

## Supplementary Appendix (for online publication)

### Aid Fragmentation and Effectiveness: What Do We Really Know

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**Table A1: Definition of variables and descriptive statistics**

Burnside & Dollar (Table 2 and 3)							
Variable name	Obs.	Mean	Std. Dev.	Min	Max	Definition	Sources
GDP p.c. growth	715	1.79	3.62	-32.42	17.05	Average over annual growth rates of real GDP p.c. based on constant local currency (in %).	World Bank (2007, 2016)*
Net ODA (% of GDP)	715	5.31	8.17	-0.13	82.39	ODA total net in % of GDP (high maximum value is Liberia over the 2006-2009 period).	OECD/DAC (2016)
F(HI)	715	0.75	0.15	0.11	0.93	Fragmentation index based on Herfindahl index for disbursements, calculated only for donor countries (1-Herfindahl).	OECD/DAC (2016)
F(CR3)	715	0.34	0.14	0.00	0.67	Fragmentation index based on concentration ratio of disbursements for the 3 largest donors = 1- sum of the share of largest three donors.	OECD/DAC (2016)
Total number of donors (N)	715	29.60	9.15	7.67	47.00	Total number of donors (N) (bi- and multilateral).	OECD/DAC (2016)

Small donors (N<10%)	715	20.81	7.73	4.33	41.75	Number of insignificant donors; includes all donors that are among the smallest donors and cumulatively account for less than 10% of aid (based on the OECD definition).	OECD/DAC (2016)
Bureaucratic quality	547	1.77	0.94	0.00	4.00	Bureaucracy quality indicator, higher scores indicate better quality (only used to split samples in Table 3).	PRS Group (2013)
Log initial GDP/capita	715	2.10	0.12	1.65	2.42	Logarithm of initial GDP p.c. in international prices.	Heston, Summers, and Aten (2006), World Bank (2016)*
Assassinations	715	0.33	1.04	0.00	11.50	Number of assassinations.	Banks and Wilson (2007, 2014)*
Ethnolinguistic fractionalization	715	0.46	0.30	0.00	0.93	Ethnolinguistic fractionalization.	Easterly and Levine (1997), Roeder (2001)*
Assassinations x ethnolinguistic fractionalization	715	0.12	0.45	0.00	7.36	Interaction between assassinations and ethnolinguistic fractionalization.	Banks (2007, 2014), Easterly and Levine (1997), Roeder (2001)*
M2 (% of GDP)	715	9.54	24.61	0.04	243.64	Money and quasi-money (M2) in % of GDP.	World Bank (2007, 2016)*

\* Data source is Clemens et al. (2012), <http://www.cgdev.org/doc/Working%20Papers/CRBB-Replication-Files.zip>, accessed 06.06.2012. More details are provided in “Technical appendix to counting chickens when they hatch: Timing and the effects of aid on growth,” [http://www.cgdev.org/doc/Working%20Papers/counting\\_chickens\\_technical\\_appendix.pdf](http://www.cgdev.org/doc/Working%20Papers/counting_chickens_technical_appendix.pdf), accessed 06.06.2012. For more recent years, we use data from the World Development Indicators (World Bank 2016).

Knack & Rahman (Table 4 and 5)							
Variable name	Obs.	Mean	Std. Dev.	Min	Max	Definition	Sources
Bureaucratic quality	485	1.76	0.95	0.00	4.00	Bureaucracy quality indicator, higher scores indicate better quality; value for the year following the four-year period covered by the right-hand side variables.	PRS Group (2013)
Net ODA (% of GDP)	485	5.92	9.28	-0.13	82.39	ODA total net in % of GDP.	OECD/DAC (2016)
F(HI)	485	0.78	0.14	0.11	0.93	Fragmentation index based on Herfindahl index for disbursements, calculated only for donor countries (1-Herfindahl).	OECD/DAC (2016)
F(CR3)	485	0.37	0.14	0.01	0.67	Fragmentation index based on concentration ratio of disbursements for the 3 largest donors = 1- Sum of the share of largest three donors.	OECD/DAC (2016)
Total number of donors (N)	485	33.72	7.90	7.67	47.00	Total number of donors (N) (bi- and multilateral).	OECD/DAC (2016)
Small donors (N<10%)	485	24.08	7.07	4.33	41.75	Number of insignificant donors; includes all donors that are among the smallest donors and cumulatively account for less than 10% of aid (based on the OECD definition).	OECD/DAC (2016)
Bureaucratic quality	1.78	0.91	0.00	4.00	1.78	Bureaucracy quality indicator, higher scores indicate better quality (only used to split samples in Table 5).	PRS Group (2013)
Log initial GDP/capita	2.10	0.12	1.65	2.34	2.10	Logarithm of initial GDP p.c. in International prices.	Heston, Summers, and Aten (2006), World Bank (2016)*
Assassinations	0.32	0.95	0.00	11.50	0.32	Number of assassinations.	Banks (2007, 2012)*

