

# Appendix: Uncovering Patterns Among Latent Variables: Human Rights and *De Facto* Judicial Independence

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## INTRODUCTION TO THE APPENDIX

The supplementary material presented in this document provides additional details about robustness checks and empirical analysis decisions discussed in the article “Uncovering Patterns Among Latent Variables: Human Rights and *De Facto* Judicial Independence.” The main article makes reference to the materials contained here. The code and data files necessary to conduct the analysis presented here are made publicly available at dataverse repositories maintained by the authors: <https://dataverse.harvard.edu/dataverse/CJFariss> and <https://dataverse.harvard.edu/dataverse/cdcrabtree>.

## A. VARIABLE DESCRIPTIONS

Below we describe the variables included in our model. (Keith, 2012, 54-112) and Keith, Tate and Poe (2009) contain a fuller discussion of this model.

**State Respect for Human Rights:** An interval variable that captures the degree to which a state respects human rights in a given year ( $t$ ). Data from Fariss (2014).

**Lagged Outcome Measure:** An interval variable that captures the degree to which a state respects human rights in a previous year ( $t-1$ ). Data from Fariss (2014).

***De Facto* Judicial Independence:** An interval variable bound between 0 and 1 that captures the degree to which courts can act independently in a state in a given year. Data from Linzer and Staton (2011). See (Keith, 2012, 152-154) for a discussion of her measure and Linzer and Staton (2011) for a discussion of the measure we use.

**Civil War:** A binary variable coded 1 if a state experienced a civil war in a given year, 0 otherwise. Data from Keith (2012). See Keith (2012, 79-80) for detailed discussion.

**International War:** A binary variable coded 1 if a state was in an international war in a given year, 0 otherwise. Data from Hallberg (2012). See Keith (2012, 80-82) for detailed discussion.

**Democracy:** A binary variable coded 1 if a state was a democracy in a given year, 0 otherwise. Data from Cheibub, Gandhi and Vreeland (2010). See Keith (2012, 82-84) for a general discussion of the effect of democracy on state respect for human rights and Cheibub, Gandhi and Vreeland (2010) for a discussion of the measure.

**Military Control:** A binary variable coded 1 if a state was controlled directly or indirectly by the military in a given year, 0 otherwise. Data from Keith (2012). See (Keith, 2012, 87) for detailed discussion.

**State-Socialist Regime:** A binary variable coded 1 if a state was run by a socialist party or coalition that does not permit non-socialist electoral opposition in a given year, 0 otherwise. Data from Keith (2012). See (Keith, 2012, 87-88) for detailed discussion.

**British Col. Exper.:** A binary variable coded 1 if a state was a territory of Great Britain at some point in its history, 0 otherwise. Data from Keith (2012). See (Keith, 2012, 90-91) for detailed discussion.

**Economic Development:** The per-capita GDP of a state. Data from Keith (2012). See (Keith, 2012, 88-90) for detailed discussion.

**Economic Growth:** The percentage growth in GDP per-capita of a state. Data from Keith (2012). See (Keith, 2012, 88-90) for detailed discussion.

**Logged Population:** The logged national population of a state. Data from Keith (2012). See (Keith, 2012, 88-90) for detailed discussion.

**Population Growth:** The average percentage growth in national population of a state. Data from Keith (2012). See (Keith, 2012, 88-90) for detailed discussion.

B. CORRELATION MATRIX WITH *de facto* JUDICIAL INDEPENDENCE AND DEMOCRACY  
MEASURES

Table 1: Correlation Matrix

<i>De Facto</i> Judicial Independence (Linzer and Staton, 2011)	
DD (Cheibub, Gandhi and Vreeland, 2010)	1.0000
Polity (Keith, 2012)	0.7258
Polity (Keith, Tate and Poe, 2009)	0.8864
Freedom House (Keith, Tate and Poe, 2009)	0.8462
GWF Autocratic Regimes (Geddes, Wright and Frantz, 2014)	0.7918
Unified Democracy Scores (Melton, Meserve and Pemstein, 2011)	0.7984
	0.8016
	0.6697
	0.8199
	0.7989
	0.8246
	0.8943
	0.8246
	0.9269
	0.8231
	0.7770
	0.6485
	0.8036
	0.7678
	1.0000

**Note:** Cells contain the correlation coefficients of intersecting row and column variables. Column 1 and reports the correlations between our measure of *de facto* judicial independence and several measures of democracy. Columns 2 through 6 report the correlations between different measures of democracy. Data come from 3015 country-year observations from 1980 to 2004.

C. RESULTS FROM MODEL THAT INCLUDES MODIFIED *de facto* JUDICIAL INDEPENDENCE  
MEASURE

We reestimate Model 3 from Table 1 with a modified version of the Linzer and Staton (2011) measure that excludes the Contract Intensive Measure score. Table presents the results. These results are also presented graphically in Figure 6.

