The Composition of the European Parliament -

Linking the permanent system of the distribution of seats in the European Parliament with the new double-majority voting system in the Council of Ministers

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KEY FINDINGS

- This paper proposes to adopt the Cambridge Compromise which is a transparent allocation method for determining the composition of the European Parliament (EP). This method is responsive to population changes and impartial to politics as well as objective, fair and durable. The Cambridge Compromise with Power-adjusted Populations is an alternative method that is more flexible with respect to the 2014 allocation, but at the cost of some transparency because of involving an additional power parameter.

- The EP composition must obey the operational principle of degressive propor-tionality whereby the Member States' representation ratios, that is, the population figure divided by the number of seats before rounding, are decreasing when passing from a more populous Member State to a less populous Member State.

- The same population figures should be used for the EP composition and for the qualified majority voting system in the Council.

- The Jagiellonian Compromise is a qualified majority voting system for the Council providing a more principled method than the current double-majority voting system.

- Our recommendation is the adoption of the Cambridge Compromise and the (inde-pendent) adoption of the Jagiellonian Compromise. Their coordinated adoption as a pair will bring a balance to the dual structure of Parliament and Council.

- Seat allocation tables for the 2019 EP are shown for a Union including the UK. For a Union without the UK, three scenarios are adjoined: with 751 EP seats (maxi-mum size), with 678 EP seats (without the 73 UK seats), and with 724 EP seats. The last is the smallest EP size for which the Cambridge Compromise with Power-adjusted Populations assigns to every Member State at least as many seats as are its 2014 allocation.

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1. TWO PROPOSALS FOR THE ALLOCATION OF EP SEATS

The European Council Decision of 2013 establishing the composition of the EP[1] states in its Article 4 that the decision shall be revised with the aim of establishing a system to allocate the seats between Member States in an objective, fair, durable and transparent way:

> This Decision shall be revised sufficiently far in advance of the beginning of the 2019-2024 parlia-mentary term on the basis of an initiative of the European Parliament presented before the end of 2016 with the aim of establishing a system which in future will make it possible, before each fresh election to the European Parliament, to allocate the seats between Member States in an objective, fair, durable and transparent way, translating the principle of degressive proportionality as laid down

in Article 1, taking account of any change in their number and demographic trends in their population, as duly ascertained thus respecting the overall balance of the institutional system as laid down in the Treaties.

We propose two allocation methods that satisfy the requirements well: the Cambridge Compromise,[2] and the Cambridge Compromise with Power-adjusted Populations.[3] The operational details of the two procedures are presented first. Thereafter follow assessments of the methods' merits from the viewpoint of primary and secondary Union law.

Cambridge Compromise

The Cambridge Compromise may be paraphrased as follows:

- Every Member State is assigned a common number of base seats. The remaining seats are allocated proportionately to population figures using the divisor method with upward rounding, and subject to a maximum allocation. In the case of the current EP, the number of base seats is 5, so that the least populous Member State finishes with 6 seats, and the proportional allocation is capped in order to produce a maximum of 96 seats.

For instance, in Table 1 the Cambridge Compromise proceeds as follows:

- Every Member State is assigned 5 base seats, plus one seat per 845 000 citizens or part thereof, with a maximum cap of 96 seats.

The currently smallest State, Malta, ends with a final tally of 6 seats (with only 4 base seats, Malta would finish with 5 seats, and with 6 base seats would finish with 7 seats). The initial assignment of 5 base seats to each of the 28 Member States utilises a total of 140 seats, leaving 611 seats for the proportional allocation.

These remaining 611 seats are allocated using the divisor method with upward rounding. The key number to be determined is the so-called divisor (845 000).[4] For example, when dividing the Czech population 10 419 743 by 845 000, the resulting quotient is 12.3. This quotient is rounded upwards to obtain the number of seats to be allocated (13). Thus the Czech Republic is allocated a total of 18 seats: 5 base seats plus 13 proportionality seats. A similar calculation is carried out for the other Member States. In the case of Germany, the quotient 5 + 95.96 = 105.96 exceeds the capping and is replaced by the 96 seat maximum.

Tables 1, 3, 5 illustrate the Cambridge Compromise, with 5 base seats in each case.

Cambridge Compromise with Power-adjusted Populations

The Cambridge Compromise with Power-adjusted Populations may be worded as follows:

- Every Member State is assigned a common number of base seats. The remaining seats are allocated proportionately to adjusted population units (that is, the population figures raised to a common power) using the divisor method with upward rounding. In the case of the current EP, the number of base seats, the divisor, and the power are adjusted so that the least populous Member State finishes with 6 seats, the most populous with 96 seats, and the total Parliament size is 751.

For instance, in Table 2 the method proceeds as follows:

- Every Member State is assigned 5 base seats, plus one seat per 301 700 adjusted population units or part thereof, with adjustment power 0.94.

The power 0.94 is determined so that the most populous Member State is allocated just 96 seats. The divisor 301 700 is determined so that the 28 Member States altogether are allocated 751 seats.[5] The base seat assignment in Table 2 is identical to that of Table 1, namely 5. The presence of these allocation keys is dictated by the goal to satisfy the requirements of primary and secondary Union law as discussed below.

Tables 2, 4, 6, 7 illustrate the Cambridge Compromise with Power-adjusted Populations. The number of base seats varies, with Tables 2 and 6 using 5, and Tables 4 and 7 using 4.

In all seven Tables, the number of seats remaining for proportional allocation depends on the numbers of base seats (4 or 5) and of Member States (28 or 27), and on the EP size under consideration (751 or 678 or 724 seats).

Assessment by primary Union law

Primary Union law, as set forth in the Treaty on European Union (TEU), lays conditions upon possible allocation methods.[6] Of particular relevance are the following requirements which we rearrange and paraphrase to ease cross-referencing in this briefing.

1. Citizens are directly represented in the EP (Art. 10(2) TEU).
2. The EP shall be composed of representatives of the Union's citizens (Art. 14(2) TEU).
3. Representation of citizens shall be degressively proportional (Art. 14(2) TEU).
4. The EP size shall not exceed 751 seats (Art. 14(2) TEU).
5. Every Member State shall be allocated at least 6 seats (Art. 14(2) TEU).
6. Every Member State shall be allocated at most 96 seats (Art. 14(2) TEU).

There is a potential ambiguity in the term ''Member State'' over whether it refers to government or to people. When "Member State" is interpreted to mean "government", Art. 10(2) TEU decrees that the appropriate representative body is the European Council and the Council, rather than the EP. As far as the composition of the EP is concerned, the term "Member State" means "people", that is, a Member State's citizenry.

The Cambridge Compromise complies perfectly well with requirements 1 and 2. The initial assignment of base seats to a Member State secures the representation of its citizenry as a whole. The subsequent proportional allocation of the remaining seats represents the citizens as individuals. Degressive proportionality (requirement 3) will be dealt with in greater detail in Section 3 below. Requirements 4–6 are numerical restrictions which are clearly fulfilled.