Ethnolinguistic fractionalization	0.46	0.30	0.00	0.93	0.46	Ethnolinguistic fractionalization.	Easterly and Levine (1997), Roeder (2001)*
Assassinations x ethnolinguistic fractionalization	0.11	0.33	0.00	3.04	0.11	Interaction between assassinations and ethnolinguistic fractionalization.	Banks (2007, 2014), Easterly and Levine (1997), Roeder (2001)*
M2 (% of GDP)	13.95	28.87	0.04	243.64	13.95	Money and quasi-money (M2) in % of GDP.	World Bank (2007, 2016)*

\* Data source is Clemens et al. (2012), <http://www.cgdev.org/doc/Working%20Papers/CRBB-Replication-Files.zip>, accessed 06.06.2012. More details are provided in “Technical appendix to counting chickens when they hatch: Timing and the effects of aid on growth,”

[http://www.cgdev.org/doc/Working%20Papers/counting\\_chickens\\_technical\\_appendix.pdf](http://www.cgdev.org/doc/Working%20Papers/counting_chickens_technical_appendix.pdf), accessed 06.06.2012. For more recent years, we use data from the World Development Indicators (World Bank 2016).

<b>Birchler &amp; Michaelowa (Tables 6 and 7)</b>							
<b>Variable name</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>	<b>Definition</b>	<b>Sources</b>
Net primary enrolment rate (%)	228	81.51	18.37	22.39	100.00	Net enrolment rate for primary education (%).	WDI (World Bank 2007, 2016)*
Aid for education	228	3.23	4.12	0.00	23.33	ODA per capita allocated to education (disbursement, constant 2000 US\$ million).	OECD/DAC (2016)
F(HI)	228	0.50	0.27	0.00	0.89	Fragmentation index based on Herfindahl Index for disbursements, calculated only for donor countries (1-Herfindahl).	OECD/DAC (2016)
F(CR3)	228	0.14	0.13	0.00	0.52	Fragmentation index based on concentration ratio of disbursements for the 3 largest donors = 1- Sum of the share of largest three donors.	OECD/DAC (2016)
Total number of donors (N)	228	9.84	6.87	1.00	26.00	Total number of donors (N) (bi- and multilateral).	OECD/DAC (2016)
Small donors (N<10%)	228	0.58	0.29	0.00	0.92	Number of insignificant donors; includes all donors that are among the smallest donors and cumulatively account for less than 10% of aid (based on the OECD definition).	OECD/DAC (2016)
Bureaucratic quality	228	1.77	0.78	0.00	3.55	Bureaucracy quality indicator, higher scores indicate better quality (only used to split samples in Table 7).	PRS Group (2013)
Log initial GDP/capita	228	2.08	0.11	1.65	2.27	Logarithm of initial GDP p.c. in international prices.	Heston, Summers, and Aten (2006), World Bank (2016)*
Assassinations	228	0.41	1.19	0.00	11.50	Number of assassinations.	Banks (2012, 2007)*

Ethnolinguistic fractionalization	228	0.47	0.29	0.00	0.93	Ethnolinguistic fractionalization.	Easterly and Levine (1997), Roeder (2001)*
Assassinations x ethnolinguistic Fractionalization	228	0.13	0.34	0.00	3.04	Interaction between assassinations and ethnolinguistic Fractionalization.	Banks (2012, 2007), Easterly and Levine (1997), Roeder (2001)*
M2 (% of GDP)	228	12.03	27.03	0.05	239.67	Money and quasi-money (M2) in % of GDP.	World Bank (2007, 2016)*

\* Data source is Clemens et al. (2012), <http://www.cgdev.org/doc/Working%20Papers/CRBB-Replication-Files.zip>, accessed 06.06.2012. More details are provided in "Technical appendix to counting chickens when they hatch: Timing and the effects of aid on growth,"

[http://www.cgdev.org/doc/Working%20Papers/counting\\_chickens\\_technical\\_appendix.pdf](http://www.cgdev.org/doc/Working%20Papers/counting_chickens_technical_appendix.pdf), accessed 06.06.2012. For more recent years, we use data from the World Development Indicators (World Bank 2016).