Table 2: *State Respect for Human Rights Across Countries (1980-2004)*

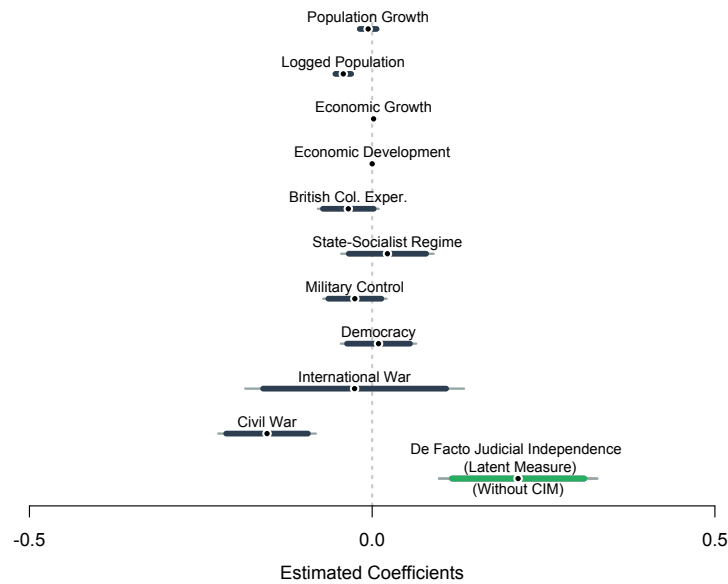
	Model 1
Lagged Outcome Measure	0.858*** (0.015)
<i>De Facto</i> Judicial Independence (Latent Measure)	0.213*** (0.059)
Civil War	−0.153*** (0.036)
International War	−0.026 (0.081)
Democracy	0.009 (0.028)
Military Control	−0.025 (0.024)
State-Socialist Regime	0.022 (0.034)
British Col. Exper.	−0.035 (0.023)
Economic Development	0.000*** (0.000)
Economic Growth	0.002*** (0.000)
Logged Population	−0.042*** (0.007)
Population Growth	−0.006 (0.007)
Constant	0.603*** (0.112)
<i>N</i>	3015

\*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$  (two-tailed).

**Note:** Robust standard errors are shown in parentheses. The *de facto* judicial independence variable is a modified version of the (Linzer and Staton, 2011) measure that excludes the Contract Intensive Measure score. Data come from 3015 country-year observations from 1980 to 2004. The outcome measure is *State Respect for Human Rights*. See Keith (2012) for more information about the model and data.



Figure 1: Effect of Modified *De Facto* Judicial Independence Measure on State Respect for Human Rights (Accounting for Uncertainty in the Outcome Measure and the Lagged Outcome Measure and the Independent Variable)



*Note:* Figure 6 presents the averaged results of 1,000 OLS models, each of which was estimated on a different set of draws from the posterior distribution of the outcome measure, the lagged outcome measure, and the primary independent variable. The primary independent variable is a modified version of the (Linzer and Staton, 2011) measure that excludes the Contract Intensive Measure score. The combined results of these models are presented in Model 1 in Table 1. The bars on either side of the point estimates represent 90% and 95% confidence intervals. Confidence intervals are calculated with robust standard errors. While we include a lagged outcome measure in our model, we do not present an estimate for it here. See text for additional details.

D. RESULTS FROM MODEL THAT ONLY INCORPORATES UNCERTAINTY IN THE PRIMARY  
INDEPENDENT VARIABLE

We present an additional set of results here, where we only take into account of the uncertainty in the latent *de facto* judicial independence measure. This new set of results is presented in column 2 of Table 5. For ease of comparison, we have included here the other models presented in Table 1. Column 1 of Table 5 presents the results using the point estimates from the latent variable. Column 3 of Table 5 presents the results once we take into account the uncertainty in the outcome and lagged outcome measures. Finally, column 4 of Table 5 presents the results once we take into account the uncertainty in the outcome measure, the lagged outcome measure, and the independent variable. Figure 6 plots the point estimates for *de facto* judicial independence from these four models.

