

Supplementary Materials for “What Determines
Preferences for an Electoral System? Evidence from a
Binding Referendum”

July 30, 2018

This document presents all robustness checks and other supplementary information mentioned in the main text. Table I provides descriptive statistics for the polling station main dataset. This is a replication of Table 2 including Māori polling stations and polling stations for “special votes”. Table II provides the 1996 Census descriptive statistics at the Area Unit level. Table III is a replication of Table 3 in the main text using all electorates (i.e., General and Māori electorates). Columns (1) – (2) in Table IV are a replication of columns (5) – (6) in Table 3 in the main text, with clusters at the Area Unit level. Columns (3) – (4) in Table IV are a replication of columns (5) – (6) in Table III in this Supplementary Materials, now with clusters at the Area Unit level. Table V is replication of Table 4 in the main paper with *all* polling stations (i.e., General Roll, Māori Roll and “special votes”). Given that “special votes” polling stations are included, we cannot use sociodemographic controls in this regression. Table VI replicates Table 4 in the paper with clusters at the Area Unit level. Table VII presents the descriptive statistics for the 1993 survey of the New Zealand Election Study. Finally, Table VIII replicates Table 7 in the paper, with (i) standard errors clustered at the Area Unit level (Panel A); and (ii) Māori electorates included (Panel B).

Table I: Summary statistics by polling station. All polling stations included (General Roll and Māori Roll).

	Mean	St. Dev.	Min	Max
<hr/> <hr/> Panel A: all polling stations, $N = 4273$ <hr/>				
# Referendum votes	448.8	475.9	0	7624
% Votes for MMP	52.14%	13.48	2.29%	97.8%
# (REF. – GE) votes	-1.15	8.61	-188	106
# Gral. Election votes	450	477	0	7796
% National	36.75%	20.12%	0%	96.1%
% Labour	33.58%	17.54%	0%	95.45%
% Alliance	17.48%	9.09%	0%	71.57%
<hr/> <hr/> Panel B: all standard polling stations (sample used in the remainder), $N = 3778$ <hr/>				
# Referendum votes	443.89	441.6	0	3094
% Votes for MMP	52.37%	13.47%	2.30%	97.78%
# (REF. – GE) votes	-0.08	3.69	-24	106
# Gral. Election votes	443.98	441.6	0	3097
% National	36.47%	20.8%	0%	96.07%
% Labour	33.59%	18.0%	0%	95.45%
% Alliance	17.72%	9.2%	0%	71.57%

†: Panel B excludes hospital votes, special votes in district before polling day, special votes on polling day, overseas special votes including service personnel votes and ordinary votes in district before polling day. # (REF. – GE) votes = Votes in Referendum – Votes in General Election.

Table II: Summary Statistics by Area Unit, 1996 Census

	Mean	St. Dev.	Min	Max
Population	1,884	1,455	0	7,824
Area (in km^2)	163.2	547	0.0423	7316
Mean MB area (in km^2) [‡]	0.008	0.040	0.00001	0.614
% Women	49.2	7.01	0	100
% \leq 24 years old	34.7	9.50	0	86.0
% \geq 65 years old	10.2	6.04	0	43.4
% Born in NZ	78.8	14.21	0	100
% White/Caucasian	81.1	20.39	0	100
% Māori	15.3	15.12	0	96.9
% Māori in Māori Roll	46.1	19.31	0	100
% Univ. Degree	7.0	6.38	0	44.5
% NZ\$ 20,000 or less	59.4	10.44	0	100
Median income in NZ\$(000)	40.3	12.39	17.5	100
% Receives <i>some</i> benefit	28.4	9.68	0	68.6
% Full time employed	34.0	7.89	0	77.4
% Earns rents or dividends	16.6	5.46	0	32.92
Observations		1,920		

[‡]: Mean MB area: mean meshblock area within Area Unit

Table III: Support for MMP at the Polling Station. Replication of Table 3 in the main text using all electorates (i.e. General and Māori electorates).