In contrast, it is harder to fit the Cambridge Compromise with Power-adjusted Populations within the framework of requirements 1 and 2. Requirement 1 calls for a direct representation of citizens. At the stage of proportional allocation, this method allocates the remaining seats in a manner proportional to population "units" which are a power of the population figures. That is, direct population figures are replaced by transformed quantities. While the invocation of a transformation signals a deviation from the principle of direct representation, it may be justified by the principle of degressively proportional representation.

There is a tension between the principles of direct representation (requirement 1) and of degressive representation (requirement 3), each of which is stipulated by primary Union law. Requirement 1 supports an allocation proportional to population, whereas requirement 3 favours an allocation giving some priority to smaller States. The Cambridge Compromise may be viewed as prioritizing direct representation over degressivity. In contrast, the Cambridge Compromise with Power-adjusted Populations allows greater degressivity, but at some cost to direct representation.

The two methods yield seat allocations that become increasingly identical as the power parameter becomes closer to unity. They coincide when the power equals unity, and this could occur in the future. For instance, if, in Table 2, the German population were to decline by five million to 76 089 331 (with other populations unchanged), the power-adjusted variant yields power 1 and is hence identical to the Cambridge Compromise. This possibility of future coincidence of the two methods mitigates the marginal disregard by the power-adjusted method of the principle of direct representation.

Assessment by secondary Union law

The extended deliberations of the EP on its composition have led to detailed specifications that have found their way into Art. 1 of the 2013 European Council Decision mentioned above:

7. The least populous Member State shall be allocated 6 seats.
8. The most populous Member State shall be allocated 96 seats.
9. Any more populous Member State shall be allocated at least as many seats as any less populous Member State.
10. The principle of degressive proportionality shall require decreasing representation ratios when passing from a more populous Member State to a less populous Member State, where the representation ratio of a Member State is defined to be the ratio of its population figure relative to its number of seats before rounding.

These requirements are satisfied by the Cambridge Compromise both with and without Power-adjusted Populations. Tables 1–7 include columns labelled "Repr.Ratio" in witness of degressive proportionality (requirement 10).

Requirement 8 insists on allocations that achieve the maximum of 96 seats. The requirement can be met with the current data, but it has the potential to breed conflict. For instance, if in Table 1 the German population were to be six million fewer, namely 75 089 331 (with other population figures unchanged), the Cambridge Compromise would allocate 94 seats to Germany. A forced allocation of 96 seats would violate degressive proportionality (requirement 3). Council has reasoned that requirements 7 and 8 reflect as closely as possible the spectrum of populations-sizes of Member States, but this reasoning is invalid in general.

2. FURTHER PROPOSALS

In the literature one can find other proposals on how to determine the composition of the EP. The topic received renewed attention during the 2003 Convention on the Future of Europe. Since then the Treaty of Lisbon entered into force and the 2013 European Council decision decreed further details. The parts that are relevant for the composition of the EP are enunciated in requirements 1–10 above. Of course past literature could not anticipate these later specifications. Therefore one has to be careful when relating past sample allocations with current settings.

Some authors proposed to refer the allocation not only to population figures, but also to gross domestic product.[7] We believe that this reference base can no longer be upheld in view of requirements 1–2. The Members of the EP represent human beings, not economic performance.

Other approaches make use of adjusted population units as does the Cambridge Compromise with Power-adjusted Populations, but in a different fashion. Rather than raising a population figure N to a power c (in Table 2: $N^c = N^{0.94}$) they advocate similar transformations. The parabolic method subtracts a multiple of the squared population: $N - cN^2$; the hyperbolic method subtracts a multiple of the inverse population $N - c/N$.[8]

The challenge is not mathematical multitude, but constitutional adequacy. The more sophisticated the adjustment function, the harder is the proof of its closeness to the principles of primary and secondary Union law. Moreover the two methods: the Cambridge Compromise and the Cambridge Compromise with Power-adjusted Populations, yield seat allocations which for many data sets sandwich the allocations of other methods. For this reason we restrict our briefing to these two methods which can be firmly justified by the legal principles of the Union.

3. DEGRESSIVE PROPORTIONALITY

The oxymoron of "degressive proportionality" has a long tradition in the debates of the EP. One may have degressive representation, proportional representation, or progressive repre-sentation just as one may have degressive taxation, proportional taxation, or progressive taxation. "Degressive proportionality", however, is a paradoxical concept. The notion is enunciated as a manifestation of solidarity in a 2007 text adopted by the EP:[9]

- The more populous States agree to be underrepresented in order to allow the less populous States to be represented better.

The 2007 resolution included an attempted specification of degressive proportionality, which has since been recognized as a potential contradiction. Meanwhile the abstract principle of degressive proportionality (requirement 3) has been given a concrete specification capable of practical implementation (requirement 10).

The implementation of degressive proportionality is challenging because the meanings of "citizens" in requirements 2 and 3 differ significantly even though both requirements appear in the same section of Art. 14 TEU. Reference to "Union citizens" (requirement 2) appears to place all EU citizens on an equal footing. However, the principle of degressive proportionality (requirement 3) discriminates the "citizens" by Member States. The citizens of more populous Member States agree to be underrepresented in order to allow the citizens of less populous Member States to be represented better.

The Cambridge Compromise achieves degressive proportionality without distorting the meaning of "citizens" beyond the minimum. It does so in each of its two stages. The first stage of assigning base seats treats all Member States alike; this is extremely degressive since it neglects population figures entirely. The second stage of proportional allocation embodies a mild form of degressivity through the use of upward rounding, which is known to introduce a slight bias in favour of the less populous Member States.[10] This type of bias reinforces the effect of degressive proportionality.

In contrast the Cambridge Compromise with Power-adjusted Populations achieves degressive proportionality by interpreting the term "citizens" in a rather broad sense. During its calculations it replaces lucent population figures – which count concrete citizens – by arcane population units – which measure abstract units. In Table 2, Malta's population of 429 344 citizens is transformed to 197 168 population units. Does this mean that only 46 percent[11] of the citizenry is accounted for? Or 46 percent of each citizen? Neither interpretation seems profitable; the interim power-adjustment remains obscure. Its justification lies in the final result which thereby achieves a higher degree of degressivity.

4. POPULATION CRITERION

How does one determine the number of citizens in a Member State? Whom does one count? These questions are fundamental to requirements 1 and 2. They demand quick practical answers, while also inviting more principled reflections.

The currently available population figures are those decreed annually by Council Decision for the qualified majority voting system in the Council of Ministers.[12] The data for the calendar year 2016 provide the starting point for our tables. The corresponding columns are labelled "QMV-2016".[13]

Since the Council and the EP are constitutional organs of the European Union with joint governance responsibility, we are compelled to the recommendation that the two institutions employ the same population data.

We return to the questions above. Presumably everybody would endorse the aim that

- every individual who qualifies as a "citizen" in the sense of requirements 1 and 2 shall be counted at least once and at most once. That is, he or she shall be counted exactly once.