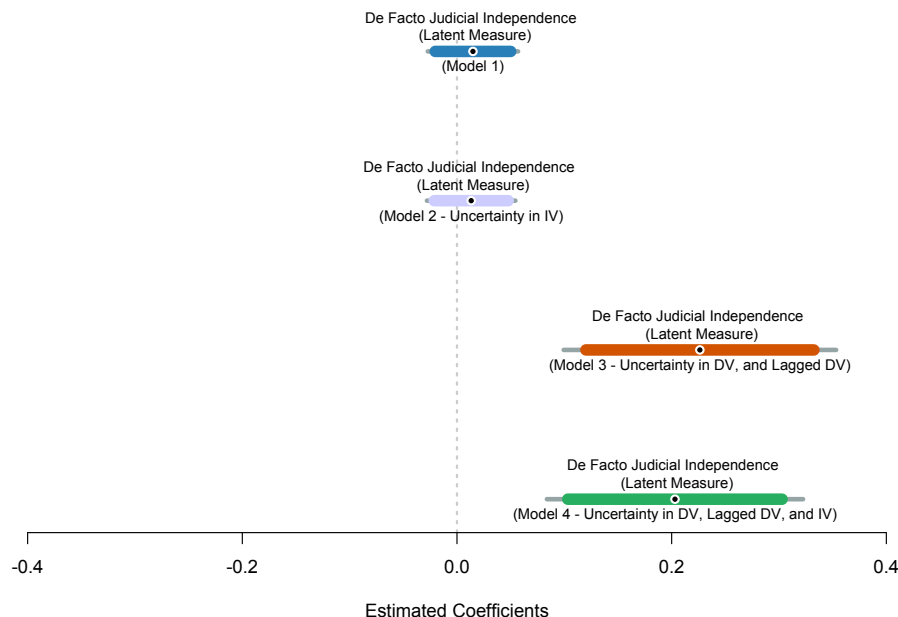
Table 3: *State Respect for Human Rights Across Countries (1980-2004)*

	Model 1	Model 2	Model 3	Model 4
Lagged Outcome Measure	0.967*** (0.004)	0.970*** (0.015)	0.859*** (0.015)	0.860*** (0.015)
<i>De Facto</i> Judicial Independence (Latent Measure)	0.015 (0.021)	0.015 (0.021)	0.226*** (0.065)	0.203*** (0.061)
Civil War	-0.031** (0.013)	-0.031** (0.013)	-0.149*** (0.036)	-0.149*** (0.036)
International War	0.008 (0.025)	0.008 (0.025)	-0.025 (0.081)	-0.024 (0.082)
Democracy	0.024** (0.010)	0.025** (0.009)	0.014 (0.027)	0.021 (0.027)
Military Control	-0.013 (0.009)	-0.013 (0.009)	-0.023 (0.024)	-0.025 (0.024)
State-Socialist Regime	0.015 (0.012)	0.014 (0.012)	0.023 (0.035)	0.023 (0.035)
British Col. Exper.	-0.022*** (0.007)	-0.022*** (0.007)	-0.039* (0.023)	-0.037 (0.023)
Economic Development	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Economic Growth	0.002*** (0.000)	0.002*** (0.000)	0.002 (0.002)	0.002 (0.002)
Logged Population	-0.013*** (0.002)	-0.013*** (0.002)	-0.042*** (0.007)	-0.042*** (0.007)
Population Growth	0.000 (0.003)	0.000 (0.003)	-0.006 (0.008)	-0.006 (0.008)
Constant	0.214*** (0.038)	0.214*** (0.037)	0.600*** (0.113)	0.602*** (0.113)
<i>N</i>	3015	3015	3015	3015

\*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$  (two-tailed).

**Note:** Robust standard errors are shown in parentheses. Data come from 3015 country-year observations from 1980 to 2004. The outcome measure is *State Respect for Human Rights*. See Keith (2012) for more information about the model and data.

Figure 2: Comparing the Effect of *De Facto* Judicial Independence Across Models



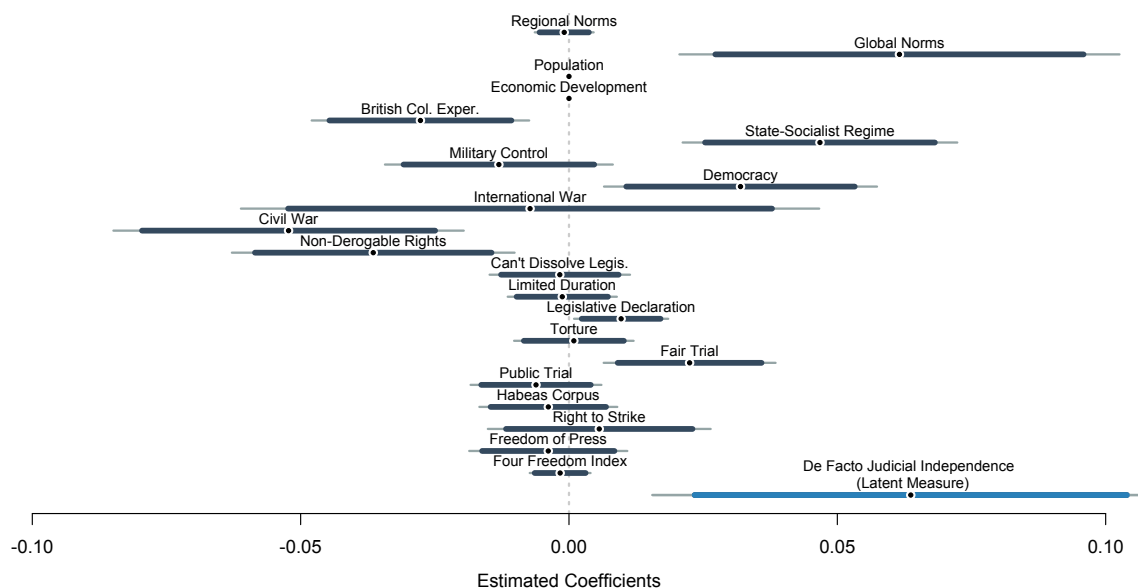
*Note:* Figure 6 plots the point estimates for *de facto* judicial independence from the four previous models. The bars on either side of the point estimates represent 90% and 95% confidence intervals. Confidence intervals are calculated with robust standard errors. The top model (blue line from Figure 1) regresses the point estimates for the latent human rights variable on the point estimates for the latent judicial independence measure in addition to the controls. The second model from the top regresses the point estimates for the latent human rights variable on 1000 draws from the latent judicial independence measure in addition to the controls. The third model from the top (orange line from Figure 2) regresses 1,000 draws from the latent human rights variable on the point estimates for the latent judicial independence measure in addition to the controls. The bottom model (green line from Figure 3) regresses 1,000 draws from the latent human rights variable on 1,000 draws from the latent judicial independence measure in addition to the controls. See text for additional details.

