Technical Report: Putting ‘political’ back in political trust: an IRT test of the unidimensionality and cross-national equivalence of political trust measures.

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**Final Report for Rasch Paper Analysis - MIRT and eRm Results**

**Item Response Theory and the Benefits of the Rasch Scale**

Item Response Theory (IRT) models are determined in light of item difficulty parameters that measure how hard or easy a specific item is to endorse. In our case, how hard or easy an institution is to trust (its perceived trustworthiness). They also model item discrimination/differentiation, that is, how much a particular item (institution) is related to the latent scale; in other words, how heavy a role it plays in determining positioning of individuals on the latent scale. Overall, item response theory models assess the likelihood of particular response as a function of a person’s positioning on the latent scale and the survey question/item’s positioning on that same latent scale (van der Linden 2017). Various constraints such as equal discrimination and particular response patterns can also be specified depending on the model (Reise 2014).

Our analysis builds on the works of Zmerli and Newton (2017) to assess whether commonly used political trust items also meet the stricter demands of the Rasch model. The Rasch model differs from Mokken scale analysis in that it specifies a number of a-priori criteria which scale items and response patterns must adhere to, in order to meet the demands of specific objectivity. The latter assumption implies that the rank of item difficulty,[1](#_bookmark0) should be the same for respondents regardless of their ability on the latent construct. Likewise, the rank of a person’s ability on the latent construct should be the same regardless of the item difficulty/location (Andrich 1988, p. 43).

In the context of the measurement of political trust, specific objectivity implies that the relative rank of the trustworthiness of an institution (item location) should be independent of the respondents and the respondents’ placement on the political trust scale.[2](#_bookmark1) Reversely, an individuals’ position along the latent political trust scale should be the same regardless of the trustworthiness ranking of a set of institutions. A political trust scale which does not have the same relative ranking of the trustworthiness of the institutions used to create the scale across score groups/(the ability continuum) cannot be interpreted in a consistent manner. It loses any substantive meaning it might have along different points on the estimated scale.

Moreover, the Rasch model, differs from the Mokken Monotone Homogeneity Model (aka the 2PL model in the IRT literature) in that it constrains all items used on a scale to differentiate equally well between response probabilities. This is different from the concept of item location/difficulty. All IRT models including the Mokken and Rasch account for diverging item location along a latent continuum. In so doing, they model the difficulty that a particular question/item may pose to the respondent. The discrimination, hereafter differentiation parameter, on the other hand, is the slope of a response curve for a particular item at its steepest point. It tells us how quickly the response probability on a given item changes as the latent political trust score changes. (Reise 2014, p. 2) It provides information about the proximity between a given item and the underlying latent scale. In the case of the measurement of political trust, it indicates the extent to which a particular institution enables us to differentiate between individuals with high levels of trust and those with low levels of political trust. By constraining all discrimination parameters to equal 1, the Rasch model, specifies a-priori the sufficiency of the sum-score for item and person location on the latent-scale. One does not need to account for an unequal weight of a particular item on the latent scale when using a

1In the context of social sciences and surveys on political trust in different institutions, the concept of item difficulty essentially

highlights the fact that institutions inspire a different level of trustworthiness in respondents. Some types of institutions are easier to trust than others.

2That is, regardless of their latent levels of political trust, respondents probed about trust in various institutions should rank the trustworthiness of those institutions in a similar way.

1

score of responses for measurement purposes; (see Muraki 1990, p. 67) for more on the impact of unequal discrimination).

**Methods**

As a starting-point for our analyses, we first assess whether trust in the institutions inquired about constitute a scale. Using non-parametric Mokken scaling we provide the overall scalability coefficients (H-score) of the institutions in each country. The coefficients and their corresponding Z-test enable us to determine if the institutions in our scale “constitute a homogeneous set of indicators of the same latent trait”, in this case, political trust (van Schuur 2003, p. 149).

To assess whether commonly used political trust measures meet the demands of the Rasch model, we examine the global fit of the data to the Rasch model and various polytomous extensions of this model. In particular we assess the fit of the data to the constraints of the Rasch Model, the Rating Scale Model (RSM) and the Partial Credit Model (PCM). The latter models are extensions of the Rasch model for polytomous data (Andrich 2016; Masters 2016). The RSM assumes a predetermined response structure (i.e. Likert Scales common in attitudinal surveys) and imposes equal category threshold parameters across all items. The PCM, on the other hand, remains agnostic about the number of categories per item and provides individual threshold estimates for each item/question (Masters 2016). For our purposes the RSM model is most appropriate, however, when response categories are sparse or irregular, the PCM can also be used to relax the constraint of equal item threshold parameters.

We rely on two procedures to investigate the fit of the data to the a-priori specification of the Rasch model. Given the large sample of countries we first assess the disparity between the model and the data using goodness of fit indices; an approach which stems primarily from the IRT literature. We use this approach as a filter to further investigate countries in which the demands of the Rasch model are likely to be met. In line with the recommendations of Maydeu-Olivares & Joe, we rely on the M2-statistic, the M2 based RMSEA, and in part, the TLI and the CFI to assess approximate fit of the models (2014). Taken together, these indicators help us assess whether a Rasch or Rasch-like model is likely to have generated the responses in the surveys used throughout this analysis. We calculate these fit indices using the mirt package which fits both unidimensional and multidimensional IRT models using maximum likelihood (ML) (P. Chalmers et al. 2015). All analyses used the RSM unidimensional model for polytomous items and the Rasch model for dichotomous items.

While model checking under the IRT framework primarily assesses whether the model fits the data, it does not provide evidence that the apriori demands of the Rasch model have been met. Investigation of fit under the Rasch framework is primarily focused on evaluating if the a-priori demands of the Rasch-model are met. The data and response patterns must fit the model in order to meet the demands of specific objectivity. To test these assumptions we rely on the Andersen Likelihood Ratio test as implemented in the R package eRm which employs conditional maximum likelihood (CML) to estimate model parameters[3](#_bookmark2) (Mair et al. 2018). The Andersen LR test is commonly used in Rasch Analysis as it is sensitive to violations of double monotonicity (parallel item response functions) due to unequal discrimination parameters. It is also useful in testing violations of the sufficiency of sum-score assumption (Meijer et al. 1990). The test builds on the demands of sub-scale homogeneity and assesses the equality of item location parameters across sub-samples (Mair, 2018). To do so, the median or mean of the raw scores on all survey items was used as a cut-off criteria, dividing the respective samples in groups of high trusters and low-trusters. The item location parameters in both sub-samples were then compared to check for important deviations. With the exception of the WVS sample used in the original article, we present results of the Andersen LR test in instances in which global fit indices suggest a close or adequate fit between the data and the model. In the case of the WVS, results from the Andersen test are provided for all countries analyzed. The Appendix to this technical report provides both mirt-global fit indicators and results from the Andersen LR test in all surveys for which these tests could be conducted. We also conducted additional non-parametric tests (for dichotomous responses) and residual-based tests of the assumptions of local stochastic independence. We

3The CML estimates and Andersen LR test most closely align with the measurement philosophy of the Rasch model (see

Von Davier 2016 in van der Linden 2017; and Mair and Hatzinger 2007).

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discuss the latter, when appropriate, as in our assessment of the Eurobarometer survey. However, for the sake of brevity we do not provide them in this technical appendix.

**Data and Sample Cuts**

We analyze commonly used political trust survey items in 8 cross-national surveys, 161 country-surveys, and 119 unique countries (see appendix Table 25 for a full list). The first analysis focuses on replicating the results of Zmerly and Newton (2017) from the 6th round of the World Values Survey using the RSM and the PCM. In so doing, we apply the same sample cuts for consistency. The final sample provides an overview of trust across 23 advanced democracies around the globe. As an extension of this analysis, we investigate the fit of respondents’ trust in various institutions from seven other cross-national surveys, namely Round 6 of the Afro barometer survey, Rounds 4 of the Arab Barometer survey, the Latino-Barometer collected between 2016 and 2017, the 8th Round of the European Social Survey, Rounds 3 and 4 of the Asian Barometer survey, the 2nd round of the South Asian Barometer, and the Eurobarometer 87.3 collected in 2017. Together these surveys provide a thorough picture of political trust across South and Central America, Africa, Europe, Asia, and 7 countries of the MENA region over the years 2010 to 2017.

Our selection of institutions to include on our political trust scales mirrors current approaches used in studies employing survey analysis in the political science literature. Tables 1,5,7,9,11, 13-15, and 19 provide a list of survey items, namely the set of institutions in which respondents expressed trust for each of the datasets included in our model. They also provide the unweighted mean values (based on a list-wide deleted sample) per items across the pooled datasets for each survey along with the number of respondents included for each analysis. The items trust in the justice system and in the police were asked in all 161 surveys. Trust in the parliament and political parties were asked in all but 2 and 3 countries respectively. 100 surveys also investigated trust in the national government and in 87 of the 161 surveys trust in the local government was inquired. Trust in the civil service was probed in 77 surveys. The electoral system featured in 65 surveys, and in 56 out of 161 surveys trust in the executive branch (president or prime minister) was probed. Additional institutions investigated the tax system (36 surveys).[4](#_bookmark3) The appendix (Table 25) provides a full list of the institutions in each of the 161 surveys kept for this analysis.

For our analysis, all answer patterns were recoded to ensure that the lowest value is equal to 0 and that lower values represent lower levels of political trust. Apart from the ESS which employed 11 response categories from 0 to 10 and the dichotomous responses of the Eurobarometer, all surveys employed a 4-point Likert structure (here recoded such that values range from 0 to 3). We employed list-wide deletion to remove respondents who failed to provide one or more responses (see appendix Table 25 for the percentage of individuals dropped from each survey and a discussion of missing data in our analysis.)

**Results**

**World Values Survey Round 6: Year (2010 to 2014)**

We first present results from our extended replication of Zmerli and Newton’s analysis which employed the fourth round of the World Values Survey in 23 advanced democracies. Table 1 below provides a summary of the sample used for this analysis.

4We did not include the item trust in the army/armed forces in any of our scales. Probing for trust in the army could be

associated with concepts broader than political trust such as nationalism ad patriotism in most instances. This is in line with scaling in many political science studies which rarely use the army item.

3

Table 1: WVS (2010-2014) Table of Descriptives based on Zmerli and Newton,2017 sample cuts

var

missing

n

M

SD

SE

min

max

range

median

mode

skew

kurtosis

CONF\_CIVSERV

0

32125

1.319

0.837

0.005

0

3

3

1

1

0.031

2.331

CONF\_GOV

0

32125

1.263

0.871

0.005

0

3

3

1

1

0.167

2.294

CONF\_PARTIES

0

32125

0.983

0.796

0.004

0

3

3

1

1

0.469

2.717

*Note:*

We present the global fit indices common in the IRT literature.

The M2 statistics, RMSEA, TLI and CFI

for the unidimensional RSM model are provided in Table 2. It is worth noting that the TLI and CFI values are not always reliable when tables of full-response patterns are sparse. Our findings, are informed by all indices and do not weigh heavily the TLI and CFI values.

Table 2: WVS (2010-2014) Rating Scale Model Global Fit Indicators and Mokken H-values

country

M2

df

p

RMSEA

RMSEA\_5

RMSEA\_95

TLI

CFI

scale\_H

se

India

196.465

12

0

0.099

0.087

0.111

-0.776

0.000

0.205

0.012

Mexico

331.858

12

0

0.117

0.106

0.128

0.834

0.337

0.546

0.013

Taiwan, Republic of China

244.621

12

0

0.133

0.119

0.148

0.643

0.000

0.597

0.017

South Africa

804.245

12

0

0.143

0.135

0.151

0.715

0.000

0.611

0.009

Spain

300.971

12

0

0.149

0.135

0.164

0.560

0.000

0.477

0.018

Poland

302.199

12

0

0.174

0.157

0.191

0.485

0.000

0.605

0.021

Slovenia

392.313

12

0

0.179

0.164

0.194

0.590

0.000

0.615

0.020

Sweden

381.103

12

0

0.179

0.164

0.195

-0.081

0.000

0.580

0.020

Germany

839.380

12

0

0.191

0.181

0.203

-0.024

0.000

0.547

0.014

Korea (South)

666.249

12

0

0.214

0.200

0.228

0.236

0.000

0.649

0.016

Netherlands

1012.109

12

0

0.221

0.210

0.233

0.242

0.000

0.645

0.013

Japan

1666.991

12

0

0.268

0.257

0.279

-0.357

0.000

0.648

0.013

Fit Indicators of the Rating Scale Model sorted by the M2-based RMSEA

As shown in Table 2, with the exception of India, the institutional trust items do constitute medium to strong Mokken scales across all countries. This replicates the results of Zmerli and Newton (2017). However, the global indicators assessing the closeness of fit between the Rasch RSM and the data strongly suggest that these scales do not fit the Rasch model. The non-significant M2-based p-values in Table 2 indicate a poor fit. Likewise, the RMSEA and their confidence intervals which are all above the widely accepted cut-off of .05 for close fit and .08 for adequate fit also indicate poor fit. The TLI and CFI values which are well below commonly accepted cut-offs of 0.95 to 0.90 depict the same picture. The Rasch Rating Scale Model is unlikely to have generated the observed data. As previously noted these indicators only provide an estimate

4

*Note:*

United States of America 1360.736 12 0 0.230 0.220 0.240 -0.136 0.000 0.577 0.014

Estonia 812.649 12 0 0.218 0.205 0.230 -0.183 0.000 0.584 0.015

Romania 741.546 12 0 0.212 0.199 0.225 0.437 0.000 0.594 0.017

Uruguay 336.469 12 0 0.181 0.164 0.198 0.270 0.000 0.497 0.020

Australia 553.898 12 0 0.179 0.167 0.192 0.296 0.000 0.485 0.017

Argentina 358.214 12 0 0.174 0.159 0.190 0.458 0.000 0.512 0.019

Cyprus 312.282 12 0 0.162 0.146 0.177 0.281 0.000 0.568 0.018

Philippines 318.961 12 0 0.146 0.133 0.160 0.422 0.000 0.516 0.018

Chile 219.670 12 0 0.136 0.120 0.152 0.621 0.000 0.549 0.017

Brazil 299.846 12 0 0.130 0.117 0.142 0.671 0.000 0.498 0.014

Peru 199.920 12 0 0.116 0.102 0.131 0.873 0.492 0.590 0.018

Item Description of Full Sample used for extended replication of Zmerli & Newton’s 2017 WVS (2010-2014) Analysis.

CONF\_POLICE 0 32125 1.591 0.881 0.005 0 3 3 2 2 -0.258 2.365

CONF\_PARL 0 32125 1.151 0.849 0.005 0 3 3 1 1 0.273 2.380

CONF\_COURTS 0 32125 1.516 0.891 0.005 0 3 3 2 2 -0.130 2.264

of closeness of fit to the data. To test whether the demands of the Rasch model are met we use the Andersen LR Test which assesses sub-scale invariance/homogeneity.

Table 3 below provides the results of the Andersen LR Test conducted in 18 of the 23 countries for which the RSM could be fit.It is worth noting that in South Africa, Uruguay, India, Mexico, and Brazil the RSM model could not be estimated as the minimization algorithm did not converge on a solution.[5](#_bookmark4) A condition for this test is that the response pattern for each item meet a number of criteria. Among them is the condition that each item have an equal number of response categories and that variation exists in the response pattern for each sub-sample. For example, in the event that everyone in the low-trusting group answers 0 to the item trust in parliament, that item cannot be used for the Andersen LR test. We also list the items that met these pre-conditions and were kept for the Andersen LR test in table 3.

Table 3: WVS (2010-2014) Andersen Likelihood Ratio Test for Rating Scale Model (RSM)

country

Slovenia

LR

3.796

Chi2.df

3

p.value

0.284

Items.kept

police, courts

Poland

6.123

3

0.106

police, courts

Netherlands

15.746

3

0.001

police, civserv

Spain

41.980

6

0.000

police, parl, civserv, parties, courts

Chile

54.379

3

0.000

police, parties

Australia

127.345

5

0.000

police, parl, civserv, courts

Germany

187.965

7

0.000

police, parl, civserv, gov, parties, courts

Philippines

13783097.215

7

0.000

police, parl, civserv, gov, parties, courts

Taiwan, Republic of China

18511187.548

6

0.000

police, civserv, gov, parties, courts

*Note:*

These results indicate a common story line. In no country within this sample does the data meet the demands of the Rasch model. Looking at the Andersen LR Test results for the RSM, trust in the police, in parliament, the civil service, the national government, political parties, and in the justice system do not form a scale which meets the demands of the Rasch model. The significant p-values in Table 3 indicate an important difference between item location parameters (the trustworthiness of these institutions) within sub-samples of highly-trusting individuals and others with low-political trust. The non-significant p-values in Slovenia, South Korea, and Poland which seem to indicate a fit of the Rasch model are evaluated only with two-item scales consisting of confidence in the police and the courts in Slovenia and Poland and confidence in the police and the civil service in South Korea. In those countries, these item pairs meet the demands of the Rasch model. However, the automatic removal of four other institutions on our scale due to inappropriate response patterns is strong evidence that a political trust scale which includes both implementing institutions such as the police, the courts and the civil service and representative institutions such as the national parliament, government, and political parties does not meet the demands of the Rasch model.[6](#_bookmark5) It is worth noting that

5A closer analysis of the item trace lines suggests that in these countries response patterns conditioned on the latent score on

certain items were very closely related, making it difficult for the algorithm to converge on a solution of the location parameters.

