

Supplementary Material

Electoral Systems and Geographic Representation

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S1 Validation of EMD Proxy

This section illustrates our approach to deriving a proxy for two-dimensional Earth Mover’s Distance (EMD) measure of discrepancy between two spatial distributions. We begin with two distributions, each characterized by a set of coordinates in two dimensions and associated weights, with each distribution’s weights summing to 1. In one dimension, the EMD is equivalent to the integral of the discrepancy between the two cumulative distribution functions (CDFs), and can thus be computed quickly. In more than one dimension, the EMD is computationally costly and thus inconvenient for distributions with many coordinates.

Our proposed proxy computes the EMD in one dimension, then repeats the calculation over several rotations of the data, and finally averages these measurements. Figure S1 below conveys the concept: we sweep through the data in the direction of each arrow, computing the 1-dimensional EMD (equivalently, the integral of CDF discrepancy) in each pass – in the figure, the cases for 3 and 6 rotations are shown – and then average the values of the EMD obtained in each of these passes.

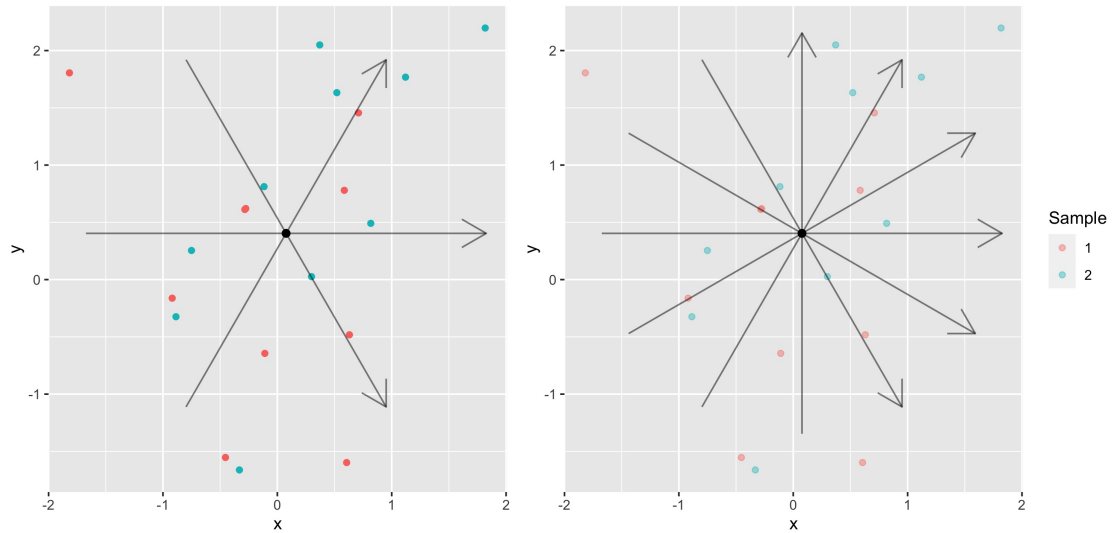


Figure S1

There is no expectation that the two procedures would agree perfectly. For example, suppose to begin with that two distributions are identical; then the 2-dimensional EMD will be zero, as will the 1-dimensional EMD in each rotation, so the two measures will agree. If we then shift one distribution one unit to the east, the EMD will be approximately 1; the 1-dimensional CDF discrepancy will be 1 in the east-west direction, 0 in the north-south direction, and something in between in other directions (so that the mean will be between 0 and 1). The properties of the proposed proxy may require deeper investigation for other uses, but for the purpose of this paper we seek only to show that the proxy agrees closely with the two-dimensional EMD in the data we analyze. To show that it is the case, we compute the EMD and the proposed proxy (with a number of rotations ranging from 3 to 10), and compare the distribution of legislator birthplaces

to the distribution of the population (both gridded) in 53 countries (all but the largest 10). The results plotted below show that the two measures agree very closely. In figure S2, we show the scatter plots of the EMD and its proxy for the 53 countries in the restricted sample across different parameters for the number of rotations. Figure S3 shows how the correlation (in red) and the correlation of ranks (in blue) varies with the number of rotations. For this dataset, the correlation of ranks is slightly lower for lower numbers of rotations, but all correlations are well above .95, suggesting the proxy is valid for our purposes across all values tested.

