

The impact of Brexit on the voting power in the Council of the European Union¹

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Abstract

The article analyses the potential impact of Brexit on the voting power of member states and indirect voting power of EU residents in the Council, in the case of adopting decisions by the qualified majority of votes. The leading hypothesis of the paper assumes that the fact of leaving the EU by Great Britain leads to another transfer of voting power to the benefit of five countries with the largest populations. The aim of the paper is also to determine to what extent the indirect voting power of residents from individual member states is equal. The obtained results indicate that a flow of voting power towards the five member states with the largest populations will be a consequence of Brexit.

Keywords: voting power, Brexit, Council of the European Union

Wpływ Brexitu na siłę głosu w Radzie Unii Europejskiej

Streszczenie

Artykuł analizuje potencjalny wpływ Brexitu na siłę głosu państw członkowskich oraz pośrednią siłę głosu rezydentów w Radzie, w przypadku przyjmowania decyzji kwalifikowaną większością głosów. Hipoteza główna zakłada, że wystąpienie Wielkiej Brytanii z Unii Europejskiej doprowadzi do kolejnego transferu siły głosu na korzyść pięciu państw o największej populacji. Celem artykułu jest również określenie w jakim stopniu pośrednia siła głosu rezydentów z poszczególnych państw członkowskich jest równa. Uzyskane rezultaty wskazują, że konsekwencją Brexitu będzie przepływ siły głosu w stronę pięciu państw Unii Europejskiej o największej populacji.

Słowa kluczowe: siła głosu, Brexit, Rada Unii Europejskiej

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On 29 March 2017, the United Kingdom (UK) government officially launched the procedure for a member state's withdrawal from the European Union (EU). This was the consequence of the referendum of 23 June 2016, in which the citizens of the United Kingdom of Great Britain and Northern Ireland voted for the country's withdrawal from the European Union. Although the referendum itself was only of non-binding, consultative nature, it led to the initiation of the process of leaving the EU under article 50 of the Treaty on European Union. This event, unprecedented in the history of European integration so far, poses a big challenge for the EU. At the same time, the UK's withdrawal from the EU will have an impact on the weighted voting system in the Council and the voting power of member states in that institution.

In the double majority system, when a decision in the Council is taken on the initiative of the European Commission or the High Representative of the Union for Foreign Affairs and Security Policy, a qualified majority constitutes at least 55% of the members of the Council (at least 16 in the case of its full composition) representing the participating member states, the total population of which is at least 65% of the population of these countries and a blocking minority must include at least four Council members (TUE: art. 16(4)).

In cases where not all the member states participate in voting, a blocking minority includes a minimum number of Council members representing more than 35% of the population of participating countries, plus one additional member (TFUE: art. 238(2)). If the Council does not act on the initiative of the European Commission or the High Representative of the Union for Foreign Affairs and Security Policy, the majority threshold for most countries is higher and support of at least 72% of the members of the Council is required. However, such situations are extremely rare and, therefore, have not been included in the further analysis.

Following the entry into force of the Treaty of Lisbon, the evolution of the compromise culture in the Council can be observed. In the case of decisions taken by qualified majority, objections or abstentions by states unable to block the decision are considered excessive and contradictory to the prevailing political culture. There is also an informal rule that, under the ordinary legislative procedure, the whole Council should defend the common position reached in this institution before the European Parliament (Novak 2013: p. 1098–1103). At the same time, qualified majority voting (QMV) has become the default method of adopting decisions in the Council (TUE: art. 16(3)) and the Treaty of Lisbon has significantly expanded the scope of use of this method of voting (Miller,

Taylor 2008: p. 79–85). As a consequence, the ability of member states to form coalitions within the Council in order to influence the outcome of this institution's decision-making process has increased.

The aim of the article is to analyse the potential impact of Brexit on the voting power of member states and indirect voting power of EU residents in the Council, in the case of adopting decisions by the qualified majority of votes, as well as to determine to what extent the indirect voting power of residents from individual member states is equal. The leading hypothesis of the paper assumes that the fact of leaving the EU by the United Kingdom leads to another transfer of voting power to the benefit of the five countries with the largest populations. In the first and second parts of the paper, the basic notation and definitions, research questions, and used methodologies were presented. Next, the way of measuring the populations of EU countries for the purpose of qualified majority voting in the Council was introduced. Then, an analysis of the change of the voting power of Council members as a result of the UK's withdrawal from the EU was performed. In the fifth part of the article, the impact of Brexit on the indirect voting power of EU residents in the Council was presented. The article ends with conclusions.

Notation and definitions

In order to conduct a voting simulations in the Council, the following notation and definitions were adopted.

For a voting game with n voters, $\mathcal{N} = \{i_1, i_2, \dots, i_n\}$ is a nonempty finite set of voters and S is a subset of \mathcal{N} . Any subset $S \subseteq \mathcal{N}$ is called a coalition. The subset S has the value $v(S)=1$ if under the voting rule is sufficient to pass a positive action, otherwise subset S has the value $v(S)=0$. A subset S is said to be a winning coalition $S \in \mathcal{W}$ if and only if $v(S)=1$. The voter i is a critical member of a coalition $S \in \mathcal{W}$ if $v(S)=1$ and $v(S - \{i\})=0$.

The set of blocking coalitions is denoted as \mathcal{B} . A subset S is a blocking coalition if $\mathcal{N} - S \notin \mathcal{W}$ and S itself is not winning $S \notin \mathcal{W}$. Minimal blocking coalition is a set of those elements S of \mathcal{B} of which no proper subset belongs to \mathcal{B} . A blocking coalition is minimal when none of the possible subcoalitions cannot guarantee the blocking of a decision in a given voting body.

