

Supplemental material
for ‘Evaluating electoral management body capacity’
by Holly Ann Garnett
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Mokken Scaling of EMB Capacity Score

Mokken Scaling (all 20 Items)

Scale 1

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Election Results	99	0.8384	1	12.12	0.9175	7.04	0.00	0
Election Results Smaller Units	99	0.7576	1	12.12	0.9175	7.04	0.00	0
Scale	99		1	12.12	0.9175	7.04	0.00	

Scale 2

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Contact Specific Names/Departments	99	0.60	19	43.73	0.56	6.83	0.00	0
Hierarchy	99	0.70	17	39.59	0.57	6.51	0.00	0
EMB member(s) name	99	0.89	4	18.28	0.78	5.68	0.00	0
EMB member(s) qualifications	99	0.51	16	40.18	0.60	6.60	0.00	0
Scale	99		28	70.89	0.60	9.06	0.00	0

Scale 3

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Disabled Voters	99	0.58	40	78.61	0.49	8.26	0.00	0
Foreign Voters	99	0.61	39	78.73	0.50	8.58	0.00	0
Voter Identification	99	0.69	26	71.94	0.63	10.36	0.00	0
Eligibility to Vote	99	0.71	19	68.44	0.72	11.33	0.00	0
Voter Registration Information	99	0.54	40	74.73	0.46	7.37	0.00	0
Scale	99		82	186.22	0.55	14.45	0.00	0

Scale 4

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Contact In Person	99	0.65	7	14.44	0.51	3.59	0.00	0

Contact Post	99	0.82	7	15.3	0.54	4.21	0.00	0
Contact Telephone	99	0.94	2	7.42	0.73	4.08	0.00	0
Scale	99		8	18.59	0.56	4.74	0.00	0

Scale 5

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Voter Identification	99	0.69	10	35.88	0.72	8.38	0.00	0
Eligibility to Vote	99	0.71	7	34.79	0.79	9.10	0.00	0
Voter Registration Information	99	0.54	7	31.64	0.77	7.68	0.00	0
Scale	99		12	51.15	0.76	10.26	0.00	0

Mean scores were created for:

- Transparency (results): Election Results, Election Results Smaller Units
- Information: Disabled Voters, Foreign Voters, Voter Identification Information, Voter Registration Information
- Transparency (personnel): Contact Specific Names/Departments, Hierarchy, EMB member(s) name, EMB member(s) qualifications
- Communication: In-person, Post, Telephone

The overall capacity scale was determined using Mokken Scaling:

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Information	99	0.53	12	19.70	0.39	2.82	0.00	0
Transparency	99	0.79	15	22.47	0.33	3.64	0.00	0
Communication	99	0.81	17	27.02	0.37	3.47	0.00	0
Scale	99		29	54.9	0.36	4.03	0.00	0

EMB Website Content Analysis Scores

Country	EMB Studied	EMB Website	Email Test	(1) Information	(2) Communication	(3) Transparency - Results	(4) Transparency - Personnel	(5) Overall Capacity Score (Sum of 1, 2 & 3)
Afghanistan	Independent Election Commission	http://www.iec.org.af/fa/	Yes	0.8	1	1	1	2.8
Albania	Central Election Commission	www.cec.org.al	Yes	0.6	1	1	1	2.6
Algeria	Ministry of the Interior and Local Authorities	http://www.interieur.gov.dz/Dynamics/frmItem.aspx?html=50&s=23&lng=ar	Yes	0.8	0.67	0.5	0	1.97
Angola	National Election Commission	www.cne.ao/	Yes	0	1	0	0.75	1
Argentina	Electoral Chamber	http://www.electoral.gov.ar/	No	0.4	1	1	0.25	2.4
Armenia	Central Election Commission	www.elections.am/	Yes	0	0.67	1	1	1.67
Australia	Australian Electoral Commission	www.aec.gov.au	Yes	1	1	1	0.75	3
Austria	Ministry of Internal Affairs	www.bmi.gv.at/wahlen	Yes	1	0.67	1	0.75	2.67
Azerbaijan	Central Election Commission	www.msk.gov.az/az/	Yes	0.4	0.67	0.5	1	1.57
Bahrain	Directorate of Election and Referendums	www.vote.bh/Ar/index	Yes	0.8	1	1	0	2.8
Bangladesh	Election Commission	www.ecs.gov.bd	Yes	0.4	1	0.5	1	1.9
Barbados	Barbados Electoral and Boundary Commission	www.electoral.barbados.gov.bb/	Yes	0.6	0.33	0	0.25	0.93
Belarus	Central Commission of the Republic of Belarus on Elections	www.rec.gov.by/	Yes	0	1	1	0.75	2
Belgium	Ministry of Interior	http://www.elections.fgov.be/index.php?id=1622&L=2	Yes	1	0.33	1	0.25	2.33