6Failure to estimate the item location parameters in the RSM when response patterns are inappropriate and the removal of certain items from the LR tests makes systematic analysis across countries in our sample more difficult. To be clear, these

5

Andersen Likelihood Ratio Test with Median Split: Location Parameters estimated with CML in eRm package.

United States of America 123.877 5 0.000 police, civserv, gov, courts

Romania 133.021 7 0.000 police, parl, civserv, gov, parties, courts

Peru 119.425 5 0.000 police, civserv, gov, courts

Cyprus 118.860 7 0.000 police, parl, civserv, gov, parties, courts

Estonia 66.030 4 0.000 police, gov, courts

Argentina 59.883 6 0.000 police, civserv, gov, parties, courts

Sweden 25.546 3 0.000 civserv, courts

Japan 11.543 3 0.009 police, parties

Korea (South) 5.988 3 0.112 police, civserv

in the case of the Philippines and Taiwan, no likelihood value converged.

In Table 4, we relax the constraint of a pre-defined response structure by using the PCM in which item category/threshold parameters are estimated individually. We note that this is not in line with the data collection process which did employ a common response structure as respondents were provided with a choice of 4 responses. However, it is likely that empirically this common structure may not emerge from the data if respondents in a given country never select a particular response category. The PCM enables us to relax the assumption of a common response structure and test the assumptions of a Rasch-type model in all 23 countries.

Table 4: WVS (2010-2014) Andersen Likelihood Ratio Test for Partial Credit Model (PCM)

country

Sweden

LR

4.568

Chi2.df

5

p.value

0.471

Items.kept

civserv, courts

Poland

6.932

5

0.226

police, courts

Netherlands

24.013

5

0.000

police, civserv

Argentina

64.700

14

0.000

police, civserv, gov, parties, courts

Chile

58.759

5

0.000

police, parties

Brazil

79.079

11

0.000

police, civserv, gov, courts

Cyprus

119.304

17

0.000

police, parl, civserv, gov, parties, courts

Estonia

102.668

8

0.000

police, gov, courts

Mexico

178.168

17

0.000

police, parl, civserv, gov, parties, courts

Philippines

226.004

17

0.000

police, parl, civserv, gov, parties, courts

United States of America

134.728

11

0.000

police, civserv, gov, courts

South Africa

234.029

17

0.000

police, parl, civserv, gov, parties, courts

Andersen Likelihood Ratio Test for PCM with Median Split: Location Parameters estimated with CML in eRm package.

Our findings shown in Table 3 are unchanged. In no country does trust in these 6 institutions generate a scale which meets the demands of the Rasch model. Where we do find non-significant p-values indicating sub-scale invariance of the item parameters across high and low trusters, the scale has been reduced to two-items due to inappropriate response patterns on the other 4 items. In Sweden, confidence in the civil service and the courts meet the demands of the Rasch model. In Slovenia and Poland it is confidence in the police and the courts which does so. And in South Korea confidence in the Police and the Civil Service constitute scales which meet the Rasch demands of specific objectivity. In all these cases, the two-items scale reflect trust in implementing institutions, a divide often seen in the literature. However, commonly used items combining both representative and implementing institutions fail to meet the demands of the Rasch model. Taken together these findings strongly suggest that a 6 item scale does not meet the demands of a unidimensional Rasch model as implemented by the RSM or the PCM.[7](#_bookmark6)

are not downfalls of this approach, on the contrary we believe they are strengths. In instances when item location parameters cannot be estimated or when the Andersen LR test removes a set of items we can conclude that the scales with a full set of items are unlikely to meet the demands of the Rasch model. For these reasons, we do employ CML and the Andersen LR test and present these results in our appendix. This allows us to double-check findings from the ML estimation procedure and their equivalent fit statistics which we present here for the sake of portraying a systematic overview.

7In addition we performed a number of robustness checks to assess whether our findings were sensitive to the number of

6

*Note:*

Uruguay 160.788 14 0.000 police, parl, civserv, gov, courts

Romania 155.176 17 0.000 police, parl, civserv, gov, parties, courts

Peru 139.368 11 0.000 police, civserv, gov, courts

India 124.487 17 0.000 police, parl, civserv, gov, parties, courts

Germany 277.264 17 0.000 police, parl, civserv, gov, parties, courts

Australia 121.958 11 0.000 police, parl, civserv, courts

Taiwan, Republic of China 81.838 14 0.000 police, civserv, gov, parties, courts

Spain 73.684 14 0.000 police, parl, civserv, parties, courts

Japan 40.782 5 0.000 police, parties

Korea (South) 9.326 5 0.097 police, civserv

Slovenia 4.589 5 0.468 police, courts

**Extensions**

We extend our analysis by using a number of the Barometer Surveys and the European Social Survey. For these extensions we present results from the mirt package which uses ML estimation. We rely on global fit indicators assessing fit between the data and the model to test the assumptions of the Rasch model in country-surveys that closely or adequately fit the Rasch model.

**Afrobarometer Survey Round 6: Year (2014 to 2015)**

The 6th round of the Afrobarometer was conducted in 36 African countries. In 32 of them respondents were probed for their levels of trust in various state institutions. Here we select 8 of these institutions, namely the presidency, the national parliament, the national electoral commission, the tax office, local governments, the police, the justice system, and the ruling party. Omitted items included trust in the army and in opposition parties. In the case of the former, trust in the army is often associated with nationalism. While it is plausible that in some countries with a history of civil unrest and mutinies individuals may be more skeptical about the army and as a result not attribute blind support to this institution, we kept in line with the common practice of excluding the army from our political trust scale. We removed trust in the opposition party to avoid creating an overly polarized scale which would include both trust in the ruling party and in the opposition party. We believe that a single party item provides enough information about political trust in political parties. Unfortunately no item probed respondents for their trust in the party system. Consequently, we relied on trust in the ruling party as a proxy for respondents confidence in the political parties. Table 5 below provides descriptive statistics of the items which we include on the scale along with the overall list-wide deleted sample size.

Table 5: Afrobarometer (2014-2015) Table of Descriptives for 8 trust items in list-wide deleted sample of 32 countries.

var

TRST\_COURTS

missing

0

n

42201

M

1.611

SD

1.075

SE

0.005

min

0

max

3

range

3

median

2

mode

2

skew

-0.125

kurtosis

1.753

TRST\_NEC

0

42201

1.535

1.115

0.005

0

3

3

2

2

-0.049

1.649

TRST\_POLICE

0

42201

1.482

1.116

0.005

0

3

3

1

1

0.029

1.644

TRST\_RULPART

0

42201

1.446

1.137

0.006

0

3

3

1

0

0.072

1.602

*Note:*

Item Description of Afrobarometer Survey Analytical Sample - Pooled sample of 32 countries.

Table 6 provides an overview of the global fit results for the unidimensional Rating Scale Model. These results largely confirm that the data do not adequately fit the Rasch model. The p-value associated with the M2 is lower than .0001 in all cases which indicates a significant difference between the model and the data, the RMSEAs and their confidence intervals fail to reach a value lower than .05 in all countries. Only Togo’s RMSEA and its lower 5% confidence interval are close to the adequate-fit cut-off of .08 suggested by (Browne and Cudeck 1993). Nevertheless, even in that case the CFI and TLI values remain low with TLI

= .927 and CFI =.848; both values below the commonly accepted cut-off of .95. This strongly indicates that the Rasch model is not a fitting model for this data and consequently its benefits and measurement properties are also not valid for commonly used political trust scales.

categories used and the items included. Dichotomizing the data such that categories 0 and 1 = 0 and 2 and 3 = 1 did not alter our findings. Moreover, eliminating trust in the police, which tended to be the worst fitting item in most countries in the WVS data did not change our findings. The eRm package and Andersen LR test were used to investigate the assumptions of the Rasch model for these robustness checks.

7

TRST\_TAX 0 42201 1.452 1.073 0.005 0 3 3 1 1 0.057 1.750

TRST\_PRESIDENT 0 42201 1.681 1.162 0.006 0 3 3 2 3 -0.207 1.572

TRST\_PARL 0 42201 1.501 1.088 0.005 0 3 3 1 1 0.002 1.712

TRST\_LOCGOV 0 42201 1.462 1.071 0.005 0 3 3 1 1 0.048 1.755

Table 6: Afrobarometer Round 6 (2014-2015) Rating Scale Model Global Fit Indicators and Mokken H-values

country

Togo

M2

200.260

df

25

p

0

RMSEA

0.083

RMSEA\_5

0.073

RMSEA\_95

0.094

TLI

0.927

CFI

0.848

scale\_H

0.673

se

0.013

Gabon

308.043

25

0

0.099

0.089

0.109

0.870

0.730

0.531

0.015

Liberia

346.440

25

0

0.106

0.096

0.116

0.857

0.703

0.539

0.016

Tanzania

773.946

25

0

0.118

0.111

0.125

0.712

0.401

0.572

0.012

Namibia

449.385

25

0

0.125

0.115

0.135

0.655

0.281

0.614

0.016

Mali

522.124

25

0

0.130

0.121

0.140

0.670

0.312

0.528

0.015

Tunisia

448.177

25

0

0.133

0.123

0.144

0.592

0.150

0.405

0.016

Guinea

510.905

25

0

0.134

0.124

0.144

0.762

0.505

0.644

0.013

Cape Verde

489.724

25

0

0.137

0.126

0.147

0.679

0.331

0.538

0.016

South Africa

1024.732

25

0

0.139

0.131

0.146

0.660

0.292

0.488

0.011

Senegal

463.889

25

0

0.141

0.130

0.153

0.614

0.196

0.508

0.017

Ghana

1192.821

25

0

0.147

0.140

0.154

0.799

0.582

0.634

0.010

Malawi

1252.630

25

0

0.156

0.149

0.164

0.574

0.112

0.453

0.011

Zimbabwe

1326.205

25

0

0.162

0.154

0.169

0.676

0.325

0.710

0.009

Benin

792.608

25

0

0.167

0.157

0.177

0.629

0.227

0.594

0.014

Mauritius

973.332

25

0

0.187

0.177

0.197

0.543

0.048

0.643

0.016

*Note:*

**Latino Barometer Survey: Year (2017)**

The Latino Barometer survey 2017 was conducted in 18 South and Central American Countries. For this analysis we assess whether six polytomous items, namely, confidence in the electoral system, the government, the justice system, parliament, political parties, and in the police meet the demands of the Rasch model. Table 7 below provides an overview of descriptive statistics for each of these items in the overall sample.

8

Fit Indicators of the Rating Scale Model sorted by the M2-based RMSEA

Cote d’Ivoire 1171.053 25 0 0.207 0.197 0.217 0.365 0.000 0.593 0.015

Kenya 1451.020 25 0 0.171 0.164 0.179 0.175 0.000 0.488 0.012

Algeria 654.146 25 0 0.162 0.152 0.173 0.769 0.518 0.696 0.013

Sierra Leone 614.563 25 0 0.157 0.146 0.168 0.541 0.043 0.490 0.017

Uganda 1110.621 25 0 0.150 0.142 0.157 0.149 0.000 0.434 0.012

Sudan 575.548 25 0 0.146 0.136 0.156 0.673 0.319 0.561 0.015

Lesotho 421.098 25 0 0.140 0.128 0.152 0.430 0.000 0.403 0.016

Botswana 508.952 25 0 0.137 0.127 0.148 0.521 0.003 0.489 0.016

SÃ£o TomÃ© and PrÃncipe 465.521 25 0 0.136 0.125 0.147 0.684 0.341 0.443 0.018

Niger 511.461 25 0 0.134 0.124 0.144 0.667 0.306 0.626 0.016

Madagascar 525.544 25 0 0.131 0.121 0.141 0.660 0.291 0.531 0.015

Mozambique 768.755 25 0 0.127 0.119 0.135 0.790 0.562 0.669 0.010

Zambia 408.480 25 0 0.123 0.112 0.133 0.754 0.488 0.559 0.015

Cameroon 324.762 25 0 0.107 0.097 0.118 0.759 0.497 0.512 0.015

Nigeria 574.243 25 0 0.100 0.093 0.107 0.874 0.737 0.485 0.010

Burundi 247.349 25 0 0.093 0.082 0.103 0.810 0.604 0.582 0.015

Table 7: Latino Barometer (2017) Table of Descriptives for 6 trust items in list-wide deleted sample of 18 countries.

var

missing

n

M

SD

SE

min

max

range

median

mode

skew

kurtosis

CONF\_ELECSYS

0

18675

1.026

0.955

0.007

0

3

3

1

0

0.517

2.228

CONF\_JUSTICE

0

18675

0.934

0.896

0.007

0

3

3

1

0

0.594

2.432

CONF\_PARTIES

0

18675

0.626

0.806

0.006

0

3

3

0

0

1.097

3.363

*Note:*

Item Description of Latino Barometer Survey Analytical Sample - Pooled sample of 18 countries.

As shown in Table 8 below, in no country does the Rasch model closely fit the political trust scale. Looking at the M2 based p-values all of them are significant beyond a cut-off of .0001 indicating a difference between the model and the data. Interestingly, the RMSEA for Colombia, Peru and Chile are well below the cut-off of

.05, nevertheless their upper confidence interval at the 95% level is well above .05. Based on a less restrictive cut-off of 0.08 for the RMSEA value, this may indicate adequate fit. However, the CFI values remain below the commonly accepted cut-off of .95 while the TLI values are slightly above it. Overall, this suggests that the Rasch model may fit in these 3 countries and a significant misfit of the Rasch model in the remaining countries. Further analysis of global fit using the Andersen LR test for both the RSM and PCM on this dataset suggested that in no country were the scale sub-sample invariant across high and low trusters. This indicates that the properties of the Rasch model and its benefits cannot be conferred upon political trust scales in South and Central America.

Table 8: Latino Barometer (2017) Rating Scale Model Global Fit Indicators and Mokken H-values

country

Colombia

M2

44.273

df

12

p

0

RMSEA

0.048

RMSEA\_5

0.034

RMSEA\_95

0.064

TLI

0.978

CFI

0.910

scale\_H

0.499

se

0.018

Chile

50.099

12

0

0.053

0.038

0.069

0.968

0.872

0.556

0.016

Panama

59.794

12

0

0.068

0.051

0.085

0.946

0.784

0.491

0.019

Bolivia

92.310

12

0

0.078

0.064

0.094

0.884

0.537

0.485

0.017

Ecuador

102.189

12

0

0.080

0.066

0.095

0.942

0.769

0.629

0.015

El Salvador

93.290

12

0

0.086

0.070

0.102

0.938

0.752

0.583

0.020

Nicaragua

123.008

12

0

0.102

0.086

0.119

0.895

0.579

0.598

0.017

Brazil

168.998

12

0

0.109

0.094

0.123

0.877

0.507

0.467

0.016

Uruguay

291.640

12

0

0.147

0.132

0.161

0.615

0.000

0.502

0.016

*Note:*

Fit Indicators of the Rating Scale Model sorted by the M2-based RMSEA

**Arab Barometer Round 4: Year (2016 to 2017)**

We evaluated a political trust scale in seven countries in the MENA region to see if they formed a Rasch-

9

Venezuela 808.489 12 0 0.240 0.226 0.254 0.321 0.000 0.514 0.015

Argentina 196.950 12 0 0.119 0.105 0.134 0.818 0.273 0.412 0.018

Costa Rica 137.103 12 0 0.106 0.090 0.122 0.719 0.000 0.455 0.018

Honduras 121.512 12 0 0.100 0.084 0.116 0.814 0.256 0.360 0.017

Guatemala 82.941 12 0 0.081 0.065 0.098 0.908 0.633 0.509 0.020

Dominican Rep. 83.269 12 0 0.079 0.064 0.096 0.934 0.737 0.519 0.020

Paraguay 76.387 12 0 0.070 0.055 0.085 0.977 0.908 0.714 0.015

Mexico 67.910 12 0 0.065 0.050 0.081 0.944 0.776 0.491 0.017

Peru 45.913 12 0 0.050 0.035 0.066 0.954 0.817 0.447 0.018

CONF\_POLICE 0 18675 1.142 0.946 0.007 0 3 3 1 1 0.355 2.148

CONF\_PARL 0 18675 0.864 0.876 0.006 0 3 3 1 0 0.711 2.645

CONF\_GOV 0 18675 0.897 0.921 0.007 0 3 3 1 0 0.703 2.512

like scale. The institutions included on the scale included the national government, the justice system, parliament, political parties, and the police. Table 9 below provides an overview of descriptive statistics for each of these items.

