



DIRECTORATE GENERAL FOR INTERNAL POLICIES

**POLICY DEPARTMENT**  
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# **The Composition of the European Parliament**

## **The r-DP Methods**

# Summary

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- The concept of Degressive Proportionality
  - After rounding and
  - Before rounding
- Current Inverse DP and imbalances
- Scientific argument for a degree of DP
- New methods for DP, the r-DP family
  - Choosing a method, the 0.5-DP method.
- Comparison of different methods
- Composition of EP after Brexit and enlargement of EU

## DP after and before rounding

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<u>Country</u>	<u>P=population</u>	<u>f(P)</u>	<u>Seats</u>
Belgium	11258434	21,50	22
Greece	10846979	20,94	21

$$11258434 / 22 = \mathbf{511747}$$

$$10846979 / 21 = \mathbf{516623}$$

$$11258434 / 21,50 = \mathbf{523648}$$

$$10846979 / 20,94 = \mathbf{518003}$$

# Current Inverse DP and imbalances

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## Some current ratios

Germany  $81089331 / 96 = 844681$

France  $66352469 / 74 = 896655$

UK  $64767115 / 73 = 887221$

Spain  $46439864 / 54 = 859997$

Romania  $19861408 / 32 = 620669$

The Netherlands  $17155169 / 26 = 659814$

# Current imbalanced allotment

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- **Ireland - Lithuania**

<u>Country</u>	<u>Population</u>	<u>Seats</u>
Ireland	4625885	11
Lithuania	2921262	11

It would be reasonable for Ireland to have about **3 seats more** than Lithuania

# Many allocations verifying DP

Country	A0	A1	...	A10	<u>A1 - A10</u>
Germany	26	96		96	0
France	26	87		78	9
U.K.	26	87		77	10
...	...	...	...	...	
Estonia	26	6		15	- 9
Cyprus	26	6		10	- 4
Luxembourg	26	6		7	- 1
Malta	26	6		6	0
Total	728	751		751	

# Degree of DP

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## Jagiellonian Compromise and ideological affinity

- Distribute a portion of the EP seats in proportion to the **square root** of the population.
- Distribute the remaining seats in **proportion** to the population.
- Scully, R., Hix, S. and Farrel, D.: **40-60**
- Our proposal: **50-50**

## Degree r of DP

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$$q_i = \frac{751 * r \sqrt{p_i}}{\sum_{i=1}^n \sqrt{p_i}} + \frac{751 * (1-r) * p_i}{\sum_{i=1}^n p_i}$$



# Allocations with different degrees of DP

Country	Population	S <sub>0</sub> =Pro.	S <sub>0.40</sub>	S <sub>0.50</sub>	S <sub>0.60</sub>	S <sub>1</sub> =PSR	Current
Germany	81089331	118	<b>98</b>	<b>93</b>	88	68	<b>96</b>
France	66352469	97	<b>83</b>	<b>79</b>	75	61	<b>74</b>
U.K.	64767115	94	<b>81</b>	<b>77</b>	74	60	<b>73</b>
Italy	61438480	89	<b>77</b>	<b>74</b>	71	59	<b>73</b>
Spain	46439864	68	<b>61</b>	<b>60</b>	58	51	<b>54</b>
Poland	38005614	56	<b>52</b>	<b>51</b>	50	46	<b>51</b>
Romania	19861408	29	<b>31</b>	<b>32</b>	32	34	<b>32</b>
The Netherlands	17155169	25	<b>28</b>	<b>28</b>	29	31	<b>26</b>
Belgium	11258434	17	<b>20</b>	<b>21</b>	22	26	<b>21</b>
Greece	10846979	16	<b>20</b>	<b>21</b>	22	25	<b>21</b>
Czech Republic	10419743	16	<b>19</b>	<b>20</b>	21	25	<b>21</b>
Portugal	10374822	16	<b>19</b>	<b>20</b>	21	25	<b>21</b>
Hungary	9855571	15	<b>18</b>	<b>19</b>	20	24	<b>21</b>
Sweden	9790000	15	<b>18</b>	<b>19</b>	20	24	<b>20</b>
Austria	8581500	13	<b>17</b>	<b>18</b>	19	22	<b>18</b>