Bhutan	Electoral Commission of Bhutan	www.election-bhutan.org.bt/	Yes	1	1	1	0.75	3
Bolivia	National Electoral Court	http://www.oep.org.bo/	Yes	0	1	1	0	2
Bosnia-Herzegovina	Election Commission	http://www.izbori.ba/Default.aspx?Lang=3	Yes	0.6	0.67	1	0.75	2.27
Botswana	Independent Election Commission	www.iec.gov.bw	No	1	0.67	1	0.25	2.67
Brazil	High Electoral Tribunal	www.tse.jus.br/	No	0.4	1	1	1	2.4
Bulgaria	Central Election Commission	www.cik.bg/	Yes	1	1	1	0.75	3
Burkina Faso	Independent National Election Commission	www.ceni.bf/	Yes	0.6	0.67	1	0.75	2.27
Cambodia	National Election Commission	www.necselect.org.kh/nec_khmer/	Yes	0.6	0.67	1	1	2.27
Cameroon	Elections Cameroon	www.elec.cm/	Yes	0.6	0.33	0.5	1	1.43
Chile	Electoral Service	http://www.servel.cl/ss/site/home.html	Yes	0.8	1	1	1	2.8
Colombia	National Electoral Council	www.registraduria.gov.co	Yes	1	1	1	1	3
Congo, Democratic Republic of	National Election Commission	www.ceni.gouv.cd/	Yes	0.8	0	0	0.25	0.8
Costa Rica	Supreme Electoral Tribunal	www.tse.go.cr	Yes	1	1	1	1	3
Cyprus	Central Electoral Service	www.moi.gov.cy/moi/moi.nsf/page16_gr/page16_gr?OpenDocument	Yes	1	1	0.5	0	2.5
Czech Rep	Ministry of the Interior	www.mvcr.cz/volby.aspx	Yes	0.8	1	1	0.75	2.8
Djibouti	National Independent Electoral Commission	www.ceni.dj/	Yes	0	0.33	0	0.5	0.33
Ecuador	Supreme Electoral Tribunal	cne.gob.ec/es/	Yes	0.4	1	1	1	2.4
Egypt	High Elections Committee	https://www.elections.eg/	Yes	0.8	0.33	1	0.25	2.13
El Salvador	Supreme Election Tribunal	www.tse.gob.sv/	No	0	1	1	0.5	2