Table 9: Arab Barometer (2017) Table of Descriptives for 5 trust items in list-wide deleted sample of 7 countries.

var

missing

n

M

SD

SE

min

max

range

median

mode

skew

kurtosis

CONF\_GOV

0

7378

1.119

1.049

0.012

0

3

3

1

0

0.391

1.867

CONF\_PARL

0

7378

0.843

0.963

0.011

0

3

3

1

0

0.809

2.494

CONF\_POLICE

0

7378

1.837

1.065

0.012

0

3

3

2

3

-0.441

1.936

Item Description of Arab Barometer Survey Analytical Sample - Pooled sample of 7 countries.

Table 10 provides an overview of global fit statistics for the RSM in the model. Surprisingly in Tunisia and Palestine, the Rasch model seems to adequately fit the data. Although the C2 based p-values remain below the .0001 level suggesting poor fit, the RMSEA, its confidence intervals and the TLI and CFI indicate adequate fit when using a relaxed cut-off of <=0.08 for the RMSEA. Taken together this suggests a reasonable fit in Tunisia and perhaps in Palestine as its upper bound confidence interval of the RMSEA (95%) are higher than 0.08. However, to ensure that the demands of the Rasch model are met, it is not enough that the data resemble the predicted values of the Rasch model. Analysis of fit of the data to the demands of the Rasch model (RSM) according to the Andersen LR Test suggests that with the exception of Tunisia, in no other country/territory surveyed in the Arab Barometer do the political trust scales exhibit sub-scale invariance across respondents with high trust and those with low levels of political trust. Moreover, in Palestine the government item is removed from the scale due to inappropriate response patterns. However, the political trust scale in Tunisia consisting of confidence in political parties, in government, in the justice system, and in the police does exhibit sub-scale invariance between respondents with low political trust and those with high political trust. Results from the Andersen LR test of the RSM model yield a non-significant p-value of

0.14. This is further depicted in Figure 1 below as most of the location parameters fall within the confidence

intervals along the diagonal line comparing location parameters among a sample above and below median levels of political trust.

Table 10: Arab Barometer (2016-2017) Rating Scale Model Global Fit Indicators and Mokken H-values

country

Tunisia

M2

86.789

df

17

p

0

RMSEA

0.065

RMSEA\_5

0.052

RMSEA\_95

0.079

TLI

0.973

CFI

0.954

scale\_H

0.456

se

0.020

Morocco

180.120

17

0

0.095

0.083

0.108

0.965

0.941

0.597

0.017

Jordan

308.699

17

0

0.126

0.114

0.138

0.833

0.716

0.497

0.020

Lebanon

386.650

17

0

0.136

0.124

0.148

0.911

0.848

0.493

0.021

Fit Indicators of the Rating Scale Model sorted by the C2-based RMSEA

10

*Note:*

Algeria 360.807 17 0 0.135 0.123 0.148 0.930 0.882 0.573 0.018

Egypt 266.237 17 0 0.123 0.110 0.137 0.915 0.856 0.465 0.019

Palestine 116.847 17 0 0.076 0.063 0.089 0.982 0.969 0.620 0.015

*Note:*

CONF\_PARTIES 0 7378 0.580 0.803 0.009 0 3 3 0 0 1.241 3.706

CONF\_JUSTICE 0 7378 1.316 1.058 0.012 0 3 3 1 0 0.163 1.783

**Figure 1:Tunisia Graphical Model Check**

beta CONF\_PARTIES.c3

beta CONF\_PARTIES.c2 beta CONF\_GOV.c3

beta CONF\_JUSTICE.c3

beta CONF\_PARTIES.c1

beta CONF\_GOV.c2 beta CONF\_JUSTICE.c2

beta CbOeNtaF\_CJOUNSFT\_ICGEO.Vc.1c1

beta CONF\_POLICE.c1 beta CONF\_POLICE.c3

beta CONF\_POLICE.c2

−4

−2

0

2

4

6

8

Beta for Group: Raw Scores < Mean

## NULL

**European Social Survey Round 8: Year (2016 to 2017)**

The 8th round of the European Social Survey provides responses to trust in 4 political institutions across twenty-three European countries. These institutions are the police, the justice system, the national parliament and political parties. As the ESS provides respondents with 11 response categories (0 to 10), it is particularly difficult to assess response patterns in this survey. Table 11 below provides the number of respondents in the final list-wide deleted sample along with descriptive statistics for each of the 4 items and Table 12 reports the global fit indicators of the Rasch Model (RSM).

Table 11: European Social Survey (ESS 2017) Table of Descriptives for 4 trust items in list-wide deleted sample of 23 countries.

var

missing

n

M

SD

SE

min

max

range

median

mode

skew

kurtosis

CONF\_JUSTICE

0

42574

5.417

2.606

0.013

0

10

10

6

5

-0.409

2.405

CONF\_PARTIES

0

42574

3.644

2.380

0.012

0

10

10

4

5

0.084

2.201

*Note:*

Item Description of ESS Analytical Sample - Pooled sample of 23 countries. Each item has 11 categories

11

Beta for Group: Raw Scores >= Mean

−2

0

2

4

CONF\_POLICE 0 42574 6.392 2.414 0.012 0 10 10 7 8 -0.762 3.150

CONF\_PARL 0 42574 4.587 2.549 0.012 0 10 10 5 5 -0.164 2.291

Table 12: European Social Survey 8 (2016-2017) Rating Scale Model Global Fit Indicators and Mokken H-values (recoded)

country

M2

df

p

RMSEA

RMSEA\_5

RMSEA\_95

TLI

CFI

scale\_H

se

Slovenia

210.188

32

0

0.067

0.058

0.075

0.986

0.924

0.585

0.015

Hungary

296.339

32

0

0.073

0.066

0.081

0.987

0.930

0.653

0.012

France

435.940

32

0

0.079

0.072

0.086

0.972

0.852

0.495

0.013

Ireland

589.563

32

0

0.082

0.076

0.088

0.972

0.850

0.498

0.012

Russian Federation

552.964

32

0

0.086

0.080

0.092

0.983

0.911

0.668

0.011

Czechia

672.523

32

0

0.095

0.089

0.101

0.979

0.889

0.674

0.011

Switzerland

461.965

32

0

0.097

0.089

0.105

0.967

0.823

0.546

0.017

United Kingdom

674.652

32

0

0.103

0.096

0.110

0.963

0.804

0.552

0.014

Netherlands

642.320

32

0

0.108

0.101

0.116

0.965

0.816

0.597

0.014

Sweden

655.347

32

0

0.115

0.107

0.122

0.960

0.786

0.578

0.015

Iceland

434.602

32

0

0.121

0.111

0.131

0.949

0.727

0.567

0.020

Lithuania

1088.013

32

0

0.128

0.121

0.134

0.953

0.747

0.595

0.012

Fit Indicators of the RSM sorted by C2-based RMSEA. Mokken Scale Values (Category 10 collapsed to 9 for Mokken Analysis)

The results shown in table 12 above indicate that trust in the justice system, the national parliament, the police and political parties generate strong Mokken scales. However, the Rasch model does not closely fit the data generating process. In no country is the C2-based p-value significant. This indicates a divergence between the data and the Rating Scale Model. Nevertheless, the values of the RMSEA, the TLI and the CFI suggest that in 6 countries the data may adequately fit the Rasch model. In Slovenia, Portugal, Hungary, Spain, France and Israel the RMSEA values are less than .08 with values lower than .08 indicating adequate fit. However, if we were to base our selection criteria on the upper confidence interval at 95%, only Slovenia and Portugal would exhibit adequate fit to the Rasch model. Nevertheless, in these six countries, the TLIs are all above .97 and the CFI values range from .85 to .93 suggesting an acceptable fit. However, a stricter and more commonly accepted TLI and CFI cut-off of values > .90 would indicate that only responses in Slovenia and Hungary exhibit adequate fit to the model. Overall, these various fit indices suggest that in most cases it is unlikely that the data generating process resembles the Rasch model. Only in a handful of countries do we find an adequate fit between the data and the model. Yet, as previously stated, we find it important to note that fit indicators do not provide much information about whether the apriori assumptions of the Rasch model are met. Results from the Andersen test, as implemented in eRm revealed that in all but six countries all four items on the scale had inaccurate response patterns, leaving no items for analysis. Of the six countries left, none were close to an acceptable p-value for the Andersen LR test. This puts into question the validity of using items with longer response categories to capture variation across respondents. Analyzing the data against the demands of the Rasch model suggests that combining political trust items with more response category does not necessarily yield better measurement. Rather, it may lead to more violations of the sufficiency of the sum-score for person placement on the latent scale.

**Asian Barometer Round 4, Round 3, and South Asian Barometer Round 2**

To assess an institutional trust scale in Asia and South Asia, we rely on the third and fourth round of the Asian barometer as well as data from the second round of the South Asian Barometer. We first analyze

12

*Note:*

Finland 956.160 32 0 0.123 0.116 0.130 0.951 0.739 0.593 0.014

Austria 869.732 32 0 0.115 0.109 0.122 0.957 0.773 0.575 0.014

Norway 661.095 32 0 0.114 0.106 0.121 0.956 0.766 0.557 0.017

Italy 946.817 32 0 0.107 0.101 0.112 0.962 0.797 0.578 0.011

Germany 936.207 32 0 0.101 0.095 0.106 0.964 0.808 0.547 0.011

Poland 504.473 32 0 0.097 0.090 0.104 0.963 0.803 0.519 0.015

Estonia 564.174 32 0 0.093 0.086 0.099 0.972 0.853 0.579 0.013

Belgium 411.665 32 0 0.083 0.076 0.090 0.979 0.886 0.584 0.014

Israel 515.407 32 0 0.079 0.073 0.085 0.973 0.857 0.501 0.012

Spain 361.584 32 0 0.075 0.068 0.082 0.980 0.894 0.571 0.013

Portugal 211.001 32 0 0.068 0.059 0.077 0.976 0.870 0.460 0.018

responses from the fourth round of the Asian barometer collected between 2014 and 2016 to ensure consistency in the timing of data collection across our analysis. At the time of analysis, data from the 4th round of the Asian Barometer was available for 9 countries: Cambodia, Malaysia, Mongolia, Myanmar, the Philippines, Singapore, South Korea, Taiwan, and Thailand. To allow for a larger coverage of countries we use data from 5 countries in the 3rd round of the Asian barometer conducted between 2010 and 2012. As of writing, five countries were not included in the 4th round of the Asian Barometer survey, namely: Japan, Hong Kong, Mainland China, India and Vietnam. Lastly, we also include data gathered in 2013 across five countries in South Asia for the second round of the South Asian Barometer. These five countries are India, Pakistan, Bangladesh, Sri Lanka and Nepal. With a few exceptions, we assessed the scale properties of a similar range of institutions across these 19 countries. Across countries featured in the 3rd and 4th round of the Asian Barometer, our scales consisted of trust in 9 institutions. They are: the civil service, the courts, local governments, the national government, the national electoral commission, parliament, political parties, the police, and the presidency. Exceptions include Singapore (Round 4) where respondents were not asked about their trust in the local government or in the national electoral commission.[8](#_bookmark7) In the 3rd round, respondents in Mainland China were not asked about the National Electoral Commission or the Presidency. In Vietnam (Round 3) trust in the presidency was not included in the questionnaire. In the remaining 5 countries featured in the second round of the South Asian Barometer Trust in the National Electoral Commission was not featured in any of the questionnaires. Where applicable respondents’ trust in the Prime Minister was asked instead of Trust in the President. In Pakistan and Nepal, questionnaires did not include trust in local governments. Trust in the National Government was not included in Bangladesh or Nepal. Lastly, the survey in Nepal did not include trust in the Parliament.[9](#_bookmark8) Tables 13 to 15 below provide an overview of key descriptive statistics for the list-wide deleted data for the 4th and 3rd rounds of the Asian Barometer as well as for the 2nd round of the South Asian Barometer. As noted, in a few countries the number of survey items does differ. A full breakdown of the number of missing items is provided for each country in the appendix. Furthermore while we provide results from the list-wide deleted sample, the proportion of respondents with missing responses on at least 1 item across these 8 items is substantial, ranging from 4.8% in South Korea to 42.5% in Myanmar.[10](#_bookmark9)

8This is due to the fact that Singapore has no elected local governments. There is however, a local administration. Moreover,

the elections department is not structured in a way that is independent of the current ruling government.

9Respondents were not asked about trust in key institutions such as local government, the national government, and the parliament in Nepal. This is warranted given that national level elections only took place in 2013 and until 2006 Nepal was a de facto Monarchy.

10Using list-wide deletion poses an important challenge for our analysis. In 84 out of 161 country-surveys more than 10% (between 10% and 49.8%) of respondents are removed from the analytical sample as a result of the procedure. This may lead to an overemphasis of the difference in the quality of the surveys. It also implies that the scales we analyze throughout this paper primarily reflect the properties of institutional trust among those who are willing to respond to these survey questions and/or who know how much trust they have in these institutions. Probing why individuals do not respond or do not know about trust in various institutions is beyond the scope of this paper. Previous research on the topic already indicates that the nature of political trust is not the same in democracies vs. authoritarian regimes. Moreover in certain settings respondents may have good reasons not to respond to survey items which may be sensitive or may put them at risk. While we do not fully investigate these points, we replicate our analysis (with the exception of the Eurobarometer) with 10 datasets in which missing responses have been imputed. The results presented here remain unchanged. We provide the full results in the supplementary materials. The imputation approach we employed makes use of some of the available responses in each country-sample and yields drastically different sample sizes in these countries. However, it does not change the findings presented throughout this paper. Regarding sample size, with the exception of country-surveys in Jordan and Lebanon in the Arab Barometer, only 1 country, Nepal, had upwards of 10% of respondents who did not provide any responses to questions about trust in the institutions we use for these scales. In Jordan and Lebanon, the surveys consisted of 300 Refugees for whom the surveys did not inquire about institutional trust. The highest percentages of completely missing responses were in Nepal (10.1%), Myanmar (6.54%), India (5.33%), and Mozambique (4.46%). Table 1 in the supplementary materials provides an overview of country-surveys in which more than 1% of the sample did not provide any response to the institutional trust items inquired about.

13

Table 13: Asian Barometer Round 4 (2014 - 2016) Table of Descriptives for 9 trust items in list-wide deleted sample of 9 countries.

var

TRST\_CIVSERV

missing

0

n

9475

M

1.643

SD

0.792

SE

0.008

min

0

max

3

range

3

median

2

mode

2

skew

-0.173

kurtosis

2.613

TRST\_LOCGOV

945

8530

1.607

0.810

0.009

0

3

3

2

2

-0.155

2.548

TRST\_NEC

945

8530

1.575

0.816

0.009

0

3

3

2

2

-0.154

2.525

TRST\_PARTIES

0

9475

1.275

0.828

0.009

0

3

3

1

1

0.172

2.457

TRST\_PRES

0

9475

1.648

0.862

0.009

0

3

3

2

2

-0.156

2.374

Item Description of ASB Round 4 Analytical Sample - Pooled sample of 9 countries. Each item has 4 categories

Table 14: Asian Barometer Round 3 (2010 - 2012) Table of Descriptives for 9 trust items in list-wide deleted sample of 5 countries.

var

TRST\_CIVSERV

missing

0

n

7461

M

1.743

SD

0.736

SE

0.009

min

0

max

3

range

3

median

2

mode

2

skew

-0.190

kurtosis

2.787

TRST\_LOCGOV

0

7461

1.890

0.726

0.008

0

3

3

2

2

-0.308

2.934

TRST\_NEC

2898

4563

1.860

0.720

0.011

0

3

3

2

NA

-0.353

3.080

TRST\_PARTIES

0

7461

1.803

0.969

0.011

0

3

3

2

2

-0.308

2.075

TRST\_PRES

3796

3665

1.475

0.767

0.013

0

3

3

1

NA

0.020

2.625

*Note:*

Item Description of ASB Round 3 Analytical Sample - Pooled sample of 5 countries. Each item has 4 categories. note that the number of items differs per country with only 7 items in Mainland China and 9 items in Hong Kong, Indonesia and Japan

Table 15: South Asian Barometer Round 2 (2013) Table of Descriptives for 9 trust items in list-wide deleted sample of 5 countries.

var

missing

n

M

SD

SE

min

max

range

median

mode

skew

kurtosis

TRST\_CIVSERV

0

7520

1.681

0.921

0.011

0

3

3

2

2

-0.285

2.271

TRST\_LOCGOV

3315

4205

1.750

0.938

0.014

0

3

3

2

NA

-0.388

2.298

TRST\_PARL

1238

6282

1.716

0.937

0.012

0

3

3

2

2

-0.273

2.199

TRST\_PM

1238

6282

1.887

0.953

0.012

0

3

3

2

2

-0.532

2.372

TRST\_PRES

1021

6499

1.979

0.935

0.012

0

3

3

2

2

-0.625

2.515

*Note:*

Item Description of South ASB Round 2 Analytical Sample - Pooled sample of 5 countries. Each item has 4 categories. note that the number of items differs per country with only 5 items in Nepal and 9 items in India and Sri Lanka

14

TRST\_POLICE 0 7520 1.443 1.003 0.012 0 3 3 2 2 -0.058 1.904

TRST\_PARTIES 0 7520 1.316 0.966 0.011 0 3 3 1 2 0.105 1.992

TRST\_NATGOV 2259 5261 1.731 0.927 0.013 0 3 3 2 NA -0.304 2.254

TRST\_COURTS 0 7520 1.984 0.928 0.011 0 3 3 2 2 -0.625 2.533

TRST\_POLICE 0 7461 2.005 0.750 0.009 0 3 3 2 2 -0.456 2.983

TRST\_PARL 0 7461 1.874 0.932 0.011 0 3 3 2 2 -0.374 2.206

TRST\_NATGOV 0 7461 1.927 0.923 0.011 0 3 3 2 2 -0.439 2.270

TRST\_COURTS 0 7461 1.904 0.749 0.009 0 3 3 2 2 -0.410 3.022

*Note:*

TRST\_POLICE 0 9475 1.639 0.855 0.009 0 3 3 2 2 -0.214 2.438

TRST\_PARL 0 9475 1.394 0.857 0.009 0 3 3 1 1 0.017 2.329

TRST\_NATGOV 0 9475 1.511 0.823 0.008 0 3 3 2 2 -0.041 2.466

TRST\_COURTS 0 9475 1.499 0.854 0.009 0 3 3 2 2 -0.035 2.369

In tables 16 to 18 below we list the global fit indicators detailing the proximity of fit between the Rating scale model and our data. As in our previous analyses, we note that these measures can only give us an approximation of the closeness of fit between the data and the Rasch RSM, orienting us towards countries in which the apriori assumptions of Rasch measurement can be further assessed. We rely on the M2/C2-based p-value, the RMSEA and its 90% confidence bands, the TLI and the CFI to assess closeness of fit between the data and the model. The results listed in tables 16 to 18 below indicate a poor fit between the data and the Rasch RSM.