# Allocations with different degrees of DP

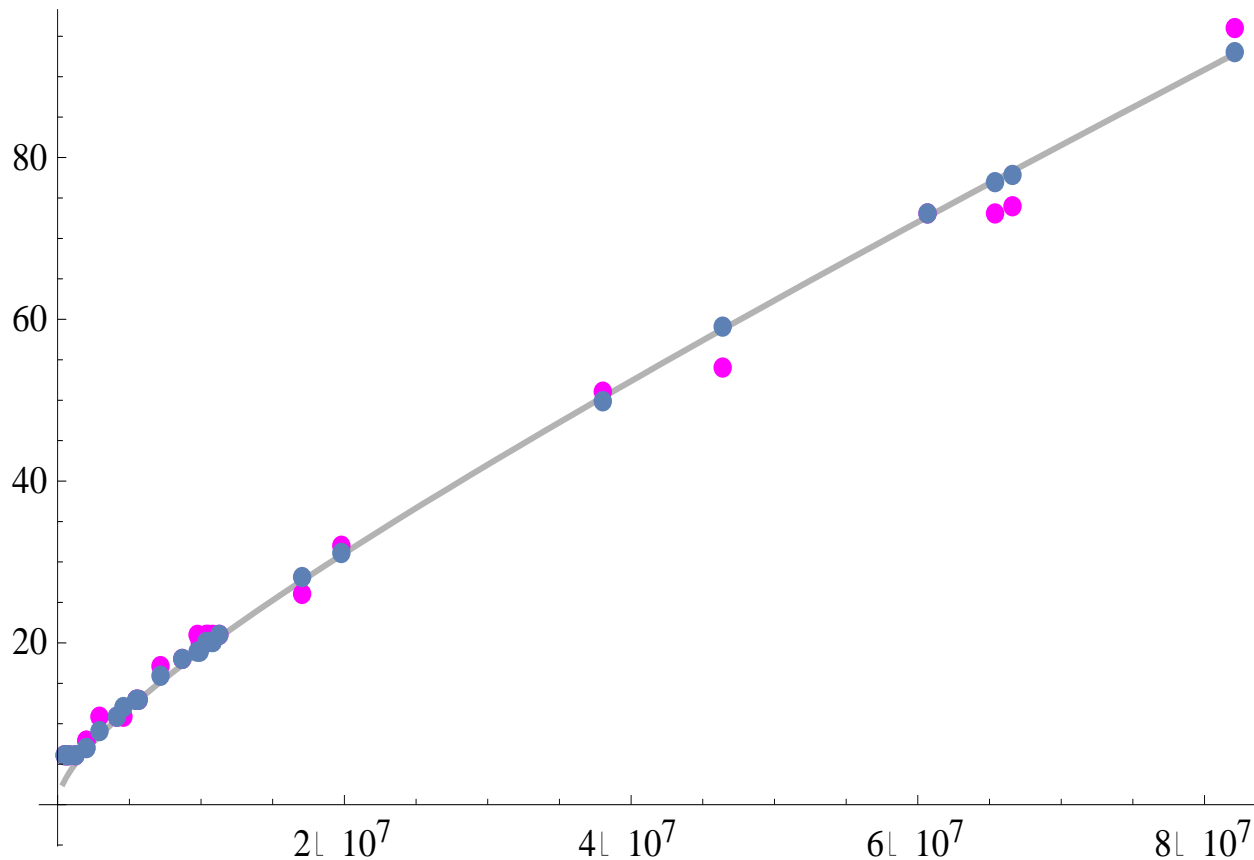
Country	Population	S <sub>0</sub> =Pro.	S <sub>0.40</sub>	S <sub>0.50</sub>	S <sub>0.60</sub>	S <sub>1</sub> =PSR	Current
Austria	8581500	13	17	18	19	22	18
Bulgaria	7202198	11	15	16	17	21	17
Denmark	5653357	9	13	13	14	18	13
Finland	5471753	8	12	13	14	18	13
Slovakia	5403134	8	12	13	14	18	13
Ireland	4625885	7	11	12	13	17	11
Croatia	4225316	7	10	11	12	16	11
Lithuania	2921262	5	8	9	10	13	11
Slovenia	2062874	3	7	7	8	11	8
Latvia	1986096	3	6	7	8	11	8
Estonia	1313271	2	5	6	6	9	6
Cyprus	847008	2	4	5	5	7	6
Luxembourg	562958	1	3	4	4	6	6
Malta	429344	1	3	3	4	5	6
Total	508940955	751	751	751	751	751	751