## E. EXTENSION OF KEITH, TATE AND POE (2009)

To determine whether our findings are model or data dependent, we re-examine the relationship between *de facto* judicial independence and state respect for human rights using the model and data from Keith, Tate and Poe (2009). To ease the comparison of these results with those presented in the main text, we drop years prior to 1980. We also exclude all cases in which we do not have country-year observations for the Unified Democracy Scores (UDS) measure, as we estimate a model with the UDS measure in Appendix F. The resulting data set comprises 2257 country-year observations from 1980-1996.

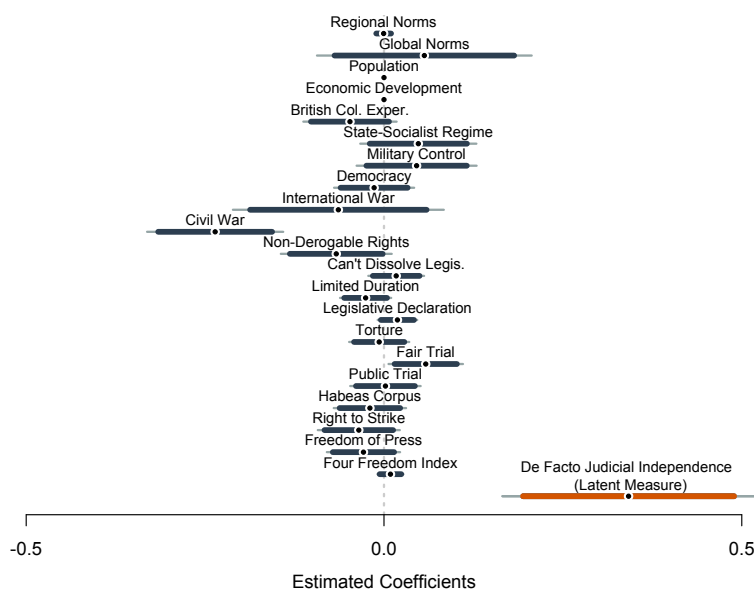
The figures and tables below present the findings from this analysis. They provide strong support for the claim that *de facto* judicial independence is positively correlated with state respect for human rights. That we obtain similar findings using across models and datasets increases our confidence in this finding.

Figure 3: Effect of *De Facto* Judicial Independence on State Respect for Human Rights



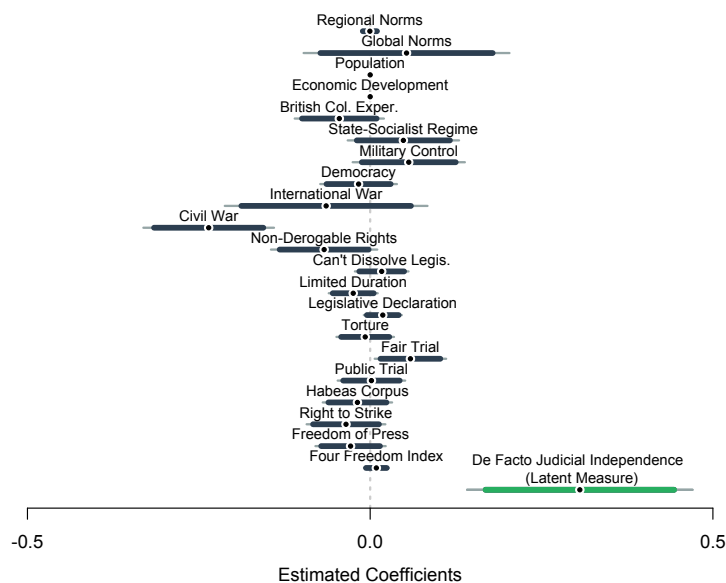
*Note:* Figure 1 presents the results of an OLS model, Model 1 in Table 1, that estimates the effect of many possible determinants on state respect for human rights. The bars on either side of the point estimates represent 90% and 95% confidence intervals. Confidence intervals are calculated with robust standard errors. While we include a lagged outcome measure in our model, we do not present an estimate for it here. See text for additional details.