\mathcal{L} is a set of subsets \mathcal{N} called losing coalitions. A set S is losing if its complement $\mathcal{N} - S \in \mathcal{W}$.

A proper simple game is a pair $(\mathcal{N}, \mathcal{W})$ such that :

- $\emptyset \notin \mathcal{W}$, the empty set of voters is not a winning coalition;
- $\mathcal{N} \in \mathcal{W}$, the entire set of voters constitutes a winning coalition;
- If $S \in \mathcal{W}$ and $S \subseteq T$ then $T \in \mathcal{W}$ – if set S is winning and T contains all voters of S then T is also a winning coalition;
- If $S \in \mathcal{W}$ then $\mathcal{N}-S \notin \mathcal{W}$, a coalition complementary to the winning coalition must be a non-winning coalition.

Research design

The leading hypothesis of this work assumes that the UK's withdrawal from the European Union will lead to another, after the introduction of the double majority system, flow of voting power to the five largest member states, and to an increase in the indirect voting power of their residents. The verification of the hypothesis requires finding answers to two research questions.

Question 1: How will the voting power of the states in the Council change in the double majority system after the UK's withdrawal from the EU?

Only seven of the countries in which the population is larger than the community average will remain in the EU after Brexit. It can, therefore, be presumed that in the case of the measurement of the voting power in the Council using the Normalised Banzhaf Index (Banzhaf 1965) and the Preventive Power Index (Coleman 1971) the voting power of the member states with the largest population will increase, as support from them is crucial for the building of winning and blocking coalitions. The absence of the UK will make it more difficult to find a coalition partner with the right voting weight. At the same time, since the number of states required to adopt a Council decision by qualified majority will be reduced from 16 to 15, it should be assumed that the voting power of the four members of the Council with the smallest population is likely to weaken.

Question 2: Will the weighted voting system, after the UK's withdrawal from the EU, be closer to a system in which the indirect voting power of all residents is equal?

Assuming that the UK's withdrawal will increase the voting power of countries with the largest population, while at the same time diminishing the voting power of the smallest members of the Council, Brexit should bring us closer to the system where the voting powers of all residents in the EU are equal. However, the difference between these systems can still be quite significant.

Computer simulations² of voting of the member states in the Council using mathematical power indices will be conducted based on the cooperative game theory. They will serve to determine the change in *a priori* voting power of the member states in the Council. Determining the conditions for the performance of the simulations, it is assumed that casting a vote “for” or “against” a submitted proposal is random and equally likely for each of the decision-makers, and that they make the decision on how to vote independently. Consequently, it should be also assumed that the formation of each of the possible coalitions of players is equally likely. Thus, the negotiating situation will not be a subject of analysis here, but only the voting rule, in isolation from other factors. It must be borne in mind that proposing their original indices to measure voting power, Shapley and Shubik (1954), as well as Coleman (1971), emphasised that they should be applied primarily in the designing of formal solutions establishing decision-making bodies, i.e. serve to compare different voting systems.

Mathematical voting power indices are intended to determine *a priori* the impact of a voting rule in a given voting body on the distribution of voting power among its members. These indices, as Linder (2008: p.593) put it, “model the voting system as an ‘abstract shell’, without taking into consideration the voters’ preferences, the range of issues over which a decision is taken, or the degree of affinity between the voters”. As a consequence, the application of the n-person game theory of weighted voting to the analysis of the voting power of states in the Council is met with accusations of insufficient empirical grounding, the cognitive and prospective value of such studies being questioned (Albert 2003, 2004; Garret, Tsebelis 1999a, 1999b). However it is not possible to identify *a priori* voting power, which derives from the decision rule itself, with *actual* or *de facto* voting power, depending on such factors as e.g. actors’ preferences and strategies, or an interplay of the institutions (Hosli, Machover 2004). This analysis assumes a normative approach under which all variables, except the voting rule itself, should be omitted.

In order to analyse the impact of the UK’s withdrawal on the voting power of the states in the Council, two mathematical indices will be used: Normalised Banzhaf Index (NBI) and Preventive Power Index (PPI). The use of NBI and PPI makes it possible

² The POWERGEN 3.0 program, developed by Author, generates indices of the players’ voting power. POWERGEN 3.0 allow to indicate for a blocking minority the minimum number of players required for its creation. This function is absent from any of the commonly available programs, and it is important in the case of simulations of voting in the EU Council in accordance with the double majority system.

to compare the obtained results with the previous research on the voting power of the member states in the Council (i.a. Moberg 2014; Sozański 2014; Kirsch 2010; Bărsan-Pipu, Tache 2009; Hosli 2008).

The NBI indicates the probability that a player (e.g. an EU Member State) will find himself in a position where it will depend on his position whether the proposal receives the majority support needed for its adoption by the voting body. The Power to Prevent (Block) Action Index indicates what is the chance of a member of a given voting body to block a decision. This index *de facto* determines the share of the winning coalitions that a given player is a critical member of in the total number of all winning coalitions. It should be kept in mind that the PPI overestimates the voting power of those voting body members that frequently tend to take extreme positions.

Computer simulations, the results of which have been presented in the article, were based on official Eurostat data³.