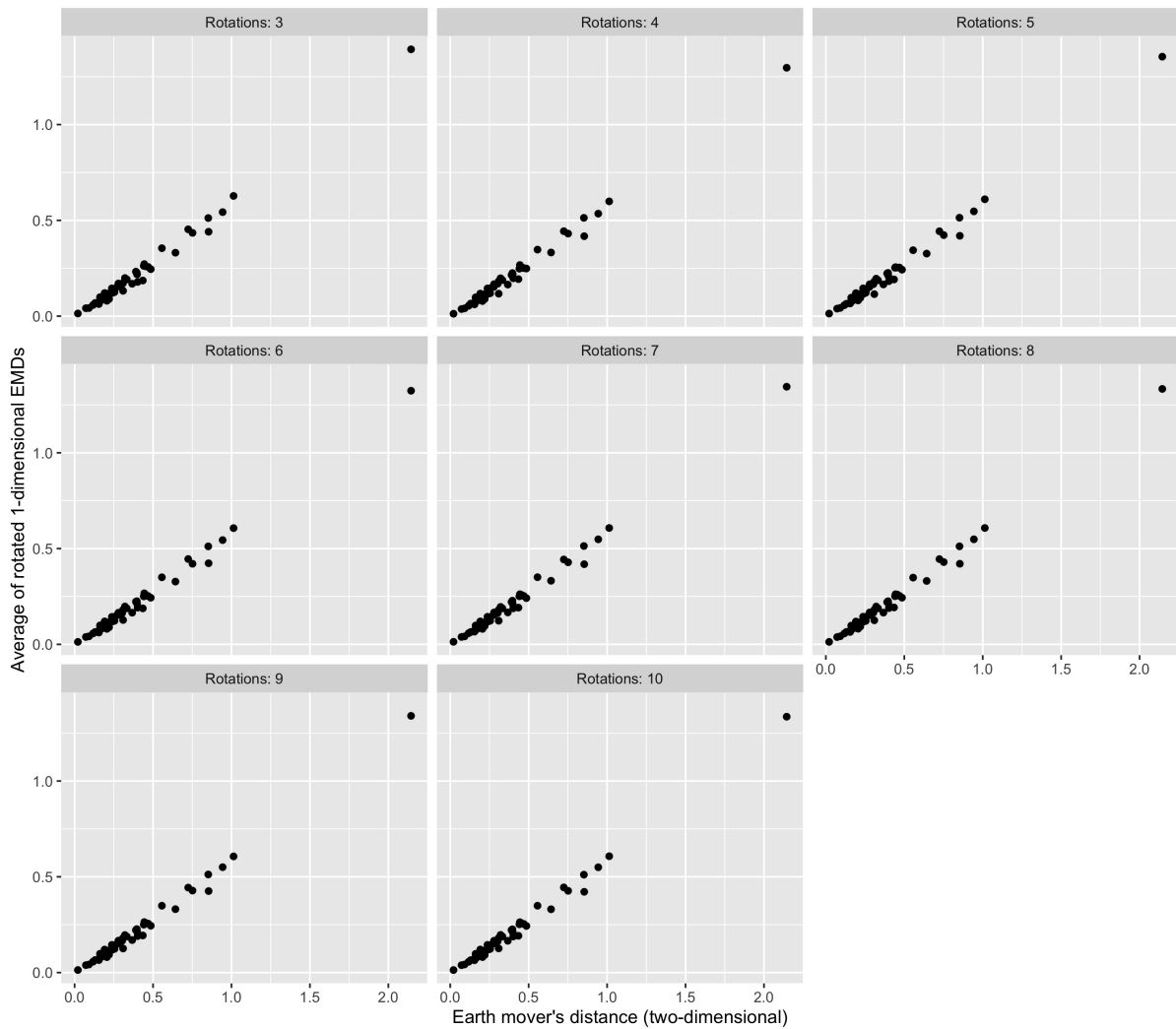


Figure S2

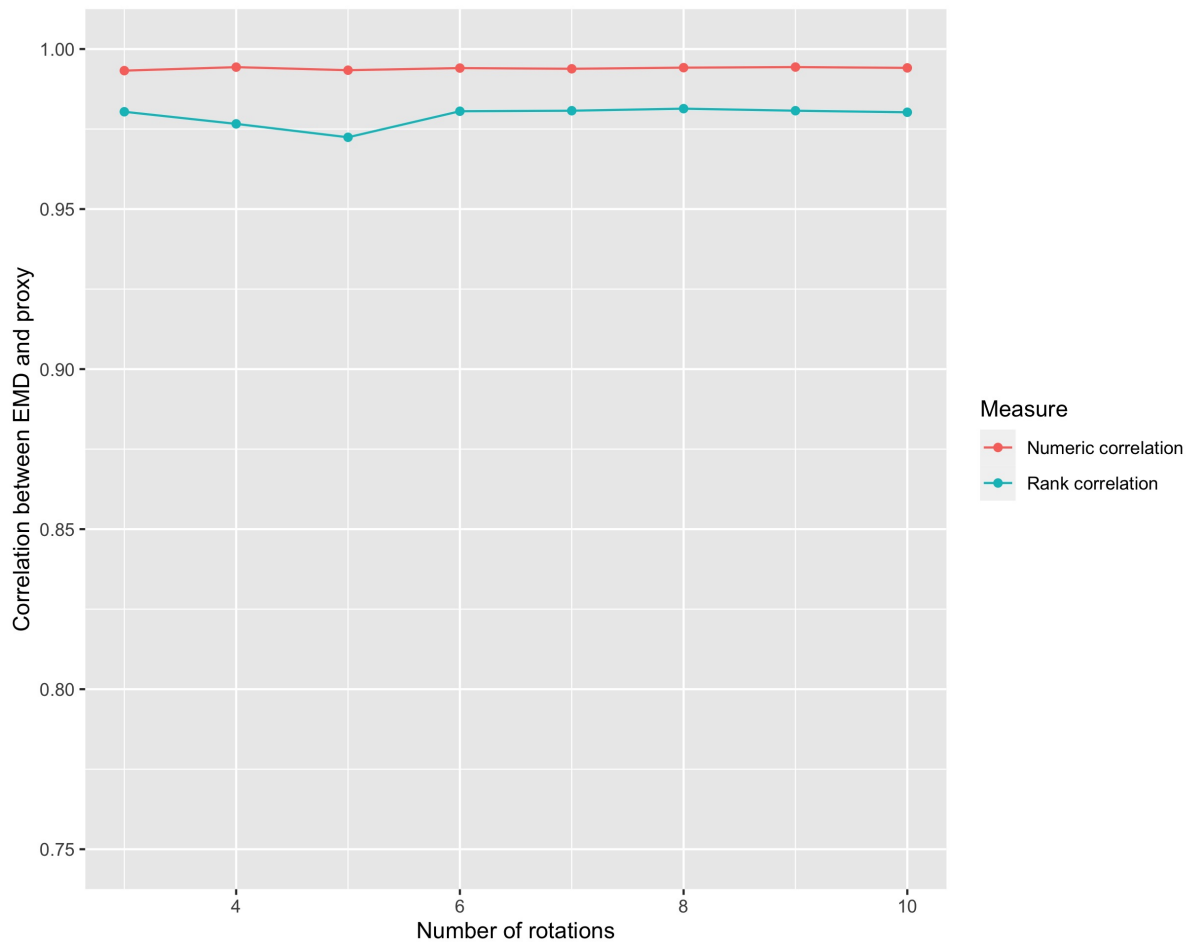


Figure S3

S2 Distribution of SURLI scores by mean district magnitude