Figure 4: Effect of *De Facto* Judicial Independent on State Respect for Human Rights (Accounting for Uncertainty in the Outcome Measure and the Lagged Outcome Measure)



*Note:* Figure 2 presents the averaged results of 1,000 OLS models, each of which was estimated on a different set of draws from the posterior distribution of the outcome measure and the lagged outcome measure. The combined results of these models are presented in Model 2 in Table 1. The bars on either side of the point estimates represent 90% and 95% confidence intervals. Confidence intervals are calculated with robust standard errors. While we include a lagged outcome measure in our model, we do not present an estimate for it here. See text for additional details.

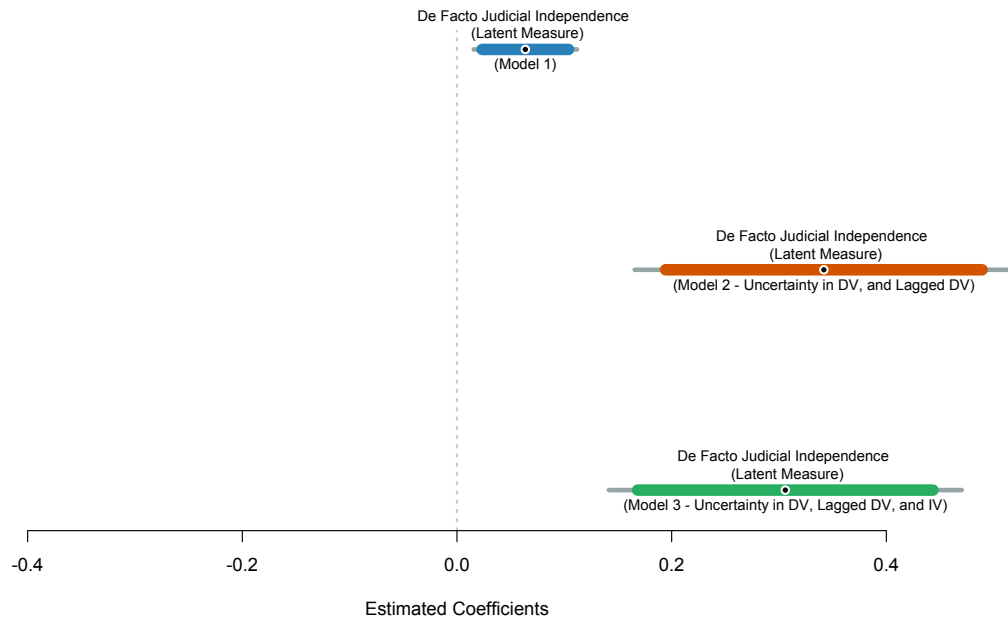
Figure 5: Effect of *De Facto* Judicial Independent on State Respect for Human Rights (Accounting for Uncertainty in the Outcome Measure, the Lagged Outcome Measure, and the Independent Variable)



*Note:* Figure 3 presents the averaged results of 1,000 OLS models, each of which was estimated on a different set of draws from the posterior distribution of the outcome measure, the lagged outcome measure, and the primary independent variable. The combined results of these models are presented in Model 3 in Table 1. The bars on either side of the point estimates represent 90% and 95% confidence intervals. Confidence intervals are calculated with robust standard errors. While we include a lagged outcome measure in our model, we do not present an estimate for it here. See text for additional details.