In the case of an indirect analysis of the voting power of residents of individual member states, it was assumed that a two-level decision-making system operates in the Council. The indirect voting power of each resident of a Member State is equal to the product of the direct voting power of the resident and the voting power of their representative in the Council. To determine the direct voting power of a resident, it is assumed that each member state is a separate constituency and that an EU resident belongs only to one constituency (EU Member State) and independently expresses their opinion on the initiative considered in the Council, as if they were doing so in a poll in which they have one vote and can vote only “for” or “against” the proposed initiative. At the same time, it is assumed that there is no significant correlation between residing in a particular state (affiliation with a constituency) and preference with regard to the issues that may become the subject matter of a decision in the Council. Representatives of a Member State in the Council vote “for” or “against” an initiative independently of one another, guided solely by the outcome of the poll in a given state. In this case, the impact of each resident on the outcome of voting in the Council is equal, if the voting power of the member states is proportional to the square root of population⁴. We should agree with Kirsch (2007: p.373) that the correlation between the preferences of residents or citizens in particular constituencies varies over time and depending on the issues being resolved, while the weighted voting system in a particular institution

³ Eurostat, *Usually resident population on 1 January* (last update 2.10.2017), http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_urespop&lang=en [accessed 25.02.2018].

⁴ About the *Penrose square root law*, cf. Felsenthal, and Machover (1998: p.63-78), Penrose (1946).

usually operates over a long period of time. Hence, it seems acceptable to assume that there is no strong correlation of preferences among residents of EU member states.

To determine how much of each country's voting power in the Council is proportional to the square root of population, the ratio of voting power to the square root of population was determined. The ratio was calculated using the formula $(\eta S)/(Hs)^5$ where:

η – the number of swings of a given player (member state) in a given voting system;

H – the sum of swings of all players;

s – the square root of the player's population;

S – the sum of square roots of the populations of all players in the council.

If, for a Member State, the ratio assumes a value of exactly 1, then its voting power is directly proportional to the square root of population (number of residents). On the other hand, when such a value occurs for all members of the Council, then we are dealing with a voting system in which the indirect voting power of all residents of the member states is equal. Where the ratio assumes a value less than or equal to 1, then the respective voting power of a given state is underestimated or overestimated in relation to the square root of its population.

In order to answer the question of how much of a voting system in the Council is convergent with the so-called equal impact system and what changes in this regard will result from the UK's withdrawal from the EU, we will determine the average absolute deviation of the ratios of voting power to the square root of the population of individual EU states from the value of this ratio equalling 1 (full proportionality).

We shall use the following formula:

$$D = \frac{\sum_{i=1}^n |x_i - 1|}{N}$$

where:

x_i – ratio of voting power to the square root of population of an individual player

N – the total number of the players

The D ratio indicates how much, on average, the voting power of the states in the analysed voting system is absolutely deviated from the weighted voting system in which the indirect voting power of all residents of those states is equal (assuming the above-mentioned assumptions are fulfilled). The higher the value of the D ratio, the

⁵ Felsenthal and Machover (1998: p.166).

higher the average absolute deviation of the voting power ratio to the square root of population of all players and, therefore, the analysed voting system is more divergent from the voting system where the voting power of all citizens in the EU is equal.

The population of member states

The Regulation of the European Parliament and of the Council on demographic statistics in Europe has normalised the way of measuring the population of individual EU member states for the needs of qualified majority voting in the Council (Regulation 1260/2013). It imposes on each country the obligation to provide the European Commission (Eurostat) with data on the population at the member state level on 31 December within eight months of the end of the reference year. In practice, the population of member states, for the purposes of qualified majority voting, is defined as the number of persons residing in an EU country at the time of reference. It is, therefore, the number of residents, and not citizens of the member state concerned, and it also includes nationals of other countries, including those who do not have EU citizenship (Kleinowski, Czaputowicz 2016: p. 142–143).

As shown by the data presented in Table 1, this system favours the countries of the ‘old Union’, in which the number of immigrants is relatively higher: for example, in Germany it is 10.5 percent, in United Kingdom and Italy more than 8 percent, in Spain more than 9 percent and in Luxembourg almost 48 percent, while in Poland it is only 0.41 percent of the population. In practice, this leads to an increase in the voting power of citizens, above all of those countries in which the relative number of immigrants-residents is high.

Table 1: Population without the citizenship of the reporting EU Member State.

Member state	Usually resident population	Population	Population without the citizenship of the country	Population without the citizenship of the country-share in total population	Population without the citizenship of the EU	Population without the citizenship of the EU-share in total population
Germany	82064489	82175684	8651958	10.53%	4850914	5.90%
France	66661621	66730453	4405775	6.60%	2877568	4.31%
United Kingdom	65341183	65382556	5684047	8.69%	2479419	3.79%

Italy	61302519	60665551	5026153	8.29%	3509130	5.78%
Spain	46438422	46440099	4417517	9.51%	2483686	5.35%
Poland	37967209	37967209	155533	0.41%	130442	0.34%
Romania	19759968	19760314	107235	0.54%	59205	0.30%
Netherlands	17235349	16979120	900501	5.30%	441796	2.60%
Belgium	11289853	11311117	1333243	11.79%	457365	4.04%
Greece	10793526	10783748	798357	7.40%	591693	5.49%
Czech Republic	10445783	10553843	476346	4.51%	280908	2.66%
Portugal	10341330	10341330	388731	3.76%	283500	2.74%
Sweden	9998000	9851017	782833	7.95%	478845	4.86%
Hungary	9830485	9830485	156606	1.59%	71463	0.73%
Austria	8711500	8700471	1267674	14.57%	651273	7.49%
Bulgaria	7153784	7153784	78058	1.09%	64946	0.91%
Denmark	5700917	5707251	463147	8.12%	273772	4.80%
Finland	5465408	5487308	229765	4.19%	135563	2.47%
Slovakia	5407910	5426252	65840	1.21%	15400	0.28%
Ireland	4664156	4726286	546050	11.55%	128066	2.71%
Croatia	4190669	4190669	43287	1.03%	29813	0.71%
Lithuania	2888558	2888558	18682	0.65%	13733	0.48%
Slovenia	2064188	2064188	107766	5.22%	90169	4.37%
Latvia	1968957	1968957	288946	14.68%	282972	14.37%
Estonia	1315944	1315944	198251	15.07%	182879	13.90%
Cyprus	848319	848319	147268	17.36%	38141	4.50%
Luxembourg	576249	576249	269175	46.71%	39669	6.88%
Malta	434403	450415	46935	10.42%	23177	5.15%
Total	510860699	510277177	37055679		20965507	

Source: Own calculations based on Eurostat, *Population on 1 January by age group, sex and citizenship* (last update 12.04.2018), http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=migr_pop1ctz&lang=en (Accessed on 14.04.2018); Eurostat, *Usually resident population on 1 January* (last update 2.10.2017), http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_urespop&lang=en (Accessed on 25.02.2018).

