Replication Materials for *Measuring Transparency*

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This folder contains the replication materials for James R. Hollyer, B. Peter Rosendorff, and James Raymond Vreeland. Measuring transparency. *Political Analysis*, forthcoming.

- Our index – and all posterior densities associated with our measurement model – is stored in the **Index Properties** subdirectory, as the **TransparencyIndex2013.RData** R file. (Results are stored in the object 'results.') We additionally provide our index in Stata format, as the file **HRV2013.dta**. This file contains all country-year means, highest posterior density intervals, and standard deviations. It also contains estimates of the first-differences in transparency values and associated highest posterior density intervals.

Included – in addition to the HRV index and all materials necessary to reproduce the tables and graphs in the paper and appendix – are materials necessary for constructing the index, running prior robustness checks, nesting the measurement model and regressions employed in the paper, and conducting comparisons of model fit. As this necessitates the inclusion of a large number of files, we have organized these materials into subdirectories, as outlined below:

- The **Index Properties** directory contains the output from our measurement model, the files necessary to output these data to a Stata .dta file, the materials necessary to construct Figures 1-2 and

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5-10 and Appendices A and B of the paper, and the convergence diagnostics presented in Appendix C of the paper.

- The **Baseline Index** directory contains the materials necessary to re-run the baseline measurement model presented in the paper.

- The **PostPred Checks** directory contains all materials necessary to obtain the posterior predictive estimates of model fit presented in the paper and in Appendix E. It also contains all material necessary to estimate the comparison 'constants only' and two-dimensional IRT models.

- The **Regressions** directory contains all material to fit the model presented in Section 6 of the paper, and to generate the accompanying Figures (11-13). It also contains all material used in Appendix F.

- The **Robustness Checks** directory contains all material necessary to reproduce our prior robustness checks (presented in Appendix D). This includes our estimates of alternative models and comparisons thereof and all materials necessary to re-run these alternative models.

We explain the contents of these folders in more detail below.

Please note that all R .r and Stata .do files will require that file paths be respecified where appropriate. Please also note that many of these models – particularly the measurement models, but also the posterior predictive checks – are quite computationally intensive. Run-times averaged 2-3 days on an Ivy Bridge i7 desktop and 3-4 days on Sandy Bridge nodes on high performance clusters.

Index Properties

This directory contains the results of our measurement model, saved as **TransparencyIndex2013.RData**. The posterior densities of all country-year transparency estimates, as well as for all difficulty and discrimination parameters are stored as the object 'results' in the R data file.

The file **FullWDITransparencyJAGSExport.r** extracts the means, highest posterior density (HPD) intervals, standard deviations, first differences and HPDs on the first differences to a Stata .dta file (HRV2013.dta). The file **TransparencyBetasExport.r** does the same for difficulty and discrimination posterior density means and HPDs (saved as TransparencyCoefficients112313.dta).

The file **Figs1_10AppendixB.do** generates Figures 1-2 and 5-10 and the figures in Appendix B of the paper. Please note that the `graph export` command use to saved all graphics has been commented out in this code. To save the graphics, simply delete the asterisk preceding this command. (**Note:** The first several lines of code of Figs1_10AppendixB.do have been commented out. These lines change several of the variable names, change several of the variables exported from R into string variables, and replace the coding of years from $1, 2, ...31$ to $1980, 1981, ...2010$. The version of HRV2013.dta we have made available already has these changes incorporated. If, however, you export the data from R – using FullWDITransparencyJAGSExport.r – then you will need to delete the asterisks preceding each line of code to run this file.)

The file **BetasPlot.do** generates Figures 3-4 and the figures in Appendix A of the paper. Please note that the `graph export` command use to saved all graphics has been commented out in this code. To save the graphics, simply delete the asterisk preceding this command.[1]

The file **ConvergeStats.r** exports the convergence statistics from the measurement model. These are outputted to a LaTeX file, ConvergeStats.tex.

All remaining files in this folder are data files. In some instances, these contain the data used to generate the figures (e.g., the PWT71full.txt file contains data from the Penn World Table version 7.1.) In others, they are intermediate files created while merging various datasets together (e.g., FH_v_HRV.dta).