This modest aim is challenging to achieve, considering that the data are gathered by a host of domestic statistical offices before being communicated to EuroStat. To this end it seems efficient and appropriate to continue to base all population figures on the internationally (UN) approved notion of "total resident population".

5. INTER-INSTITUTIONAL BALANCE

Population figures feature not only in the seat allocation of the EP, but also in the qualified majority voting system of the Council. A group of Member States constitutes a qualified majority if the group consists of at least 55 percent of all Member States (that is, at least 16 Member States out of 28) and if the Member States in the group represent at least 65 percent of the Union's population. This decision-making rule is referred to as the double-majority voting rule.

There is an established mathematical framework for the evaluation of fairness within a system of qualified majority voting focusing on two quantities: the decision power of a Member State, and the decision power of a Union citizen.[14] The decision power of a Union citizen is determined from the decision power of his or her Member State by dividing the latter by the square root of the Member State's population figure.[15] It transpires that the double-majority voting rule leads to an uneven distribution of decision power among Union citizens. Citizens from middle-size Member States have slightly less power than citizens from Member States that are smaller (due to the 55 percent clause) or larger (due to the 65 percent clause).[16]

The Jagiellonian Compromise is a qualified majority system that awards all Union citizens an equal decision power. It assigns to each Member State a voting weight that is defined to be the square root of its population figure. Moreover it introduces a quota. The Jagiellonian quota is defined to be the average of the square root of the population total and the sum of the voting weights.[17] In the Jagiellonian Compromise a group of Member States qualifies as a majority if the sum of their voting weights meets or exceeds the quota.

In terms of conceptual analysis, the Jagiellonian Compromise is unique in its transparency. It turns out that the decision power of a Member State is virtually the same as its voting weight divided by the voting weight total.[18] As a consequence the decision power of every citizen attains the same constant value. Numerically this cannot be but a tiny quantity in a Union of half a billion citizens. The principal conclusion is conceptual:

- The Jagiellonian Compromise awards to all Union citizens the same and equal power to participate (indirectly via their governments) in Council's decisions.

Table 8 illustrates the application of the Jagiellonian Compromise to the current Council, Table 9 to a Council without UK.

6. RECOMMENDATIONS

We believe that the Union's institutions will be served best by the adoption of the Cambridge Compromise for the composition of the EP, and the Jagiellonian Compromise for the qualified majority system in the Council. These are two independent recommendations.

There is added strength in the above recommendations when viewed as a pair. The Cambridge Compromise would transfer some of the representative weight from middle-sized Member States to smaller and larger Member States. The Jagiellonian Compromise would transfer some of the decision power from smaller and larger Member States to middle-sized Member States. Each of these transfers is soundly rooted in the constitutional directive to put citizens first. The directions of the transfers have a balancing effect, and thus the pair is in equilibrium.

If the full Cambridge Compromise is viewed as being too insensitive to the current composition of the EP, the Cambridge Compromise with Power-adjusted Populations may be considered as an interim measure. If the latter were to be adopted for the 2019 allocation, our recommendation of the Jagiellonian Compromise would still stand.

We recommend that the adopted allocation method be firmly rooted in primary and secondary Union law, and that such consideration should receive prominent emphasis. Neither the Cambridge Compromise, nor the Cambridge Compromise with Power-adjusted Populations,

requires a change to primary Union law. Moreover both methods are compatible with the establishment of a joint constituency, as supported by the EP in a 2015 vote.[19]

7. SEAT ALLOCATION TABLES FOR THE 2019 EP

Seven tables are presented to illustrate how the Cambridge Compromise (CC) and the Cambridge Compromise with Power-adjusted Populations (CCPP) apply to various scenarios.

Table 1 (CC-28-751) and Table 2 (CCPP-28-751) deal with the current Union of 28 Member States – that is, including the UK – and maintain the current EP size of 751 seats.

Table 3 (CC-27-751) and Table 4 (CCPP-27-751) deal with a Union of 27 Member States – that is, without the UK – and an EP of continuing size of 751 seats.

Table 5 (CC-27-678) and Table 6 (CCPP-27-678) are based on the assumption that, upon Brexit, the 73 UK seats are left vacant. This option reduces the EP size to 678 seats.

All tables include a final column exhibiting the differences between the proposed seat allocations and the 2014 status quo seats. These differences are sometimes appreciable. We emphasize that the 2014 allocation is a patchwork without systematic rationale, and that it is a challenging undertaking to achieve even a minor progression towards a representative equilibrium among Union citizens. Once a start is made and the inherited unevenness reduced, future re-allocations are solely reflective of natural population dynamics.

Of the six tables, only Table 4 (CCPP-27-751) promises the pleasing prospect that all Member States meet or exceed their 2014 seats. That is, no Member State has to relinquish any of its current seats. However, a no-loss situation emerges also with fewer seats. The smallest EP size to achieve this effect with the Cambridge Compromise with Power-adjusted Populations is 724 seats.

Table 7 (CCPP-27-724) therefore displays the allocation of 724 EP seats between the 27 Member States (without UK) that emerges when using the Cambridge Compromise with Power-adjusted Populations.

Table 1 :   Cambridge Compromise, including UK

CC-28-751	QMV-2016	Quotient	Seats	Repr.Ratio	2014	Diff.
Germany	81 089 331	~~5+95.96~~	96	844 681	96	0
France	66 352 469	5+78.5	84	794 416	74	10
United Kingdom	64 767 115	5+76.6	82	793 253	73	9
Italy	61 438 480	5+72.7	78	790 630	73	5
Spain	46 439 864	5+54.96	60	774 534	54	6
Poland	38 005 614	5+44.98	50	760 461	51	-1
Romania	19 861 408	5+23.5	29	696 778	32	-3
The Netherlands	17 155 169	5+20.3	26	678 017	26	0
Belgium	11 258 434	5+13.3	19	614 423	21	-2
Greece	10 846 979	5+12.8	18	608 128	21	-3
Czech Republic	10 419 743	5+12.3	18	601 218	21	-3
Portugal	10 374 822	5+12.3	18	600 468	21	-3
Hungary	9 855 571	5+11.7	17	591 450	21	-4
Sweden	9 790 000	5+11.6	17	590 264	20	-3
Austria	8 581 500	5+10.2	16	566 226	18	-2
Bulgaria	7 202 198	5+8.5	14	532 577	17	-3
Denmark	5 653 357	5+6.7	12	483 591	13	-1
Finland	5 471 753	5+6.5	12	476 823	13	-1
Slovakia	5 403 134	5+6.4	12	474 199	13	-1
Ireland	4 625 885	5+5.5	11	441 636	11	0
Croatia	4 225 316	5+5.0004	11	422 516	11	0
Lithuania	2 921 262	5+3.5	9	345 421	11	-2
Slovenia	2 062 874	5+2.4	8	277 221	8	0
Latvia	1 986 096	5+2.4	8	270 202	8	0
Estonia	1 313 271	5+1.6	7	200 372	6	1
Cyprus	847 008	5+1.002	7	141 112	6	1
Luxembourg	562 958	5+0.7	6	99 353	6	0
Malta	429 344	5+0.5	6	77 948	6	0
Sum (Divisor)	508 940 955	(845 000)	751	–	751	±32

Notes:

Cambridge Compromise:
   Every Member State is assigned 5 base seats, plus one seat per 845 000 citizens or part thereof, with a maximum cap of 96 seats.