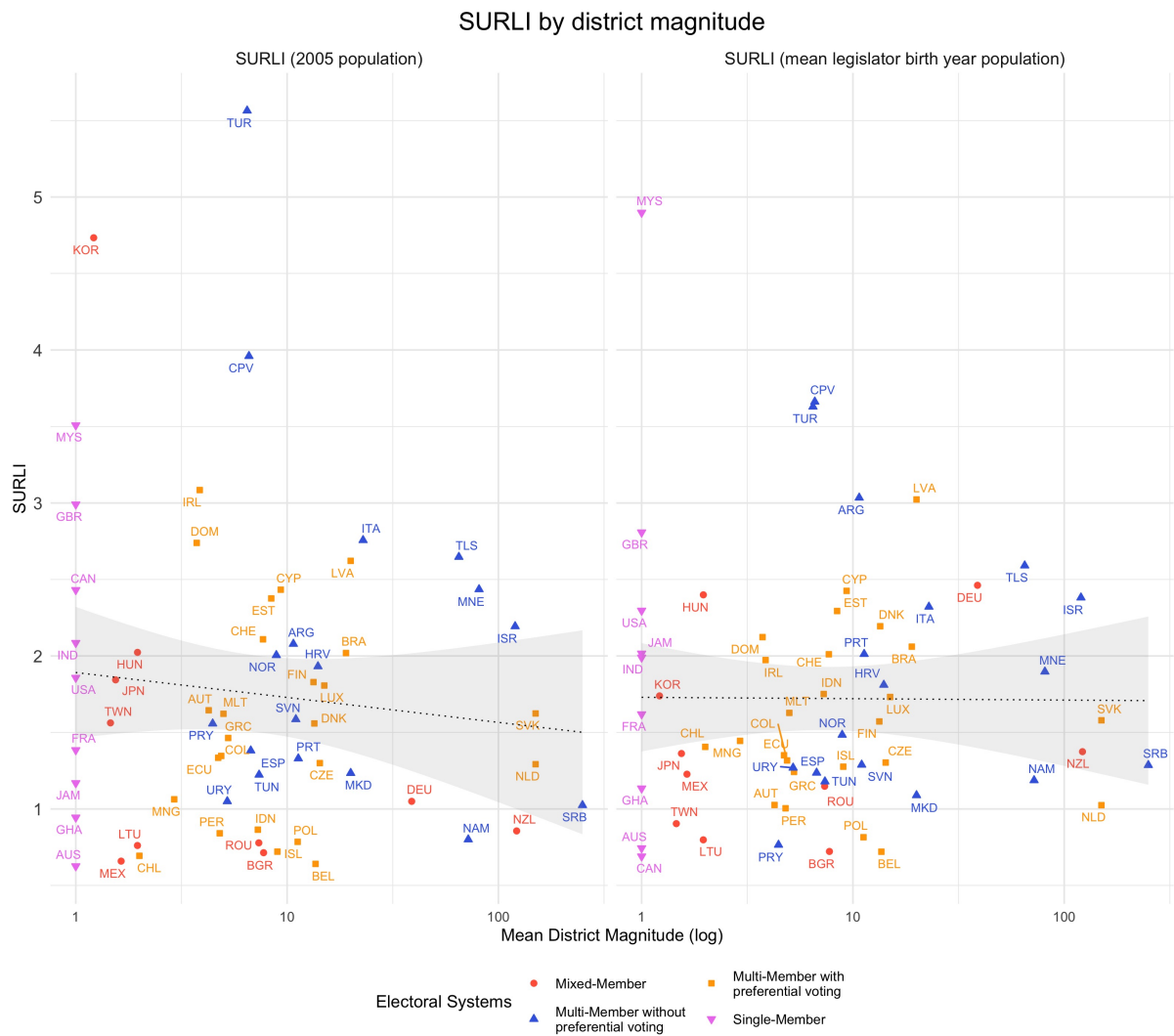


Figure S4: Figure 4 with alternative measurement of the district magnitude variable.

