

Opening the Black Box Appendix

These are the statistical appendices for **Opening the Black Box of International Aid: Understanding Delivery Actors and Democratization** by Caroline Dunton and Jack Hasler.

For questions or comments on these appedices, please contact Jack Hasler at jhasler@gwu.edu.

Appendix A1: Donor Countries

DonorName	yearly_mean_disbursement_mill	min_recipients	max_recipients
Australia	440.0528874	21	75
Austria	11.5656375	17	39
Belgium	77.2602279	35	59
Canada	187.3442822	44	108
Czech Republic	3.3927799	16	26
Denmark	121.7239389	1	77
Estonia	1.5611606	12	15
Finland	34.7234662	26	78
France	87.0695265	68	102
Germany	443.5323385	61	108
Greece	1.7333526	1	17
Hungary	0.1901363	15	28
Iceland	0.2750526	1	4
Ireland	57.3973553	46	71
Italy	32.9352527	1	67
Japan	185.0282322	21	100
Korea	57.0148506	51	90
Latvia	0.3262304	6	6
Lithuania	0.4775556	6	13
Luxembourg	10.2945917	23	32
Netherlands	127.5803917	1	78
New Zealand	9.1415673	9	14
Norway	226.4750653	74	88
Poland	13.4057539	9	19
Portugal	5.1771190	7	24
Slovak Republic	1.0010950	6	14
Slovenia	0.6892109	9	13
Spain	141.1016398	52	78
Sweden	324.0185736	57	99
Switzerland	100.3724773	45	73
United Kingdom	635.4025147	85	100
United States	1748.1639588	92	114

##Appendix A2: Recipient Countries

RecipientName	yearly_mean_disbursement_mill	min_donors	max_donors
Afghanistan	1454.5988050	20	25
Albania	28.5554133	5	20
Algeria	5.4053150	4	14
Angola	18.9078871	3	16
Argentina	3.9492563	2	16
Armenia	21.8520699	2	18
Azerbaijan	14.0008915	4	19
Bangladesh	86.0097028	3	20
Belarus	20.5872266	3	20
Benin	25.8190745	5	14
Bhutan	4.7590775	2	10
Bolivia	56.6474398	6	20
Botswana	1.6344430	4	9
Brazil	28.6001162	6	19
Burkina Faso	32.2047531	6	17
Burundi	21.5998049	5	20
Cabo Verde	3.1641287	4	11
Cambodia	68.5745215	5	19
Cameroon	13.9559663	3	17
Central African Republic	3.6249119	2	9
Chad	4.3630840	3	11
Chile	5.9774782	5	15
China (People's Republic of)	47.9533944	4	20
Colombia	156.9757603	6	20
Comoros	0.8484550	1	3
Congo	2.3406678	1	9
Costa Rica	2.7829063	2	11
Cote d'Ivoire	8.7633801	3	14
Croatia	10.8587451	4	12
Cuba	15.4430655	4	14
Democratic Republic of the Congo	91.4338458	6	19
Djibouti	1.7626598	1	7
Dominican Republic	12.7146573	3	12
Ecuador	20.4083401	5	17
Egypt	48.3275946	4	22
El Salvador	26.5036880	4	17
Equatorial Guinea	0.4801148	1	5
Eritrea	2.7852548	2	10
Ethiopia	48.2342318	6	21
Fiji	6.3788682	2	9
Former Yugoslav Republic of Macedonia	21.7824471	7	18
Gabon	0.9324397	1	6
Gambia	1.8252312	1	9
Georgia	44.2521776	5	20
Ghana	47.0745862	4	20
Guatemala	61.7343904	6	20
Guinea	8.4133248	3	12
Guinea-Bissau	2.6027050	2	10
Guyana	3.4596139	2	6
Haiti	70.6847130	4	17
Honduras	31.8183669	5	19
India	80.6042903	3	23
Indonesia	201.6217122	5	20
Iran	4.1153556	2	13

(continued)