Allocation Key:
   There is a sole key number: the divisor 845 000. The divisor is determined so that the 28 Member States altogether are allocated 751 seats.

Sample calculations for Malta:
   QMV-2016/Divisor = 429 344 / 845 000 = 0.5
   Quotient = Base seats+(QMV-2016/Divisor) = 5+0.5 = 5.5, rounded upwards to 6 seats
   Repr.Ratio = QMV-2016/Quotient = 429 344 / (5 + 429 344 / 845 000) = 77 948

Maximum cap active only for Germany:
   Quotient for Germany 5+95.96 = 105.96 is discarded and capped at 96 seats.

Verification of degressive proportionality:
   Representation ratios decrease when passing from a more populous Member State to a less populous Member State.

Column "Diff." exhibits deviations of proposed "Seats" from "2014" seats .

Table 2 :   Cambridge Compromise with Power-adjusted Populations, including UK

CCPP-28-751	QMV-2016	Adjusted	Quotient	Seats	Repr.Ratio	2014	Diff.
Germany	81 089 331	27 191 045	5+90.1	96	852 440	96	0
France	66 352 469	22 518 822	5+74.6	80	833 157	74	6
United Kingdom	64 767 115	22 012 698	5+72.96	78	830 750	73	5
Italy	61 438 480	20 947 589	5+69.4	75	825 433	73	2
Spain	46 439 864	16 101 913	5+53.4	59	795 604	54	5
Poland	38 005 614	13 336 961	5+44.2	50	772 377	51	-1
Romania	19 861 408	7 246 519	5+24.02	30	684 429	32	-2
The Netherlands	17 155 169	6 314 389	5+20.9	26	661 612	26	0
Belgium	11 258 434	4 250 004	5+14.1	20	589 853	21	-1
Greece	10 846 979	4 103 839	5+13.6	19	583 096	21	-2
Czech Republic	10 419 743	3 951 715	5+13.1	19	575 735	21	-2
Portugal	10 374 822	3 935 698	5+13.05	19	574 939	21	-2
Hungary	9 855 571	3 750 256	5+12.4	18	565 424	21	-3
Sweden	9 790 000	3 726 797	5+12.4	18	564 179	20	-2
Austria	8 581 500	3 292 679	5+10.9	16	539 251	18	-2
Bulgaria	7 202 198	2 792 654	5+9.3	15	505 191	17	-2
Denmark	5 653 357	2 224 170	5+7.4	13	456 943	13	0
Finland	5 471 753	2 156 944	5+7.1	13	450 376	13	0
Slovakia	5 403 134	2 131 508	5+7.1	13	447 836	13	0
Ireland	4 625 885	1 841 972	5+6.1	12	416 547	11	1
Croatia	4 225 316	1 691 639	5+5.6	11	398 351	11	0
Lithuania	2 921 262	1 195 739	5+3.96	9	325 912	11	-2
Slovenia	2 062 874	862 193	5+2.9	8	262 526	8	0
Latvia	1 986 096	831 994	5+2.8	8	256 017	8	0
Estonia	1 313 271	563 966	5+1.9	7	191 180	6	1
Cyprus	847 008	373 434	5+1.2	7	135 787	6	1
Luxembourg	562 958	254 359	5+0.8	6	96 346	6	0
Malta	429 344	197 168	5+0.7	6	75 943	6	0
Sum (Keys)	508 940 955	(0.94)	(301 700)	751	–	751	±21

Notes:

Cambridge Compromise with Power-adjusted Populations:
Every Member State is assigned 5 base seats, plus one seat per 301 700 adjusted population units or part thereof, where the adjusted units are obtained by raising the population figures to the power 0.94.

Allocation Keys:
There are two key numbers: the power 0.94 and the divisor 301 700. They are determined so that the allocation yields just 96 seats for the most populous Member State and 751 seats for the 28 Member States altogether.

Sample calculations for Malta:
Adjusted = $429\,344^{0.94}$ = 197 168
Adjusted/Divisor = 197 168 / 301 700 = 0.7
Quotient = Base seats+(Adjusted/Divisor) = 5+0.7 = 5.7, rounded upwards to 6 seats
Repr.Ratio = QMV-2016/Quotient = 429 344 / (5 + $429\,344^{0.94}$ / 301 700) = 75 943

Maximum cap is automatic since it is built into determination of power 0.94.

Verification of degressive proportionality:
Representation ratios decrease when passing from a more populous Member State to a less populous Member State.

Column "Diff." exhibits deviations of proposed "Seats" from "2014" seats .

Table 3:   Cambridge Compromise, without UK and with 751 EP seats

CC-27-751	QMV-2016	Quotient	Seats	Repr.Ratio	2014	Diff.
Germany	81 089 331	5+115.2	96	844 681	96	0
France	66 352 469	5+94.3	96	691 172	74	22
Italy	61 438 480	5+87.3	93	665 583	73	20
Spain	46 439 864	5+65.99	71	654 139	54	17
Poland	38 005 614	5+54.01	60	644 073	51	9
Romania	19 861 408	5+28.2	34	597 798	32	2
The Netherlands	17 155 169	5+24.4	30	583 936	26	4
Belgium	11 258 434	5+15.999	21	536 144	21	0
Greece	10 846 979	5+15.4	21	531 345	21	0
Czech Republic	10 419 743	5+14.8	20	526 062	21	-1
Portugal	10 374 822	5+14.7	20	525 487	21	-1
Hungary	9 855 571	5+14.01	20	518 568	21	-1
Sweden	9 790 000	5+13.9	19	517 656	20	-1
Austria	8 581 500	5+12.2	18	499 075	18	0
Bulgaria	7 202 198	5+10.2	16	472 748	17	-1
Denmark	5 653 357	5+8.03	14	433 747	13	1
Finland	5 471 753	5+7.8	13	428 294	13	0
Slovakia	5 403 134	5+7.7	13	426 176	13	0
Ireland	4 625 885	5+6.6	12	399 691	11	1
Croatia	4 225 316	5+6.004	12	383 965	11	1
Lithuania	2 921 262	5+4.2	10	319 219	11	-1
Slovenia	2 062 874	5+2.9	8	260 087	8	0
Latvia	1 986 096	5+2.8	8	253 900	8	0
Estonia	1 313 271	5+1.9	7	191 265	6	1
Cyprus	847 008	5+1.2	7	136 534	6	1
Luxembourg	562 958	5+0.8	6	97 062	6	0
Malta	429 344	5+0.6	6	76 530	6	0
Sum (Divisor)	444 173 840	(703 700)	751	–	678	79-6

Notes:

Cambridge Compromise:
Every Member State is assigned 5 base seats, plus one seat per 703 700 citizens or part thereof, with a maximum cap of 96 seats.