Table 16: Asian Barometer Round 4 (2014-2016) Rating Scale Model Global Fit Indicators and Mokken H-values

country

M2

df

p

RMSEA

RMSEA\_5

RMSEA\_95

TLI

CFI

scale\_H

se

Philippines

200.128

33

0

0.068

0.059

0.077

0.913

0.841

0.419

0.015

Cambodia

209.032

33

0

0.078

0.068

0.089

0.871

0.763

0.507

0.017

Malaysia

398.497

33

0

0.103

0.094

0.113

0.724

0.494

0.516

0.016

Singapore

288.240

18

0

0.126

0.113

0.139

0.729

0.302

0.638

0.018

Thailand

718.611

33

0

0.147

0.137

0.156

0.674

0.401

0.547

0.016

Fit Indicators of the Rating Scale Model sorted by the M2-based RMSEA

Table 17: Asian Barometer Round 3 (2010-2012) Rating Scale Model Global Fit Indicators and Mokken H-values

country

Indonesia

M2

204.675

df

33

p

0

RMSEA

0.065

RMSEA\_5

0.056

RMSEA\_95

0.073

TLI

0.923

CFI

0.859

scale\_H

0.528

se

0.016

Japan

1472.344

33

0

0.163

0.156

0.170

0.486

0.058

0.462

0.015

Mainland China

2783.855

18

0

0.230

0.223

0.238

-0.072

0.000

0.637

0.012

Fit Indicators of the Rating Scale Model sorted by the M2-based RMSEA

Table 18: South Asian Barometer (2013) Rating Scale Model Global Fit Indicators and Mokken H-values

country

M2

df

p

RMSEA

RMSEA\_5

RMSEA\_95

TLI

CFI

scale\_H

se

Nepal

149.491

17

0

0.079

0.068

0.091

0.940

0.898

0.372

0.018

Bangladesh

586.914

32

0

0.130

0.121

0.140

0.958

0.936

0.701

0.014

Sri Lanka

1220.934

51

0

0.143

0.136

0.150

0.899

0.857

0.496

0.015

Fit Indicators of the Rating Scale Model sorted by the M2-based RMSEA

In no country do we find a non-significant difference between the data and the model based on the M2/C2 statistics. Relying on the RMSEA, the TLI and the CFI, the results appear to be more nuanced, but yield

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*Note:*

India 2025.006 51 0 0.137 0.132 0.142 0.889 0.842 0.436 0.012

Pakistan 941.606 41 0 0.103 0.097 0.109 0.925 0.890 0.393 0.011

*Note:*

Hong Kong 1162.373 33 0 0.211 0.200 0.221 -0.131 0.000 0.555 0.020

Vietnam 220.117 25 0 0.093 0.082 0.105 0.698 0.371 0.587 0.018

*Note:*

Korea 816.544 33 0 0.144 0.136 0.153 0.691 0.434 0.459 0.016

Taiwan 724.927 33 0 0.124 0.116 0.132 0.799 0.631 0.480 0.015

Myanmar 324.831 33 0 0.098 0.088 0.107 0.924 0.860 0.741 0.014

Mongolia 202.640 33 0 0.068 0.059 0.077 0.836 0.699 0.331 0.015

the same conclusions. In the fourth round survey, only the Philippines (RMSEA=.068 [.059 - .077]; TLI =

.91; CFI = .84) come close to the established cut-off for adequate fit. However, the CFI value < .90 casts some doubt on this. Analysis for the 3rd round reveals a similar pattern. In no country does the M2/C2 based p-value indicate a close fit between the data and the model. Only in Indonesia do the values of the RMSEA (.065 [.056 - .073]), TLI (.92) and CFI (.86) come close to the accepted cut-off suggesting adequate fit in these countries. Lastly, analysis of the South Asian Barometer also indicate a similar pattern. Only in Nepal does the institutional trust scale, consisting of trust in the president, the courts, political parties, the civil service and the police, approach values of adequate or reasonable fit based o the RMSEA, TLI and CFI values. However, in Nepal the Andersen LR test assessing the apriori specifications of the Rasch model led to a rejection of the null hypothesis indicating that the data met the demands of sub-scale invariance. In the Philippines and Indonesia, the procedure failed to converge on a solution for the item location estimates among the high trusting sample. This also indicates a misfit between the data and the model.

**Eurobarometer 87.3 (2017)**

The Eurobarometer 87.3 provides 35 nationally representative surveys with batteries of trust items measured dichotomously. We focus on 7 national institutions: the courts, the police, the national parliament, political parties, the national government, local government and the public administration. Answers were recoded to values 0 and 1 and ranged from 0 (tend not to trust) to 1(tend to trust).Table 19 below provides the number of respondents in the final list-wide deleted sample along with descriptive statistics for each of the 7 items and Table 20 reports the global fit indicators of the Rasch Model (RSM).

Table 19: Eurobarometer 87.3 (2017) Table of Descriptives for 7 trust items in list-wide deleted sample of 35 countries/territories.

var

TRST\_COURTS

missing

0

n

26547

M

0.530

SD

0.499

SE

0.003

min

0

max

1

range

1

median

1

mode

1

skew

-0.122

kurtosis

1.015

TRST\_NATGOV

0

26547

0.404

0.491

0.003

0

1

1

0

0

0.390

1.152

TRST\_POLICE

0

26547

0.694

0.461

0.003

0

1

1

1

1

-0.840

1.706

TRST\_PUBADMIN

0

26547

0.509

0.500

0.003

0

1

1

1

1

-0.035

1.001

Item Description of EUB Analytical Sample - Pooled sample of 35 countries. Items are dichotomous

16

*Note:*

TRST\_POLPART 0 26547 0.230 0.421 0.003 0 1 1 0 0 1.284 2.650

TRST\_PARL 0 26547 0.390 0.488 0.003 0 1 1 0 0 0.449 1.202

TRST\_LOCGOV 0 26547 0.510 0.500 0.003 0 1 1 1 1 -0.039 1.002

Table 20: Eurobarometer 87.3 (2017) Rasch Model (for dichotomous data) Fit Indicators

country

M2

df

p

RMSEA

RMSEA\_5

RMSEA\_95

SRMSR

TLI

CFI

Albania

136.718

20

0

0.081

0.068

0.094

0.103

0.979

0.980

Croatia

154.034

20

0

0.084

0.072

0.096

0.075

0.952

0.954

Serbia

131.374

20

0

0.086

0.072

0.100

0.073

0.957

0.959

Hungary

168.934

20

0

0.089

0.076

0.101

0.099

0.971

0.972

Estonia

133.001

20

0

0.095

0.080

0.110

0.076

0.934

0.937

Portugal

196.050

20

0

0.096

0.084

0.108

0.077

0.959

0.961

Slovenia

198.112

20

0

0.100

0.088

0.113

0.109

0.926

0.929

Finland

213.191

20

0

0.105

0.092

0.118

0.091

0.919

0.922

Poland

215.642

20

0

0.111

0.097

0.124

0.096

0.911

0.915

Sweden

231.951

20

0

0.111

0.098

0.124

0.090

0.904

0.909

Great Britain

179.449

20

0

0.112

0.098

0.128

0.089

0.911

0.916

Germany West

260.100

20

0

0.116

0.104

0.129

0.095

0.925

0.929

The Netherlands

254.451

20

0

0.118

0.105

0.131

0.108

0.925

0.929

Denmark

256.837

20

0

0.120

0.107

0.133

0.099

0.860

0.866

Northern Ireland

87.571

20

0

0.121

0.096

0.148

0.119

0.943

0.945

Slovakia

288.305

20

0

0.126

0.114

0.139

0.133

0.947

0.949

Belgium

352.474

20

0

0.133

0.121

0.145

0.119

0.871

0.877

Ireland

347.521

20

0

0.143

0.130

0.156

0.123

0.912

0.916

Fit Indicators of the Rasch Model sorted by the M2-based RMSEA

As observed in Table 20, the 7-item scale does not indicate a close fit between the observed data and the Rasch model. Using a loose cut-off of <= 0.08 for the RMSEA values, no country clearly exhibits close fit. While, in approximately 10 countries the lower-bound confidence interval of the RMSEA fall between

0.07 and 0.08, all upper confidence bands at 95% threshold are well beyond the 0.09. The SRMSR values also suggest misfit between the data and the Rasch model as no country-indicator falls below the commonly accepted value of 0.05 or if we applied the loose RMSEA cut-off of 0.08 for that matter. The M2-based p- value also suggest misfit. Nevertheless, most of the TLI and CFI values, for the most part, suggest acceptable fit between the Rasch model and the observed data with TLI and CFI consistently estimated above 0.90. In fact in 9 countries, TLI and CFI values are above the stricter cut-off of 0.95. While this provides a somewhat blurry picture, we consider that the observed data are unlikely to have been generated by a Rasch-like process

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*Note:*

Germany East 202.779 20 0 0.137 0.120 0.155 0.107 0.892 0.897

Austria 307.111 20 0 0.130 0.117 0.143 0.109 0.820 0.829

Czech Republic 282.561 20 0 0.123 0.110 0.135 0.119 0.833 0.841

Italy 265.400 20 0 0.120 0.108 0.133 0.128 0.930 0.933

Romania 264.537 20 0 0.119 0.106 0.132 0.094 0.874 0.880

Bulgaria 238.280 20 0 0.117 0.104 0.131 0.122 0.950 0.952

Makedonia/FYROM 222.725 20 0 0.113 0.100 0.127 0.116 0.947 0.949

Malta 83.046 20 0 0.112 0.088 0.138 0.129 0.961 0.963

Luxembourg 101.681 20 0 0.111 0.090 0.132 0.113 0.924 0.928

Latvia 186.616 20 0 0.107 0.093 0.122 0.112 0.892 0.897

Turkey 216.040 20 0 0.104 0.091 0.116 0.102 0.960 0.962

Montenegro 107.971 20 0 0.100 0.082 0.118 0.163 0.976 0.977

Lithuania 159.607 20 0 0.095 0.082 0.109 0.093 0.894 0.899

Cyprus (Republic) 83.197 20 0 0.090 0.070 0.110 0.084 0.946 0.948

France 136.482 20 0 0.087 0.073 0.101 0.080 0.926 0.930

Greece 160.400 20 0 0.085 0.073 0.098 0.081 0.903 0.908

Spain 135.841 20 0 0.081 0.068 0.094 0.099 0.952 0.954

as the indicators do not all point in the same direction.

Table 21: Eurobarometer 87.3 (2017) Rasch Model (for dichotomous data) Andersen Likelihood Ratio Test

country

Great Britain

LR

4.483

Chi2.df

6

p.value

0.612

Items.kept

courts, police, pubadmin, polpart, locgov, natgov, parl

Romania

6.942

6

0.326

courts, police, pubadmin, polpart, locgov, natgov, parl

Northern Ireland

9.514

6

0.147

courts, police, pubadmin, polpart, locgov, natgov, parl

Spain

11.719

5

0.039

courts, police, pubadmin, locgov, natgov, parl

France

17.917

6

0.006

courts, police, pubadmin, polpart, locgov, natgov, parl

Finland

16.819

4

0.002

courts, pubadmin, polpart, natgov, parl

Hungary

21.763

6

0.001

courts, police, pubadmin, polpart, locgov, natgov, parl

Germany West

25.480

6

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

Greece

23.271

4

0.000

courts, police, pubadmin, locgov, parl

Sweden

29.229

6

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

Czech Republic

31.614

6

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

Slovenia

34.320

6

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

Montenegro

36.585

6

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

Turkey

43.768

6

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

Ireland

50.541

6

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

Denmark

52.399

6

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

Austria

84.543

6

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

Belgium

113.973

6

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

Andersen Likelihood Ratio Test with Mean Split: Location Parameters estimated with CML in eRm package.

Interestingly enough, in 6 out of 35 countries, the scales indicate sub-sample homogeneity between low and high trusters. In Great Britain, Slovakia, Romania, Lithuania, Northern Ireland and Portugal results from the Andersen LR test are non-significant, well-above the cut-off of 0.05 (see Table 21). In those six countries/territories, the endorsability (item location/beta coef) of each of the 7 institutions analyzed is the same for groups below the mean level of trust and individuals above that mean. However, the mirt- indicators indicate poor fit of the Rasch model in these same countries. While this suggests a mismatch between the results of the global fit indices and a test of the assumptions of the Rasch-model, it is not necessarily the case. The Rasch model requires the assumption of local independence to be met. While the Andersen-test is sensitive to violations of double-monotonicity, sufficiency of sum-scores, and in part

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*Note:*

Italy 84.292 5 0.000 courts, police, pubadmin, locgov, natgov, parl

The Netherlands 72.294 6 0.000 courts, police, pubadmin, polpart, locgov, natgov, parl

Albania 50.706 6 0.000 courts, police, pubadmin, polpart, locgov, natgov, parl

Makedonia/FYROM 44.905 6 0.000 courts, police, pubadmin, polpart, locgov, natgov, parl

Poland 42.510 6 0.000 courts, police, pubadmin, polpart, locgov, natgov, parl

Luxembourg 34.852 6 0.000 courts, police, pubadmin, polpart, locgov, natgov, parl

Bulgaria 32.619 6 0.000 courts, police, pubadmin, polpart, locgov, natgov, parl

Serbia 30.696 6 0.000 courts, police, pubadmin, polpart, locgov, natgov, parl

Croatia 28.508 6 0.000 courts, police, pubadmin, polpart, locgov, natgov, parl

Cyprus (Republic) 26.566 6 0.000 courts, police, pubadmin, polpart, locgov, natgov, parl

Malta 22.932 6 0.001 courts, police, pubadmin, polpart, locgov, natgov, parl

Latvia 20.733 6 0.002 courts, police, pubadmin, polpart, locgov, natgov, parl

Estonia 20.023 6 0.003 courts, police, pubadmin, polpart, locgov, natgov, parl

Germany East 16.530 6 0.011 courts, police, pubadmin, polpart, locgov, natgov, parl

Portugal 12.593 6 0.050 courts, police, pubadmin, polpart, locgov, natgov, parl

Lithuania 7.901 6 0.245 courts, police, pubadmin, polpart, locgov, natgov, parl

Slovakia 6.554 6 0.364 courts, police, pubadmin, polpart, locgov, natgov, parl

unidimensionality (depending on the operationalization of the test), it does not necessarily indicate whether the items meet the demands of local stochastic independence. Hence, it is plausible that a scale meet the criteria of the Andersen-LR test and violate the assumption of local independence. In this instance, this seems to be the case. While the Eurobarometer trust scale analyzed suggests sub-sample homogeneity across 6 countries, a non-parametric test of the assumption of local independence (Ponocny 2001) available for dichotomous data in eRm reveals clear correlations among items. That is, beyond respondents’ trust abilities and the item positions of each institution on the scale, certain items probing for trust in different institutions are still related. This implies that in certain cases indicating trust in one institution is indicative of indicating trust in another in ways that are not captured by the estimated Rasch trust scales. In most cases local dependencies emerge between courts and the police, courts and the public administration, public administration and local government, parties and parliament, and national government and parliament. If anything, these dependencies suggest that trust in these set of institutions may be more distinct than the estimated political trust scale. Overall, these findings help explain the mismatch between the mirt-based results and the Andersen LR test and support our conclusions that the data are unlikely to have been generated by a Rasch-like process.