S3 Robustness Checks (Cross-country analysis)

Table S1: Alternative specifications of model 1 in table 3

<i>Dependent variable:</i>					
SURLI (2005 benchmark)					
	(1)	(2)	(3)	(4)	(5)
Multi-Member	1.03** (0.42)	1.03** (0.43)	0.93** (0.40)	0.98** (0.40)	0.98** (0.41)
Single-Member	0.45 (0.46)	0.43 (0.47)	0.40 (0.48)	0.28 (0.48)	0.26 (0.49)
Preferential Voting	-0.60* (0.30)	-0.53* (0.31)	-0.56* (0.30)	-0.62** (0.30)	-0.56* (0.31)
log(median DM)	-0.18 (0.11)	-0.21* (0.12)			
log(mean DM)			-0.20* (0.11)	-0.20* (0.11)	-0.23* (0.12)
log(Population)	0.05 (0.16)	0.04 (0.17)	-0.04 (0.16)	0.04 (0.16)	0.03 (0.17)
log(Land Area)	-0.18* (0.09)	-0.22* (0.12)	-0.15 (0.09)	-0.17* (0.09)	-0.22* (0.12)
log(GDP p.c.)	0.09 (0.12)	0.10 (0.14)	0.31 (0.20)	0.09 (0.12)	0.10 (0.14)
Assembly Size	0.002 (0.001)	0.002 (0.001)	0.002 (0.001)	0.002 (0.001)	0.002 (0.001)
Federalism	-0.19 (0.36)			-0.15 (0.36)	
Spatial Gini		1.03 (6.86)			0.95 (6.78)
Democracy score			-0.54 (0.39)		
Constant	1.64 (2.60)	2.11 (2.70)	1.32 (2.48)	1.91 (2.61)	2.34 (2.70)
Observations	62	60	62	62	60
R ²	0.21	0.23	0.24	0.22	0.24
Adjusted R ²	0.08	0.09	0.11	0.08	0.10

Note:

*p<0.1; **p<0.05; ***p<0.01

Table S2: Alternative Specifications of model 2 in table 3

<i>Dependent variable:</i>					
SURLI (2005 benchmark)					
	(1)	(2)	(3)	(4)	(5)
Share Multi-Member	0.37 (0.48)	0.36 (0.50)	0.34 (0.52)	0.49 (0.51)	0.50 (0.53)
Mixed-Member	-0.73* (0.37)	-0.72* (0.37)	-0.67* (0.36)	-0.62* (0.37)	-0.61 (0.37)
Preferential Voting	-0.54* (0.30)	-0.47 (0.31)	-0.51* (0.30)	-0.57* (0.30)	-0.51 (0.31)
log(median DM)	-0.15 (0.11)	-0.17 (0.11)			
log(mean DM)			-0.18 (0.11)	-0.18 (0.11)	-0.20* (0.12)
log(Population)	0.05 (0.17)	0.05 (0.17)	-0.04 (0.16)	0.04 (0.16)	0.04 (0.17)
log(Land area)	-0.18* (0.09)	-0.24* (0.12)	-0.15 (0.09)	-0.18* (0.09)	-0.23* (0.12)
log(GDP p.c.)	0.09 (0.13)	0.11 (0.14)	0.32 (0.20)	0.09 (0.13)	0.11 (0.14)
Assembly Size	0.002 (0.001)	0.002 (0.001)	0.002 (0.001)	0.002 (0.001)	0.002 (0.001)
Federalism	-0.21 (0.36)			-0.18 (0.36)	
Spatial Gini		2.02 (6.86)			1.81 (6.81)
Democracy Score			-0.58 (0.39)		
Constant	2.19 (2.67)	2.61 (2.77)	1.79 (2.52)	2.22 (2.66)	2.59 (2.74)
Observations	62	60	62	62	60
R ²	0.20	0.21	0.24	0.21	0.22
Adjusted R ²	0.06	0.07	0.10	0.07	0.08

Note:

*p<0.1; **p<0.05; ***p<0.01

Table S3: Alternative specifications of model 3 in table 3

<i>Dependent variable:</i>					
SURLI (mean MP birth year)					
	(1)	(2)	(3)	(4)	(5)
Multi-Member	0.57 (0.35)	0.54 (0.35)	0.53 (0.33)	0.55 (0.33)	0.52 (0.33)
Single-Member	0.64* (0.38)	0.82** (0.38)	0.87** (0.40)	0.63 (0.40)	0.83** (0.40)
Preferential Voting	-0.26 (0.25)	-0.16 (0.25)	-0.18 (0.25)	-0.26 (0.25)	-0.15 (0.25)
log(median DM)	-0.03 (0.09)	-0.01 (0.10)			
log(mean DM)			-0.01 (0.09)	-0.02 (0.09)	0.002 (0.10)
log(Population)	-0.12 (0.13)	-0.01 (0.14)	-0.14 (0.13)	-0.12 (0.13)	-0.01 (0.14)
log(Land area)	-0.13* (0.08)	-0.22** (0.10)	-0.08 (0.08)	-0.13 (0.08)	-0.22** (0.10)
log(GDP p.c.)	-0.08 (0.10)	0.02 (0.11)	0.16 (0.17)	-0.09 (0.10)	0.02 (0.11)
Assembly Size	0.002** (0.001)	0.002** (0.001)	0.002** (0.001)	0.002** (0.001)	0.002** (0.001)
Federalism	0.34 (0.29)			0.35 (0.29)	
Spatial Gini		7.82 (5.60)			8.06 (5.58)
Democracy Score			-0.53 (0.32)		
Constant	5.00** (2.13)	2.97 (2.21)	3.04 (2.05)	5.00** (2.15)	2.90 (2.22)
Observations	62	60	62	62	60
R ²	0.21	0.23	0.23	0.21	0.23
Adjusted R ²	0.08	0.09	0.10	0.08	0.09

Note:

*p<0.1; **p<0.05; ***p<0.01

Table S4: Alternative specifications of model 4 in table 3

<i>Dependent variable:</i>					
SURLI (mean MP birth year)					
	(1)	(2)	(3)	(4)	(5)
Share MTM	-0.09 (0.39)	-0.25 (0.41)	-0.31 (0.42)	-0.10 (0.42)	-0.29 (0.43)
Mixed-Member	-0.61** (0.30)	-0.70** (0.30)	-0.72** (0.30)	-0.60* (0.30)	-0.69** (0.30)
Preferential Voting	-0.26 (0.25)	-0.16 (0.25)	-0.19 (0.25)	-0.25 (0.25)	-0.15 (0.25)
log(median DM)	-0.02 (0.09)	-0.02 (0.09)			
log(mean DM)			-0.01 (0.09)	-0.02 (0.09)	-0.001 (0.10)
log(Population)	-0.12 (0.13)	-0.02 (0.14)	-0.14 (0.13)	-0.12 (0.13)	-0.02 (0.14)
log(Land area)	-0.13 (0.08)	-0.21** (0.10)	-0.08 (0.08)	-0.13 (0.08)	-0.21** (0.10)
log(GDP p.c.)	-0.09 (0.10)	0.02 (0.11)	0.16 (0.17)	-0.09 (0.10)	0.02 (0.11)
Assembly Size	0.002** (0.001)	0.002** (0.001)	0.002** (0.001)	0.002** (0.001)	0.002** (0.001)
Federalism	0.35 (0.29)			0.35 (0.29)	
Spatial Gini		7.66 (5.56)			7.93 (5.55)
Democracy Score			-0.52 (0.32)		
Constant	5.70** (2.17)	3.87* (2.24)	3.97* (2.07)	5.69** (2.17)	3.80* (2.24)
Observations	62	60	62	62	60
R ²	0.21	0.23	0.23	0.21	0.23
Adjusted R ²	0.08	0.09	0.10	0.08	0.09

Note:

*p<0.1; **p<0.05; ***p<0.01

Table S5: Main model, excludes micro-countries (no. grids ≤ 20)

	<i>Dependent variable:</i>			
	SURLI (2005 benchmark)		SURLI (mean MP birth year)	
	(1)	(2)	(3)	(4)
Multi-Member	0.82* (0.41)		0.41 (0.33)	
Single-Member	0.68 (0.46)		0.95** (0.37)	
Share MTM		-0.03 (0.48)		-0.47 (0.39)
Mixed-Member		-0.77** (0.36)		-0.71** (0.29)
Preferential Voting	-0.35 (0.30)	-0.29 (0.30)	-0.04 (0.25)	-0.05 (0.25)
log(median DM)	-0.13 (0.11)	-0.11 (0.11)	0.02 (0.09)	0.01 (0.09)
log(Population)	-0.02 (0.16)	-0.03 (0.16)	-0.12 (0.13)	-0.13 (0.13)
log(Land area)	-0.12 (0.10)	-0.12 (0.10)	-0.04 (0.08)	-0.04 (0.08)
log(GDP p.c.)	0.53** (0.23)	0.55** (0.23)	0.36* (0.18)	0.34* (0.18)
Assembly Size	0.002 (0.001)	0.002 (0.001)	0.002* (0.001)	0.002** (0.001)
Democracy Score	-0.91** (0.42)	-0.96** (0.42)	-0.85** (0.34)	-0.82** (0.34)
Constant	-1.16 (2.74)	-0.39 (2.76)	0.76 (2.21)	1.87 (2.23)
Observations	58	58	58	58
R ²	0.26	0.26	0.27	0.27
Adjusted R ²	0.13	0.12	0.14	0.13

Note: *p<0.1; **p<0.05; ***p<0.01

Table S6: Main model, excludes US

	<i>Dependent variable:</i>			
	SURLI (2005 benchmark)		SURLI (mean MP birth year)	
	(1)	(2)	(3)	(4)
Multi-Member	0.99** (0.42)		0.56 (0.34)	
Single-Member	0.55 (0.48)		0.79** (0.39)	
Share MTM		0.21 (0.50)		-0.21 (0.40)
Mixed-Member		-0.77** (0.37)		-0.69** (0.31)
Preferential Voting	-0.54* (0.30)	-0.48 (0.30)	-0.19 (0.25)	-0.19 (0.25)
log(median DM)	-0.18 (0.11)	-0.16 (0.11)	-0.03 (0.09)	-0.03 (0.09)
log(Population)	-0.04 (0.16)	-0.04 (0.17)	-0.15 (0.13)	-0.15 (0.14)
log(Land area)	-0.16 (0.09)	-0.15 (0.10)	-0.09 (0.08)	-0.09 (0.08)
log(GDP p.c.)	0.31 (0.21)	0.33 (0.21)	0.14 (0.17)	0.14 (0.17)
Assembly Size	0.002 (0.001)	0.002 (0.001)	0.002** (0.001)	0.002** (0.001)
Democracy Score	-0.57 (0.40)	-0.61 (0.40)	-0.51 (0.32)	-0.51 (0.32)
Constant	1.14 (2.59)	1.78 (2.61)	3.47 (2.12)	4.33** (2.12)
Observations	61	61	61	61
R ²	0.24	0.23	0.23	0.23
Adjusted R ²	0.10	0.09	0.10	0.10