# The proposed method: 0.5-DPL

Country	BR=Before rounding	0.5-DPL	Pop./BR	Pop./Cur
Germany	91.49	92	886319	844681
France	77.74	78	853518	896655
UK	76.24	77	849516	887221
Italy	73.07	74	840817	841623
Spain	58.52	59	793573	859997
Poland	50.07	51	759050	745208
Romania	30.73	31	646320	620669
The Netherlands	27.62	28	621114	659814
Belgium	20.48	21	549728	536116
Greece	19.96	20	543436	516523
Czech Republic	19.41	20	536823	496178
Portugal	19.35	20	536167	494039
Hungary	18.68	19	527600	469313
Sweden	18.59	19	526627	489500
Austria	16.99	17	505091	476750
Bulgaria	15.09	16	477283	423659
Denmark	12.85	13	439950	434874
Finland	12.57	13	435303	420904
Slovakia	12.47	13	433291	415626
Ireland	11.27	12	410460	420535
Croatia	10.63	11	397490	384120
Lithuania	8.41	9	347356	265569
Slovenia	6.79	7	303811	257859
Latvia	6.63	7	299562	248262
Estonia	5.18	6	218879	218879
Cyprus	4.01	6	141168	141160
Luxembourg	3.18	6	93826	93826
Malta	2.73	6	71557	71557
		751		



# Proposed and current allocations, in graphics



# The size of the EU after Brexit

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- **More than 678 = 751-73.**
- **Less than 726.** For transnational lists, (although a system that encourages European Political Parties would be better. In fact, my research group will make a proposal for an electoral system for the European Union).
- Entry of new Member States in the EU.
- We propose **between 690 and 710** seats.
- A size of **H = 701 seats** has been chosen here.

# Comparison of methods for the composition of EP after Brexit

Country	Population	$S_{0.5L}$	Po.	Pa.	CC	Current
Germany	81089331	96	96	96	96	96
France	66352469	82	81	83	90	74
Italy	61438480	77	76	79	84	73
Spain	46439864	62	61	63	65	54
Poland	38005614	53	52	54	54	51
Romania	19861408	33	32	32	31-	32
The Netherlands	17155169	29	28	29	27	26
Belgium	11258434	22	21	21	20-	21
Greece	10846979	21	21	20-	19-	21
Czech Republic	10419743	21	20-	20-	19-	21
Portugal	10374822	21	20-	20-	19-	21
Hungary	9855571	20-	19-	19-	18-	21
Sweden	9790000	20	19-	19-	18-	20

# Comparison of methods for the composition of EP after Brexit

Country	Population	$S_{0.5L}$	Po.	Pa.	CC	Current
Austria	8581500	18	18	17-	16-	18
Bulgaria	7202198	16-	16-	15-	15-	17
Denmark	5653357	14	14	13	13	13
Finland	5471753	13	14	13	12-	13
Slovakia	5403134	13	14	13	12-	13
Ireland	4625885	12	12	12	11	11
Croatia	4225316	11	12	11	11	11
Lithuania	2921262	9-	10-	10-	9-	11
Slovenia	2062874	7-	9	8	8	8
Latvia	1986096	7-	9	8	8	8
Estonia	1313271	6	8	7	7	6
Cyprus	847008	6	7	7	7	6
Luxembourg	562958	6	6	6	6	6
Malta	429344	6	6	6	6	6
Total	444173840	701	701	701	701	678