**Discussion:**

The results presented here provide a clear picture. Commonly used political trust scales do not meet the demands of the Rasch model. With the exception of Tunisia where a scale consisting of trust in political parties, the government, the justice system and the police, no other political trust scale in the countries analyzed throughout this paper met the demands of the Rasch model. When we relax the commonly accepted cut-offs for the fit-indices such that RMSEA <= 0.08, our selection is limited to 21 countries. If we consider the TLI and CFI values with a cut-off of >= 0.90, only 6 of those 21 countries indicate a plausible fit of the Rasch model. They are Colombia and Paraguay (Latino Barometer), Tunisia and Palestine (Arab Barometer), and Slovenia and Hungary from the ESS. Moreover, only in Colombia, Tunisia and Slovenia are the upper 95% confidence bounds of the RMSEA higher than the relaxed cut-off of 0.08. Overall, the Rasch/Rating Scale Model does not seem to fit the data well. Moreover, Graphical model checks, suggests that in the country-surveys in which the RSM or PCM model converged and the mirt-based fit indices suggested adequate fit of the Rasch model, the assumption of sub-scale homogeneity did not hold across groups above and below the median sum score on the scale. In other words, the latent positioning of the trustworthiness of an institution on our scale differed in these different samples. In Colombia, for example, the threshold of “always trusting” the Police, was not comparable for individuals below the median sum score of political trust and those above it. The category essentially loses meaning in a comparative sense.

Results from the Andersen Likelihood Ratio Test based on the Rasch, Rating Scale and Partial Credit Model, suggest that in 6 countries (Slovakia, Romania, Northern Ireland, Turkey, the Czech Republic and Greece) dichotomous scales from the Eurobarometer survey including 7 items are sub-scale homogenous beyond a

0.01 cut-off. Of the polytomous items, only Tunisia surveyed in the Arab Barometer met the demands of the Rasch model as evaluated by the Andersen LR test (double-monotonicity, sufficiency of sum-score). It is worth noting that in an additional 6 countries, some sub-sample homogeneous scales emerge after removal of inappropriate items and also meet this cut-off. However, the removal of these items already challenge the notion that a common set of items can meet the demands of the Rasch model across these countries or surveys.

Lastly, it is particularly telling that of the national political trust scales that either exhibited adequate fit to the Rasch model or met the demands of the Andersen LR test, important local dependencies emerged between the items, violating the assumption of local independence by which responses to a trust survey item should be independent from responses on another item apart from the underlying political trust trait being measured. In Tunisia, for example, important dependencies emerged between confidence in the Parliament and Confidence in Government, the Parliament and the Justice System, as well as between Political Parties and Parliament.

Taken together, our findings provide strong evidence that often used political trust scales consisting of trust in primarily implementing and primarily representative institutions do not meet the measurement assumptions of the Rasch model. Perhaps, this does not come as a surprise. The Rasch Model imposes strict a-priori

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conditions which a scale must meet in order to be considered specifically objective. Among them are the assumptions that item ordering remains consistent at different parts of a unidimensional scale and that all differentiation parameters remain equal. For a political trust scale these assumptions mean that the relative ranking of the trustworthiness of institutions within a country must be consistent regardless of one’s latent political trust or another trait along which the population can be divided. Perhaps, this is too strict of a constraint.

Moreover, the assumption within Rasch Analysis by which discrimination/differentiation parameters are constrained to be the same (equal to 1) insinuates that every institution used in the creation of the scale should have the same impact on the overall scale. It assumes that institutions such as the police and political parties weigh equally in respondents’ attitudes of political trust. This is unlikely to be the case and our results presented here suggest that in most countries, with the exception of Tunisia, this demand is not met.

In most countries, individuals with high levels of trust and those with lower levels of trust do not rank the trustworthiness of political institutions in their country in the same way. This implies that commonly used political trust scales do not have the same institutional hierarchy within countries. They are devoid of interpretation. While we know which institutions make up the scale, a person’s placement on that political trust scale does not provide any information as to the institutions she/he is more or less likely to place their trust in.

However, while our analysis shows that in most cases institutional political trust scales do not meet the demands of the Rasch model, our results do indicate some exceptions worth investigating further. First, in a few cases a combination of questions about trust in state institutions can exhibit Rasch-like properties. In the WVS survey, scales constructed based on a subset of items such as trust in the police, trust in the courts, and the civil service did exhibit sub-scale homogeneity in Slovenia, Korea and Poland (see Table 3 above). In all three cases, these institutions are what may be considered as implementing institutions. Thus, while our analysis suggests that a scale consisting of trust in both implementing and representative institutions does not meet the demands of the Rasch model, it is worth investigating whether a scale consisting of trust in institutions primarily associated with implementation of policies adheres to the demands of the Rasch model. A second point, also based on our analysis of the WVS data, is that in most countries in the survey, the first threshold indicating moving from no trust at all to having a little trust in state institutions also exhibits sub-scale homogeneity. This may indicate that measures of distrust in state institutions may provide better comparative quality within countries. However, these questions will need to be investigated in future research on these topics. Lastly, while we do not present these findings here, analysis of the local stochastic independence assumption indicate important violations. Responses to trust in various institutions are not only informed by the perceived trustworthiness of the institutions inquired about and the latent trust of respondents, rather important associations between sets of institutions (i.e. implementing vs. representative) influence patterns of responses. What do these findings mean for the measurement of political trust? Political trust scales including trust in implementing and representative institutions do not form Rasch scales, however, they do form medium and strong mokken scales (Monotone Homogeneity Models). The fact that they do has important implications for measurement. The Mokken Monotone Homogeneity Model is a nonparametric measurement model which, under certain conditions, allows stochastic ordering of groups based on sum- scores. Adherence to the MHM Mokken scale suggests that in most countries a combination of institutional trust items can be used to form a scale with weak stochastic ordering. Along such a scale “a subgroup with total scores in excess of a cut score xc has a higher mean value of theta than any subgroup scoring below the cut score” (Sijtsma & Molenaar 2016, p.307). The combination of these findings provide some clarity about the nature of political trust scales across the globe. Unidimensional political trust scales exhibit partial ordinality and in most cases, their sum scores will provide insights about groups’ levels of trust. However, these scales cannot be interpreted substantively across countries or within countries. Individual scores on these scales do not provide any insight as to which institutions may have been endorsed or not. Lastly, our analysis shows that these scales cannot be used with great precision, for example to differentiate individuals with the same sum-scores. Researchers interested in constructing fine-tuned political trust scales with greater measurement precision should instead apply item response theory models with discrimination parameters such as the 2PL model for dichotomous data and the general rating scale model and graded response models for polytomous data. These parametric models are specific cases of the broader nonparametric mokken scale of MHM and provide item parameters and discrimination parameters. While

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the use of these models does not apply IIO by which a scale can also have substantive interpretation, they may be use to account for the variation in differentiation of items on the scale. This in turns allow greater measurement precision in calculating person scores on the latent dimension than sum-scores. In the words of Muraki “when the discriminations of items vary to a great extent, collapsing the category points of a Likert scale without considering their differential effect on the items is not generally recommended” (1990,

p. 67). When institutions have a differentiated impact on a political trust scale, accurate measurement of individuals’ trust requires accounting for this differentiation.

**Appendix - Supplementary materials**

**Missing Responses**

The Rasch Measurement model and its polytomous extensions such as the Rating Scale Model and Partial Credit Model assume that responses to questions about political trust are a logistic function of a person’s latent levels of trust (theta/ability) and the trustworthiness of an institution (alpha/location parameter). Our primary goal in this paper is to assess whether this assumption provides an accurate measurement model of political/institutional trust across and within countries. Using list-wide deleted data we show that this is not the case. However, the use of list-wide deletion for this analysis resulted in 54 out of 126 country-samples samples in which 10% to 42% of respondents were removed. list-wide deletion essentially leads to an analysis of the scalability of institutional trust using samples of individuals who responded to all survey questions and who knew know how much trust they placed in political institutions. It is thus, unclear what the scale properties of political trust are in the overall survey sample and in particular among those who did not provide responses to every survey question or who simply did not know how much trust they had.

To our knowledge, imputation methods used to deal with missing responses have advantages and disadvantages for our analysis. While imputing missing responses would enable us to assess the properties of a political trust scale for a fuller sample, it is unclear whether such methods would violate the assumptions at the heart of the Rasch scaling procedure. Imputing responses requires an expectation of the population of individuals who are not likely to respond to a survey question or who do not know how much trust they should place in the institutions inquired about. In our case, we do not believe that this expectation results from a completely random process (Missing Completely at Random) (King et al. 2001). Instead, given the wide range of countries analyzed, we suspect that a number of factors, apart from trust itself, are likely to influence the missingness process. First, refusal to respond to an inquiry about trust in an institution is likely to be influenced by: 1. Whether the context in which the survey was undertaken is one in which dissenting opinions can be expressed. + 1a. This may include the national security context, + 1b. or a person’s social context and the individuals around at the time the survey was conducted. Furthermore, individuals who indicate not knowing how much trust they have in a set of institutions could be influenced by the factors above as well as their level of education. 2. Don’t know responses could vary along education levels if education enables individuals to better gage the trustworthiness of an institution. Or if higher/lower educated individuals are less likely to respond to survey questions for other reasons. Lastly the pattern of missingness could be non-ignorable if individuals who are distrusting of the institutions inquired about are simply less likely to respond to survey questions or more likely to use the category don’t know.

If the process underlying the missingness is external to trust itself, as in points 1 and 2 above, then imputation methods could be used and we can assume that the data is missing almost at random. Remedying the situation would entail imputing missing responses based on the factors we believe are at the heart of the missingness process. However, while employing such a technique would provide more accurate responses, it would also entail a clear violation of the Rasch measurement model by which the only factors that ought to influence individuals’ response patterns is their latent levels of trust and the trustworthiness of the institutions inquired about.

Another approach would be to impute missing responses by conditioning on an estimate of a person’s latent score and the item difficutly parameters. The estimate of the latent score can be calculated for all individuals who provide at least one response by utilizing all available information and response patterns in the dataset, including response patterns with some missing responses. Yet, even this approach would entail

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Table 22: Mean and SD of Global Fit Indices Across Imputed Country-Surveys with Plausible Fit of the Rasch Model

country Colombia

survey\_wave LB\_2017

M2 43.783

M2\_SD 2.236

df 12

p 0

p\_SD 0

RMSEA 0.047

RMSEA\_SD

0.002

RMSEA\_5

0.032

RMSEA\_5SD

0.002

RMSEA\_95

0.062

RMSEA\_95SD

0.002

TLI 0.978

TLI\_SD 0.001

CFI 0.914

CFI\_SD 0.006

calcul M2

comp\_miss

0.000

Chile

LB\_2017

50.236

1.591

12

0

0

0.052

0.001

0.037

0.001

0.067

0.001

0.970

0.001

0.879

0.005

M2

1.167

Indonesia Tunisia Nepal

ASB\_3 ARB\_4 SASB\_2

196.210

96.691

137.756

5.676

8.741

12.044

33

17

17

0

0

0

0

0

0

0.057

0.063

0.064

0.001

0.003

0.003

0.049

0.051

0.054

0.001

0.003

0.003

0.065

0.075

0.074

0.001

0.003

0.003

0.937

0.975

0.963

0.002

0.003

0.004

0.885

0.958

0.937

0.004

0.005

0.006

M2 C2 C2

1.677

NA NA

Portugal

ESS\_8

203.762

4.050

32

0

0

0.065

0.001

0.057

0.001

0.074

0.001

0.977

0.001

0.879

0.003

C2

NA

Slovenia Paraguay Palestine

ESS\_8 LB\_2017 ARB\_4

217.581

78.789

116.083

5.737

3.608

4.558

32

12

17

0

0

0

0

0

0

0.067

0.068

0.070

0.001

0.002

0.002

0.058

0.054

0.058

0.001

0.002

0.002

0.075

0.083

0.082

0.001

0.002

0.002

0.986

0.977

0.984

0.000

0.001

0.001

0.924

0.909

0.972

0.002

0.005

0.001

C2 M2 C2

NA 0.500 NA

Hungary

ESS\_8

299.502

6.129

32

0

0

0.072

0.001

0.065

0.001

0.080

0.001

0.987

0.000

0.931

0.002

C2

NA

Spain Israel Togo

ESS\_8 ESS\_8 AB\_6

373.913

510.728

200.785

9.617

7.931

7.410

32

32

25

0

0

0

0

0

0

0.074

0.077

0.077

0.001

0.001

0.002

0.067

0.071

0.067

0.001

0.001

0.002

0.081

0.083

0.087

0.001

0.001

0.002

0.980

0.975

0.933

0.001

0.000

0.003

0.894

0.867

0.860

0.003

0.002

0.006

C2 C2 M2

NA NA 1.333

France Ireland

ESS\_8 ESS\_8

432.969

597.354

4.113

10.621

32

32

0

0

0

0

0.078

0.080

0.000

0.001

0.071

0.075

0.000

0.001

0.084

0.086

0.000

0.001

0.972

0.973

0.000

0.001

0.853

0.856

0.001

0.003

C2 C2

NA NA

Belgium

Russian Federation

ESS\_8 ESS\_8

413.434

551.694

3.352

4.745

32

32

0

0

0

0

0.082

0.082

0.000

0.000

0.075

0.076

0.000

0.000

0.089

0.088

0.000

0.000

0.979

0.984

0.000

0.000

0.887

0.917

0.001

0.001

C2 C2

NA NA

*Note:*

Table Sorted by RMSEA and descending CFI values. Fit Indices are based on Mean of 10 datasets with imputed missing responses. Respondents who did not provide any responses were removed from the analysis.

the assumption that the data is missing almost at random. It is unclear whether that assumption can be held if respondents who are less trusting are also less likely to respond to survey questions on political trust. Nevertheless, if we assume that the data is missing almost at random, the latter approach would enable us to estimate missing responses without a clear violation of the very assumptions we wish to test. Hence, this imputing approach provides an advantage in enabling us to estimate missing responses. However, we do so reluctantly noting that such imputation may not be valid if the missingness process is non-ignorable such that missingness is determined by trust levels themselves.

Overall, our findings using list-wide deletion suggest that in nearly all country-surveys the Rasch model does not accurately reflect the data generating process and its assumptions are unmet. We are concerned with missingness, only in the event, that the response patterns of respondents removed due to list-wide deletion do actually meet the Rasch model and changes our overall findings. One way to test this counterfactual is to assume a most likely case in which all missing responses were imputed from a Rasch-like process. That is, we impute missing responses conditionally on a person’s latent political trust (theta) and item difficulty parameters (beta) as estimated by the Rating Scale Model. This is a most-likely case in which all missing responses are imputed based on a process which in part reflects the Rasch model itself. We then, assess whether the Rasch model fits these imputed datasets containing original survey responses and imputed missing responses. The analysis was conducted using the R package mirt. Ability estimates (theta) were assumed to be normally distributed and we used plausible value imputation to generate 10 different datasets based on a sample in which respondents gave at least 1 answer to the trust items. (Chalmers and Ng 2017) Table 19 below provides an overview of country-surveys in which the Rasch model plausibly fit the imputed datasets. We show countries in which the fit indices were beyond the following cut-off, indicating plausible fit of the model to the data: An upper confidence bound of the RMSEA (95%) < 0.09, and TLI and CFI values > 0.85. We note that the CFI and TLI values are well below the often-used cut-off of 0.90. Across 10, imputed datasets we show the mean global fit indicators as well as their standard deviations.

Of the 126 country-surveys analyzed (105 countries)[does not include Eurobarometer], a plausible fit was only found in 17 country-surveys when we used the relaxed TLI, CFI, and upper-bound of the RMSEA listed above. As shown in Table 19, the fit indices did not vary greatly across each of the 10 datasets with imputed values replacing missing responses. More importantly, we note that these fit values do not differ much from those found in the original analysis using list-wide deletion. We take this as an indication that our results are not influenced by the pattern of missingness observed across these datasets. Even when we assume a counterfactual in which missing responses are imputed based on a Rasch-like process, the overall fit indices barely change. In the event that missing data may have made a difference, we would expect significantly better fit. However, this is not the case. The results presented throughout this analysis do not depend on the pattern of missingness. (Note, analysis of the Eurobarometer data, which was later included did not alter these conclusions.)