Note: *p<0.1; **p<0.05; ***p<0.01

Table S7: Main model, controls for presidentialism

	<i>Dependent variable:</i>			
	SURLI (2005 benchmark)		SURLI (mean MP birth year)	
	(1)	(2)	(3)	(4)
Multi-Member	0.99** (0.42)		0.57* (0.34)	
Single-Member	0.47 (0.48)		0.76* (0.39)	
Share MTM		0.27 (0.50)		-0.18 (0.40)
Mixed-Member		-0.73* (0.37)		-0.68** (0.30)
Preferential Voting	-0.52* (0.30)	-0.46 (0.30)	-0.18 (0.25)	-0.17 (0.25)
log(median DM)	-0.20* (0.11)	-0.17 (0.11)	-0.05 (0.09)	-0.05 (0.09)
log(Population)	-0.03 (0.16)	-0.04 (0.17)	-0.14 (0.13)	-0.14 (0.13)
log(Land area)	-0.15 (0.09)	-0.15 (0.10)	-0.07 (0.08)	-0.07 (0.08)
log(GDP p.c.)	0.29 (0.21)	0.31 (0.21)	0.13 (0.17)	0.13 (0.17)
Assembly size	0.002 (0.001)	0.002 (0.001)	0.002** (0.001)	0.002** (0.001)
Democracy Score	-0.57 (0.39)	-0.62 (0.39)	-0.53 (0.32)	-0.53 (0.32)
Presidential	-0.20 (0.27)	-0.16 (0.27)	-0.23 (0.22)	-0.24 (0.22)
Constant	1.43 (2.53)	1.99 (2.56)	3.47* (2.07)	4.29** (2.08)
Observations	62	62	62	62
R ²	0.25	0.24	0.25	0.25
Adjusted R ²	0.10	0.09	0.10	0.10

Note:

*p<0.1; **p<0.05; ***p<0.01

Table S8: Main Model, interacts district magnitude (logged) and preferential voting

	<i>Dependent variable:</i>			
	SURLI (2005 benchmark)		SURLI (mean MP birth year)	
	(1)	(2)	(3)	(4)
Multi-Member	1.02** (0.42)		0.58* (0.35)	
Single-Member	0.47 (0.48)		0.82** (0.39)	
Share MTM		0.30 (0.50)		-0.22 (0.41)
Mixed-Member		-0.74** (0.37)		-0.72** (0.30)
Preferential Voting	-0.87 (0.53)	-0.75 (0.53)	-0.33 (0.44)	-0.34 (0.44)
log(median DM)	-0.24* (0.13)	-0.20 (0.13)	-0.05 (0.11)	-0.06 (0.11)
PV × log(median DM)	0.16 (0.21)	0.13 (0.21)	0.07 (0.18)	0.07 (0.18)
log(Population)	-0.06 (0.17)	-0.07 (0.17)	-0.15 (0.14)	-0.16 (0.14)
log(Land area)	-0.14 (0.10)	-0.14 (0.10)	-0.08 (0.08)	-0.08 (0.08)
log(GDP p.c.)	0.31 (0.20)	0.33 (0.21)	0.16 (0.17)	0.16 (0.17)
Assembly Size	0.002 (0.001)	0.002 (0.001)	0.002** (0.001)	0.002** (0.001)
Democracy Score	-0.60 (0.40)	-0.64 (0.40)	-0.55 (0.33)	-0.54 (0.33)
Constant	1.57 (2.56)	2.09 (2.58)	3.28 (2.12)	4.16* (2.12)
Observations	62	62	62	62
R ²	0.25	0.24	0.23	0.23
Adjusted R ²	0.10	0.09	0.08	0.08

Note:

*p<0.1; **p<0.05; ***p<0.01

Table S9: Main model, number of districts used instead of median district magnitude

	<i>Dependent variable:</i>			
	SURLI (2005 benchmark)		SURLI (mean MP birth year)	
	(1)	(2)	(3)	(4)
Multi-Member	0.82** (0.39)		0.48 (0.32)	
Single-Member	0.20 (0.59)		1.01** (0.48)	
Share MTM		0.31 (0.62)		-0.47 (0.50)
Mixed-Member		-0.56 (0.40)		-0.77** (0.32)
Preferential Voting	-0.44 (0.29)	-0.40 (0.29)	-0.17 (0.24)	-0.17 (0.24)
No. Districts	0.002 (0.002)	0.002 (0.002)	-0.001 (0.001)	-0.0005 (0.001)
log(Population)	-0.02 (0.16)	-0.03 (0.17)	-0.13 (0.13)	-0.14 (0.13)
log(Land area)	-0.13 (0.09)	-0.14 (0.09)	-0.09 (0.08)	-0.08 (0.08)
log(GDP p.c.)	0.28 (0.21)	0.30 (0.21)	0.17 (0.17)	0.16 (0.17)
Assembly Size	0.001 (0.001)	0.001 (0.001)	0.002** (0.001)	0.002** (0.001)
Democracy Score	-0.53 (0.40)	-0.58 (0.40)	-0.54 (0.32)	-0.52 (0.32)
Constant	0.81 (2.49)	1.23 (2.58)	2.97 (2.03)	4.07* (2.09)
Observations	62	62	62	62
R ²	0.22	0.21	0.23	0.23
Adjusted R ²	0.09	0.08	0.10	0.10

Note:

*p<0.1; **p<0.05; ***p<0.01

Table S10: Main model, control for countries with a residency requirement rule (USA, Argentina, Brazil, Chile, Taiwan, Ecuador), coded from Massicotte, Blais and Yoshinaka, 2004.