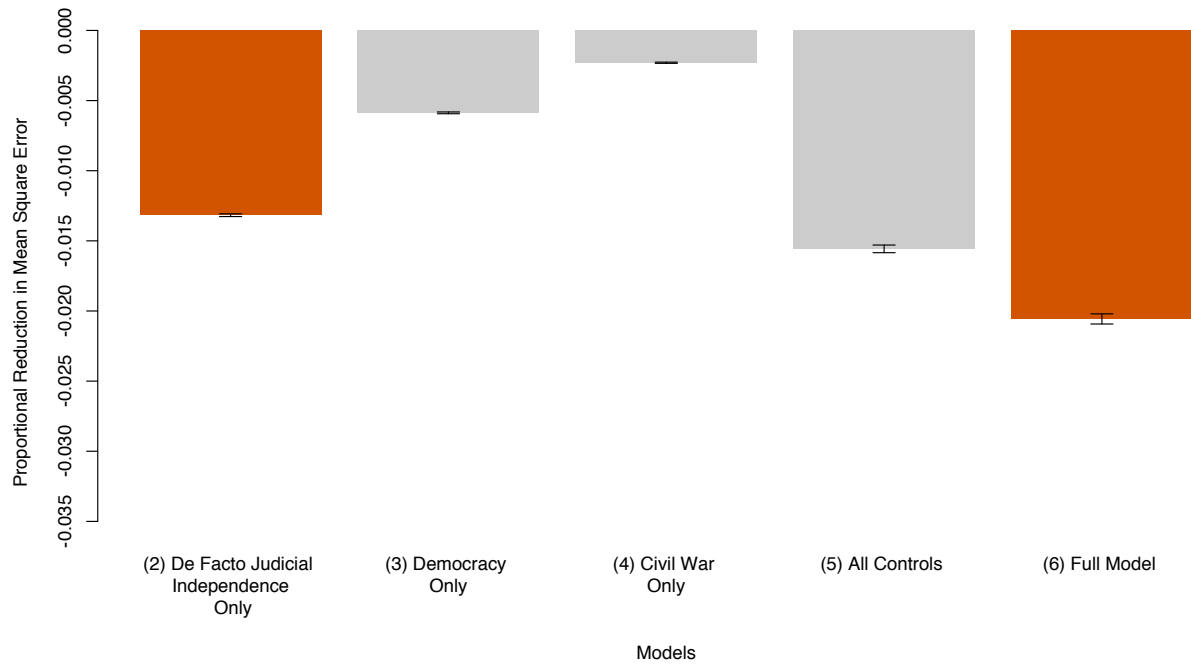


Figure 6: Comparing the Effect of *De Facto* Judicial Independence Across Models



*Note:* Figure 4 plots the point estimates for *de facto* judicial independence from the three previous models. The bars on either side of the point estimates represent 90% and 95% confidence intervals. Confidence intervals are calculated with robust standard errors. The top model (blue line from Figure 1) regresses the point estimates for the latent human rights variable on the point estimates for the latent judicial independence measure in addition to the controls. The middle model (orange line from Figure 2) regresses 1,000 draws from the latent human rights variable on the point estimates for the latent judicial independence measure in addition to the controls. The lower model (green line from Figure 3) regresses 1,000 draws from the latent human rights variable on 1,000 draws from the latent judicial independence measure in addition to the controls. See text for additional details.

Figure 7: Cross-Validation Results



*Note:* Figure 5 plots the average percent reduction in mean square error of each model compared to the baseline model, which includes only the lagged outcome measure, revealing the additional predictive power of individual variables and combinations of variables. Each bar in the figure corresponds to a model reported in Table 2. Model 1 is the baseline model that all other models are compared to. Thus, Bar 2 corresponds to Model 2, Bar 3 corresponds to Model 3, Bar 4 corresponds to Model 4, Bar 5 corresponds to Model 5, and Bar 6 corresponds to Model 6. The black lines bracketing the end of each column represent 95% confidence intervals. See text for additional details.

Table 4: *State Respect for Human Rights Across Countries (1979-1996)*

	Model 1	Model 2	Model 3
Lagged Outcome Measure	0.974*** (0.005)	0.853*** (0.018)	0.856*** (0.018)
<i>De Facto</i> Judicial Independence (Latent Measure)	0.064*** (0.025)	0.341*** (0.090)	0.306*** (0.084)
Four Freedom Index	-0.002 (0.003)	0.009 (0.009)	0.009 (0.009)
Freedom of Press	-0.004 (0.008)	-0.029 (0.026)	-0.029 (0.026)
Right to Strike	0.006 (0.011)	-0.035 (0.029)	-0.035 (0.029)
Habeas Corpus	-0.004 (0.007)	-0.020 (0.026)	-0.019 (0.026)
Public Trial	-0.006 (0.006)	0.002 (0.025)	0.002 (0.025)
Fair Trial	0.022*** (0.008)	0.058** (0.027)	0.059** (0.027)
Torture	0.001 (0.006)	-0.007 (0.021)	-0.007 (0.021)
Legislative Declaration	0.010** (0.004)	0.019 (0.014)	0.018 (0.014)
Limited Duration	-0.001 (0.005)	-0.026 (0.018)	-0.025 (0.018)
Can't Dissolve Legis.	-0.002 (0.007)	0.017 (0.020)	0.017 (0.020)
Non-Derogable Rights	-0.036*** (0.013)	-0.067* (0.040)	-0.067* (0.040)
Civil War	-0.052*** (0.017)	-0.236*** (0.049)	-0.24*** (0.049)
International War	-0.007 (0.027)	-0.064 (0.075)	-0.064 (0.075)
Democracy	0.032** (0.013)	0.046 (0.043)	0.056 (0.041)
Military Control	-0.013 (0.011)	-0.014 (0.029)	-0.017 (0.029)
State-Socialist Regime	0.047*** (0.013)	0.048 (0.041)	0.048 (0.041)
British Col. Exper.	-0.027*** (0.010)	-0.048 (0.033)	-0.045 (0.033)
Economic Development	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Population	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Global Norms	0.061*** (0.021)	0.056 (0.077)	0.053 (0.077)
Regional Norms	-0.001 (0.003)	-0.000 (0.006)	-0.000 (0.006)
Constant	-0.066** (0.026)	-0.163* (0.098)	-0.150 (0.098)
<i>N</i>	2257	2257	2257

\*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$  (two-tailed).