Allocation Key:
There is a sole key number: the divisor 703 700. The divisor is determined so that the 27 Member States altogether are allocated 751 seats.

Sample calculations for Malta:
QMV-2016/Divisor = 429 344 / 703 700 = 0.6
Quotient = Base seats+(QMV-2016/Divisor) = 5+0.6 = 5.6, rounded upwards to 6 seats
Repr.Ratio = QMV-2016/Quotient = 429 344 / (5 + 429 344 / 703 700) = 76 530

Maximum cap active for Germany and France:
Quotient for Germany 5+115.2 = 120.2 is discarded and capped at 96 seats.
Quotient for France 5+94.3 =99.3 is discarded and capped at 96 seats.

Verification of degressive proportionality:
Representation ratios decrease when passing from a more populous Member State to a less populous Member State.

Column "Diff." exhibits deviations of proposed "Seats" from "2014" seats.

Table 4: Cambridge Compromise with Power-adjusted Populations, without UK and with 751 EP seats

CCPP-27-751	QMV-2016	Adjusted	Quotient	Seats	Repr.Ratio	2014	Diff.
Germany	81 089 331	1 422 898	4+91.01	96	853 455	96	0
France	66 352 469	1 217 320	4+77.9	82	810 524	74	8
Italy	61 438 480	1 146 586	4+73.3	78	794 402	73	5
Spain	46 439 864	922 234	4+58.99	63	737 269	54	9
Poland	38 005 614	789 081	4+50.5	55	697 708	51	4
Romania	19 861 408	476 268	4+30.5	35	576 300	32	3
The Netherlands	17 155 169	424 971	4+27.2	32	550 154	26	6
Belgium	11 258 434	306 232	4+19.6	24	477 304	21	3
Greece	10 846 979	297 489	4+19.03	24	471 028	21	3
Czech Republic	10 419 743	288 332	4+18.4	23	464 284	21	2
Portugal	10 374 822	287 364	4+18.4	23	463 560	21	2
Hungary	9 855 571	276 111	4+17.7	22	454 992	21	1
Sweden	9 790 000	274 681	4+17.6	22	453 882	20	2
Austria	8 581 500	247 920	4+15.9	20	432 148	18	2
Bulgaria	7 202 198	216 326	4+13.8	18	403 782	17	1
Denmark	5 653 357	179 182	4+11.5	16	365 652	13	3
Finland	5 471 753	174 688	4+11.2	16	360 611	13	3
Slovakia	5 403 134	172 981	4+11.1	16	358 669	13	3
Ireland	4 625 885	153 293	4+9.8	14	335 086	11	3
Croatia	4 225 316	142 863	4+9.1	14	321 612	11	3
Lithuania	2 921 262	107 205	4+6.9	11	269 063	11	0
Slovenia	2 062 874	81 782	4+5.2	10	223 471	8	2
Latvia	1 986 096	79 404	4+5.1	10	218 758	8	2
Estonia	1 313 271	57 555	4+3.7	8	170 968	6	2
Cyprus	847 008	40 916	4+2.6	7	128 002	6	1
Luxembourg	562 958	29 776	4+1.9	6	95 343	6	0
Malta	429 344	24 117	4+1.5	6	77 463	6	0
Sum (Keys)	444 173 840	(0.778)	(15 634)	751	–	678	73-0

Notes:

Cambridge Compromise with Power-adjusted Populations:
    Every Member State is assigned 4 base seats, plus one seat per 15 634 adjusted population units or part thereof, where the adjusted units are obtained by raising the population figures to the power 0.778.

Allocation Keys:
    There are two key numbers: the power 0.778 and the divisor 15 634. They are determined so that the allocation yields just 96 seats for the most populous Member State and 751 seats for the 27 Member States altogether.

Sample calculations for Malta:
    Adjusted = $429\,344^{0.778}$ = 24 117
    Adjusted/Divisor = 24 117 / 15 634 = 1.5
    Quotient = Base seats+(Adjusted/Divisor) = 4+1.5 = 5.5, rounded upwards to 6 seats
    Repr.Ratio = QMV-2016/Quotient = 429 344 / (4 + $429\,344^{0.778}$ / 15 634) = 77 463

Maximum cap is automatic since it is built into determination of power 0.778.

Verification of degressive proportionality:
    Representation ratios decrease when passing from a more populous Member State to a less populous Member State.

Column "Diff." exhibits deviations of proposed "Seats" from "2014" seats .

Table 5 :   Cambridge Compromise, without UK and with 678 EP seats

CC-27-678	QMV-2016	Quotient	Seats	Repr.Ratio	2014	Diff.
Germany	81 089 331	5+98.1	96	844 681	96	0
France	66 352 469	5+80.2	86	778 486	74	12
Italy	61 438 480	5+74.3	80	774 850	73	7
Spain	46 439 864	5+56.2	62	759 384	54	8
Poland	38 005 614	5+45.96	51	745 852	51	0
Romania	19 861 408	5+24.02	30	684 493	32	-2
The Netherlands	17 155 169	5+20.7	26	666 379	26	0
Belgium	11 258 434	5+13.6	19	604 850	21	-2
Greece	10 846 979	5+13.1	19	598 749	21	-2
Czech Republic	10 419 743	5+12.6	18	592 049	21	-3
Portugal	10 374 822	5+12.5	18	591 322	21	-3
Hungary	9 855 571	5+11.9	17	582 575	21	-4
Sweden	9 790 000	5+11.8	17	581 424	20	-3
Austria	8 581 500	5+10.4	16	558 086	18	-2
Bulgaria	7 202 198	5+8.7	14	525 369	17	-3
Denmark	5 653 357	5+6.8	12	477 642	13	-1
Finland	5 471 753	5+6.6	12	471 037	13	-1
Slovakia	5 403 134	5+6.5	12	468 477	13	-1
Ireland	4 625 885	5+5.6	11	436 669	11	0
Croatia	4 225 316	5+5.1	11	417 967	11	0
Lithuania	2 921 262	5+3.5	9	342 374	11	-2
Slovenia	2 062 874	5+2.5	8	275 255	8	0
Latvia	1 986 096	5+2.4	8	268 335	8	0
Estonia	1 313 271	5+1.6	7	199 343	6	1
Cyprus	847 008	5+1.02	7	140 601	6	1
Luxembourg	562 958	5+0.7	6	99 100	6	0
Malta	429 344	5+0.5	6	77 792	6	0
Sum (Divisor)	444 173 840	(827 000)	678	–	678	±29

Notes:

Cambridge Compromise:
    Every Member State is assigned 5 base seats, plus one seat per 827 000 citizens or part thereof, with a maximum cap of 96 seats.