RecipientName	yearly_mean_disbursement_mill	min_donors	max_donors
Iraq	456.9180706	13	17
Jamaica	6.3294399	2	7
Jordan	117.9180350	3	20
Kazakhstan	9.6389152	4	16
Kenya	80.1714018	6	21
Kyrgyzstan	22.3051994	5	17
Lao People's Democratic Republic	15.9992780	4	16
Lebanon	46.8039203	5	18
Lesotho	7.8773361	3	9
Liberia	38.9934898	3	14
Libya	7.9510836	1	17
Madagascar	11.0539298	4	12
Malawi	34.6974273	4	13
Malaysia	2.9551220	1	12
Mali	50.8584651	5	18
Mauritania	11.9195473	2	11
Mauritius	0.4265234	1	6
Mexico	132.6085961	4	17
Moldova	29.5185392	6	23
Mongolia	17.2359259	3	15
Montenegro	8.8445712	8	14
Morocco	23.9511903	3	19
Mozambique	87.6945988	7	20
Myanmar	38.0469665	3	20
Namibia	5.9325416	4	12
Nepal	60.7691377	3	20
Nicaragua	38.8104418	7	20
Niger	17.1756209	5	15
Nigeria	85.0738216	4	17
Oman	0.3797759	1	3
Pakistan	154.7422217	2	18
Panama	2.5051635	3	10
Papua New Guinea	117.1378629	2	12
Paraguay	16.1879296	3	16
Peru	63.7063885	6	19
Philippines	50.8924215	5	20
Rwanda	46.2629052	6	19
Saudi Arabia	0.2538672	1	3
Senegal	25.6061974	4	18
Sierra Leone	28.6801440	2	14
Solomon Islands	119.7760372	2	6
Somalia	91.2825448	13	16
South Africa	39.9234432	7	21
South Sudan	100.8168156	11	16
Sri Lanka	24.5863051	3	18
Sudan	117.6504522	4	36
Suriname	4.4668753	2	6
Swaziland	1.0041118	2	10
Syrian Arab Republic	1.4057986	2	7
Tajikistan	18.8086136	4	16
Tanzania	113.9272925	6	19
Thailand	12.0081322	2	17
Timor-Leste	47.5006820	5	17
Togo	5.2253727	2	13
Trinidad and Tobago	0.3306104	2	5

(continued)

RecipientName	yearly_mean_disbursement_mill	min_donors	max_donors
Tunisia	27.8908622	4	20
Turkey	20.0261200	5	18
Turkmenistan	2.8889970	2	8
Uganda	81.5923011	7	20
Ukraine	81.5269930	4	26
Uruguay	1.5824601	1	10
Uzbekistan	6.7342377	2	12
Venezuela	6.9438789	5	13
Yemen	28.3589591	5	15
Zambia	47.5677902	4	14
Zimbabwe	54.4750888	4	17

Appendix B1: ECM Model

One of the things you can test for with an error correction model is endogeneity resulting from reverse causality. This is possible if we believe countries are likely to systematically change their method of delivering aid and how much they give based changes in a country's level of democracy. The following ecm model should have coefficients that are 0 for all but the lagged dependent variables. Some are significantly different from 0, which is bad, but the coefficients are very small. As a result, we can say that some endogeneity does appear to be present.

% Table created by stargazer v.5.2.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Sun, Sep 09, 2018 - 2:00:25 PM

Table 2:

	<i>Dependent variable:</i>				
	NGO	IGO	CORP	DONOR	RECIP
lag_ngo	0.495*** (0.007)				
lag_igo		0.310*** (0.009)			
lag_corp			0.123*** (0.034)		
lag_gov_d				0.554*** (0.008)	
lag_gov_r					0.385*** (0.010)
lag_polity2	0.009*** (0.002)	0.009*** (0.002)	0.002*** (0.001)	0.001 (0.002)	0.002 (0.002)
lag_gdp	0.039*** (0.014)	-0.027 (0.016)	-0.013* (0.007)	0.090*** (0.015)	0.066*** (0.015)
lag_pop	-0.055 (0.055)	-0.069 (0.062)	0.117*** (0.026)	0.199*** (0.057)	0.281*** (0.057)
lag_urban	-0.001 (0.002)	0.002 (0.002)	0.004*** (0.001)	0.008*** (0.002)	0.005** (0.002)
diff_polity2	0.004** (0.002)	0.006*** (0.002)	0.0001 (0.001)	0.002 (0.002)	0.001 (0.002)
diff_gdp	0.018 (0.019)	-0.010 (0.022)	0.024*** (0.009)	0.133*** (0.020)	0.083*** (0.020)
diff_pop	-0.213 (0.295)	-0.113 (0.339)	-0.021 (0.141)	0.106 (0.309)	-0.139 (0.307)
diff_urban	-0.005 (0.011)	-0.0001 (0.013)	0.005 (0.005)	0.004 (0.012)	0.005 (0.012)
Observations	13,513	13,513	13,513	13,513	13,513
R ²	0.296	0.103	0.011	0.321	0.153
Adjusted R ²	0.172	-0.054	-0.163	0.202	0.004
F Statistic (df = 9; 11495)	535.762***	146.918***	13.798***	604.591***	230.730***

Note:

*p<0.1; **p<0.05; ***p<0.01

##Appendix C1: Other Types of Democracy Measures For space reasons, the egalitarian and deliberative measures in VDem were not included in the main results, but they are presented here. They provide even stronger support for our theory.

Table 3: All VDem Results

	<i>Dependent variable:</i>				
	Electoral	Liberal	Participatory	Deliberative	Egalitarian
Donor Gov	0.019 (0.018)	0.022 (0.015)	0.015 (0.011)	0.040** (0.018)	0.014 (0.011)
Target Gov	0.019 (0.020)	0.031* (0.017)	0.012 (0.012)	0.026 (0.020)	0.009 (0.013)
NGO	0.069*** (0.017)	0.048*** (0.015)	0.056*** (0.011)	0.090*** (0.017)	0.051*** (0.011)
IGO	0.033* (0.017)	0.022 (0.015)	0.017 (0.011)	0.036** (0.018)	0.028** (0.011)
Corporation	0.060 (0.048)	0.070* (0.041)	0.048 (0.030)	0.040 (0.048)	0.013 (0.031)
Other	0.065*** (0.014)	0.052*** (0.012)	0.036*** (0.008)	0.069*** (0.014)	0.042*** (0.009)
log(GDP)	0.328*** (0.028)	0.187*** (0.024)	0.151*** (0.017)	0.204*** (0.028)	0.161*** (0.018)
Urban	-0.036*** (0.004)	-0.032*** (0.004)	-0.028*** (0.003)	-0.062*** (0.004)	-0.029*** (0.003)
log(Population)	0.247** (0.108)	0.486*** (0.093)	0.363*** (0.067)	-0.122 (0.109)	0.069 (0.069)
Observations	15,798	15,798	15,798	15,798	15,798
R ²	0.018	0.013	0.017	0.032	0.018
Adjusted R ²	-0.149	-0.155	-0.150	-0.133	-0.148
F Statistic (df = 9; 13504)	27.268***	19.457***	26.146***	49.334***	27.859***

Note:

*p<0.1; **p<0.05; ***p<0.01

##Appendix C2: Freedom House As stated in the paper, VDem was chosen for its comprehensive approach and clear rating guidelines while polity was chosen for its ubiquity in the discipline. Freedom House can be somewhat more opaque in its ratings which are based on expert answers to questions rather than a cohesive overview. That said, they are still a useful robustness check to make sure our results are not dependent on a particular rating of democracy.

In the results below, the scales for civil liberties, political rights and status are inverted from the other measures in the table and those in vdem and polity. For these, a lower score means that the country in question is more free, not less. As such, all but the rule of law model support our argument to some degree. This is not surprising as our coding as “democratic purpose” excludes some types of aid that might be targeted at rule of law, such as aid to police forces and prisons.

It is worth noting that for civil liberties and personal autonomy, the coefficient for aid delivered by the recipient country is statistically significant, contradicting our theory. While the effect is not robust to other specifications of the dependent variable, it does present some cause for caution.