**Note:** Robust standard errors are shown in parentheses. All models account for uncertainty in the outcome measure, the lagged outcome measure, and the independent variable. Data come from 2257 country-year observations from 1980 to 1996. The outcome measure is *State Respect for Human Rights*. See Keith, Tate and Poe (2009) for more information about the model and data.

Table 5: *State Respect for Human Rights Across Countries (1979-1996) - Models Used for Cross Validation*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Lagged Outcome Measure	0.950*** (0.013)	0.903*** (0.014)	0.933*** (0.013)	0.941*** (0.014)	0.876*** (0.017)	0.856*** (0.018)
<i>De Facto</i> Judicial Independence (Latent Measure)	-	0.308*** (0.052)	-	-	-	0.300*** (0.085)
Democracy	-	-	0.110*** (0.026)	-	0.149*** (0.033)	0.060 (0.042)
Civil War	-	-	-	-0.133*** (0.044)	-0.235*** (0.049)	-0.238*** (0.048)
Four Freedom Index	-	-	-	-	0.009 (0.010)	0.009 (0.009)
Freedom of Press	-	-	-	-	-0.027 (0.027)	-0.028 (0.027)
Right to Strike	-	-	-	-	-0.036 (0.029)	-0.036 (0.028)
Habeas Corpus	-	-	-	-	-0.010 (0.026)	-0.019 (0.026)
Public Trial	-	-	-	-	-0.000 (0.026)	0.002 (0.025)
Fair Trial	-	-	-	-	0.062** (0.027)	0.059** (0.026)
Torture	-	-	-	-	-0.012 (0.021)	-0.007 (0.021)
Legislative Declaration	-	-	-	-	0.015 (0.014)	0.018 (0.014)
Limited Duration	-	-	-	-	-0.017 (0.018)	-0.025 (0.018)
Can't Dissolve Legis.	-	-	-	-	0.015 (0.020)	0.017 (0.020)
Non-Derogable Rights	-	-	-	-	-0.072* (0.040)	-0.068* (0.040)
International War	-	-	-	-	-0.070 (0.075)	-0.066 (0.074)
Military Control	-	-	-	-	-0.043 (0.028)	-0.017 (0.028)
State-Socialist Regime	-	-	-	-	0.054 (0.041)	0.051 (0.041)
British Col. Exper.	-	-	-	-	-0.024 (0.033)	-0.044 (0.034)
Economic Development	-	-	-	-	0.000** (0.000)	0.000 (0.000)
Population	-	-	-	-	-0.000*** (0.000)	-0.000*** (0.000)
Global Norms	-	-	-	-	0.027 (0.078)	0.055 (0.077)
Regional Norms	-	-	-	-	-0.000 (0.006)	-0.000 (0.006)
Constant	0.032** (0.012)	-0.108*** (0.025)	-0.015 (0.016)	0.043*** (0.012)	-0.045 (0.097)	-0.151 (0.098)
<i>N</i>	2255	2255	2255	2255	2255	2255

\*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$  (two-tailed).

**Note:** Robust standard errors are shown in parentheses. Data come from 2255 country-year observations from 1980 to 1996. The outcome measure is *State Respect for Human Rights*. See Keith, Tate and Poe (2009) for more information about the model and data.

## F. MODELS WITH UNIFIED DEMOCRACY SCORE MEASURE

We replace the DD measure of democracy with a latent variable measure, the Unified Democracy Scores (UDS), and re-examine the relationship between *de facto* judicial independence and state respect for human rights. The extent to which scholars should prefer the UDS measure to the DD measure depends on how they conceptualize democracy. If they think that democracy is unobservable and that there are degrees of democracy, they should prefer the UDS measure. If they think that democracy is observable and that states are either democratic or not, they should prefer the DD measure. While we think that the continuing debate about whether and how democracy can be measured is important, we leave that debate to others.

Table 8 presents the results our analysis. After replacing the DD measure with the UDS measure in Model 3 from Table 1, the results change. Column 1 in Table Table 8 shows that *de facto* judicial independence is no longer a strong predictor of increased state respect for human rights. In marked contrast, the results from the Keith, Tate and Poe (2009) model, presented in column 2 in Table 8, are consistent with the models reported in the manuscript.