Allocation Key:
    There is a sole key number: the divisor 827 000. The divisor is determined so that the 27 Member States altogether are allocated 678 seats.

Sample calculations for Malta:
    QMV-2016/Divisor = 429 344 / 827 000 = 0.5
    Quotient = Base seats+(QMV-2016/Divisor) = 5+0.5 = 5.5, rounded upwards to 6 seats
    Repr.Ratio = QMV-2016/Quotient = 429 344 / (5 + 429 344 / 827 000) = 77 792

Maximum cap active only for Germany:
    Quotient for Germany 5+98.1 = 103.1 is discarded and capped at 96 seats.

Verification of degressive proportionality:
    Representation ratios decrease when passing from a more populous Member State to a less populous Member State.

Column "Diff." exhibits deviations of proposed "Seats" from "2014" seats .

Table 6 :   Cambridge Compromise with Power-adjusted Populations, without UK and with 678 EP seats

CCPP-27-678	QMV-2016	Adjusted	Quotient	Seats	Repr.Ratio	2014	Diff.
Germany	81 089 331	20 691 474	5+90.2	96	852 146	96	0
France	66 352 469	17 187 702	5+74.9	80	830 528	74	6
Italy	61 438 480	16 006 907	5+69.7	75	821 954	73	2
Spain	46 439 864	12 355 892	5+53.8	59	789 279	54	5
Poland	38 005 614	10 265 005	5+44.7	50	764 275	51	-1
Romania	19 861 408	5 631 956	5+24.5	30	672 354	32	-2
The Netherlands	17 155 169	4 918 304	5+21.4	27	649 067	26	1
Belgium	11 258 434	3 331 326	5+14.5	20	576 895	21	-1
Greece	10 846 979	3 218 553	5+14.02	20	570 168	21	-1
Czech Republic	10 419 743	3 101 114	5+13.5	19	562 850	21	-2
Portugal	10 374 822	3 088 745	5+13.5	19	562 059	21	-2
Hungary	9 855 571	2 945 477	5+12.8	18	552 618	21	-3
Sweden	9 790 000	2 927 346	5+12.8	18	551 384	20	-2
Austria	8 581 500	2 591 469	5+11.3	17	526 737	18	-1
Bulgaria	7 202 198	2 203 714	5+9.6	15	493 226	17	-2
Denmark	5 653 357	1 761 503	5+7.7	13	446 010	13	0
Finland	5 471 753	1 709 098	5+7.4	13	439 602	13	0
Slovakia	5 403 134	1 689 263	5+7.4	13	437 125	13	0
Ireland	4 625 885	1 463 205	5+6.4	12	406 649	11	1
Croatia	4 225 316	1 345 612	5+5.9	11	388 956	11	0
Lithuania	2 921 262	956 429	5+4.2	10	318 656	11	-1
Slovenia	2 062 874	693 246	5+3.02	9	257 194	8	1
Latvia	1 986 096	669 345	5+2.9	8	250 879	8	0
Estonia	1 313 271	456 539	5+1.99	7	187 898	6	1
Cyprus	847 008	304 296	5+1.3	7	133 895	6	1
Luxembourg	562 958	208 540	5+0.9	6	95 277	6	0
Malta	429 344	162 310	5+0.7	6	75 228	6	0
Sum (Keys)	444 173 840	(0.925)	(229 500)	678	–	678	±18

Notes:

Cambridge Compromise with Power-adjusted Populations:
Every Member State is assigned 5 base seats, plus one seat per 229 500 adjusted population units or part thereof, where the adjusted units are obtained by raising the population figures to the power 0.925.

Allocation Keys:
There are two key numbers: the power 0.925 and the divisor 229 500. They are determined so that the allocation yields just 96 seats for the most populous Member State und 678 seats for the 27 Member States altogether.

Sample calculations for Malta:
Adjusted = $429\ 344^{0.925}$ = 162 310
Adjusted/Divisor = 162 310 / 229 500 = 0.7
Quotient = Base seats+(Adjusted/Divisor) = 5+0.7 = 5.7, rounded upwards to 6 seats
Repr.Ratio = QMV-2016/Quotient = 429 344 / (5 + $429\ 344^{0.925}$ / 229 500)= 75 228

Maximum cap is automatic since it is built into determination of power 0.925.

Verification of degressive proportionality:
Representation ratios decrease when passing from a more populous Member State to a less populous Member State.

Column "Diff." exhibits deviations of proposed "Seats" from "2014" seats.

Table 7 :   Cambridge Compromise with Power-adjusted Populations, without UK
              and with 724 EP seats

CCPP-27-724	QMV-2016	Adjusted	Quotient	Seats	Repr.Ratio	2014	Diff.
Germany	81 089 331	2 948 033	4+91.04	96	853 169	96	0
France	66 352 469	2 501 953	4+77.3	82	816 460	74	8
Italy	61 438 480	2 349 331	4+72.6	77	802 540	73	4
Spain	46 439 864	1 868 602	4+57.7	62	752 568	54	8
Poland	38 005 614	1 586 045	4+48.98	53	717 327	51	2
Romania	19 861 408	932 765	4+28.8	33	605 405	32	1
The Netherlands	17 155 169	827 437	4+25.6	30	580 469	26	4
Belgium	11 258 434	586 285	4+18.1	23	509 284	21	2
Greece	10 846 979	568 699	4+17.6	22	503 030	21	1
Czech Republic	10 419 743	550 310	4+16.995	21	496 288	21	0
Portugal	10 374 822	548 368	4+16.9	21	495 564	21	0
Hungary	9 855 571	525 813	4+16.2	21	486 963	21	0
Sweden	9 790 000	522 950	4+16.2	21	485 846	20	1
Austria	8 581 500	469 521	4+14.5	19	463 857	18	1
Bulgaria	7 202 198	406 824	4+12.6	17	434 809	17	0
Denmark	5 653 357	333 723	4+10.3	15	395 161	13	2
Finland	5 471 753	324 928	4+10.03	15	389 869	13	2
Slovakia	5 403 134	321 591	4+9.9	14	387 828	13	1
Ireland	4 625 885	283 224	4+8.7	13	362 904	11	2
Croatia	4 225 316	262 998	4+8.1	13	348 559	11	2
Lithuania	2 921 262	194 463	4+6.01	11	291 961	11	0
Slovenia	2 062 874	146 298	4+4.5	9	242 174	8	1
Latvia	1 986 096	141 829	4+4.4	9	237 001	8	1
Estonia	1 313 271	101 115	4+3.1	8	184 377	6	2
Cyprus	847 008	70 634	4+2.2	7	137 025	6	1
Luxembourg	562 958	50 570	4+1.6	6	101 220	6	0
Malta	429 344	40 517	4+1.3	6	81 760	6	0
Sum (Keys)	444 173 840	(0.818)	(32 380)	724	–	678	46-0

Notes:

Cambridge Compromise with Power-adjusted Populations:
Every Member State is assigned 4 base seats, plus one seat per 32 380 adjusted population units or part thereof, where the adjusted units are obtained by raising the population figures to the power 0.818.