**MIRT Goodness of Fit Results for List-Wide Deleted Data in all 161 country surveys**

22

7.3

7.3

7.3

7.3

Table 23: Global Fit Indices of List-Wide Deleted Data in all Coun- try Surveys

country

survey\_wavpeerc\_miss

M2

df

p

RMSEA

RMSEA\_5RMSEA\_9S5RMSR

TLI

CFI

Colombia

LB\_2017

4.083

44.273

12

0

0.048

0.034

0.064

NA

0.978

0.910

Chile

LB\_2017

6.083

50.099

12

0

0.053

0.038

0.069

NA

0.968

0.872

Mexico

LB\_2017

8.250

67.910

12

0

0.065

0.050

0.081

NA

0.944

0.776

Slovenia

ESS\_8

4.208

210.193

32

0

0.067

0.058

0.075

NA

0.986

0.924

Portugal

ESS\_8

4.016

211.004

32

0

0.068

0.059

0.077

NA

0.976

0.870

Mongolia

ASB\_4

10.016

202.640

33

0

0.068

0.059

0.077

NA

0.836

0.699

Hungary

ESS\_8

4.213

296.349

32

0

0.073

0.066

0.081

NA

0.987

0.930

Palestine

ARB\_4

14.250

116.853

17

0

0.076

0.063

0.089

NA

0.982

0.969

Bolivia

LB\_2017

9.167

92.310

12

0

0.078

0.064

0.094

NA

0.884

0.537

Nepal

SASB\_2

36.350

149.491

17

0

0.079

0.068

0.091

NA

0.940

0.898

Israel

ESS\_8

6.257

515.407

32

0

0.079

0.073

0.085

NA

0.973

0.857

Albania

EUB\_8

17.636

136.718

20

0

0.081

0.068

0.094

0.103

0.979

0.980

Guatemala

LB\_2017

9.900

82.941

12

0

0.081

0.065

0.098

NA

0.908

0.633

Belgium

ESS\_8

1.529

411.675

32

0

0.083

0.076

0.090

NA

0.979

0.886

Croatia

EUB\_8

6.445

154.034

20

0

0.084

0.072

0.096

0.075

0.952

0.954

El Salvador

LB\_2017

7.300

93.290

12

0

0.086

0.070

0.102

NA

0.938

0.752

23

Greece EUB\_8 4.257 160.400 20 0 0.085 0.073 0.098 0.081 0.903 0.908

Togo AB\_6 15.917 200.260 25 0 0.083 0.073 0.094 NA 0.927 0.848

Ireland ESS\_8 5.296 589.465 32 0 0.082 0.076 0.088 NA 0.972 0.850

Spain EUB\_8 13.911 135.841 20 0 0.081 0.068 0.094 0.099 0.952 0.954

Ecuador LB\_2017 3.083 102.189 12 0 0.080 0.066 0.095 NA 0.942 0.769

Dominican Rep. LB\_2017 5.700 83.269 12 0 0.079 0.064 0.096 NA 0.934 0.737

France ESS\_8 1.932 435.955 32 0 0.079 0.072 0.086 NA 0.972 0.852

Cambodia ASB\_4 27.583 209.032 33 0 0.078 0.068 0.089 NA 0.871 0.763

Spain ESS\_8 6.895 361.579 32 0 0.075 0.068 0.082 NA 0.980 0.894

Paraguay LB\_2017 8.417 76.387 12 0 0.070 0.055 0.085 NA 0.977 0.908

Panama LB\_2017 13.400 59.794 12 0 0.068 0.051 0.085 NA 0.946 0.784

Philippines ASB\_4 7.583 200.128 33 0 0.068 0.059 0.077 NA 0.913 0.841

Tunisia ARB\_4 19.917 86.790 17 0 0.065 0.052 0.079 NA 0.973 0.954

Indonesia ASB\_3 19.484 204.675 33 0 0.065 0.056 0.073 NA 0.923 0.859

Peru LB\_2017 6.083 45.913 12 0 0.050 0.035 0.066 NA 0.954 0.817

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

Table 23: Global Fit Indices of List-Wide Deleted Data in all Coun- try Surveys *(continued)*

country

survey\_wavpeerc\_miss

M2

df

p

RMSEA

RMSEA\_5RMSEA\_9S5RMSR

TLI

CFI

Russian Federation

ESS\_8

9.053

552.963

32

0

0.086

0.080

0.092

NA

0.983

0.911

Hungary

EUB\_8

12.026

168.934

20

0

0.089

0.076

0.101

0.099

0.971

0.972

Pakistan

SASB\_2

16.486

443.092

25

0

0.090

0.083

0.097

NA

0.737

0.453

Estonia

ESS\_8

4.012

564.200

32

0

0.093

0.086

0.099

NA

0.972

0.853

Estonia

EUB\_8

37.624

133.001

20

0

0.095

0.080

0.110

0.076

0.934

0.937

Morocco

ARB\_4

11.917

180.119

17

0

0.095

0.083

0.108

NA

0.965

0.941

Portugal

EUB\_8

12.213

196.050

20

0

0.096

0.084

0.108

0.077

0.959

0.961

Switzerland

ESS\_8

6.689

461.958

32

0

0.097

0.089

0.105

NA

0.967

0.823

Gabon

AB\_6

3.005

308.043

25

0

0.099

0.089

0.109

NA

0.870

0.730

Honduras

LB\_2017

7.800

121.512

12

0

0.100

0.084

0.116

NA

0.814

0.256

Montenegro

EUB\_8

14.451

107.971

20

0

0.100

0.082

0.118

0.163

0.976

0.977

Slovenia

EUB\_8

12.648

198.112

20

0

0.100

0.088

0.113

0.109

0.926

0.929

Nicaragua

LB\_2017

11.200

123.008

12

0

0.102

0.086

0.119

NA

0.895

0.579

Malaysia

ASB\_4

14.167

398.497

33

0

0.103

0.094

0.113

NA

0.724

0.494

Finland

EUB\_8

13.142

213.191

20

0

0.105

0.092

0.118

0.091

0.919

0.922

24

Costa Rica LB\_2017 6.300 137.103 12 0 0.106 0.090 0.122 NA 0.719 0.000

Turkey EUB\_8 8.774 216.040 20 0 0.104 0.091 0.116 0.102 0.960 0.962

United Kingdom ESS\_8 2.808 674.702 32 0 0.103 0.096 0.110 NA 0.963 0.804

Germany ESS\_8 2.630 936.229 32 0 0.101 0.095 0.106 NA 0.964 0.808

Swaziland AB\_6 25.833 177.139 18 0 0.100 0.087 0.113 NA 0.803 0.494

Nigeria AB\_6 7.667 574.243 25 0 0.100 0.093 0.107 NA 0.874 0.737

India WVS\_6 0.443 196.465 12 0 0.099 0.087 0.111 NA -0.776 0.000

Myanmar ASB\_4 42.531 324.831 33 0 0.098 0.088 0.107 NA 0.924 0.860

Poland ESS\_8 7.202 504.489 32 0 0.097 0.090 0.104 NA 0.963 0.803

Lithuania EUB\_8 23.909 159.607 20 0 0.095 0.082 0.109 0.093 0.894 0.899

Czechia ESS\_8 2.027 672.520 32 0 0.095 0.089 0.101 NA 0.979 0.889

Vietnam ASB\_3 24.601 220.117 25 0 0.093 0.082 0.105 NA 0.698 0.371

Burundi AB\_6 13.583 247.349 25 0 0.093 0.082 0.103 NA 0.810 0.604

Cyprus (Republic) EUB\_8 21.200 83.197 20 0 0.090 0.070 0.110 0.084 0.946 0.948

France EUB\_8 25.460 136.482 20 0 0.087 0.073 0.101 0.080 0.926 0.930

Serbia EUB\_8 24.826 131.374 20 0 0.086 0.072 0.100 0.073 0.957 0.959

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

7.3

Table 23: Global Fit Indices of List-Wide Deleted Data in all Coun- try Surveys *(continued)*

country

Liberia

survey\_wavpeerc\_miss

M2

346.440

df

25

p

0

RMSEA

0.106

RMSEA\_5RMSEA\_9S5RMSR

TLI

0.857

CFI

0.703

AB\_6

4.587

0.096

0.116

NA

Cameroon

AB\_6

11.506

324.762

25

0

0.107

0.097

0.118

NA

0.759

0.497

Netherlands

ESS\_8

3.212

642.315

32

0

0.108

0.101

0.116

NA

0.965

0.816

Poland

EUB\_8

23.033

215.642

20

0

0.111

0.097

0.124

0.096

0.911

0.915

Sweden

EUB\_8

15.286

231.951

20

0

0.111

0.098

0.124

0.090

0.904

0.909

Great Britain

EUB\_8

39.347

179.449

20

0

0.112

0.098

0.128

0.089

0.911

0.916

Norway

ESS\_8

1.359

661.098

32

0

0.114

0.106

0.121

NA

0.956

0.766

Austria

ESS\_8

2.239

869.735

32

0

0.115

0.109

0.122

NA

0.957

0.773

Peru

WVS\_6

4.380

199.920

12

0

0.116

0.102

0.131

NA

0.873

0.492

Bulgaria

EUB\_8

22.868

238.280

20

0

0.117

0.104

0.131

0.122

0.950

0.952

The Netherlands

EUB\_8

16.667

254.451

20

0

0.118

0.105

0.131

0.108

0.925

0.929

Argentina

LB\_2017

9.583

196.950

12

0

0.119

0.105

0.134

NA

0.818

0.273

Italy

EUB\_8

17.366

265.400

20

0

0.120

0.108

0.133

0.128

0.930

0.933

Northern Ireland

EUB\_8

28.793

87.571

20

0

0.121

0.096

0.148

0.119

0.943

0.945

Zambia

AB\_6

14.846

408.480

25

0

0.123

0.112

0.133

NA

0.754

0.488

Egypt

ARB\_4

19.667

266.237

17

0

0.123

0.110

0.137

NA

0.915

0.856

25

Finland ESS\_8 0.883 956.220 32 0 0.123 0.116 0.130 NA 0.951 0.739

Czech Republic EUB\_8 13.538 282.561 20 0 0.123 0.110 0.135 0.119 0.833 0.841

Iceland ESS\_8 2.273 434.609 32 0 0.121 0.111 0.131 NA 0.949 0.727

Denmark EUB\_8 18.307 256.837 20 0 0.120 0.107 0.133 0.099 0.860 0.866

Romania EUB\_8 14.144 264.537 20 0 0.119 0.106 0.132 0.094 0.874 0.880

Tanzania AB\_6 9.765 773.946 25 0 0.118 0.111 0.125 NA 0.712 0.401

Mexico WVS\_6 2.650 331.858 12 0 0.117 0.106 0.128 NA 0.834 0.337

Germany West EUB\_8 14.765 260.100 20 0 0.116 0.104 0.129 0.095 0.925 0.929

Sweden ESS\_8 4.191 655.351 32 0 0.115 0.107 0.122 NA 0.960 0.786

Makedonia/FYROM EUB\_8 25.636 222.725 20 0 0.113 0.100 0.127 0.116 0.947 0.949

Malta EUB\_8 49.800 83.046 20 0 0.112 0.088 0.138 0.129 0.961 0.963

Luxembourg EUB\_8 34.766 101.681 20 0 0.111 0.090 0.132 0.113 0.924 0.928

Brazil LB\_2017 7.417 168.998 12 0 0.109 0.094 0.123 NA 0.877 0.507

Latvia EUB\_8 27.572 186.616 20 0 0.107 0.093 0.122 0.112 0.892 0.897

Italy ESS\_8 4.189 946.869 32 0 0.107 0.101 0.113 NA 0.962 0.797

7.3

7.3

7.3

7.3

7.3

Table 23: Global Fit Indices of List-Wide Deleted Data in all Coun- try Surveys *(continued)*

country

survey\_wavpeerc\_miss

M2

df

p

RMSEA

RMSEA\_5RMSEA\_9S5RMSR

TLI

CFI

Namibia

AB\_6

9.417

449.385

25

0

0.125

0.115

0.135

NA

0.655

0.281

Singapore

ASB\_4

9.047

288.240

18

0

0.126

0.113

0.139

NA

0.729

0.302

Mozambique

AB\_6

22.958

768.755

25

0

0.127

0.119

0.135

NA

0.790

0.562

Brazil

WVS\_6

3.836

299.846

12

0

0.130

0.117

0.142

NA

0.671

0.000

Mali

AB\_6

2.167

522.124

25

0

0.130

0.121

0.140

NA

0.670

0.312

Belgium

EUB\_8

7.610

352.474

20

0

0.133

0.121

0.145

0.119

0.871

0.877

Tunisia

AB\_6

20.583

448.177

25

0

0.133

0.123

0.144

NA

0.592

0.150

Guinea

AB\_6

9.583

510.905

25

0

0.134

0.124

0.144

NA

0.762

0.505

Lebanon

ARB\_4

21.333

386.646

17

0

0.136

0.124

0.148

NA

0.911

0.848

SÃ£o TomÃ© and PrÃncipe

AB\_6

20.234

465.521

25

0

0.136

0.125

0.147

NA

0.684

0.341

Germany East

EUB\_8

13.523

202.779

20

0

0.137

0.120

0.155

0.107

0.892

0.897

South Africa

AB\_6

12.762

1024.732

25

0

0.139

0.131

0.146

NA

0.660

0.292

Senegal

AB\_6

26.833

463.889

25

0

0.141

0.130

0.153

NA

0.614

0.196

South Africa

WVS\_6

8.383

804.245

12

0

0.143

0.135

0.151

NA

0.715

0.000

Burkina Faso

AB\_6

9.917

429.895

18

0

0.146

0.134

0.158

NA

0.623

0.030

26

Egypt AB\_6 27.546 233.749 12 0 0.146 0.130 0.163 NA 0.033 0.000

Korea ASB\_4 4.833 816.544 33 0 0.144 0.136 0.153 NA 0.691 0.434

Ireland EUB\_8 20.020 347.521 20 0 0.143 0.130 0.156 0.123 0.912 0.916

Lesotho AB\_6 32.417 421.098 25 0 0.140 0.128 0.152 NA 0.430 0.000

Botswana AB\_6 14.500 508.952 25 0 0.137 0.127 0.148 NA 0.521 0.003

Cape Verde AB\_6 17.167 489.724 25 0 0.137 0.126 0.147 NA 0.679 0.331

Chile WVS\_6 6.200 219.670 12 0 0.136 0.120 0.152 NA 0.621 0.000

Algeria ARB\_4 8.000 360.818 17 0 0.135 0.123 0.148 NA 0.930 0.882

Niger AB\_6 9.167 511.461 25 0 0.134 0.124 0.144 NA 0.667 0.306

Taiwan, Republic of China WVS\_6 11.551 244.621 12 0 0.133 0.119 0.148 NA 0.643 0.000

Madagascar AB\_6 2.333 525.544 25 0 0.131 0.121 0.141 NA 0.660 0.291

Austria EUB\_8 15.000 307.111 20 0 0.130 0.117 0.143 0.109 0.820 0.829

Lithuania ESS\_8 4.618 1088.100 32 0 0.128 0.121 0.134 NA 0.953 0.747

Slovakia EUB\_8 17.791 288.305 20 0 0.126 0.114 0.139 0.133 0.947 0.949

Jordan ARB\_4 27.800 308.704 17 0 0.126 0.114 0.138 NA 0.833 0.716

Taiwan ASB\_4 17.381 724.927 33 0 0.124 0.116 0.132 NA 0.799 0.631

Table 23: Global Fit Indices of List-Wide Deleted Data in all Coun- try Surveys *(continued)*

country

Sudan

survey\_wavpeerc\_miss

M2

575.548

df

25

p

0

RMSEA

0.146

RMSEA\_5RMSEA\_9S5RMSR

TLI

0.673

CFI

0.319

AB\_6

13.833

0.136

0.156

NA

Thailand

ASB\_4

19.250

718.611

33

0

0.147

0.137

0.156

NA

0.674

0.401

Ghana

AB\_6

9.708

1192.821

25

0

0.147

0.140

0.154

NA

0.799

0.582

Uganda

AB\_6

19.417

1110.621

25

0

0.150

0.142

0.157

NA

0.149

0.000

India

SASB\_2

32.570

1708.803

33

0

0.157

0.151

0.163

NA

0.462

0.013

Cyprus

WVS\_6

4.200

312.282

12

0

0.162

0.146

0.177

NA

0.281

0.000

Sri Lanka

SASB\_2

34.116

1006.553

33

0

0.162

0.154

0.171

NA

0.422

0.000

Japan

ASB\_3

12.553

1472.344

33

0

0.163

0.156

0.170

NA

0.486

0.058

Morocco

AB\_6

17.833

507.056

18

0

0.166

0.154

0.179

NA

0.705

0.242

Kenya

AB\_6

18.690

1451.020

25

0

0.171

0.164

0.179

NA

0.175

0.000

Argentina

WVS\_6

7.476

358.214

12

0

0.174

0.159

0.190

NA

0.458

0.000

Australia

WVS\_6

4.672

553.898

12

0

0.179

0.167

0.192

NA

0.296

0.000

Uruguay

WVS\_6

17.300

336.469

12

0

0.181

0.164

0.198

NA

0.270

0.000

Germany

WVS\_6

8.016

839.380

12

0

0.191

0.181

0.203

NA

-0.024

0.000

Hong Kong

ASB\_3

35.957

1162.373

33

0

0.211

0.200

0.221

NA

-0.131

0.000

Korea (South)

WVS\_6

0.833

666.249

12

0

0.214

0.200

0.228

NA

0.236

0.000

27

Romania WVS\_6 10.246 741.546 12 0 0.212 0.199 0.225 NA 0.437 0.000

Cote d’Ivoire AB\_6 10.842 1171.053 25 0 0.207 0.197 0.217 NA 0.365 0.000

Mauritius AB\_6 9.250 973.332 25 0 0.187 0.177 0.197 NA 0.543 0.048

Sweden WVS\_6 20.564 381.103 12 0 0.179 0.164 0.195 NA -0.081 0.000

Slovenia WVS\_6 7.390 392.313 12 0 0.179 0.164 0.194 NA 0.590 0.000

Poland WVS\_6 17.184 302.199 12 0 0.174 0.157 0.191 NA 0.485 0.000

Benin AB\_6 8.000 792.608 25 0 0.167 0.157 0.177 NA 0.629 0.227

Bangladesh SASB\_2 28.301 508.625 18 0 0.163 0.151 0.176 NA 0.666 0.141

Algeria AB\_6 20.417 654.146 25 0 0.162 0.152 0.173 NA 0.769 0.518

Zimbabwe AB\_6 17.208 1326.205 25 0 0.162 0.154 0.169 NA 0.676 0.325

Sierra Leone AB\_6 19.563 614.563 25 0 0.157 0.146 0.168 NA 0.541 0.043

Malawi AB\_6 16.292 1252.630 25 0 0.156 0.149 0.164 NA 0.574 0.112

Spain WVS\_6 8.915 300.971 12 0 0.149 0.135 0.164 NA 0.560 0.000

Uruguay LB\_2017 9.500 291.640 12 0 0.147 0.132 0.161 NA 0.615 0.000

Philippines WVS\_6 0.500 318.961 12 0 0.146 0.133 0.160 NA 0.422 0.000

Table 23: Global Fit Indices of List-Wide Deleted Data in all Coun- try Surveys *(continued)*

country

survey\_wavpeerc\_miss

M2

df

p

RMSEA

RMSEA\_5RMSEA\_9S5RMSR

TLI

CFI

Netherlands

WVS\_6

10.568

1012.109

12

0

0.221

0.210

0.233

NA

0.242

0.000

Mainland China

ASB\_3

16.556

2783.855

18

0

0.230

0.223

0.238

NA

-0.072

0.000

Japan

WVS\_6

21.326

1666.991

12

0

0.268

0.257

0.279

NA

-0.357

0.000

*Note:*

Table Sorted by Survey Wave, RMSEAvalues.