	(1)	(2)	(3)	(4)	(5)	(6)
Mean MB Area within AU	-119.9** (48.44)	-99.51** (42.00)	-101.5** (43.87)	-45.70** (22.12)	-96.09** (40.44)	-40.47** (19.51)
Pop. Density	1.306*** (0.394)	0.893** (0.390)	0.692* (0.400)	-0.243 (0.355)	0.522 (0.370)	-0.324 (0.336)
% Women	0.404** (0.183)	0.265 (0.175)	0.454** (0.180)	0.152 (0.123)	0.458** (0.181)	0.135 (0.123)
% Born in NZ	-0.269*** (0.0528)	-0.239*** (0.0515)	-0.249*** (0.0517)	-0.153*** (0.0442)	-0.228*** (0.0523)	-0.139*** (0.0446)
% Maori	0.121*** (0.0444)	0.0267 (0.0454)	0.0595 (0.0480)	0.151*** (0.0373)	0.0856* (0.0482)	0.149*** (0.0372)
% > 64 y.o.	-0.112 (0.0901)	-0.278*** (0.101)	-0.210* (0.108)	-0.0477 (0.0786)	-0.255** (0.106)	-0.0865 (0.0774)
% < 25 y.o.	-0.154 (0.0946)	-0.117 (0.0971)	-0.113 (0.101)	0.00725 (0.0684)	-0.146 (0.0956)	0.00234 (0.0688)
% College degree	0.392*** (0.0629)	0.329*** (0.0683)	0.331*** (0.0769)	0.315*** (0.0743)	0.381*** (0.0770)	0.344*** (0.0761)
% < NZD 20,000	-0.0614 (0.0672)	-0.297*** (0.0899)	-0.225** (0.106)	-0.00971 (0.0855)		
Median income in \$(000)	-0.382*** (0.0497)	-0.313*** (0.0606)	-0.292*** (0.0605)	-0.155*** (0.0372)	0.629*** (0.183)	0.241* (0.141)
(Median income) ² in \$(000)					-0.007*** (0.001)	-0.003*** (0.001)
% receives <i>some</i> benefit		0.455*** (0.109)	0.457*** (0.131)	0.0426 (0.105)	0.548*** (0.125)	0.145 (0.0932)
% Maori in Maori Roll (as in 1998)			-0.0235 (0.0205)	-0.0183 (0.0162)	-0.0280 (0.0205)	-0.0212 (0.0163)
% earns rents or dividends			-0.110 (0.158)	0.355*** (0.122)	-0.194 (0.155)	0.313** (0.123)
% full employment			0.183 (0.124)	0.203* (0.109)	0.197* (0.106)	0.170* (0.0944)
Māori electorate (dummy)	9.361*** (1.462)	9.401*** (1.401)	9.500*** (1.296)	-4.913*** (1.305)	9.439*** (1.278)	-4.577*** (1.339)
Party controls	NO	NO	NO	YES	NO	YES
R ²	0.332	0.350	0.362	0.660	0.384	0.665
Observations	3,617	3,617	3,449	3,334	3,449	3,334

*** Significant at 1% level; ** at 5% level; * at 10% level.

Dependent variable: Percentage of votes for MMP at the Polling Station. All variables refer to *Area Unit* level data. Population density: (People per km^2)/1,000. Party controls: share of votes for Labour, for National, and for Alliance. Standard errors clustered at the electoral district level. Regressions are weighted, where weights given by number of votes at the polling station: ‘#referendum votes at the polling station/# total referendum votes’.

Table IV: Support for MMP at the Polling Station. Columns (1) – (2): Replication of columns (5) – (6) in Table 3 in the main text, with clusters at the Area Unit level. Columns (3) – (4): Replication of of columns (5) – (6) in Table III above, with clusters at the Area Unit level.

	General Roll only		All electorates	
	(1)	(2)	(3)	(4)
Mean MB Area within AU	-94.64*** (36.00)	-40.05** (16.07)	-96.09*** (35.79)	-40.47** (15.95)
Pop. Density	0.525* (0.284)	-0.330 (0.228)	0.522* (0.281)	-0.324 (0.227)
% Women	0.457*** (0.143)	0.133 (0.111)	0.458*** (0.143)	0.135 (0.109)
% Born in NZ	-0.235*** (0.0308)	-0.142*** (0.0231)	-0.228*** (0.0305)	-0.139*** (0.0230)
% Maori	0.0941*** (0.0299)	0.153*** (0.0204)	0.0856*** (0.0285)	0.149*** (0.0196)
% > 64 y.o.	-0.292*** (0.0896)	-0.105 (0.0708)	-0.255*** (0.0888)	-0.0865 (0.0698)
% <25 y.o.	-0.145* (0.0742)	-0.00039 (0.0536)	-0.146** (0.0735)	0.00234 (0.0529)
% College degree	0.374*** (0.0612)	0.342*** (0.0516)	0.381*** (0.0613)	0.344*** (0.0516)
Median income (in thousands of \$)	0.640*** (0.126)	0.254*** (0.0892)	0.629*** (0.126)	0.241*** (0.0884)
Median income ² (in thousands of \$)	-0.007*** (0.001)	-0.003*** (0.0007)	-0.007*** (0.001)	-0.003*** (0.0007)
% Maori in Maori Roll (as in 1998)	-0.0329** (0.0163)	-0.0218* (0.0124)	-0.0280* (0.0160)	-0.0212* (0.0122)
% earns rents or dividends	-0.172 (0.112)	0.321*** (0.0891)	-0.194* (0.110)	0.313*** (0.0878)
% receives <i>some</i> benefit	0.589*** (0.0996)	0.164** (0.0758)	0.548*** (0.0974)	0.145* (0.0740)
% full employment	0.193** (0.0960)	0.167** (0.0699)	0.197** (0.0958)	0.170** (0.0692)
Maori electorate (dummy)			9.439*** (0.577)	-4.577*** (0.680)
Party controls	NO	YES	NO	YES
R ²	0.375	0.665	0.384	0.665
Observations	2,961	2,960	3,449	3,334

*** Significant at 1% level; ** at 5% level; * at 10% level.

Dependent variable: Percentage of votes for MMP at the Polling Station. All variables refer to *Area Unit* level data. Population density: (People per km^2)/1,000. Party controls: share of votes for Labour, for National, and for Alliance. Standard errors clustered at the Area Unit level. Weights are given by the ratio '#referendum votes at the polling station/# total referendum votes'.

Table V: Support for MMP at the Polling Station, by party support. Replication of Table 4 in the main paper with *all* polling stations (i.e., General Roll, Māori Roll and “special votes”). Hence, no sociodemographic controls can be added).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
% Labour	0.286*** (0.0112)	-0.0933*** (0.0117)	-0.0933*** (0.0117)	-0.0949*** (0.0116)	-0.0822*** (0.0120)	-0.0838*** (0.0119)	0.422*** (0.00890)
% National		-0.498*** (0.0137)	-0.498*** (0.0137)	-0.508*** (0.0136)	-0.464*** (0.0142)	-0.497*** (0.0138)	
% Alliance	0.535*** (0.0197)	0.146*** (0.0181)	0.146*** (0.0181)	0.132*** (0.0177)	0.155*** (0.0178)	0.138*** (0.0177)	
% Smaller parties							0.567*** (0.0120)
% REF. – % G.E.				0.628*** (0.0742)	0.639*** (0.0758)	0.636*** (0.0764)	0.683*** (0.0788)
log (# Polling stations)					-0.0396*** (0.00257)		
Total votes (in thousands)						0.0150*** (0.00227)	0.0144*** (0.00225)
Dummy Māori Electorate	0.0764*** (0.00571)	-0.0345*** (0.00471)	-0.0345*** (0.00471)	-0.0325*** (0.00595)	0.0377*** (0.00746)	-0.0416*** (0.00695)	-0.0534*** (0.00698)
Weights	YES	YES	YES	YES	YES	YES	YES
R ²	0.399	0.563	0.563	0.575	0.604	0.587	0.578
Observations	4,265	4,129	4,129	4,129	4,129	4,129	4,130