Allocation Keys:
There are two key numbers: the power 0.818 and the divisor 32 380. They are determined so that the allocation yields just 96 seats for the most populous Member State und 724 seats for the 27 Member States altogether.

Sample calculations for Malta:
Adjusted = $429\,344^{0.818}$ = 40 517
Adjusted/Divisor = 40 517 / 32 380 = 1.3
Quotient = Base seats+(Adjusted/Divisor) = 4+1.3 = 5.3, rounded upwards to 6 seats
Repr.Ratio = QMV-2016/Quotient = 429 344 / (4 + $429\,344^{0.818}$ / 32 380) = 81 760

Maximum cap is automatic since it is built into determination of power 0.818.

Verification of degressive proportionality:
Representation ratios decrease when passing from a more populous Member State to a less populous Member State.

Column "Diff." exhibits deviations of proposed "Seats" from "2014" seats.

Table 8 :   Jagiellonian Compromise, including UK

JagCom-28	QMV-2016	Voting Weight	Decision Power	DM-2016	Diff.
Germany	81 089 331	9 005	9.10	10.19	-1.09
France	66 352 469	8 146	8.24	8.45	-0.21
United Kingdom	64 767 115	8 048	8.15	8.27	-0.12
Italy	61 438 480	7 838	7.93	7.91	0.02
Spain	46 439 864	6 815	6.90	6.20	0.70
Poland	38 005 614	6 165	6.24	5.07	1.17
Romania	19 861 408	4 457	4.51	3.78	0.73
The Netherlands	17 155 169	4 142	4.19	3.50	0.69
Belgium	11 258 434	3 355	3.39	2.90	0.49
Greece	10 846 979	3 293	3.33	2.86	0.47
Czech Republic	10 419 743	3 228	3.27	2.81	0.46
Portugal	10 374 822	3 221	3.26	2.81	0.45
Hungary	9 855 571	3 139	3.18	2.76	0.42
Sweden	9 790 000	3 129	3.16	2.75	0.41
Austria	8 581 500	2 929	2.96	2.63	0.33
Bulgaria	7 202 198	2 684	2.71	2.49	0.22
Denmark	5 653 357	2 378	2.40	2.33	0.07
Finland	5 471 753	2 339	2.37	2.31	0.06
Slovakia	5 403 134	2 324	2.35	2.30	0.05
Ireland	4 625 885	2 151	2.17	2.22	-0.05
Croatia	4 225 316	2 056	2.08	2.18	-0.10
Lithuania	2 921 262	1 709	1.73	2.05	-0.32
Slovenia	2 062 874	1 436	1.45	1.96	-0.51
Latvia	1 986 096	1 409	1.42	1.95	-0.53
Estonia	1 313 271	1 146	1.16	1.88	-0.72
Cyprus	847 008	920	0.93	1.84	-0.91
Luxembourg	562 958	750	0.76	1.81	-1.05
Malta	429 344	655	0.66	1.79	-1.13
Sum	508 940 955	98 867	100.00	100.00	±6.74
Quota		60 713	61.41		

Notes:

Jagiellonian Compromise for qualified majority voting in the Council 2016:
  A group of Member States constitutes a qualified majority provided the sum of their voting weights meets or exceeds the quota 60 713.

System keys:
  The voting weight of a Member State is the square root of the population figure rounded to the nearest whole number.
  The quota is the rounded average of the square root of the population total ($508\ 940\ 955^{0.5} = 22\ 559.7$) and the sum of the voting weights (98 867).

System merits:
  The decision power of a Member State is identical to the percentage voting weight.
  The decision powers of all Union citizens are equal.

Column "Diff." exhibits deviations of proposed "Decision Power" from "DM-2016" decision power of the Double-Majority voting rule in 2016 [in percentage points].

Table 9 :   Jagiellonian Compromise, without UK

JagCom-27	QMV-2016	Voting Weight	Decision Power	DM-2016	Diff.
Germany	81 089 331	9 005	9.89	11.89	-2.00
France	66 352 469	8 146	8.97	9.95	-0.98
Italy	61 438 480	7 838	8.64	9.25	-0.61
Spain	46 439 864	6 815	7.52	7.66	-0.14
Poland	38 005 614	6 165	6.80	6.54	0.26
Romania	19 861 408	4 457	4.91	4.00	0.91
The Netherlands	17 155 169	4 142	4.56	3.70	0.86
Belgium	11 258 434	3 355	3.69	3.02	0.67
Greece	10 846 979	3 293	3.63	2.97	0.66
Czech Republic	10 419 743	3 228	3.55	2.92	0.63
Portugal	10 374 822	3 221	3.55	2.91	0.64
Hungary	9 855 571	3 139	3.46	2.85	0.61
Sweden	9 790 000	3 129	3.45	2.84	0.61
Austria	8 581 500	2 929	3.22	2.70	0.52
Bulgaria	7 202 198	2 684	2.95	2.53	0.42
Denmark	5 653 357	2 378	2.62	2.35	0.27
Finland	5 471 753	2 339	2.57	2.33	0.24
Slovakia	5 403 134	2 324	2.56	2.32	0.24
Ireland	4 625 885	2 151	2.37	2.22	0.15
Croatia	4 225 316	2 056	2.26	2.18	0.08
Lithuania	2 921 262	1 709	1.88	2.02	-0.14
Slovenia	2 062 874	1 436	1.58	1.91	-0.33
Latvia	1 986 096	1 409	1.55	1.90	-0.35
Estonia	1 313 271	1 146	1.26	1.82	-0.56
Cyprus	847 008	920	1.01	1.77	-0.76
Luxembourg	562 958	750	0.83	1.73	-0.90
Malta	429 344	655	0.72	1.72	-1.00
Sum	444 173 840	90 819	100.00	100.00	±7.77
Quota		55 947	61.60		

Notes:

Jagiellonian Compromise for qualified majority voting in a Council without UK:
   A group of Member States constitutes a qualified majority provided the sum of their voting weights meets or exceeds the quota 55 947.

System keys:
   The voting weight of a Member State is the square root of the population figure rounded to the nearest whole number.
   The quota is the rounded average of the square root of the population total ($444\ 173\ 840^{0.5}$ = 21 075.4) and the sum of the voting weights (90 819).

System merits:
   The decision power of a Member State is identical to the percentage voting weight.
   The decision powers of all Union citizens are equal.

Column "Diff." exhibits deviations of proposed "Decision Power" from "DM-2016" decision power of the Double-Majority voting rule in 2016 [in percentage points].