	<i>Dependent variable:</i>			
	SURLI (2005 benchmark)		SURLI (mean MP birth year)	
	(1)	(2)	(3)	(4)
Multi-Member	0.99** (0.42)		0.54 (0.34)	
Single-Member	0.55 (0.46)		0.89** (0.38)	
Share MTM		0.22 (0.49)		-0.32 (0.40)
Mixed-Member		-0.77** (0.37)		-0.74** (0.30)
Preferential Voting	-0.53* (0.30)	-0.48 (0.30)	-0.20 (0.24)	-0.20 (0.24)
log(median DM)	-0.18* (0.11)	-0.16 (0.11)	-0.01 (0.09)	-0.02 (0.09)
log(Population)	-0.03 (0.17)	-0.04 (0.17)	-0.18 (0.14)	-0.19 (0.14)
log(Land area)	-0.15 (0.09)	-0.15 (0.10)	-0.10 (0.08)	-0.10 (0.08)
log(GDP p.c.)	0.33 (0.21)	0.34 (0.21)	0.12 (0.17)	0.11 (0.17)
Assembly Size	0.002 (0.001)	0.002 (0.001)	0.003** (0.001)	0.003** (0.001)
Democracy Score	-0.58 (0.40)	-0.62 (0.40)	-0.45 (0.33)	-0.44 (0.33)
Residency Requirements	-0.09 (0.47)	-0.07 (0.47)	0.48 (0.38)	0.47 (0.38)
Constant	0.90 (2.72)	1.63 (2.78)	4.16* (2.20)	5.13** (2.25)
Observations	62	62	62	62
R ²	0.24	0.23	0.26	0.25
Adjusted R ²	0.09	0.08	0.11	0.11

Note:

*p<0.1; **p<0.05; ***p<0.01

Table S11: Main model, uses log transformation of the dependent variable.

	<i>Dependent variable:</i>			
	log(SURLI) (2005 benchmark)		log(SURLI) (mean MP birth year)	
	(1)	(2)	(3)	(4)
Multi-Member	0.28*** (0.09)		0.15* (0.08)	
Single-Member	0.18* (0.10)		0.17* (0.09)	
Share MTM		0.05 (0.11)		-0.04 (0.09)
Mixed-Member		-0.23*** (0.08)		-0.17** (0.07)
Preferential Voting	-0.13* (0.07)	-0.12* (0.07)	-0.04 (0.06)	-0.04 (0.06)
log(median DM)	-0.04 (0.02)	-0.03 (0.02)	-0.002 (0.02)	-0.0005 (0.02)
log(Population)	0.01 (0.04)	0.005 (0.04)	-0.03 (0.03)	-0.03 (0.03)
log(Land area)	-0.05** (0.02)	-0.05** (0.02)	-0.03 (0.02)	-0.03 (0.02)
log(GDP p.c.)	0.08* (0.05)	0.08* (0.05)	0.02 (0.04)	0.02 (0.04)
Assembly Size	0.0003 (0.0003)	0.0003 (0.0003)	0.001** (0.0002)	0.001** (0.0002)
Democracy Score	-0.12 (0.09)	-0.13 (0.09)	-0.09 (0.08)	-0.09 (0.08)
Constant	-0.18 (0.55)	0.03 (0.56)	0.58 (0.48)	0.78 (0.49)
Observations	62	62	62	62
R ²	0.28	0.28	0.24	0.24
Adjusted R ²	0.16	0.15	0.11	0.11

Note:

*p<0.1; **p<0.05; ***p<0.01

Table S12: Main model, SURLI expressed as the difference between real EMD and the mean of simulated EMDs, normalised by the standard deviation of the simulated EMDs. Formally, let d denote a country's actual EMD, and let $\delta = \{\delta_1, \delta_2, \dots, \delta_M\}$ denote M counterfactual EMDs assuming a representative legislature. Then this version of SURLI is $(d - \bar{\delta})/\text{sd}(\bar{\delta})$.

	<i>Dependent variable:</i>			
	SURLI (2005 benchmark)		SURLI (mean MP birth year)	
	(1)	(2)	(3)	(4)
Multi-Member	2.94** (1.18)		1.71* (0.95)	
Single-Member	1.64 (1.31)		2.53** (1.05)	
Share MTM		0.73 (1.38)		-0.73 (1.10)
Mixed-Member		-2.28** (1.04)		-2.17** (0.83)
Preferential Voting	-1.47* (0.85)	-1.32 (0.85)	-0.54 (0.68)	-0.56 (0.68)
log(median DM)	-0.45 (0.31)	-0.39 (0.30)	-0.04 (0.25)	-0.06 (0.24)
log(Population)	-0.10 (0.46)	-0.12 (0.47)	-0.35 (0.37)	-0.36 (0.37)
log(Land area)	-0.37 (0.26)	-0.36 (0.27)	-0.19 (0.21)	-0.18 (0.21)
log(GDP p.c.)	1.08* (0.58)	1.11* (0.58)	0.61 (0.47)	0.60 (0.46)
Assembly Size	0.01 (0.004)	0.01 (0.004)	0.01** (0.003)	0.01** (0.003)
Democracy Score	-1.90* (1.12)	-2.02* (1.12)	-1.70* (0.90)	-1.68* (0.89)
Constant	-2.21 (7.06)	-0.26 (7.20)	3.18 (5.66)	5.87 (5.75)
Observations	62	62	62	62
R ²	0.25	0.24	0.27	0.26
Adjusted R ²	0.12	0.11	0.14	0.14

Note:

*p<0.1; **p<0.05; ***p<0.01

Table S13: Main model, no logged population controls.