One explanation for the null finding regarding *de facto* judicial independence is that the UDS measure and the Linzer and Staton (2011) measure are highly correlated. The point estimates from these two measures correlate at 0.894 in the dataset used to estimate Model 3 in Table 1, while they correlate at 0.846 in the data used to estimate Model 1 in Appendix E. The small difference in the degree to which these measures correlate across datasets is unlikely to explain the conflicting findings. This suggests that one of the models could be misspecified. More likely however, is the possibility that the latent UDS measure and the human rights measure are measure overlapping theoretical concepts as suggested by Hill Jr (2014); Hill Jr and Jones (2014). As we discussed in the manuscript, most earlier human rights studies use Polity or Freedom House measures of democracy. Again however, this choice is problematic because the Polity and Freedom House indicators classify regimes, in part, based on their respect for human rights (Hill Jr, 2014; Hill Jr and Jones, 2014). This conceptual and empirical overlap make it difficult to disentangle the independent associations between human rights and democracy in these models. The conceptual overlap is severe between the *de facto* judicial independence and the UDS measures. It is not

surprising that these three variables all co-vary. Disentangling the conceptual overlap between some of the democracy indicators included in the estimate of the UDS variable and measures of human rights is an ongoing research project (e.g., Hill Jr and Jones, 2014). We believe that future research should also look at the conceptual and empirical overlap between the Linzer and Staton (2011) measure and the UDS measure as well.





Table 6: *State Respect for Human Rights Across Countries - UDS Measure*

	Model 1	Model 2
Lagged Outcome Measure	0.853*** (0.015)	0.847*** (0.018)
<i>De Facto</i> Judicial Independence (Latent Measure)	0.070 (0.074)	0.233** (0.102)
Four Freedom Index	-	0.008 (0.010)
Freedom of Press	-	-0.036 (0.028)
Right to Strike	-	-0.044 (0.030)
Habeas Corpus	-	-0.021 (0.027)
Public Trial	-	0.004 (0.026)
Fair Trial	-	0.062** (0.027)
Torture	-	-0.006 (0.022)
Legislative Declaration	-	0.022 (0.015)
Limited Duration	-	-0.024 (0.018)
Can't Dissolve Legis.	-	0.015 (0.020)
Non-Derogable Rights	-	-0.064 (0.040)
Civil War	-0.161*** (0.036)	-0.235*** (0.049)
International War	-0.027 (0.081)	-0.058 (0.078)
Democracy (UDS)	0.064** (0.022)	0.054* (0.030)
Military Control	-0.026 (0.023)	-0.027 (0.029)
State-Socialist Regime	0.057 (0.036)	0.054 (0.042)
British Col. Exper.	-0.022 (0.023)	-0.051 (0.034)
Economic Development	0.000*** (0.000)	0.000*** (0.000)
Economic Growth	0.002 (0.002)	-
Population	-	-0.000*** (0.000)
Logged Population	-0.045*** (0.007)	-
Population Growth	-0.004 (0.007)	-
Global Norms	-	0.053 (0.079)
Regional Norms	-	-0.001 (0.006)
Constant	0.707*** (0.117)	-0.0748 (0.110)
<i>N</i>	3015	2255

\*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$  (two-tailed).

**Note:** Robust standard errors are shown in parentheses. Data for Model 1 come from 3013 country-year observations from 1980 to 2004. Data for Model 2 come from 2255 country-year observations from 1980 to 1996. The outcome measure is *State Respect for Human Rights*. See Keith, Tate and Poe (2009) and Keith (2012) for more information about the model and data.

## G. NOTES ON ESTIMATOR CHOICE

We use an OLS estimator in our analysis because the latent human rights variable is an interval-level, continuous variable. Using a continuous measure, instead of the standard ordered categorical human rights variables common in the literature, opens up all of the well known econometric techniques available for estimating continuous outcome measures in panel data settings (e.g., Arellano and Bond, 1991; Beck and Jackman, 1998; Beck and Katz, 1995, 2011; Blundell and Bond, 1998; M.Wooldridge, 2010). Moving beyond the use of these frequentist tools, Bayesian hierarchical models for panel data may also be useful for exploring the dynamic relationships between different latent variables (Gelman and Hill, 2007; Western, 1998). A particular advantage of these models is that they can find breaks or change points in the different series (e.g., Barry and Hartigan, 1993; Chib, 1998; Ratkovic and Eng, 2010). The exploration all of these estimation choices is an important new research opportunity for human rights scholars but a detailed discussion of the relative benefits of each choice is beyond the scope of this research note. Though we do not yet have concrete suggestions for which estimator is the most optimal for estimating the relationship between continuous, the tools briefly highlighted here are useful starting points for applied researchers. We also add that the model building and validation processes should always go hand in hand, which Gelman and Shalizi (20) defines as a process of continuous model expansion.

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