# Enlargements of the EU in the 2019-2024 term

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(0.974 is the factor of Adams method)

$$f(p) = 0.974 \left( \frac{701 * 0.5 \sqrt{p}}{90820.4} + \frac{701 * 0.5 p}{444173840} \right)$$



# Enlargements of the EU in the 2019-2024 term

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<b>Country</b>	<b>P=Population</b>	<b>f(p)</b>	<b><i>S</i><sub>0.5L</sub></b>
Turkey	78214000	93.36	94
Serbia	7103000	15.48	16
Bosnia and Herz.	3750000	10.16	11
Albania	2887000	8.61	9
Macedonia	2071000	7.01	8
Montenegro	620000	3.44	6

# Enlargements of the EU in the 2024 - 2029 term. Comparisons

Country	Population	6-96	5-96	4-96	No Limitations	Current
Germany	81089331	85	<b>86</b>	86	86	<b>96</b>
Turkey	78214000	83	<b>83</b>	84	84	-
France	66352469	72	<b>73</b>	73	74	<b>74</b>
Italy	61438480	68	<b>69</b>	69	69	<b>73</b>
Spain	46439864	54	<b>55</b>	55	55	<b>54</b>
Poland	38005614	47	<b>47</b>	47	47	<b>51</b>
Romania	19861408	29	<b>29</b>	29	29	<b>32</b>
Netherlands	17155169	26	<b>26</b>	26	26	<b>26</b>
Belgium	11258434	19	<b>19</b>	20	20	<b>21</b>
Greece	10846979	19	<b>19</b>	19	19	<b>21</b>
Czech Rep.	10419743	18	<b>18</b>	19	19	<b>21</b>
Portugal	10374822	18	<b>18</b>	18	19	<b>21</b>
Hungary	9855571	18	<b>18</b>	18	18	<b>21</b>
Sweden	9790000	18	<b>18</b>	18	18	<b>20</b>
Austria	8581500	16	<b>16</b>	16	16	<b>18</b>
Bulgaria	7202198	14	<b>14</b>	15	15	<b>17</b>
Serbia	7103000	14	<b>14</b>	14	14	-

# Enlargements of the EU in the 2024 - 2029 term. Comparisons

Country	Population	6-96	5-96	4-96	No Limitations	Current
Denmark	5653357	12	12	12	12	13
Finland	5471753	12	12	12	12	13
Slovakia	5403134	12	12	12	12	13
Ireland	4625885	11	11	11	11	11
Croatia	4225316	10	10	10	10	11
Bosnia-Herz	3750000	9	10	10	10	-
Albania	2887000	8	8	8	8	-
Lithuania	2921262	8	8	8	8	11
Macedonia	2071000	7	7	7	7	-
Slovenia	2062874	7	7	7	7	8
Latvia	1986096	7	7	7	7	8
Estonia	1313271	6	5	5	5	6
Cyprus	847008	6	5	4	4	6
Montenegro	620000	6	5	4	4	-
Luxemb.	562958	6	5	4	3	6
Malta	429344	6	5	4	3	6
Total	538818840	751	751	751	751	678

# Comparisons with other methods

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In my research group, professors:

J. Martínez-Aroza and

A. Palomares-Bautista,

carry out programmes for many other simulations.

# Conclusions

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- The proposed 0.5-DPL method is **transparent, simple** and **durable**.
- In the future, if the constraints **6-96 are modified or removed**, the proposed method works properly.
- The **double majority rule of the Council** (55% of the States and 65% of the population) favors the most populated and less populated states. In **compensation**, the 0.5-DPL method is one of the most favorable methods for medium-sized states.
- The proposed method is **justified** both: **scientifically and politically**  $r = 0.4$  is also scientifically justified.

# Presentation by

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