The described phenomenon does not result from the so-called migration crisis, which EU countries have been struggling with since 2015⁶, but it did have some influ-

⁶ A rise in the number of immigrants and refugees arriving in Europe was already noticeable in previous years.

ence on them. In the years 2014–2016, the total net migration balance for the entire EU was positive and amounted to 4 178 583 people, which is relatively small in relation to its population. However, there has been a concentration of migration in several member states, where the percentage of immigrants in the population was already quite high. The target country of immigration was mainly Germany (2 214 009 people), Great Britain (896 145 people), Sweden (273 952 people), Austria (253 295 people), Italy (206 159 people), and the Netherlands (169 361).

The number of residents may not be equated with the total population of a state, but the differences are very small. For the majority of EU countries, the reported population is equal to, or slightly higher than the number of residents. A strange situation occurs only in Italy, where, according to official data, the number of residents is by ca. 640 000 people higher than the population of this country. Consequently, it is doubtful whether the given data are correct in this case.

Following the entry into force of Regulation (EU) No. 1260/2013, the practice of updating the annex to the Council's Rules of Procedure specifying the population of individual member states has been ceased, followed by the direct application of Art. 4 of the aforementioned regulation.

The change of the voting power of Council members as a result of the UK's withdrawal from the EU

The introduction, under the Treaty of Lisbon, of a new weighted voting system in the Council, the so-called double majority system, has led to a flow of voting power towards the four EU member states with the largest population (Felsenthal, Machover 2004; Bobay 2004; Baldwin, Widgren 2003), the support of which became crucial to the formation of a winning or blocking coalition. Accordingly, as indicated in Table 2, the UK's withdrawal from the EU has led to changes in the voting power of other member states as measured using the NBI and the PPI.

In the case of voting power measured using the NBI, Brexit leads to its flow towards the five members of the Council with the largest population, in particular Poland and Spain. Changing the weighted voting system will also be beneficial for Romania and the Netherlands, but to a much lesser extent.

Table 2: The change of the voting power of the states in the Council for decisions adopted by qualified majority after the UK's withdrawal from the EU.

State	EU 28 states		EU 27 after Brexit		Change relative to EU 28 states			
	NBI	PPI	NBI	PPI	NBI change	NBI change (%)	PPI change	PPI change (%)
Germany	0.1025	0.748	0.1198	0.7897	0.0173	16.84	0.0417	5.57
France	0.0844	0.6157	0.0995	0.6563	0.0152	17.96	0.0406	6.59
United Kingdom	0.0829	0.6049	-	-	-	-	-	-
Italy	0.0787	0.5739	0.0918	0.6055	0.0132	16.75	0.0315	5.50
Spain	0.0618	0.4512	0.0762	0.5023	0.0143	23.18	0.051	11.31
Poland	0.0507	0.3698	0.0649	0.428	0.0142	28.12	0.0583	15.77
Romania	0.0375	0.2739	0.04	0.2638	0.0025	6.55	-0.0102	- 3.72
Netherlands	0.0349	0.2549	0.0371	0.245	0.0022	6.33	-0.01	- 3.92
Belgium	0.0289	0.2112	0.0302	0.1992	0.0013	4.34	-0.0121	- 5.72
Greece	0.0285	0.2076	0.0296	0.1953	0.0012	4.10	-0.0123	- 5.94
Czech Republic	0.0281	0.2051	0.0292	0.1926	0.0011	3.92	-0.0125	- 6.09
Portugal	0.028	0.2043	0.0291	0.1918	0.0011	3.88	-0.0125	- 6.13
Sweden	0.0277	0.2018	0.0287	0.1891	0.001	3.69	-0.0127	- 6.30
Hungary	0.0275	0.2006	0.0285	0.1878	0.001	3.61	-0.0128	- 6.38
Austria	0.0264	0.1924	0.0271	0.179	0.0008	2.98	-0.0134	- 6.95
Bulgaria	0.0248	0.181	0.0253	0.1667	0.0005	1.95	-0.0143	- 7.88
Denmark	0.0233	0.1703	0.0235	0.1553	0.0002	0.92	-0.015	- 8.81
Finland	0.0231	0.1685	0.0233	0.1534	0.0002	0.73	-0.0151	- 8.98
Slovakia	0.023	0.1681	0.0232	0.153	0.0002	0.68	-0.0152	- 9.02
Ireland	0.0223	0.1627	0.0223	0.1471	0	0.06	-0.0156	- 9.59
Croatia	0.0218	0.1592	0.0217	0.1433	-0.0001	- 0.37	-0.0159	- 9.97
Lithuania	0.0205	0.1496	0.0202	0.133	-0.0003	- 1.63	-0.0166	- 11.11
Slovenia	0.0197	0.1435	0.0192	0.1264	-0.0005	- 2.53	-0.0171	- 11.92
Latvia	0.0196	0.1428	0.0191	0.1256	-0.0005	- 2.64	-0.0172	- 12.02
Estonia	0.0189	0.138	0.0183	0.1204	-0.0006	- 3.39	-0.0175	- 12.71
Cyprus	0.0184	0.1345	0.0177	0.1167	-0.0007	- 3.97	-0.0178	- 13.23
Luxembourg	0.0182	0.1325	0.0174	0.1145	-0.0008	- 4.32	-0.0179	- 13.55
Malta	0.018	0.1314	0.0172	0.1134	-0.0008	- 4.52	-0.018	- 13.73

Source: Own calculations.