	<i>Dependent variable:</i>			
	SURLI (2005 benchmark)		SURLI (mean MP birth year)	
	(1)	(2)	(3)	(4)
Multi-Member	1.00** (0.41)		0.62* (0.34)	
Single-Member	0.55 (0.45)		0.82** (0.38)	
Share MTM		0.25 (0.47)		-0.16 (0.39)
Mixed-Member		-0.77** (0.36)		-0.73** (0.30)
Preferential Voting	-0.55* (0.29)	-0.49* (0.29)	-0.24 (0.24)	-0.25 (0.24)
log(median DM)	-0.18* (0.11)	-0.15 (0.10)	-0.02 (0.09)	-0.03 (0.09)
log(Land area)	-0.17** (0.07)	-0.17** (0.07)	-0.13** (0.06)	-0.13** (0.06)
log(GDP p.c.)	0.31 (0.20)	0.32 (0.20)	0.14 (0.17)	0.13 (0.17)
Assembly Size	0.002* (0.001)	0.002* (0.001)	0.001** (0.001)	0.002** (0.001)
Democracy Score	-0.54 (0.37)	-0.58 (0.37)	-0.44 (0.31)	-0.43 (0.31)
Constant	0.78 (1.90)	1.37 (1.89)	1.74 (1.58)	2.57 (1.56)
Observations	62	62	62	62
R ²	0.24	0.23	0.22	0.22
Adjusted R ²	0.12	0.11	0.10	0.10

Note:

*p<0.1; **p<0.05; ***p<0.01

S4 Comparison of PR and SMD Tier (Germany)

Table S14 shows the share of ‘parachuters’ among MPs elected in the list-PR and nominal tier in German elections between 1998 and 2017. As in analysis of Italian legislators in section 5.1, we use Germany’s 16 Länder (States) as the common reference geographical unit for both tiers: these correspond to the districts of the MTM and SM districts do not cross State borders. Hence, the figures for the share of parachuters in the SM tier differs slightly from those in table 7, where ‘parachuters’ are coded from the location of their birthplaces relative to the *single-member* district they were elected in.

Table S14: Share of legislators born outside of the State they were elected in, Germany 1998-2017.

Election	Share of ‘parachuters’	
	list-PR tier	SM district tier
1998	0.44	0.33
2002	0.40	0.29
2005	0.41	0.25
2009	0.43	0.23
2013	0.41	0.23
2017	0.43	0.23
Overall	0.42	0.26

S5 Robustness Checks (Germany-Britain Comparison)

Table S15: Models from table 8 (UK case study) with additional controls.

	<i>Dependent variable:</i>		
	P(MP is a ‘parachuter’)		
	(1)	(2)	(3)
Party margin in previous election	1.00** (0.49)	1.08** (0.49)	0.99** (0.49)
Party ^[a]			
Labour	-2.27*** (0.82)	-2.47*** (0.82)	-2.25*** (0.83)
Lib Dem	-2.02** (0.96)	-2.10** (0.96)	-1.97** (0.96)
Other	-2.39** (1.04)	-2.31** (1.04)	-1.63 (1.39)
SNP	-2.07 (1.37)	-2.03 (1.38)	-1.58 (1.42)
Election ^[b]			
2005	-0.81 (0.83)	-0.88 (0.83)	-0.86 (0.83)
2010	-1.09 (0.76)	-1.17 (0.76)	-1.13 (0.76)
2015	-1.73** (0.78)	-1.84** (0.78)	-1.76** (0.78)
2017	-1.82** (0.84)	-1.85** (0.84)	-1.66** (0.84)
2019	-1.91** (0.76)	-2.02*** (0.76)	-1.93** (0.76)
By-election	-1.30 (1.38)	-1.61 (1.37)	-1.57 (1.37)
log(Constituency land area)	0.20*** (0.06)		
Constituency land area		0.0002* (0.0001)	0.0002* (0.0001)
Gender (male)		-0.20 (0.17)	
Country ^[c]			
Northern Ireland			-0.76 (1.16)
Scotland			-0.45 (0.34)
Wales			-0.33 (0.31)
Constant	1.56* (0.80)	2.72*** (0.75)	2.53*** (0.73)
Party × Election Interaction	Yes	Yes	Yes
Observations	864	864	864
Log Likelihood	-493.94	-497.01	-496.33
Akaike Inf. Crit.	1,057.89	1,066.02	1,068.67

[a] = ref. cat. Conservative, [b] = ref. cat. 2001, [c] = ref. cat. England
 *p<0.1; **p<0.05; ***p<0.01

Table S16: Models from table 9 (Germany case study) with additional controls.

	<i>Dependent variable:</i>		
	P(MP is a ‘parachuter’)		
	(1)	(2)	(3)
Party margin in previous election	−1.59** (0.81)	−1.64** (0.81)	−1.53* (0.84)
Party ^[a]			
Other	−14.11 (882.74)	−14.01 (882.74)	−13.94 (882.74)
SPD	0.05 (0.56)	0.05 (0.57)	0.06 (0.56)
Election ^[b]			
2002	−0.39 (0.60)	−0.40 (0.60)	−0.38 (0.60)
2005	−0.26 (0.62)	−0.28 (0.62)	−0.25 (0.62)
2009	−0.72 (0.57)	−0.75 (0.57)	−0.73 (0.57)
2013	−0.57 (0.59)	−0.63 (0.59)	−0.64 (0.59)
2017	0.15 (0.57)	0.15 (0.58)	0.16 (0.57)
log(Constituency land area)	0.01 (0.08)		
Constituency land area		0.0002* (0.0001)	0.0001 (0.0001)
Gender (male)		−0.08 (0.20)	
Region (West)			−0.17 (0.25)
Constant	−0.43 (0.72)	−0.50 (0.57)	−0.41 (0.59)
Party × Election Interaction	Yes	Yes	Yes
Observations	604	604	604
Log Likelihood	−362.78	−361.12	−360.98
Akaike Inf. Crit.	763.57	762.25	761.96

[a] = ref. cat. CDU/CSU, [b] = ref. cat. 1998.

*p<0.1; **p<0.05; ***p<0.01