Table 4: All Freedom House Results

	<i>Dependent variable:</i>				
	Civil Liberties	Personal Autonomy	Political Rights	Rule of Law	Status
Donor Gov	−0.002 (0.011)	−0.029 (0.020)	0.001 (0.018)	−0.018 (0.024)	0.011 (0.008)
Target Gov	−0.025* (0.013)	0.049** (0.023)	−0.028 (0.021)	0.008 (0.028)	0.005 (0.009)
NGO	−0.034*** (0.011)	0.047** (0.019)	−0.093*** (0.017)	0.019 (0.023)	−0.022*** (0.008)
IGO	−0.001 (0.011)	−0.039** (0.019)	−0.039** (0.017)	−0.021 (0.023)	−0.014* (0.008)
Corporation	0.060 (0.100)	−0.105 (0.177)	0.124 (0.158)	0.031 (0.214)	0.096 (0.070)
Other	−0.024*** (0.008)	0.047*** (0.015)	−0.025* (0.013)	0.058*** (0.018)	−0.006 (0.006)
log(GDP)	−0.135*** (0.017)	0.689*** (0.030)	−0.238*** (0.027)	0.201*** (0.036)	−0.046*** (0.012)
Urban	0.026*** (0.003)	−0.079*** (0.005)	0.010** (0.004)	−0.051*** (0.006)	0.023*** (0.002)
log(Population)	1.197*** (0.071)	−0.234* (0.126)	0.934*** (0.113)	−2.273*** (0.152)	0.101** (0.050)
Observations	14,201	14,201	14,201	14,201	14,201
R ²	0.070	0.056	0.017	0.064	0.025
Adjusted R ²	−0.103	−0.120	−0.167	−0.111	−0.157
F Statistic (df = 9; 11967)	100.136***	78.651***	22.642***	91.046***	34.265***

Note:

*p<0.1; **p<0.05; ***p<0.01

##Appendix C3: Lagged measures of democracy

Table 5: Main Results with Lagged DV

	<i>Dependent variable:</i>			
	Electoral	Liberal	Participatory	PolityIV
Donor Gov	−0.010 (0.013)	−0.008 (0.010)	−0.007 (0.008)	0.014 (0.037)
Target Gov	−0.006 (0.015)	−0.006 (0.012)	−0.004 (0.009)	0.019 (0.041)
NGO	0.025* (0.013)	0.012 (0.010)	0.017** (0.007)	0.077** (0.036)
IGO	0.030** (0.013)	0.009 (0.010)	0.013* (0.007)	0.121** (0.036)
Corporation	−0.024 (0.035)	−0.016 (0.028)	−0.013 (0.020)	−0.010 (0.098)
Other	−0.001 (0.010)	−0.002 (0.008)	−0.003 (0.006)	0.013 (0.028)
log(GDP)	0.176*** (0.020)	0.102*** (0.016)	0.052*** (0.012)	0.024 (0.057)
Urban	−0.022*** (0.003)	−0.020*** (0.002)	−0.013*** (0.002)	−0.004 (0.009)
log(Population)	−0.055 (0.080)	0.163** (0.063)	0.038 (0.046)	0.415* (0.222)
lagpoly	6.583*** (0.062)			
laglib		7.358*** (0.059)		
lagpartip			7.459*** (0.060)	
lag_polity				0.660** (0.007)
Observations	15,798	15,798	15,798	15,757
R ²	0.464	0.545	0.540	0.424
Adjusted R ²	0.373	0.467	0.461	0.326
F Statistic	1,168.129*** (df = 10; 13503)	1,614.893*** (df = 10; 13503)	1,582.961*** (df = 10; 13503)	990.367*** (df = 10; 13503)

Note:

* p<0.1; ** p<0.05;

##Appendix C4: Including all types of donors

Lagged VDEM

Oneway (individual) effect Within Model

Call: plm(formula = as.formula(paste("polity2", paste(c(ind.vars.total.controlled, "lag_polity2"), collapse = "+"), sep = "~")), data = working, index = c("DyadName"), method = "random")

Unbalanced Panel: n = 2694, T = 1-12, N = 17263

Residuals: Min. 1st Qu. Median 3rd Qu. Max. -10.2416396 -0.0638133 0.0012202 0.0654451 8.4441346