*** Significant at 1% level; ** at 5% level; * at 10% level.

Dependent variable: Percentage of votes for MMP at the Polling Station. % Smaller parties: Percentage of votes for all parties other than National or Labour. % REF. – % G.E.: (Total votes referendum-Total votes general election)/Total votes general election. log (# Polling stations): refers to the number of polling stations in the electorate. Weights are given by the ratio ‘#referendum votes at the polling station/# total referendum votes’.

Table VI: Support for MMP at the Polling Station, by party support, with sociodemographic controls (General Roll only). Replication of Table 4 with clusters at the Area Unit level.

	(1)	(2)	(3)	(4)	(5)	(6)
% Labour	0.1038*** (0.0201)	0.6219*** (0.0667)	-0.1712*** (0.0161)	-0.1122*** (0.0179)	0.0539 (0.0447)	
% Labour × % Labour		-0.0073*** (0.0008)			-0.0025*** (0.0006)	
% National			-0.5979*** (0.0199)	-0.5365*** (0.0214)	-0.1474*** (0.0507)	
% National × % National					-0.0049*** (0.0006)	
% Alliance				0.1163*** (0.0248)	0.2382*** (0.0527)	0.5023*** (0.0620)
% Alliance × % Alliance					-0.0029*** (0.0008)	-0.0037*** (0.0009)
% National – % Labour						-0.1704*** (0.0079)
(% National – % Labour) ²						-0.0025*** (0.0001)
Clustered SE	YES	YES	YES	YES	YES	YES
Weights	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES
R ²	0.365	0.402	0.654	0.660	0.701	0.650
Observations	2,961	2,961	2,961	2,960	2,960	2,960

*** Significant at 1% level; ** at 5% level; * at 10% level.

Dependent variable: Percentage of votes for MMP at the Polling Station. Controls used (all refer to Area Unit level): mean meshblock area, population density, % women, % born in NZ, % Māori, % college degree, % > 64 y.o., % < NZD 20,000, median income, % Māori in Māori Roll, % earns rents or dividends, % receives *some* benefit, % full employment. Standard errors clustered at the Area Unit level. Weights given by number of votes at the polling station.