In turn, for the six member states with the smallest populations, the NBI assumes a slightly lower value. In the case of the other members of the Council, a very slight increase in their voting power can be observed.

Following the UK’s withdrawal from the EU, only in the case of Germany, France, Italy, Spain and Poland there will be an increase in the ability to block decisions measured by the PPI. This clearly indicates that after Brexit the importance of these states in the process of building blocking coalitions will increase even further. Theoretically, the change is most beneficial for the governments of Warsaw and Madrid, but their ability to block decisions will continue to diverge considerably from the opportunities that Italy, France and, above all, Germany will obtain. The ability to block a decision in the Council will decrease for all other states. At the same time, there is a relationship between population and a change in the PPI. With the decline in the population of a state, the value of the PPI decreases to a larger extent as a result of the UK’s withdrawal from the EU. This indicates that the key criterion of weighing votes when creating blocking coalitions will be the EU population. Given that it is difficult to build a blocking coalition consisting of a large number of member states in the Council, the disproportion in the ability to block a decision between Germany, France and Italy and the remaining members of the Council may be even greater in practice.

It should be borne in mind that in the case of weighting votes in the Council in accordance with the double majority system, it is not easy to build a blocking coalition based on one country with a population of over 30 million. It is difficult even with two such member states, except when one of the coalition partners is Germany. Table 3 presents the smallest blocking coalitions possible to be created, assuming that maximum one or two countries out of six with the largest populations in the EU take part in them.

Table 3: Minimum number of states necessary to build a blocking coalition in the Council, assuming the participation of selected countries with the largest populations.

Member states	EU-28	EU-27 after Brexit	Member states	EU-28	EU-27 after Brexit
Germany	1+8	1+6	Germany and France	2+2	2+2 (2+1)
France	1+10	1+7	Visegrad Group	4+12	4+8

United Kingdom	1+10	-	Poland and UK	2+6	-
Italy	1+11	1+8	Spain and Poland	2+8	2+6
Spain	1+14	1+10	Italy and Spain	2+6	2+3
Poland	1+15	1+11	Italy and Poland	2+6	2+4

Source: Own calculations.

An analysis of the data included in the table clearly indicates that, as a result of leaving the EU by Great Britain, it will be easier to build blocking coalitions around the five Council members with the largest populations. This will be the result of lowering the decision-making threshold of the population in the case of QMV, from approximately 332.0 million to 289.6 million people, i.e. by almost 42.5 million. After Brexit, the Franco-German tandem could create a blocking coalition with one more country with a population of around 8 million, if it were not for the fact that at least four Council members would still be required to create it⁷. It should be remembered that, in practice, there is very little chance of winning over the most populous countries from the group of medium-sized ones for a coalition. In most cases, a blocking coalition will have to be larger than the smallest one possible to create, by at least several countries. In the case of Poland or Spain building a blocking coalition with medium-sized and small states, this probably means the need to create a coalition exceeding 55% of EU countries. However, after Brexit, in the case of the governments in Madrid and Warsaw, it will be easier to create blocking coalitions in partnership with Germany, France or Italy, and for Poland also within the Visegrad Group. Consequently, it should be stated that the UK's withdrawal from the EU will strengthen the position of the European Commission and, indirectly, of the three largest EU-27 member states – in terms of their population – as it will be much easier to accept the European Commission's proposal in the Council than to change or reject it. As a consequence, the “guardian of the law” in the EU can become its “midwife” even more. It only needs to win over 3–4 largest states (especially Germany) and 11–12 other Council members for its initiative.

⁷ The creation of a blocking coalition by the German-French tandem will require winning over two countries with a total population of about 7 million people.

It should be kept in mind that in many cases a legislative initiative proposal prepared by the European Commission is neutral, or of minor importance for some member states and, in this case, they tend to support the proposal presented by the Commission. Therefore, after Brexit, it will gain a lot of freedom in shaping proposed initiatives, provided that it takes into account the preferences of the largest EU countries to a sufficient degree and, at the same time, it will be able to count on the support of the majority of Council members.

The voting power of member states in the Council changes, if we assume that there are relatively stable coalitions in it. Table 4 indicates how the voting power of Council members changes, measured using the NBI and PPI, assuming that the countries of the Visegrad Group and the Franco-German tandem co-ordinate their position on the EU forum. The size of the change was expressed as a percentage, in relation to the value of the voting power indices calculated on the assumption that all countries make their own decision independently of one another. The values of the indices for the cases mentioned above are presented in table 6, which has been attached in the annex.

In respect of the ability to block decisions in the Council, as measured using the PPI, the co-operation of V4 states leads to its reduction for all other members of the Council, also after the UK’s withdrawal from the EU. Co-ordinating the position in the discussed institution by the members of the Visegrad Group increases their ability to build blocking coalitions, both in the EU consisting of 28 and 27 states. The PPI index for V4 takes the value of 0.7815 and 0.7997 respectively, which is more than in the case of Germany.

Table 4: The change of the voting power in the Council, measured using the NBI and PPI, in relation to the simulation assuming that all countries make their own decision independently of one another.