Coefficients: Estimate Std. Error t-value Pr(>|t|) log(gov_d_total + 1) 0.0190183 0.0371153 0.5124 0.608371
log(gov_r_total + 1) -0.0283556 0.0240445 -1.1793 0.238298 log(ngo_total + 1) 0.0936884 0.0363109 2.5802
0.009885 log(igo_total + 1) 0.1023593 0.0324059 3.1587 0.001588 log(corp_total + 1) 0.0490349 0.0910375
0.5386 0.590155 log(other_total + gov_o_total + 1) 0.0247007 0.0253471 0.9745 0.329827 log(gdp) -0.0543295
0.0594298 -0.9142 0.360638 urban 0.0015956 0.0093299 0.1710 0.864206 log(pop) 0.6073608 0.2363207 2.5701
0.010178 lag_polity2 0.6149028 0.0069107 88.9786 < 2.2e-16

log(gov_d_total + 1)

log(gov_r_total + 1)

log(ngo_total + 1) ** log(igo_total + 1) ** log(corp_total + 1)

log(other_total + gov_o_total + 1)

log(gdp)

urban

log(pop) *

lag_polity2 *** — Signif. codes: 0 ‘**0.001**’ 0.01 ‘0.05’ 0.1 ‘1’

Total Sum of Squares: 33648 Residual Sum of Squares: 21461 R-Squared: 0.36219 Adj. R-Squared: 0.24377

F-statistic: 826.744 on 10 and 14559 DF, p-value: < 2.22e-16

Table 6: Main Results

	<i>Dependent variable:</i>			
	Electoral	Liberal	Participatory	PolityIV
Donor Gov	0.018 (0.017)	0.024* (0.015)	0.014 (0.010)	0.043 (0.045)
Target Gov	0.036*** (0.010)	0.029*** (0.009)	0.019*** (0.007)	0.040 (0.028)
NGO	0.065*** (0.016)	0.044*** (0.013)	0.052*** (0.010)	0.242*** (0.042)
IGO	0.039*** (0.014)	0.023* (0.012)	0.022** (0.009)	0.184*** (0.038)
Corporation	0.046 (0.043)	0.073** (0.037)	0.037 (0.027)	0.324*** (0.115)
Other	0.053*** (0.011)	0.044*** (0.009)	0.028*** (0.007)	0.133*** (0.029)
log(GDP)	0.297*** (0.024)	0.165*** (0.021)	0.138*** (0.015)	0.242*** (0.064)
Urban	-0.034*** (0.004)	-0.029*** (0.003)	-0.027*** (0.002)	-0.006 (0.010)
log(Population)	0.222** (0.095)	0.429*** (0.082)	0.355*** (0.059)	1.832*** (0.253)
Observations	20,408	20,408	20,408	20,408
R ²	0.016	0.011	0.016	0.017
Adjusted R ²	-0.165	-0.171	-0.165	-0.164
F Statistic (df = 9; 17235)	31.667***	21.624***	30.703***	32.599***

Note:

*p<0.1; **p<0.05; ***p<0.01

##Appendix C5: Analysis by Recipient-Year Aggregating by recipient pools together variation that might exist on the donor level. By using the dyad level, however, we may be artificially increasing the importance of recipients that receive aid from numerous sources. As a robustness check, we aggregate by the recipient in the models below. The results generally also support our argument, that less fungible sources like NGOs and IGOs increase democratization more. Under this specification, corporations increase democracy by a significant but smaller amount for two of the four dependent variables.