Table VII: Descriptive statistics, New Zealand Election Study, 1993 survey

	Full 1993 Dataset		Cross-sectional analysis dataset	
	Mean	Std. Dev.	Mean	Std. Dev.
Voted for MMP in 1993 Referendum	0.51	0.5	0.55	0.5
Voted for FFP in 1993 Referendum	0.4	0.49	0.45	0.5
Did Not Vote in 1993 Referendum	0.09	0.29		
Voted for Change in 1992 Referendum	0.58	0.49	0.63	0.48
Supported FPP in 1992 Referendum	0.21	0.41	0.22	0.42
Did Not Vote in 1992 Referendum	0.21	0.41	0.15	0.36
Age	47.9	16.9	46.9	15.8
Female	0.51	0.5	0.48	0.5
NZ European	0.9	0.3	0.93	0.25
Māori	0.06	0.23	0.04	0.19
Other Ethnicity	0.05	0.21	0.03	0.17
Immigrant	0.17	0.38	0.17	0.38
No Qualifications	0.29	0.46	0.25	0.43
School Qualifications	0.39	0.49	0.39	0.49
Non-University Post-School Degree	0.2	0.4	0.23	0.42
University Degree	0.11	0.31	0.13	0.34
Employed	0.57	0.5	0.6	0.49
Retired	0.24	0.42	0.21	0.41
Non-Employed	0.2	0.4	0.19	0.39
Personal Income (thousands)	23.6	19.8	25.5	21
Personal Income Missing/Don't know	0.21	0.41	0.1	0.3
Personal Ideology - Extreme Left	0.08	0.27	0.08	0.28
Personal Ideology - Left	0.1	0.3	0.11	0.32
Personal Ideology - Central	0.32	0.47	0.33	0.47
Personal Ideology - Right	0.13	0.34	0.15	0.36
Personal Ideology - Extreme Right	0.08	0.27	0.09	0.29
Personal Ideology - Don't Know	0.29	0.45	0.23	0.42
General Trust - (Strongly) Agree	0.65	0.48	0.66	0.47
General Trust - Neither Agree/Disagree	0.12	0.33	0.14	0.35
General Trust - (Strongly) Disagree	0.18	0.39	0.17	0.37
General Trust - Don't Know	0.04	0.19	0.03	0.16
Trust Government - (Strongly) Agree	0.31	0.46	0.32	0.47
Trust Government - Neither Agree/Disagree	0.18	0.38	0.19	0.39
Trust Government - Disagree	0.37	0.48	0.38	0.49
Trust Government - Strongly Disagree	0.08	0.27	0.08	0.27
Trust Government - Don't Know	0.05	0.23	0.03	0.18
Knows Previous MP's name	0.75	0.43	0.8	0.4
Political Interest - Very Interested	0.15	0.36	0.17	0.37
Political Interest - Somewhat	0.48	0.5	0.53	0.5
Political Interest - Slight or less	0.36	0.48	0.3	0.46
Reads Newspaper - Often or Sometimes	0.63	0.48	0.68	0.47
Reads Newspaper - Rare or Never	0.37	0.48	0.32	0.47
Religion - None	0.25	0.43	0.28	0.45
Religion - Catholic	0.14	0.34	0.13	0.34
Religion - Protestant	0.6	0.49	0.58	0.49
Religion - Non-Christian	0.02	0.13	0.01	0.12
Politically Engaged (min=0; max=3)	2.23	1	2.56	0.75
Supports Principles of MMP (min=-4; max=4)	0.06	1.51	0.06	1.62
Voted Strategically in 1993	0.07	0.26	0.07	0.25
Did not vote in 1990	0.09	0.29	0.08	0.27
Voted for National in 1990	0.46	0.5	0.48	0.5
Voted for Labour in 1990	0.33	0.47	0.32	0.47
Voted for Alliance in 1990	0.07	0.25	0.07	0.26
Voted for Other parties in 1990	0.05	0.21	0.05	0.22
Whether changed vote from 1990 to 1993	0.47	0.5	0.43	0.5
Support to National (min=1; max=5)	2.81	1.3	2.82	1.35
Support to Labour (min=1; max=5)	2.89	1.12	2.83	1.11
Support to Alliance (min=1; max=5)	3.2	1	3.2	1.01
Did not vote in 1993	0.08	0.27	0.01	0.1
Voted for National in 1993	0.34	0.47	0.39	0.49
Voted for Labour in 1993	0.3	0.46	0.3	0.46
Voted for Alliance in 1993	0.18	0.39	0.2	0.4
Voted for Other parties in 1993	0.1	0.3	0.11	0.31
Auckland	0.23	0.42	0.24	0.43
Wellington	0.1	0.29	0.1	0.3
Christchurch	0.1	0.29	0.1	0.31
Other cities	0.27	0.45	0.28	0.45
Town	0.1	0.3	0.09	0.29
Countryside	0.2	0.4	0.19	0.39
Observations	2251		1296	

Table VIII: Determinants of differential turnout across Referendum and General Election. Replication of Table 7 in the paper, with (i) standard errors clustered at the Area Unit level (Panel A); and (ii) Māori electorates included (Panel B).