Fiji	Elections Fiji	www.electionsfiji.gov.fj/	Yes	1	1	1	0.5	3
Georgia	Central Election Commission	www.cec.gov.ge	Yes	0.8	0.67	1	1	2.47
Germany	Ministry of Interior	www.bundeswahlleiter.de	Yes	0.8	1	1	0.5	2.8
Ghana	Election Commission of Ghana	www.ec.gov.gh/	Yes	0.2	0.67	0	1	0.87
Grenada	Parliamentary Election Office	www.gov.gd/departments/parliamentary_election_office.html	Yes	0	1	0	0.25	1
Guinea	National Election Commission	www.ceniguinee.org/	Yes	0.6	0	0	0.75	0.6
Guinea-Bissau	National Election Commission	www.cne-guineebissau.org/	Yes	0	0.67	1	0.25	1.67
Honduras	Supreme Electoral Tribunal	www.tse.hn	Yes	0	0.33	1	1	1.33
Hungary	Ministry of Interior and National Election Office	http://valasztas.hu/hu/ovi/index.html	Yes	1	1	1	1	3
Iceland	Election Commission	www.landskjoer.is/	Yes	0.8	1	1	0.75	2.8
India	Election Commission	eci.nic.in/eci/eci.html	Yes	0.8	1	1	0.75	2.8
Indonesia	General Election Commission	www.kpu.go.id	Yes	0.6	1	1	1	2.6
Iran	Ministry of Interior	http://www.shoragc.ir/Portal/Home/	Yes	0.4	0.67	0	0.5	1.07
Iraq	High Election Commission	http://www.ihec.iq/ar/	Yes	0.8	0.67	1	1	2.47
Israel	Central Elections Committee	www.knesset.gov.il/elections17/heb/cec/CecIndex.asp	Yes	0.8	0.33	0.5	0.25	1.63
Italy	Ministry of Interior	www.interno.gov.it/it	Yes	0.8	0.67	1	0.75	2.47
Japan	Ministry of Internal Affairs	www.soumu.go.jp/	Yes	1	1	1	0.5	3
Jordan	Independent Election Commission	www.entikhabat.jo/public/DefaultAr.aspx	Yes	0.8	1	1	0.75	2.8
Kenya	Independent Boundaries and Election Commission	www.iebc.or.ke/	Yes	0.8	1	1	1	2.8

Korea, Republic	National Election Commission	www.nec.go.kr/portal/main.do	Yes	1	1	1	1	3
Kuwait	Election Commission	eservices1.moi.gov.kw/elections/mainmenu.nsf	No	0	0	1	0	1
Latvia	Central Election Commission	www.cvk.lv/pub/public/index.html	Yes	0.8	1	1	1	2.8
Lithuania	Central Elections Committee	www.vrk.lt	Yes	0.4	0.67	1	0.75	2.07
Macedonia	State Election Commission	www.sec.mk/index.php?lang=mk	Yes	0.2	1	1	0.75	2.2
Madagascar	National Election Commission	www.ceni-madagascar.mg/	Yes	0	0.33	0.5	0.5	0.83
Malawi	Electoral Commission	www.mec.org.mw/	Yes	0	1	1	1	2
Malaysia	Election Commission	www.spr.gov.my/	Yes	1	1	0	1	2
Maldives	Elections Commission	http://www.elections.gov.mv/index-2.html	Yes	0	0.67	0.5	0.25	1.17
Malta	Electoral Commission	http://www.electoral.gov.mt	Yes	1	1	1	0.75	3
Mauritania	National Independent Election Commission	www.ceni.mr/	Yes	0.2	1	1	0.5	2.2
Mauritius	Office of the Election Commissioner	electoral.govmu.org/English/Pages/default.aspx	Yes	0.8	1	1	0.75	2.8
Mexico	Federal Election Institute	www.ine.mx/portal/	Yes	1	1	1	1	3
Micronesia	Office of President	http://www.fsmpio.fm/	No	0	0.67	1	0.25	1.67
Moldova	Central Election Commission	http://www.cec.md/index.php?l=ro	Yes	0.8	1	1	1	2.8
Mongolia	General Election Commission	www.gec.gov.mn/	Yes	1	1	1	1	3
Montenegro	Republic Electoral Commission	http://www.dik.co.me/	Yes	0	0.67	0	0.5	0.67
Namibia	Election Commission of Namibia	www.ecn.na/	Yes	0.6	1	1	1	2.6
Nepal	Nepal Election Commission	www.election.gov.np/election/np	Yes	0.6	0.67	1	1	2.27
Netherlands	Electoral Council	www.kiesraad.nl	No	1	1	1	0.75	3