Table 7: Main Results

	<i>Dependent variable:</i>			
	Electoral	Liberal	Participatory	PolityIV
Donor Gov	0.012 (0.026)	0.016 (0.022)	0.012 (0.016)	-0.035 (0.068)
Target Gov	-0.005 (0.030)	0.010 (0.025)	-0.001 (0.018)	0.079 (0.078)
NGO	0.068* (0.040)	0.048 (0.034)	0.047* (0.024)	0.132 (0.105)
IGO	0.080** (0.035)	0.073** (0.029)	0.039* (0.021)	0.393*** (0.091)
Corporation	0.067 (0.054)	0.097** (0.045)	0.058* (0.033)	0.290** (0.141)
Other	0.058* (0.031)	0.070*** (0.026)	0.041** (0.018)	0.121 (0.080)
log(GDP)	0.132 (0.094)	0.039 (0.079)	0.019 (0.057)	-0.198 (0.245)
Urban	-0.015 (0.014)	-0.016 (0.011)	-0.017** (0.008)	0.015 (0.035)
log(Population)	0.010 (0.352)	0.121 (0.294)	0.246 (0.212)	1.464 (0.917)
Observations	1,362	1,362	1,362	1,362
R ²	0.035	0.040	0.035	0.061
Adjusted R ²	-0.065	-0.060	-0.065	-0.037
F Statistic (df = 9; 1233)	4.956***	5.707***	5.008***	8.833***

Note:

*p<0.1; **p<0.05; ***p<0.01

Appendix C6: Effect of All Aid on Democratization

Table 8: Main Results

	<i>Dependent variable:</i>			
	Electoral	Liberal	Participatory	PolityIV
Donor Gov	0.019** (0.008)	0.017*** (0.006)	0.015*** (0.005)	0.059*** (0.020)
Target Gov	-0.005 (0.006)	-0.001 (0.006)	0.001 (0.004)	0.028 (0.018)
NGO	0.032*** (0.010)	0.029*** (0.009)	0.027*** (0.006)	0.219*** (0.028)
IGO	0.001 (0.009)	-0.003 (0.007)	0.003 (0.005)	-0.004 (0.023)
Corporation	-0.034* (0.019)	-0.023 (0.016)	-0.015 (0.012)	-0.061 (0.051)
Other	0.014** (0.006)	0.011** (0.005)	0.010** (0.004)	0.032* (0.017)
log(GDP)	0.295*** (0.021)	0.166*** (0.018)	0.124*** (0.013)	0.184*** (0.056)
Urban	-0.030*** (0.003)	-0.028*** (0.003)	-0.025*** (0.002)	-0.008 (0.009)
log(Population)	0.356*** (0.084)	0.525*** (0.071)	0.442*** (0.051)	2.205*** (0.226)
Observations	25,897	25,897	25,897	25,897
R ²	0.014	0.010	0.014	0.019
Adjusted R ²	-0.134	-0.137	-0.134	-0.127
F Statistic (df = 9; 22531)	34.581***	26.231***	34.866***	49.284***

Note:

*p<0.1; **p<0.05; ***p<0.01

Appendix C7: Effect of Broader Dem Aid Coding on Democratization

Table 9: Main Results

	<i>Dependent variable:</i>			
	Electoral	Liberal	Participatory	PolityIV
Donor Gov	0.002 (0.013)	0.008 (0.011)	0.009 (0.008)	0.008 (0.034)
Target Gov	0.012 (0.010)	0.012 (0.009)	0.012* (0.006)	0.109*** (0.028)
NGO	0.057*** (0.014)	0.045*** (0.012)	0.047*** (0.009)	0.213*** (0.038)
IGO	0.049*** (0.012)	0.038*** (0.011)	0.033*** (0.008)	0.179*** (0.033)
Corporation	-0.030 (0.028)	-0.019 (0.024)	-0.011 (0.017)	0.030 (0.074)
Other	0.036*** (0.009)	0.029*** (0.008)	0.025*** (0.006)	0.079*** (0.024)
log(GDP)	0.302*** (0.024)	0.173*** (0.021)	0.129*** (0.015)	0.261*** (0.065)
Urban	-0.033*** (0.004)	-0.030*** (0.003)	-0.025*** (0.002)	-0.015 (0.010)
log(Population)	0.345*** (0.096)	0.528*** (0.083)	0.416*** (0.059)	2.133*** (0.257)
Observations	20,191	20,191	20,191	20,191
R ²	0.016	0.013	0.017	0.020
Adjusted R ²	-0.135	-0.139	-0.134	-0.131
F Statistic (df = 9; 17498)	32.554***	24.707***	33.585***	39.860***

Note:

*p<0.1; **p<0.05; ***p<0.01