Baseline Index

This directory contains the files necessary to re-run our IRT model. (The underlying data used in the model are saved as **FullWDIIRTprep2.dta** in the main directory.)

The file **FullWDITransparencyIndex19802010ver3.txt** is the JAGS algorithm used to estimate the model. The file **FullWDITransparencyIndexConstruct231013.r** is the R file that calls JAGS, loads the data and stores all results.

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[1]We have found that, on some machines, the variable name labels – which normally appear along the left hand column of the graphs generated by this .do file – do not print correctly. If this proves to be an issue, one should be able to print the variable names by deleting the `ycommon` modifier in the `graph combine` commands that appear throughout the code. This comes at the expense of the alignment between the Discrimination and Difficulty parameter graphs. We have been unable to diagnose why this code should produce varying results across machines holding versions of Stata constant at ver. 11.2.

Note we do not set a randomization seed for JAGS, so re-running the model will not produce precisely identical results – minor variations may occur.

PostPred Checks

This directory contains all material necessary to reproduce the posterior predictive checks we use to assess model fit in Section 3 of the paper and in Appendix E.

The file **PosteriorPrediciveBaseline.r** constructs the TePCP measure of model fit using the baseline measurement model.

The file **ConstantsOnly.r** both runs the 'constants only' measurement model and constructs TePCP measure based on this model. Results are saved as **ConstantsOnly.RData**. (The ConstantsOnly.txt file contains the JAGS code for this measurement model.)

The file **TwoDimenIRTWDI26102013.r** runs the two dimensional IRT measurement model. The results are saved as **TwoDimenIRT.RData**. (The JAGS code for the two dimensional model is saved in TwoDimenWDIIndex19802010.txt.) The file **PosteriorPredictiveChecks2Dim.r** constructs the TePCP measure based off of the results of this model.

Figures 1-3 in the Appendix can be reproduced simply by plotting histograms of each of the three resulting TePCP distributions.

Regressions

This directory contains all material necessary to reproduce the regressions in Section 6 of the paper and the content of Appendix F.

The file **TransparencyABPrep.r** fits a nested algorithm containing both the measurement model and the regressions reported in Section 6 of the paper. (The JAGS code for this algorithm is contained in the file ABPReplicationver1.txt.) The results of this model are outputted to the file **TransparencyABPrep.RData**. (The data underlying the measurement algorithm is stored as IRTDataforABPRep.dta. While the additional data for the regression is stored as ABPOneModelFinal2.dta.)

The file **ABPmarginalEffects.r** uses this output to construct Figures 11-13 in the text.

The file **TransparencyHRVFracReported.r** fits a regression model of ICRG governance indicators against an alternative sum-score measure of transparency. (The JAGS code underlying this model is stored as FracReportedABP.txt.) These results are stored as **FracABPResults.RData**. (This measurement algorithm also makes use of the IRTDataforABPRep.dta data file. It additionally makes use of the HRVvFracReportedData.dta data file.)

The file **FracReportedComparisons.r** uses the output of both models to construct Figures 4-7 of the Appendix (all contained in Appendix F). (HRVModelFit.dta is an intermediary output of this file.)

Robustness Checks

This directory contains all the material necessary to reproduce our prior robustness checks, as reported in Appendix D.

The .RData files contained in this directory hold the estimates from all alternatively specified models presented. The file **PriorRobustnessTests.r** uses these data to construct Tables 2-5 in the Appendix. The output is saved as a .txt file containing LaTeX code for each table – PriorRobustnessCorrMatrices.txt.

This directory also contains the code necessary to re-run each of the 18 alternative specifications used as prior robustness tests. The JAGS code for each model is saved in **PriorRobustness***.txt**, where *** is an indexing. The final number of this index refers to alternative specifications of the prior on the difficulty and discrimination parameters (an index value of 0 is equivalent to the baseline model). The penultimate number of the index refers to alternative specifications of the prior on initial (1980) transparency index values. The first number of the index refers to alternative specifications of the hyperprior on the country specific smoothing term τ_c.

The files **Robustness***.r** will run each of these alternative specifications, each of which is outputted to **Robustness***.RData**.

All measurement files in this folder make use of the FullWDIIRTprep2.dta data file as a source for the underlying data.