28

Venezuela LB\_2017 4.083 808.489 12 0 0.240 0.226 0.254 NA 0.321 0.000

United States of America WVS\_6 4.839 1360.736 12 0 0.230 0.220 0.240 NA -0.136 0.000

Estonia WVS\_6 7.958 812.649 12 0 0.218 0.205 0.230 NA -0.183 0.000

Table 24: Andersen LR test in all country-surveys where estimation was possible

country

survey\_wave

model

LRsplit

LR

Chi2.df

p.value

Items.kept

Slovakia Romania

EUB\_87.3 EUB\_87.3

RM RM

Median" Median"

6.554

6.942

6

6

0.364

0.326

courts, police, pubadmin, polpart, locgov, natgov, parl courts, police, pubadmin, polpart, locgov, natgov, parl

Slovenia Malta

WVS\_6 EUB\_87.3

RSM RM

Median" Median"

3.796

7.179

3

5

0.284

0.208

police, courts

courts, police, polpart, locgov, natgov, parl

Northern Ireland

Korea (South)

EUB\_87.3

WVS\_6

RM

RSM

Median"

Median"

9.514

5.988

6

3

0.147

0.112

courts, police, pubadmin, polpart, locgov, natgov, parl

police, civserv

Poland Turkey

WVS\_6 EUB\_87.3

RSM RM

Median" Median"

6.123

12.099

3

6

0.106

0.060

police, courts

courts, police, pubadmin, polpart, locgov, natgov, parl

Bulgaria Spain

EUB\_87.3 EUB\_87.3

RM RM

Median" Median"

11.474

11.719

5

5

0.043

0.039

courts, police, pubadmin, locgov, natgov, parl courts, police, pubadmin, locgov, natgov, parl

Czech Republic Greece

EUB\_87.3 EUB\_87.3

RM RM

Median" Median"

14.699

15.876

6

6

0.023

0.014

courts, police, pubadmin, polpart, locgov, natgov, parl courts, police, pubadmin, polpart, locgov, natgov, parl

Tunisia Japan

ARB\_4 WVS\_6

PCM RSM

Median" Median"

24.409

11.543

11

3

0.011

0.009

gov, justice, police, parties police, parties

France

Lithuania

EUB\_87.3

EUB\_87.3

RM

RM

Median"

Median"

17.917

17.932

6

6

0.006

0.006

courts, police, pubadmin, polpart, locgov, natgov, parl

courts, police, pubadmin, polpart, locgov, natgov, parl

Jordan Estonia

ARB\_4 EUB\_87.3

PCM RM

Median" Median"

22.818

20.023

8

6

0.004

0.003

gov, justice, parl

courts, police, pubadmin, polpart, locgov, natgov, parl

Great Britain Finland

EUB\_87.3 EUB\_87.3

RM RM

Median" Mean

20.506

16.819

6

4

0.002

0.002

courts, police, pubadmin, polpart, locgov, natgov, parl courts, pubadmin, polpart, natgov, parl

Latvia Hungary

EUB\_87.3 EUB\_87.3

RM RM

Median" Median"

20.733

21.763

6

6

0.002

0.001

courts, police, pubadmin, polpart, locgov, natgov, parl courts, police, pubadmin, polpart, locgov, natgov, parl

Netherlands Costa Rica

WVS\_6 LB\_2017

RSM RSM

Median" Median"

15.746

24.268

3

6

0.001

0.000

police, civserv

police, parl, gov, justice, elecsys

Nepal

Portugal

SASB\_2

EUB\_87.3

PCM

RM

Median"

Median"

38.472

24.793

14

6

0.000

0.000

pres, courts, civserv, parties, police

courts, police, pubadmin, polpart, locgov, natgov, parl

Germany West Sweden

EUB\_87.3 EUB\_87.3

RM RM

Mean Median"

25.480

26.129

6

6

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl courts, police, pubadmin, polpart, locgov, natgov, parl

Cyprus (Republic) Thailand

EUB\_87.3 ASB\_4

RM PCM

Median" Median"

26.566

36.534

6

11

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl parties, police, locgov, nec

Croatia

EUB\_87.3

RM

Median"

28.508

6

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

30

Table 24: Andersen LR test in all country-surveys where estimation was possible *(continued)*

country

Honduras

survey\_wave

LB\_2017

model

RSM

LRsplit

Median"

LR

29.779

Chi2.df

6

p.value

0.000

Items.kept

police, parl, justice, parties, elecsys

Serbia Bolivia

EUB\_87.3 LB\_2017

RM PCM

Median" Median"

30.696

41.977

6

11

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl police, parl, gov, elecsys

Morocco

Sweden

ARB\_4

WVS\_6

PCM

RSM

Median"

Median"

36.900

25.546

8

3

0.000

0.000

gov, justice, police

civserv, courts

Slovenia Portugal

EUB\_87.3 ESS\_8

RM PCM

Median" Median"

34.320

59.159

6

19

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl justice, parl

Luxembourg Montenegro

EUB\_87.3 EUB\_87.3

RM RM

Mean Median"

34.852

36.585

6

6

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl courts, police, pubadmin, polpart, locgov, natgov, parl

Denmark El Salvador

EUB\_87.3 LB\_2017

RM RSM

Median" Median"

38.579

33.910

6

4

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl police, parl, justice

Paraguay Spain

LB\_2017 WVS\_6

RSM RSM

Median" Median"

33.273

41.980

3

6

0.000

0.000

parl, gov

police, parl, civserv, parties, courts

Poland

Singapore

EUB\_87.3

ASB\_4

RM

PCM

Median"

Median"

42.510

40.897

6

5

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl

natgov, parties

Makedonia/FYROM Korea

EUB\_87.3 ASB\_4

RM RSM

Median" Median"

44.905

45.217

6

6

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl pres, courts, civserv, locgov, nec

Germany Palestine

ESS\_8 ARB\_4

PCM PCM

Mean Median"

72.490

57.666

19

11

0.000

0.000

justice, parties

gov, justice, police, parties

Ireland Albania

EUB\_87.3 EUB\_87.3

RM RM

Median" Median"

50.541

50.706

6

6

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl courts, police, pubadmin, polpart, locgov, natgov, parl

Cambodia Argentina

ASB\_4 LB\_2017

PCM RSM

Median" Median"

86.313

53.565

23

7

0.000

0.000

pres, courts, natgov, parties, civserv, police, locgov, nec

police, parl, gov, justice, parties, elecsys

Mongolia

Chile

ASB\_4

LB\_2017

PCM

RSM

Median"

Median"

95.763

52.080

26

4

0.000

0.000

pres, courts, natgov, parties, parl, civserv, police, locgov, nec

police, gov, elecsys pres, parties, nec

Hong Kong Argentina

ASB\_3 WVS\_6

PCM RSM

Mean Median"

63.702

59.883

8

6

0.000

0.000

police, civserv, gov, parties, courts

president, parl, nec, tax, locgov, rulpart, police, courts

Lesotho Chile

AB\_6 WVS\_6

RSM RSM

Median" Median"

68.855

54.379

9

3

0.000

0.000

police, parties

Ecuador Germany East

LB\_2017 EUB\_87.3

RSM RM

Median" Median"

61.535

64.392

5

6

0.000

0.000

police, gov, justice, elecsys

courts, police, pubadmin, polpart, locgov, natgov, parl

31

Table 24: Andersen LR test in all country-surveys where estimation was possible *(continued)*

country

Sri Lanka

survey\_wave

SASB\_2

model

PCM

LRsplit

Median"

LR

97.118

Chi2.df

20

p.value

0.000

Items.kept

pm, parl, locgov, courts, civserv, parties, police

Brazil Nicaragua

WVS\_6 LB\_2017

PCM RSM

Median" Median"

79.079

72.934

11

7

0.000

0.000

police, civserv, gov, courts

police, parl, gov, justice, parties, elecsys

Morocco Estonia

AB\_6 WVS\_6

PCM RSM

Median" Median"

97.783

66.030

17

4

0.000

0.000

president, tax, locgov, rulpart, police, courts police, gov, courts

The Netherlands Peru

EUB\_87.3 LB\_2017

RM RSM

Mean Median"

72.294

72.421

6

6

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl police, parl, gov, parties, elecsys

Dominican Rep.

LB\_2017

RSM

Median"

69.647

5

0.000

police, parl, gov, parties

Egypt Egypt

ARB\_4 AB\_6

RSM RSM

Median" Median"

70.018

75.798

5

7

0.000

0.000

gov, justice, parl, parties

president, nec, tax, locgov, police, courts

Tunisia Guatemala

AB\_6 LB\_2017

PCM RSM

Median" Median"

115.807

23

7

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts police, parl, gov, justice, parties, elecsys

82.289

114.064

Swaziland

Mauritius

AB\_6

AB\_6

PCM

PCM

Median"

Median"

20

17

0.000

0.000

president, parl, nec, tax, locgov, police, courts

president, tax, locgov, rulpart, police, courts

110.339

84.543

Austria Italy

EUB\_87.3 EUB\_87.3

RM RM

Median" Median"

6

5

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl courts, police, pubadmin, locgov, natgov, parl

84.292

113.973

Belgium Algeria

EUB\_87.3 AB\_6

RM PCM

Median" Median"

6

20

0.000

0.000

courts, police, pubadmin, polpart, locgov, natgov, parl president, parl, nec, tax, locgov, police, courts

143.652

Benin Botswana

AB\_6 AB\_6

PCM RSM

Median" Median"

320.846

191.176

23

9

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts president, parl, nec, tax, locgov, rulpart, police, courts

Burkina Faso Burundi

AB\_6 AB\_6

RSM RSM

Median" Median"

178.263

489.830

8

9

0.000

0.000

president, parl, nec, tax, locgov, police, courts president, parl, nec, tax, locgov, rulpart, police, courts

Cameroon

Cape Verde

AB\_6

AB\_6

RSM

RSM

Median"

Median"

229.269

12494429.463

9

9

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts

president, parl, nec, tax, locgov, rulpart, police, courts

Cote d’Ivoire Gabon

AB\_6 AB\_6

RSM RSM

Median" Median"

391.548

130.409

9

8

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts president, parl, nec, tax, locgov, police, courts

Ghana Guinea

AB\_6 AB\_6

RSM RSM

Median" Median"

575.089

344.056

9

9

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts president, parl, nec, tax, locgov, rulpart, police, courts

Kenya Liberia

AB\_6 AB\_6

RSM RSM

Median" Median"

464.100

161.788

9

9

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts president, parl, nec, tax, locgov, rulpart, police, courts

Madagascar

AB\_6

PCM

Median"

202.184

23

0.000

president, parl, nec, tax, locgov, rulpart, police, courts

32

Table 24: Andersen LR test in all country-surveys where estimation was possible *(continued)*

country

Malawi

survey\_wave

AB\_6

model

PCM

LRsplit

Median"

LR

170.047

Chi2.df

23

p.value

0.000

Items.kept

president, parl, nec, tax, locgov, rulpart, police, courts

Mali

Mozambique

AB\_6

AB\_6

RSM

RSM

Median"

Median"

167.097

269.411

9

8

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts

parl, nec, tax, locgov, rulpart, police, courts

Namibia Niger

AB\_6 AB\_6

RSM RSM

Mean Mean

163.963

15653917.813

8

9

0.000

0.000

president, nec, tax, locgov, rulpart, police, courts president, parl, nec, tax, locgov, rulpart, police, courts

SÃ£o TomÃ© and PrÃncipe Senegal

AB\_6 AB\_6

RSM PCM

Median" Median"

306.758

226.155

9

23

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts president, parl, nec, tax, locgov, rulpart, police, courts

Sierra Leone South Africa

AB\_6 AB\_6

RSM PCM

Median" Median"

218.957

233.836

9

23

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts president, parl, nec, tax, locgov, rulpart, police, courts

Sudan Tanzania

AB\_6 AB\_6

RSM RSM

Median" Median"

225.994

506.992

9

9

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts president, parl, nec, tax, locgov, rulpart, police, courts

Togo

Uganda

AB\_6

AB\_6

RSM

RSM

Median"

Median"

103.784

324.122

9

9

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts

president, parl, nec, tax, locgov, rulpart, police, courts

Zambia Zimbabwe

AB\_6 AB\_6

RSM RSM

Median" Median"

192.626

681.944

9

9

0.000

0.000

president, parl, nec, tax, locgov, rulpart, police, courts president, parl, nec, tax, locgov, rulpart, police, courts

Algeria Lebanon

ARB\_4 ARB\_4

PCM RSM

Median" Median"

157.611

1127686.609

14

4

0.000

0.000

gov, justice, parl, police, parties parl, police, parties

Indonesia Japan

ASB\_3 ASB\_3

PCM PCM

Median" Median"

121.168

142.589

14

20

0.000

0.000

courts, natgov, parties, parl, nec

pres, courts, parties, civserv, police, locgov, nec

Mainland China Malaysia

ASB\_3 ASB\_4

PCM PCM

Median" Median"

228.727

121.574

11

14

0.000

0.000

courts, civserv, police, locgov natgov, parties, civserv, police, nec

Myanmar

Philippines

ASB\_4

ASB\_4

RSM

RSM

Median"

Median"

14451209.842

15586342.002

7

10

0.000

0.000

pres, natgov, parties, civserv, locgov, nec

pres, courts, natgov, parties, parl, civserv, police, locgov, nec

Taiwan Israel

ASB\_4 ESS\_8

PCM RSM

Median" Median"

138.585

128.399

20

11

0.000

0.000

pres, courts, natgov, civserv, police, locgov, nec justice, police, parl

Russian Federation Brazil

ESS\_8 LB\_2017

RSM RSM

Median" Median"

18473314.866

101.731

12

4

0.000

0.000

justice, police, parl, parties police, justice, elecsys

Colombia Mexico

LB\_2017 LB\_2017

RSM RSM

Median" Median"

194.788

125.066

5

6

0.000

0.000

police, parl, justice, elecsys police, parl, gov, justice, elecsys

Panama Uruguay

LB\_2017 LB\_2017

RSM RSM

Median" Median"

88.737

207.569

5

6

0.000

0.000

police, parl, parties, elecsys

police, gov, justice, parties, elecsys

33

Table 24: Andersen LR test in all country-surveys where estimation was possible *(continued)*

country

Venezuela

survey\_wave

LB\_2017

model

PCM

LRsplit

Median"

LR

515.588

Chi2.df

17

p.value

0.000

Items.kept

police, parl, gov, justice, parties, elecsys

Bangladesh India

SASB\_2 SASB\_2

RSM RSM

Median" Median"

101.325

256.856

7

10

0.000

0.000

pm, parl, locgov, courts, parties, police

pres, pm, natgov, parl, locgov, courts, civserv, parties, police

Pakistan Australia

SASB\_2 WVS\_6

PCM RSM

Median" Median"