State	The Visegrad Group coalition				The Visegrad Group coalition and Franco-German tandem			
	EU 28 states		EU 27 after Brexit		EU 28 states		EU 27 after Brexit	
	NBI change (%)	PPI change (%)	NBI change (%)	PPI change (%)	NBI change (%)	PPI change (%)	NBI change (%)	PPI change (%)
Germany	15.02	-5.51	12.99	-9.53				
France	9.11	-10.33	13.46	-9.21	4.29	-	0.002	-

United Kingdom	8.65	-10.73	-	-	-12.06	-39.05	-	-
Italy	6.93	-12.09	14.18	-8.63	-13.28	-39.85	-16.24	-44.24
Spain	-6.38	-23.13	15.04	-7.89	-20.15	-44.68	-13.71	-42.52
Visegrad Group	0.81	-	3.92	-	10.11	-	10.49	-
Romania	8.80	-10.70	-7.85	-26.25	2.90	-28.74	-8.88	-39.34
Netherlands	6.17	-12.85	-7.63	-26.18	2.19	-29.24	-7.96	-38.81
Belgium	-0.60	-18.46	-9.33	-27.44	1.72	-29.60	-4.62	-36.51
Greece	-1.56	-18.98	-9.51	-27.61	1.40	-29.59	-4.16	-36.22
Portugal	-2.35	-19.79	-10.14	-28.09	1.21	-29.86	-4.20	-36.23
Sweden	-3.65	-20.83	-11.30	-28.97	0.36	-30.43	-4.94	-36.68
Austria	-8.86	-25.00	-15.56	-32.36	-3.20	-32.79	-7.55	-38.40
Bulgaria	-15.76	-30.77	-21.76	-37.33	-8.02	-36.22	-11.77	-41.21
Denmark	-19.61	-33.87	-24.41	-39.60	-9.60	-37.26	-11.93	-41.45
Finland	-15.69	-30.74	-20.22	-36.09	-4.69	-33.95	-6.50	-37.69
Ireland	-14.83	-30.14	-18.44	-34.86	-1.88	-32.10	-2.40	-35.15
Croatia	-16.80	-31.62	-20.31	-36.11	-3.01	-32.75	-3.33	-35.53
Lithuania	-23.97	-37.63	-27.07	-41.63	-8.05	-36.37	-7.90	-38.68
Slovenia	-26.50	-39.61	-28.86	-43.08	-8.75	-36.74	-7.50	-38.43
Latvia	-25.38	-38.74	-27.48	-42.04	-7.06	-35.63	-5.35	-37.07
Estonia	-24.92	-38.32	-26.22	-40.86	-4.27	-33.65	-1.22	-34.13
Cyprus	-25.03	-38.29	-25.48	-40.26	-2.66	-32.41	1.76	-32.13
Luxembourg	-26.49	-39.51	-26.93	-41.35	-3.50	-33.01	1.03	-32.55
Malta	-24.77	-38.23	-24.73	-39.62	-0.65	-31.18	4.72	-30.11

Source: Own calculations.

Thus, the co-operation of the Czech Republic, Poland, Slovakia and Hungary in the Council definitely increases its ability to block decisions. However, it should be remembered that a condition for creating a blocking coalition is to recruit an appropriate number of coalition partners.

Co-ordinating the position in the Council at the same time by the Franco-German tandem and members of the Visegrad Group significantly affects the voting power of EU countries in this institution. In the case of a permanent coalition of the governments in Berlin and Paris, their NBI increases by only about 4% for EU-28, and practically

does not change after Brexit. However, it should be noted that it takes very high values of around 0.2–0.22. The Franco-German tandem gains an extremely high ability to block decisions, as the PPI value is close to 1. This means that in practice it is unlikely that decisions in the Council will be adopted against France and Germany, especially after Brexit. As a result, when preparing a legislative initiative, the European Commission must take into account the interests of the Franco-German tandem to a sufficient degree.

In the discussed case, the co-operation of the members of the Visegrad Group increases the probability that they will be in the position of a key player for the adoption of an initiative in the Council by approximately 10%. At the same time, the V4 countries are an important partner in the case of attempts to build a blocking coalition. In the case of other EU countries, including Italy, Great Britain and Spain, the co-operation between the Franco-German tandem and members of the Visegrad Group leads to a 30%-40% reduction in their ability to block decisions, measured using the PPI. In such a situation, it is very difficult for EU member states with medium-sized and small populations to build a blocking coalition without the support of at least one, and preferably two, Council members with a population of over 30 million. The total population of the countries making up the Visegrad Group is around 63,65 million, which is comparable to the population of France. Therefore, the position of the largest “players” in the Council most often determines whether the creation of a blocking coalition is feasible.

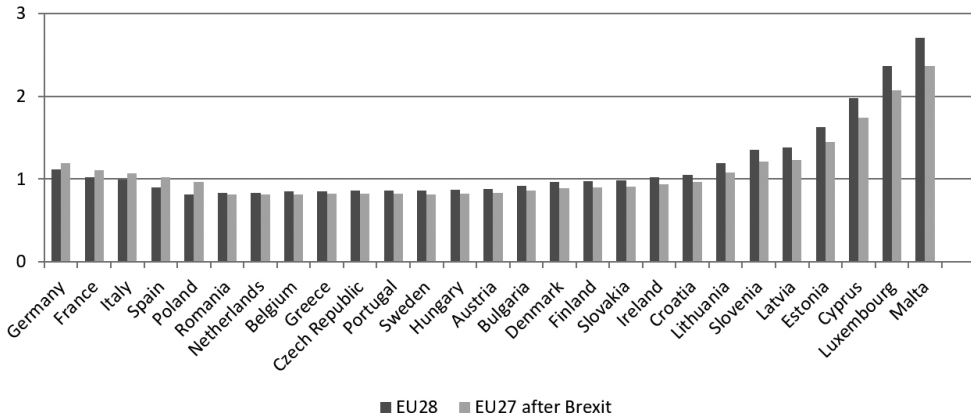
The impact of Brexit on the indirect voting power of EU residents in the Council

As a result of the UK’s withdrawal, the EU population will decrease, which, coupled with the flow of voting power between the member states, will have a clear impact on the indirect voting power of EU residents in the Council and the convergence of the voting system in this institution with the so-called equal impact system.