Panel A: Clusters at the Area Unit level.			
Dependent variable: Turnout Referendum (%) - Turnout General Election (%) (polling station level)	(1)	(2)	(3)
Pop. density	-0.0226** (0.0093)	-0.0021 (0.0104)	-0.0031 (0.0102)
% Women	-0.0034 (0.0044)	0.0024 (0.0051)	0.0032 (0.0051)
% NZ born	0.0053*** (0.0015)	0.0051*** (0.0014)	0.0045*** (0.0013)
% Maori	-0.0001 (0.0010)	0.0002 (0.0013)	0.0006 (0.0012)
% 65 y.o. or older	-0.0003 (0.0021)	-0.0023 (0.0032)	-0.0026 (0.0032)
% 25 y.o. or younger	-0.0026 (0.0022)	-0.0025 (0.0019)	-0.0022 (0.0018)
% college degree	0.0075*** (0.0025)	0.0086*** (0.0021)	0.0077*** (0.0021)
Median income (in thousands of \$)	0.0088** (0.0040)	-0.0009 (0.0039)	-0.0007 (0.0037)
Median income ² (in thousands of \$)	-0.0001 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)
Labour share in polling station (%)		-0.0034*** (0.0008)	-0.0008 (0.0013)
National share in polling station (%)			0.0034** (0.0014)
Alliance share in polling station (%)			0.0039* (0.0022)
Other controls	YES	YES	YES
Clustered SE	YES	YES	YES
Weights	YES	YES	YES
R ²	0.0720	0.0960	0.1020
Observations	3,104	2,961	2,960

Panel B: Including Maori electorates (clusters at the electorate level).			
Dependent variable: Turnout Referendum (%) - Turnout General Election (%) (polling station level)	(1)	(2)	(3)
Pop. density	-0.0235** (0.0091)	-0.0033 (0.0102)	-0.0050 (0.0102)
% Women	-0.0034 (0.0043)	0.0017 (0.0050)	0.0030 (0.0050)
% NZ born	0.0055*** (0.0014)	0.0053*** (0.0013)	0.0045*** (0.0013)
% Maori	0.0008 (0.0011)	0.0020 (0.0016)	0.0023 (0.0015)
% 65 y.o. or older	-0.0000 (0.0021)	-0.0009 (0.0033)	-0.0013 (0.0033)
% 25 y.o. or younger	-0.0031 (0.0022)	-0.0031 (0.0019)	-0.0025 (0.0018)
% college degree	0.0080*** (0.0025)	0.0093*** (0.0022)	0.0081*** (0.0021)
Median income (in thousands of \$)	0.0094** (0.0039)	-0.0022 (0.0041)	-0.0021 (0.0038)
Median income ² (in thousands of \$)	-0.0001* (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)
Labour share in polling station (%)		-0.0026*** (0.0009)	0.0008 (0.0017)
National share in polling station (%)			0.0044** (0.0017)
Alliance share in polling station (%)			0.0053** (0.0024)
Maori electorate	0.0226 (0.1668)	0.0641 (0.1822)	0.1376 (0.2167)
Other controls	YES	YES	YES
Clustered SE	YES	YES	YES
Weights	YES	YES	YES
R ²	0.0619	0.0800	0.0905
Observations	3,617	3,449	3,334

(See next page for notes) *** Significant at 1% level; ** at 5% level; * at 10% level.

Panel A. All variables refer to Area Unit. Variables not shown: Mean meshblock area within Area Unit, % Māori in Māori Roll, % earns rents or dividends, % receives some benefit, % full employment. Standard errors clustered at the Area Unit level (1,376 clusters). Regressions weighted by polling station # votes.

Panel B. All variables refer to Area Unit. Variables not shown: Mean meshblock area within Area Unit, % Māori in Māori Roll, % earns rents or dividends, % receives some benefit, % full employment. Standard errors clustered at the electoral district level (99 clusters). Regressions weighted by polling station # votes.