259.270

127.345

23

5

0.000

0.000

pres, pm, natgov, parl, courts, civserv, parties, police police, parl, civserv, courts

Cyprus

WVS\_6

RSM

Median"

118.860

7

0.000

police, parl, civserv, gov, parties, courts

Germany India

WVS\_6 WVS\_6

RSM PCM

Median" Median"

187.965

124.487

7

17

0.000

0.000

police, parl, civserv, gov, parties, courts police, parl, civserv, gov, parties, courts

Mexico Peru

WVS\_6 WVS\_6

PCM RSM

Median" Median"

178.168

119.425

17

5

0.000

0.000

police, parl, civserv, gov, parties, courts police, civserv, gov, courts

Philippines

Romania

WVS\_6

WVS\_6

RSM

RSM

Median"

Median"

13783097.215

133.021

7

7

0.000

0.000

police, parl, civserv, gov, parties, courts

police, parl, civserv, gov, parties, courts

South Africa

Taiwan, Republic of China

WVS\_6 WVS\_6

PCM RSM

Median" Median"

234.029

18511187.548

17

6

0.000

0.000

police, parl, civserv, gov, parties, courts police, civserv, gov, parties, courts

United States of America Uruguay

WVS\_6 WVS\_6

RSM PCM

Median" Median"

123.877

160.788

5

14

0.000

0.000

police, civserv, gov, courts police, parl, civserv, gov, courts

Nigeria Vietnam

AB\_6 ASB\_3

RSM PCM

error error

NA NA

NA NA

NA NA

NA NA

Austria Belgium

ESS\_8 ESS\_8

PCM PCM

error error

NA NA

NA NA

NA NA

NA NA

Czechia

Estonia

ESS\_8

ESS\_8

PCM

PCM

error

error

NA

NA

NA

NA

NA

NA

NA

NA

Finland France

ESS\_8 ESS\_8

PCM PCM

error error

NA NA

NA NA

NA NA

NA NA

Hungary Iceland

ESS\_8 ESS\_8

PCM PCM

error error

NA NA

NA NA

NA NA

NA NA

Ireland Italy

ESS\_8 ESS\_8

PCM PCM

error error

NA NA

NA NA

NA NA

NA NA

Lithuania Netherlands

ESS\_8 ESS\_8

PCM PCM

error error

NA NA

NA NA

NA NA

NA NA

Norway

ESS\_8

RSM

error

NA

NA

NA

NA

34

Table 24: Andersen LR test in all country-surveys where estimation was possible *(continued)*

country

survey\_wave model LRsplit

LR Chi2.df p.value Items.kept

Poland Slovenia

ESS\_8 ESS\_8

PCM PCM

error error

NA NA

NA NA

NA NA

NA NA

Spain Sweden

ESS\_8 ESS\_8

PCM PCM

error error

NA NA

NA NA

NA NA

NA NA

Switzerland United Kingdom

ESS\_8 ESS\_8

PCM PCM

error error

NA NA

NA NA

NA NA

NA NA

*Note:*

Table Sorted by p-values.

35

87.3

87.3

87.3

\_2

87.3

\_2

\_2

87.3

\_2

87.3

87.3

87.3

87.3

87.3

87.3

87.3

87.3

Table 25: Country Surveys, Proportion of Missing Respondents with list-wide Deletion, and Institutions Included in the Scale

country

survey

perc\_misJsustice

Police

Parl.

Parties

rulpart

Natgov

Elecsys

Locgov

Presi.

Civserv

Tax

pm

Malta

EUB\_

49.800

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Great Britain

EUB\_

39.347

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Nepal

SASB

36.350

Yes

Yes

NA

Yes

NA

NA

NA

NA

Yes

Yes

NA

NA

Luxembourg

EUB\_

34.766

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

India

SASB

32.570

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

Northern Ireland

EUB\_

28.793

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Jordan

ARB\_4

27.800

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

NA

NA

NA

Latvia

EUB\_

27.572

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Senegal

AB\_6

26.833

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Makedonia/FYROM

EUB\_

25.636

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Serbia

EUB\_

24.826

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Lithuania

EUB\_

23.909

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Mozambique

AB\_6

22.958

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Lebanon

ARB\_4

21.333

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

NA

NA

NA

Cyprus (Republic)

EUB\_

21.200

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Sweden

WVS\_6

20.564

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

Yes

NA

NA

37

Tunisia AB\_6 20.583 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Japan WVS\_6 21.326 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Bulgaria EUB\_ 22.868 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Poland EUB\_ 23.033 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Vietnam ASB\_3 24.601 Yes Yes Yes Yes NA Yes Yes Yes NA Yes NA NA

France EUB\_ 25.460 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Swaziland AB\_6 25.833 Yes Yes Yes NA NA NA Yes Yes Yes NA Yes NA

Egypt AB\_6 27.546 Yes Yes NA NA NA NA Yes Yes Yes NA Yes NA

Cambodia ASB\_4 27.583 Yes Yes Yes Yes NA Yes Yes Yes Yes Yes NA NA

Bangladesh SASB 28.301 Yes Yes Yes Yes NA NA NA Yes NA Yes NA Yes

Lesotho AB\_6 32.417 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Sri Lanka SASB 34.116 Yes Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes

Hong Kong ASB\_3 35.957 Yes Yes Yes Yes NA Yes Yes Yes Yes Yes NA NA

Estonia EUB\_ 37.624 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Myanmar ASB\_4 42.531 Yes Yes Yes Yes NA Yes Yes Yes Yes Yes NA NA

87.3

87.3

87.3

87.3

87.3

87.3

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87.3

87.3

87.3

Table 25: Country Surveys, Proportion of Missing Respondents with list-wide Deletion, and Institutions Included in the Scale *(con- tinued)*

country

survey

perc\_misJsustice

Police

Parl.

Parties

rulpart

Natgov

Elecsys

Locgov

Presi.

Civserv

Tax

pm

SÃ£o TomÃ© and PrÃncipe

AB\_6

20.234

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Tunisia

ARB\_4

19.917

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

NA

NA

NA

Sierra Leone

AB\_6

19.563

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Uganda

AB\_6

19.417

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Kenya

AB\_6

18.690

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Morocco

AB\_6

17.833

Yes

Yes

Yes

NA

Yes

NA

NA

Yes

Yes

NA

Yes

NA

Albania

EUB\_

17.636

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Italy

EUB\_

17.366

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Zimbabwe

AB\_6

17.208

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Cape Verde

AB\_6

17.167

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Mainland China

ASB\_3

16.556

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Malawi

AB\_6

16.292

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Sweden

EUB\_

15.286

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Zambia

AB\_6

14.846

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Botswana

AB\_6

14.500

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

38

Germany West EUB\_ 14.765 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Austria EUB\_ 15.000 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Togo AB\_6 15.917 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Pakistan SASB 16.486 Yes Yes Yes Yes NA Yes NA NA Yes Yes NA Yes

The Netherlands EUB\_ 16.667 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Poland WVS\_6 17.184 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Uruguay WVS\_6 17.300 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Taiwan ASB\_4 17.381 Yes Yes Yes Yes NA Yes Yes Yes Yes Yes NA NA

Slovakia EUB\_ 17.791 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Denmark EUB\_ 18.307 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Thailand ASB\_4 19.250 Yes Yes Yes Yes NA Yes Yes Yes Yes Yes NA NA

Indonesia ASB\_3 19.484 Yes Yes Yes Yes NA Yes Yes Yes Yes Yes NA NA

Egypt ARB\_4 19.667 Yes Yes Yes Yes NA Yes NA NA NA NA NA NA

Ireland EUB\_ 20.020 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Algeria AB\_6 20.417 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

87.3

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Table 25: Country Surveys, Proportion of Missing Respondents with list-wide Deletion, and Institutions Included in the Scale *(con- tinued)*

country

survey

perc\_misJsustice

Police

Parl.

Parties

rulpart

Natgov

Elecsys

Locgov

Presi.

Civserv

Tax

pm

Palestine

ARB\_4

14.250

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

NA

NA

NA

Romania

EUB\_

14.144

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Sudan

AB\_6

13.833

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Czech Republic

EUB\_

13.538

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Panama

LB\_20

13.400

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

South Africa

AB\_6

12.762

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Japan

ASB\_3

12.553

Yes

Yes

Yes

Yes

NA

Yes

Yes

Yes

Yes

Yes

NA

NA

Hungary

EUB\_

12.026

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Taiwan, Republic of China

WVS\_6

11.551

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

Yes

NA

NA

Nicaragua

LB\_20

11.200

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

Netherlands

WVS\_6

10.568

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

Yes

NA

NA

Mongolia

ASB\_4

10.016

Yes

Yes

Yes

Yes

NA

Yes

Yes

Yes

Yes

Yes

NA

NA

Guatemala

LB\_20

9.900

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

Ghana

AB\_6

9.708

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Guinea

AB\_6

9.583

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

39

Argentina LB\_20 9.583 Yes Yes Yes Yes NA Yes Yes NA NA NA NA NA

Tanzania AB\_6 9.765 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Burkina Faso AB\_6 9.917 Yes Yes Yes NA NA NA Yes Yes Yes NA Yes NA

Romania WVS\_6 10.246 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Cote d’Ivoire AB\_6 10.842 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Cameroon AB\_6 11.506 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Morocco ARB\_4 11.917 Yes Yes Yes Yes NA Yes NA NA NA NA NA NA

Portugal EUB\_ 12.213 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Slovenia EUB\_ 12.648 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Finland EUB\_ 13.142 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Germany East EUB\_ 13.523 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Burundi AB\_6 13.583 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Spain EUB\_ 13.911 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Malaysia ASB\_4 14.167 Yes Yes Yes Yes NA Yes Yes Yes Yes Yes NA NA

Montenegro EUB\_ 14.451 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

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17

87.3

17

17

17

87.3

17

17

87.3

17

Table 25: Country Surveys, Proportion of Missing Respondents with list-wide Deletion, and Institutions Included in the Scale *(con- tinued)*

country

survey

perc\_misJsustice

Police

Parl.

Parties

rulpart

Natgov

Elecsys

Locgov

Presi.

Civserv

Tax

pm

Namibia

AB\_6

9.417

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Bolivia

LB\_20

9.167

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

Russian Federation

ESS\_8

9.053

Yes

Yes

Yes

Yes

NA

NA

NA

NA

NA

NA

NA

NA

Spain

WVS\_6

8.915

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

Yes

NA

NA

Paraguay

LB\_20

8.417

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

Mexico

LB\_20

8.250

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

Algeria

ARB\_4

8.000

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

NA

NA

NA

Estonia

WVS\_6

7.958

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

Yes

NA

NA

Nigeria

AB\_6

7.667

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Philippines

ASB\_4

7.583

Yes

Yes

Yes

Yes

NA

Yes

Yes

Yes

Yes

Yes

NA

NA

Brazil

LB\_20

7.417

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

El Salvador

LB\_20

7.300

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

Spain

ESS\_8

6.895

Yes

Yes

Yes

Yes

NA

NA

NA

NA

NA

NA

NA

NA

Croatia

EUB\_

6.445

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Israel

ESS\_8

6.257

Yes

Yes

Yes

Yes

NA

NA

NA

NA

NA

NA

NA

NA

40

Costa Rica LB\_20 6.300 Yes Yes Yes Yes NA Yes Yes NA NA NA NA NA

Switzerland ESS\_8 6.689 Yes Yes Yes Yes NA NA NA NA NA NA NA NA

Poland ESS\_8 7.202 Yes Yes Yes Yes NA NA NA NA NA NA NA NA

Slovenia WVS\_6 7.390 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Argentina WVS\_6 7.476 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Belgium EUB\_ 7.610 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Honduras LB\_20 7.800 Yes Yes Yes Yes NA Yes Yes NA NA NA NA NA

Benin AB\_6 8.000 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Germany WVS\_6 8.016 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

South Africa WVS\_6 8.383 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Turkey EUB\_ 8.774 Yes Yes Yes Yes NA Yes NA Yes NA Yes NA NA

Singapore ASB\_4 9.047 Yes Yes Yes Yes NA Yes NA NA Yes Yes NA NA

Niger AB\_6 9.167 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Mauritius AB\_6 9.250 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Uruguay LB\_20 9.500 Yes Yes Yes Yes NA Yes Yes NA NA NA NA NA

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17

17

87.3

17

17

17

Table 25: Country Surveys, Proportion of Missing Respondents with list-wide Deletion, and Institutions Included in the Scale *(con- tinued)*

country

survey

perc\_misJsustice

Police

Parl.

Parties

rulpart

Natgov

Elecsys

Locgov

Presi.

Civserv

Tax

pm

Chile

LB\_20

6.083

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

Dominican Rep.

LB\_20

5.700

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

United States of America

WVS\_6

4.839

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

Yes

NA

NA

Australia

WVS\_6

4.672

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

Yes

NA

NA

Liberia

AB\_6

4.587

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

Greece

EUB\_

4.257

Yes

Yes

Yes

Yes

NA

Yes

NA

Yes

NA

Yes

NA

NA

Slovenia

ESS\_8

4.208

Yes

Yes

Yes

Yes

NA

NA

NA

NA

NA

NA

NA

NA

Sweden

ESS\_8

4.191

Yes

Yes

Yes

Yes

NA

NA

NA

NA

NA

NA

NA

NA

Colombia

LB\_20

4.083

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

Portugal

ESS\_8

4.016

Yes

Yes

Yes

Yes

NA

NA

NA

NA

NA

NA

NA

NA

Brazil

WVS\_6

3.836

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

Yes

NA

NA

Ecuador

LB\_20

3.083

Yes

Yes

Yes

Yes

NA

Yes

Yes

NA

NA

NA

NA

NA

United Kingdom

ESS\_8

2.808

Yes

Yes

Yes

Yes

NA

NA

NA

NA

NA

NA

NA

NA

Germany

ESS\_8

2.630

Yes

Yes

Yes

Yes

NA

NA

NA

NA

NA

NA

NA

NA

Iceland

ESS\_8

2.273

Yes

Yes

Yes

Yes

NA

NA

NA

NA

NA

NA

NA

NA

41

Madagascar AB\_6 2.333 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Mexico WVS\_6 2.650 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Gabon AB\_6 3.005 Yes Yes Yes NA Yes NA Yes Yes Yes NA Yes NA

Netherlands ESS\_8 3.212 Yes Yes Yes Yes NA NA NA NA NA NA NA NA

Estonia ESS\_8 4.012 Yes Yes Yes Yes NA NA NA NA NA NA NA NA

Venezuela LB\_20 4.083 Yes Yes Yes Yes NA Yes Yes NA NA NA NA NA

Italy ESS\_8 4.189 Yes Yes Yes Yes NA NA NA NA NA NA NA NA

Cyprus WVS\_6 4.200 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Hungary ESS\_8 4.213 Yes Yes Yes Yes NA NA NA NA NA NA NA NA

Peru WVS\_6 4.380 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Lithuania ESS\_8 4.618 Yes Yes Yes Yes NA NA NA NA NA NA NA NA

Korea ASB\_4 4.833 Yes Yes Yes Yes NA Yes Yes Yes Yes Yes NA NA

Ireland ESS\_8 5.296 Yes Yes Yes Yes NA NA NA NA NA NA NA NA

Peru LB\_20 6.083 Yes Yes Yes Yes NA Yes Yes NA NA NA NA NA

Chile WVS\_6 6.200 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Table 25: Country Surveys, Proportion of Missing Respondents with list-wide Deletion, and Institutions Included in the Scale *(con- tinued)*

country

survey

perc\_misJsustice

Police

Parl.

Parties

rulpart

Natgov

Elecsys

Locgov

Presi.

Civserv

Tax

pm

Mali

AB\_6

2.167

Yes

Yes

Yes

NA

Yes

NA

Yes

Yes

Yes

NA

Yes

NA

France

ESS\_8

1.932

Yes

Yes

Yes

Yes

NA

NA

NA

NA

NA

NA

NA

NA

Norway

ESS\_8

1.359

Yes

Yes

Yes

Yes

NA

NA

NA

NA

NA

NA

NA

NA

Korea (South)

WVS\_6

0.833

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

Yes

NA

NA

India

WVS\_6

0.443

Yes

Yes

Yes

Yes

NA

Yes

NA

NA

NA

Yes

NA

NA

*Note:*

Table Sorted in Descending Order by Percent of Sample dropped as a result of list-wide deletion

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Philippines WVS\_6 0.500 Yes Yes Yes Yes NA Yes NA NA NA Yes NA NA

Finland ESS\_8 0.883 Yes Yes Yes Yes NA NA NA NA NA NA NA NA

Belgium ESS\_8 1.529 Yes Yes Yes Yes NA NA NA NA NA NA NA NA

Czechia ESS\_8 2.027 Yes Yes Yes Yes NA NA NA NA NA NA NA NA

Austria ESS\_8 2.239 Yes Yes Yes Yes NA NA NA NA NA NA NA NA