New Zealand	Elections New Zealand	www.elections.org.nz/	Yes	1	0.67	1	1	2.67
Norway	Ministry of Local Government and Regional Development	https://www.regjering.no/nb/tema/valg-og-demokrati/valgportalen-valg-no/id456491/	Yes	1	1	1	1	3
Pakistan	Election Commission	www.ecp.gov.pk	No	0.6	1	1	0.75	2.6
Panama	Panama Electoral Tribunal	www.tribunal-electoral.gob.pa	Yes	0.6	0.67	1	1	2.27
Paraguay	High Tribunal of Electoral Justice	www.tsje.gov.py	Yes	1	1	1	1	3
Philippines	Commission on Elections	www.comelec.gov.ph	Yes	0.8	1	1	1	2.8
Romania	Permanent Electoral Authority and Central Election Bureau	www.roaep.ro	Yes	1	0.67	1	1	2.67
Rwanda	National Election Commission	www.comelena.gov.rw/home/	Yes	1	0.33	0	0.75	1.33
Serbia	Republic Election Commission	http://www.rik.parlament.gov.rs/index_1.htm	Yes	0	1	1	0.75	2
Sierra Leone	National Election Commission	www.nec-sierraleone.org/	Yes	0.6	0.33	1	0.5	1.93
Slovakia	Ministry of Interior	www.civil.gov.sk	Yes	1	1	1	0.5	3
Slovenia	Republic Election Commission	http://www.dvk-rs.si/index.php/si	Yes	1	1	0.5	0.75	2.5
Solomon Islands	Election Commission	www.siec.gov.sb/	Yes	0.8	1	0.5	0	2.3
South Africa	Independent Electoral Commission	www.elections.org.za	Yes	1	1	1	1	3
Swaziland	Elections and Boundaries Commission	www.gov.sz/index.php?option=com_content&id=366&Itemid=343	Yes	0.6	1	0	0.25	1.6
Sweden	Electoral Authority	www.val.se/	Yes	1	1	1	0	3
Tajikistan	Central Commission for Elections and Referenda	http://www.kmir.tj/tj/konunguzori.html	Yes	0	1	0	0.5	1
Thailand	Electoral Commission	www.ect.go.th/	Yes	1	1	1	0.25	3

Togo	National Election Commission	www.ceni-tg.org/	Yes	0.6	0.67	1	0.5	2.27
Tonga	Electoral Commission	www.tongaelections.com/	Yes	0.6	1	0	0.5	1.6
Tunisia	Independent Election Commission	www.isie.tn/	Yes	1	1	1	0.5	3
Turkey	Supreme Electoral Council	http://www.ysk.gov.tr	Yes	0.6	0.67	1	0.5	2.27
Ukraine	Central Election Commission	www.cvk.gov.ua	Yes	0.8	0.67	1	1	2.47
United States	Federal Electoral Commission	www.fec.gov	Yes	1	0.67	0	1	1.67
Uruguay	Electoral Court	www.corteelectoral.gub.uy/	No	0.6	1	1	0.5	2.6
Venezuela	National Electoral Court	www.cne.gov.ve/web/index.php	Yes	0	1	1	0.5	2
Zimbabwe	Election Commission	www.zec.gov.zw/	Yes	0.8	0.67	1	1	2.47

All countries above had elections between mid-2012 and 2014 (when coding took place).

One major EMB per country was chosen for coding, based on the Electoral Management Design Handbook (2014 edition). Some website links, however, had changed.

Data and Variables

Variable	Coding	Source
<i>Measures of EMB Capacity</i>		
EMB Budgets	Could you provide us with an estimate of your organization's overall budget last national election year (in the currency of your country?)	Electoral Management Survey / ELECT Survey
EMB Staff	What is the total number of <i>permanent</i> staff of your organisation, including support and administrative staff? If you don't know the correct number please provide the closest estimation.	Electoral Management Survey / ELECT Survey
EMB Foreign Assistance	Does your organization receive assistance from international organizations or governments? Finance Assistance Donated supplies and equipment Training for personnel Assistance in the form of advice and consultation 'On the ground' logistical and personnel support Legal support Technical/computing assistance Other, namely: [text] Options: 1. On a regular basis 2. Often 3. Occasionally 4. Rarely 5. Never 6. N/A	Electoral Management Survey / ELECT Survey
VDem EMB Capacity	Does the Election Management Body (EMB) have sufficient staff and resources to administer a well-run national election? Clarification: The EMB refers to whatever body (or bodies) is charged with administering national elections. 0: No. There are glaring deficits in staff, financial, or other resources affecting the organization across the territory. 1: Not really. Deficits are not glaring but they nonetheless seriously compromised the organization of administratively well-run elections in many parts of the country. 2: Ambiguous. There might be serious deficiencies compromising the organization of the election but it could also be a product of human errors and co-incidence or other factors outside the control of the EMB. 3: Mostly. There are partial deficits in resources but these are neither serious nor widespread. 4: Yes. The EMB has adequate staff and other resources to administer a well-run election	Varieties of Democracy (Expert survey)
PEI EMB Performance	Thinking about the electoral authorities administering elections, in your view... Do you agree or disagree with the following statements... "The election authorities performed well." 5-point Likert scale from from "Strongly disagree" to "Strongly agree".	Perceptions of Electoral Integrity Index (Expert Survey)