1   OJ L 181, 29.6.2013, p. 57–58 (www.uni-augsburg.de/bazi/OJ/2013L181p57.pdf)

2   G.R. Grimmett / J.-F. Laslier / F. Pukelsheim / V. Ramírez González / R. Rose / W. Słomczy ski / M. Zachariasen / K. yczkowski: The Allocation Between the EU Member States of the Seats in the European Parliament – Cambridge Compromise. Note. European Parliament, Directorate-General for Internal Policies, Policy Department C: Citizen's Rights and Constitutional Affairs, PE 432.760, March 2011 (www.uni-augsburg.de/pukelsheim/2011f.pdf)

3   G.R. Grimmett / K.-F. Oelbermann / F. Pukelsheim: A power-weighted variant of the EU27 Cambridge Compromise. Mathematical Social Sciences 63, 2012, 136-140 (www.uni-augsburg.de/pukelsheim/2012a.pdf). – Power adjustments have been proposed in the literature since quite some time, see for example: (1) H. Theil: The desired political entropy. American Political Science Review 63, 1969, 521-525. (2) H. Theil / L. Schrage: The apportionment problem and the European Parliament. European Economic Review 9, 1977, 247-263. (3) A. Moberg: The voting system in the Council of the European Union. The balance between large and small countries. Scandinavian Political Studies 21, 1998, 347-365. Reprinted in: A. Moberg: The Weight of Nations. Four Papers on the Institutional Negotiations in the EU 1996–2007. Malmö, 2014 (www.uni-augsburg.de/bazi/Moberg2014.pdf). (4) F. Arndt: Distribution of seats at the European Parliament – Democratic political equality, protection of diversity and the enlargement process. Pages 93-115 in: The Emerging Constitutional Law of the European Union – German and Polish Perspectives. Beiträge zum ausländischen öffentlichen Recht und Völkerrecht, Band 163. Editors A. Bodnar / M. Kowalski / K. Raible / Frank. Heidelberg, 2003. (5) F. Arndt: Ausrechnen statt aushandeln: Rationalitätsgewinne durch ein formalisiertes Modell für die Bestimmung der Zusammensetzung des Europäischen Parlaments (with an English summary). Zeitschrift für ausländisches öffentliches Recht und Völkerrecht – Heidelberg Journal of International Law 68, 2008, 247-279.

4   An efficient way to determine the divisor is discussed, for example, in Sect. 4.6 of F. Pukelsheim: Proportional Representation – Apportionment Methods and Their Applications. With a Foreword by Andrew Duff MEP. Springer International Publishing, Cham (CH), 2014 (www.uni-augsburg.de/pukelsheim/2014a-FrontMatter.pdf)

5   Generally there are several powers that guarantee 96 seats for the most populous Member States. For the data in Table 2 there are five powers that serve the purpose: 0.94, 0.943, 0.9444, 0.946, 0.947. It can be shown that the smallest of these (0.94) conforms best to the principle of degressive proportionality; see the above references. The larger powers involve the transfer of a seat from a less populous Member State to a more populous Member State: for 0.943 from Romania to United Kingdom, for 0.9444 from Portugal to Romania, for 0.946 from The Netherlands to United Kingdom, and 0.947 from Slovakia to Romania. The selection of the smallest feasible power 0.94 is verbally expressed by saying that the most populous Member State realizes "just" 96 seats. An efficient algorithm to determine the power is described in Grimmett / Oelbermann / Pukelsheim, note 3; or Sect. 12.8 of Pukelsheim, note 4. The algorithm is implemented in the free software Bazi (www.uni-augsburg.de/bazi/).

6   OJ C 326, 26.10.2012, p. 13–45 (www.uni-augsburg.de/bazi/OJ/2012C326p13.pdf)

7   C. Bertini / G. Gambarelli / I. Stach: Apportionment strategies for the European Parliament. Homo Oeconomicus 22, 2005, 589-604.

8   See, e.g., V. Ramírez / A. Palomares / M.L. Márquez: Degressively proportional methods for the allotment of the European Parliament Seats amongst the EU Member States. In B. Simeone / F. Pukelsheim (Editors): Mathematics and Democracy – Recent Advances in Voting Systems and Collective Choice. Springer: Berlin, 2006 p. 205–220. Or W. Słomczy ski / K. yczkowski: On bounds for allcation of seats in the European Parliament. In: M. Cichocki / K. yczkowski (Editors): Institutional Design and Voting Power in the European Union. Ashgate: London, 2010, p. 269–281.

9   OJ C 227 E, 4.9.2008, p. 132-138, no. 5 (www.uni-augsburg.de/bazi/OJ/2008C227Ep132.pdf)

10 See Chap. 7 in Pukelsheim, note 4. – The counterpart of the divisor method with upward rounding is the divisor method with downward rounding which is also known as the D'Hondt method or the Jefferson method. The D'Hondt method is notorious for being biased in favor of stronger parties at the expense of weaker parties which explains much of its widespread usage.

11 197 168 is 45.9 percent of 429 344.

12 Links to the 2004–2016 population figures are provided at www.uni-augsburg.de/bazi/literature.html#QMV-Pop

13 OJ L 332, 18.12.2015, p. 133–135 (www.uni-augsburg.de/bazi/OJ/2015L332p133.pdf)

14 In repeated decision-making settings the term "a priori decision power" denotes the probability that the participant's vote is decisive for adopting the act. For large populations the decision power of a citizen behaves proportionally to the decision power of his or her Member State divided by the square root of the Member State's population figure. See, e.g., eq. (8) in D. Leech / H. Aziz: The double majority voting rule of the EU Reform Treaty as a democratic ideal for an enlarging Union: An appraisal using voting power analysis. In: M. Cichocki / K. yczkowski (Editors): Institutional Design and Voting Power in the European Union. Ashgate: London, 2010, p. 59–73.

15 For the double-majority voting rule the Member States' decision powers were kindly provided by Dan Felsenthal (Jerusalem) and Dennis Leech (London).

16 See Figure 14.1 in F. Pukelsheim: Putting citizens first: Representation and power in the European Union. In Cichocki / yczkowski, note 15, p. 235–253 (www.uni-augsburg.de/pukelsheim/2010a.pdf)

[17] W. Słomczyński / K. Życzkowski: Penrose voting system and optimal quota. Acta Physica Polonica B 37, 2006, 3133–3143 (chaos.if.uj.edu.pl/~karol/pdf/SZapp06.pdf)

[18] For the Jagiellonian Compromise the Member States' decision powers were calculated using the program ipgenf on the website "Computer Algorithms for Voting Power Analysis" of Dennis Leech and Richard Leech (homepages.warwick.ac.uk/~ecaae/). However, this specific decision rule makes computers superfluous since a Member State's decision power is virtually equal to the relative voting weight (=voting weight / total of all voting weights). Sample calculation for Malta in Table 8: 655 / 98 867 = 0.66 percent.

[19] European Parliament resolution of 11 November 2015 on the reform of the electoral law of the European Union (2015/2035(INL)) (www.uni-augsburg.de/bazi/OJ/20xxCyyEpzz.pdf)