Chart 1 presents how the ratio of the voting power of individual Council members (as measured using the NBI) to the square root of their population will change. Assuming that the population of states is determined by the number of people residing in a given country (residents), and not its citizens, we can observe that Brexit will lead to an even greater overestimation of Germany’s voting power in relation to the voting system where the voting power of all residents in the EU is equal. In the case of France

and Italy, for which, with 28 member states, the ratio of voting power to the square root of population assumed a value close to 1, the UK's withdrawal leads to a marked overestimation of the voting power of these states and, consequently, of the indirect voting power of their residents. In turn, the voting power of Spain and Poland becomes approximately proportional to the square root of their population. In the case of all other countries, the indirect voting power of the population is reduced, including the degree of overestimation of the voting power of the seven members of the Council with the smallest populations is lowered.

Chart 1: The change in the ratio of the voting power of member states to the square root of population as a result of the UK's withdrawal from the EU.



Source: Own calculations.

At the same time, Brexit will result in the underestimation of the indirect voting power of Croatian residents and will increase the underestimation of the voting power of states with a population of less than 20 million, and more than 4 million.

To answer the question about the extent to which the double weighted voting system in the Council is convergent with the voting system where the voting power of all citizens/inhabitants is equal, based on the data in Table 2 and Table 3, the *D* ratio was determined for the EU consisting of 28 member states, as well as after the UK's withdrawal from it.

Table 5: The convergence of the weighted voting system in the Council with the system where the voting power of all citizens is equal for EU-28 and EU-27.

UE Member State	EU-28					EU-27				
	Population	Square root of the population	Number of swings (η)	Ratio of voting power to the square root of population (A)	A-1	Population	Square root of the population	Number of swings (η)	Ratio of voting power to the square root of population (A)	A-1
Germany	82064489	9058.9	22733139	1.120	0.120	82064489	9058.9	13862450	1.194	0.194
France	66661621	8164.7	18712511	1.023	0.023	66661621	8164.7	11602800	1.109	0.109
United Kingdom	65341183	8083.4	18384157	1.015	0.015	-	-	-	-	-
Italy	61302519	7829.6	17443533	0.995	-0.005	61302519	7829.6	10781652	1.074	0.074
Spain	46438422	6814.6	13714289	0.898	-0.102	46438422	6814.6	8923652	1.022	0.022
Poland	37967209	6161.8	11237887	0.814	-0.186	37967209	6161.8	7620132	0.965	-0.035
Romania	19759968	4445.2	8326020	0.836	-0.164	19759968	4445.2	4667788	0.819	-0.181
Netherlands	17235349	4151.5	7748574	0.833	-0.167	17235349	4151.5	4315106	0.811	-0.189
Belgium	11289853	3360.0	6420399	0.853	-0.147	11289853	3360.0	3514460	0.816	-0.184
Greece	10793526	3285.4	6310049	0.857	-0.143	10793526	3285.4	3457710	0.821	-0.179
Czech Republic	10445783	3232.0	6232589	0.861	-0.139	10445783	3232.0	3398484	0.820	-0.180
Portugal	10341330	3215.8	6209199	0.862	-0.138	10341330	3215.8	3392302	0.823	-0.177
Sweden	9998000	3162.0	6132746	0.866	-0.134	9998000	3162.0	3320350	0.819	-0.181
Hungary	9830485	3135.4	6095624	0.868	-0.132	9830485	3135.4	3311336	0.824	-0.176
Austria	8711500	2951.5	5846208	0.884	-0.116	8711500	2951.5	3143488	0.831	-0.169
Bulgaria	7153784	2674.7	5499738	0.918	-0.082	7153784	2674.7	2951190	0.861	-0.139
Denmark	5700917	2387.7	5175260	0.968	-0.032	5700917	2387.7	2735522	0.894	-0.106
Finland	5465408	2337.8	5122592	0.978	-0.022	5465408	2337.8	2710090	0.904	-0.096
Slovakia	5407910	2325.5	5109810	0.981	-0.019	5407910	2325.5	2700556	0.906	-0.094
Ireland	4664156	2159.7	4943536	1.022	0.022	4664156	2159.7	2591314	0.936	-0.064
Croatia	4190669	2047.1	4837930	1.055	0.055	4190669	2047.1	2535384	0.966	-0.034
Lithuania	2888558	1699.6	4546652	1.194	0.194	2888558	1699.6	2352344	1.080	0.080
Slovenia	2064188	1436.7	4361382	1.355	0.355	2064188	1436.7	2231102	1.212	0.212
Latvia	1968957	1403.2	4340184	1.381	0.381	1968957	1403.2	2220220	1.234	0.234
Estonia	1315944	1147.1	4192994	1.632	0.632	1315944	1147.1	2125120	1.445	0.445
Cyprus	848319	921.0	4087880	1.981	0.981	848319	921.0	2059548	1.745	0.745

Luxembourg	576249	759.1	4026282	2.368	1.368	576249	759.1	2019018	2.075	1.075
Malta	434403	659.1	3994488	2.706	1.706	434403	659.1	2000204	2.368	1.368
Σ	510860699	99010.00	221785652			445519516	90267.5	116543322		
D	0.27				0.24					
D-15%	0.187				0.184					

Source: Own calculations.

As shown by the data presented in Table 1, for EU-28 the *D* ratio assumes the value of 0.27, which means that the weighted voting system in force in the Council differs significantly from the system where the voting power of all residents is equal. For comparison, in the case of the Nice system used in the past, it was only 0.131.

As a result of Brexit, the value of the *D* ratio will be slightly reduced, but it will still be difficult to recognise the weighted voting system in the Council as consistent with the equal impact system. In connection with the fact that a mean is a measure sensitive to the occurrence of extreme values of a studied feature, the *D* ratio was calculated in the set of analysed data after excluding 15% of the statistical units of the studied general populations (EU states) with extreme values (2 states for which the voting power ratio to the square root of population was to the largest extent deviated from the value of 1, and 2 states for which the deviation was the smallest). In this case, for 28 EU states, the *D* ratio assumes the value of 0.187, while after the UK's withdrawal from the EU it amounts to 0.184. On the other hand, in the same situation for the Nice system, with 28 member states, the *D* ratio amounted to 0.12.

Conclusions

The conducted analysis confirms the truthfulness of the hypothesis put forward at the beginning. In the case of the first research questions asked (Q1), it should be stated that the UK's withdrawal from the EU will lead to a flow of voting power measured using the NBI primarily towards the five member states with the largest population, especially Germany. Brexit will increase the ability to block decisions, as measured by the PPI, by the five members of the Council with the largest population and, at the same time, lower it for all other states. There is a clear correlation here, according to which the decline in the PPI value in percentage terms increases with the decline in the population of the state. Co-ordinating the position in the Council by Germany and

France, as well as by the Visegrad Group, leads to an increase in their voting power in this institution, especially after Brexit.

As a result of Brexit, there will be a clear overestimation of the indirect voting power of German and French residents (Q2), while underestimating the indirect voting power of residents of 15 countries. The weighted voting system in the Council for QMV decisions still will be deviating from the system where the voting power of all residents is equal to a significant extent - the D ratio amounted to 0.24.

It can be said that as a result of the UK's withdrawal from the EU, the importance of the population criterion in the building of blocking and winning coalitions within the Council will increase. The position of the five countries with the largest population, including Germany, France and Italy, will to an even larger extent determine the area within which a compromise in the negotiations conducted in the Council will be possible.

Annex

Table 6: The voting power of states in the Council, measured using the NBI and PPI, assuming the occurrence of selected coalitions of states.

State	The Visegrad Group coalition				The Visegrad Group coalition and Franco-German tandem			
	EU 28 states		EU 27 after Brexit		EU 28 states		EU 27 after Brexit	
	NBI	PPI	NBI	PPI	NBI	PPI	NBI	PPI
Germany	0.1179	0.7068	0.1354	0.7145	0.1949	0.9858	0.2277	0.9998
France	0.0921	0.5521	0.1129	0.5959				
United Kingdom	0.0901	0.5400	-	-	0.0729	0.3687	-	-
Italy	0.0842	0.5045	0.1048	0.5532	0.0682	0.3452	0.0769	0.3376
Spain	0.0579	0.3468	0.0877	0.4627	0.0493	0.2496	0.0658	0.2887
Visegrad Group	0.1304	0.7815	0.1515	0.7997	0.1424	0.7201	0.1611	0.7073
Romania	0.0408	0.2446	0.0369	0.1945	0.0386	0.1952	0.0364	0.1600
Netherlands	0.0371	0.2221	0.0343	0.1809	0.0357	0.1804	0.0341	0.1499
Belgium	0.0287	0.1722	0.0274	0.1445	0.0294	0.1487	0.0288	0.1265
Greece	0.0281	0.1682	0.0268	0.1414	0.0289	0.1462	0.0284	0.1246
Portugal	0.0274	0.1645	0.0262	0.1385	0.0284	0.1439	0.0280	0.1228

Sweden	0.0270	0.1617	0.0258	0.1362	0.0281	0.1421	0.0277	0.1215
Austria	0.0252	0.1513	0.0242	0.1279	0.0268	0.1356	0.0265	0.1165
Bulgaria	0.0232	0.1389	0.0223	0.1177	0.0253	0.1279	0.0251	0.1104
Denmark	0.0212	0.1272	0.0205	0.1081	0.0239	0.1207	0.0239	0.1048
Finland	0.0209	0.1254	0.0202	0.1065	0.0236	0.1196	0.0237	0.1039
Ireland	0.0198	0.1190	0.0192	0.1012	0.0229	0.1156	0.0229	0.1007
Croatia	0.0192	0.1152	0.0186	0.0980	0.0224	0.1133	0.0225	0.0989
Lithuania	0.0175	0.1048	0.0169	0.0893	0.0211	0.1070	0.0214	0.0938
Slovenia	0.0164	0.0983	0.0159	0.0837	0.0203	0.1029	0.0206	0.0906
Latvia	0.0163	0.0975	0.0157	0.0831	0.0203	0.1025	0.0205	0.0902
Estonia	0.0154	0.0923	0.0149	0.0787	0.0196	0.0993	0.0200	0.0876
Cyprus	0.0148	0.0885	0.0143	0.0755	0.0192	0.0970	0.0195	0.0858
Luxem- bourg	0.0144	0.0864	0.0140	0.0737	0.0189	0.0957	0.0193	0.0847
Malta	0.0142	0.0852	0.0138	0.0727	0.0188	0.0950	0.0192	0.0841

Source: Own calculations.

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