PEI EMB Sub-Index	This is an additive scale conformed by the four EMB variables (“The election authorities were impartial”, “The authorities distributed information to citizens.”, “The authorities allowed public scrutiny of their performance”, “The election authorities performed well.”) and standardized to a 0-100 point scale.	Perceptions of Electoral Integrity Index
<i>Country-Level Variables</i>		
GDP	Gross Domestic Product, per capita, PPP	World Bank (most recent year available used)
Freedom House Electoral Democracy	From Freedom House assigns the designation ‘electoral democracy’ to countries that meet minimum standards for political rights (see methodology: https://freedomhouse.org/report/freedom-world-2015/methodology) This is a dichotomous variable (Non-Electoral Democracy: 0, Electoral Democracy: 1)	Freedom House (2016 or most recent year available is used)
Government Effectiveness	Quality of public service provision, the quality of the bureaucracy, the competence of civil servants, the independence of the civil service from partisan pressures, and the credibility of the government’s commitment to policies. (-2.5 to 2.5)	World Bank, Acquired from: Quality of Governance Dataset
Internet use	Internet users per 100 persons (0-100) No data was available on this dataset for Macedonia, so 2014 data from the World Bank was added. http://data.worldbank.org/indicator/IT.NET.USER.P2	World Bank, Acquired from: Quality of Governance Dataset
Regime Durability/Length of Democracy	The number of years since the last regime transition that led to a three point change or greater from previous year. Note: Polity studies only countries with populations of 500000 or more. For the following countries, the length of democracy was estimated using the following sources: Barbados (1966) http://thecommonwealth.org/our-member-countries/barbados/constitution-politics Grenada (1983) http://news.bbc.co.uk/2/hi/americas/1209649.stm Montenegro (2003) https://freedomhouse.org/report/freedom-world/2007/montenegro#.Vb_SivlViko Maldives (2008) https://freedomhouse.org/report/freedom-world/2010/maldives#.Vb_S0vlViko Tonga (2010) https://freedomhouse.org/report/freedom-press/2013/tonga#.Vb_TrviVikp Micronesia (1979) https://freedomhouse.org/report/freedom-world/2003/micronesia#.Vb_TVvlViko Serbia (2004) http://www.systemicpeace.org/polity/ser2.htm Iceland (1944) (https://freedomhouse.org/report/freedom-world/2015/iceland) Malta (1964) (http://www.parlament.mt/historicalbackground?l)	Polity, Acquired from: from PEI_3.0.

Datasets:

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- International IDEA, Global Database on Elections and Democracy, <http://www.idea.int/db/>
- Norris, Pippa; Wynter, Thomas; Grömping, Max, 2017, "Perceptions of Electoral Integrity, (PEI-5.5)", doi:10.7910/DVN/EWYTZ7, Harvard Dataverse, V2, UNF:6:orsycndtUZPrE58BWhCdtg=

- Teorell, Jan, Stefan Dahlberg, Sören Holmberg, Bo Rothstein, Felix Hartmann & Richard Svensson. 2015. The Quality of Government Standard Dataset, version Jan15. University of Gothenburg: The Quality of Government Institute, <http://www.qog.pol.gu.se>
- Freedom House, Freedom in the World Report 2016, <https://freedomhouse.org/report-types/freedom-world>
- World Bank, International Comparison Program database, <https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD>