be considerably less equitable than in 2010. As can be seen from the tables for the member-states (Tables 1–27), the two most egregious cases are: on the one hand Malta, which will have 140.3% more than its fair share; and on the other hand Greece, which will have 17.4% too little.

[12] In fact Denmark and Finland, as well as Slovakia, will experience the smallest change in β, and consequently in their equitability Quotient.

Returning to Table 28, we observe that the Reform Treaty QM rule is quite efficient: it has a relatively high value of Coleman's index A (the a priori probability of approving an act rather than blocking it) and a correspondingly low resistance R. In betting terms, this means that the a priori odds against approval of an act will be approximately 27 to 4 in 2015 and subsequently 34 to 5. This is a very considerable improvement compared to the Nice rule, which is extremely (and dangerously) inefficient.

With respect to sensitivity S and mean majority deficit (MMD), the Reform Treaty QM rule is also a definite improvement compared to the Nice rule.

Now let us turn to the period 2015–50. As can be seen in Table 29, according to EUROSTAT forecasts the total EU population will continue to grow until 2020, reaching its maximal size of 496.2 million. Beginning in 2025, the total EU population decreases gradually, reaching its smallest size of 471.8 million in 2050, with the steepest drop of 8.4 million occurring between 2045 and 2050. But different groups of countries will undergo quite distinct demographic changes.

The populations of all ten Eastern European and Baltic EU member-states decreases steadily throughout the period 2005–50. The steepest decrease (in both absolute and relative terms) among these countries is experienced by Poland which is expected to lose 4.4 million people (11.5%) between 2005 and 2050.

Among the remaining EU member-states, relatively significant decreases in populations are expected to occur in Germany and Italy, while relatively significant increases are expected to occur in France and the United Kingdom.

As a result of these different population changes in individual countries, the rank-order according to population size of the six most populous EU members (Germany, France, United Kingdom, Italy, Spain, Poland) as well as that of the four least populous EU members (Estonia, Cyprus, Luxembourg, Malta) and that of Austria (ranked 15) and Lithuania (ranked 21) will remain unchanged during the entire period 2005–50. The rank-order of the remaining 15 EU members is expected to change at least once during this period (cf. Table 30).

The ψ, β and γ values for the various member-states during the period 2015–50 are of course consistent with both the absolute and relative sizes of their respective populations. Thus, for example, the values of these three measures for Germany are larger than those of any other EU member in any given period because Germany's population size ranks 1 in all periods. However, since Germany's population decreases consistently from 2015 onwards so do the values of these three measures. However, the changes from

one period to the next are quite small. For details, see Tables 1–27 and the corresponding charts.

Finally, as can be observed from Table 28, the changes from one period to the next during 2015–50 of each of the synoptic parameters are very small and insignificant.

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