Knack & Rahman (Table A6)							
Variable name	Obs.	Mean	Std. Dev.	Min	Max	Definition	Sources
Bureaucratic quality	83	2	1	0	4	Bureaucratic quality indicator, higher scores indicate better quality; value in 2001.	PRS Group (2013)
F(HI)	83	0.76	0.14	0.30	0.91	Fragmentation index based on Herfindahl Index for disbursements, calculated only for donor countries (1-Herfindahl).	OECD/DAC (2016)
F(CR3)	83	0.36	0.14	0.08	0.61	Fragmentation index based on concentration ratio of disbursements for the 3 largest donors = 1- Sum of the share of largest three donors.	OECD/DAC (2016)
Total number of donors (N)	83	27.58	2.41	20.90	31.05	Total number of donors (N) (bi- and multilateral).	OECD/DAC (2016)
Small donors (N<10%)	83	18.55	2.39	13.42	25.85	Number of insignificant donors; includes all donors that are among the smallest donors and cumulatively account for less than 10% of aid (based on the OECD definition).	OECD/DAC (2016)
Initial bureaucratic quality	83	2.26	1.21	0.00	6.00	Bureaucratic quality indicator, higher scores indicate better quality; value in 1982.	PRS Group (2013)*
Population change/initial population	83	1.89	1.07	-0.80	3.98	Change in population divided by initial population.	World Bank (2004)*
GDP p.c. change/Initial GDP p.c.	83	1.16	2.22	-4.54	8.69	Change in GDP p.c. divided by initial GDP.	World Bank (2004)*
No. of years covered	83	15.88	4.99	3.00	19.00	Number of years covered by the cross-section (varies by recipient since not all countries were covered by ICRG over the whole period of the cross sectional analysis).	PRS Group (2013)*
Aid/GNI	83	7.11	9.00	0.05	50.56	Aid flows as percentage of gross national income (GNI).	World Bank (2004)*

\* Data source is Knack and Rahman (2007).

<b>Birchler &amp; Michaelowa (Tables A8 and A9)</b>							
<b>Variable name</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>	<b>Definition</b>	<b>Sources</b>
Net primary enrolment rate (%)	166	81.86	16.25	27.04	100.00	Net enrolment rate for primary education (%).	World Bank (2012)*
Aid for education	166	51.78	73.35	0.09	494.18	Aid allocated to education (disbursement, constant 2000 US\$ million). [Birchler and Michaelowa (2016) mistakenly identify this variable as "Education aid per capita," but have in fact not used per capita data.]	OECD/DAC (2012)*
F(HI)	166	0.57	0.21	0.03	0.90	Fragmentation index based on Herfindahl Index for disbursements, calculated only for donor countries (1-Herfindahl).	OECD/DAC (2016)
F(CR3)	166	0.15	0.13	-0.29	0.54	Fragmentation index based on concentration ratio of disbursements for the 3 largest donors = 1- Sum of the share of largest three donors.	OECD/DAC (2016)
Total number of donors (N)	166	10.40	6.06	1.20	25.20	Total number of donors (N) (bi- and multilateral).	OECD/DAC (2016)
Small donors (N<10%)	166	6.29	4.35	0.00	17.00	Number of insignificant donors; includes all donors that are among the smallest donors and cumulatively account for less than 10% of aid (based on the OECD definition).	OECD/DAC (2016)
Initial Bureaucratic quality	166	1.65	0.83	0.00	3.92	Initial bureaucracy quality indicator, higher scores indicate better quality (only used to split samples in Table A9).	PRS Group (2013)
Log initial GDP p.c.	164	4509.39	4735.63	239.07	23362.07	Logarithm of initial GDP p.c. in international prices.	World Bank (2012)*
Education expenditure	166	16.62	4.13	6.35	32.78	Public spending on education (% of government expenditure).	World Bank (2012)*



PTR	166	34.77	13.48	11.14	79.98	Pupil-teacher ratio in primary education.	World Bank (2012)*
Young population	166	37.59	7.92	14.80	49.64	Population aged 0-14 (% of total population).	World Bank (2012)*
GDP per capita	166	4485.21	4712.06	239.07	23362.07	GDP per capita (constant 2000 US\$).	World Bank (2012)*
Budget (surplus)	166	-1.46	4.23	-18.40	35.14	Cash surplus/deficit (% of GDP).	World Bank (2012)*
Inflation	166	19.17	81.97	-4.07	1008.95	Inflation (consumer prices, % annual).	World Bank (2012)*
Openness	166	75.14	35.77	22.36	206.43	Openness (export+import in % of GDP).	World Bank (2012)*
Freedom	166	4.04	1.57	1.00	7.00	Freedom House (mean of political rights and civil liberties; lowest freedom=7, highest=1).	Freedom House (2011)*

\* Data source is Birchler and Michaelowa (2016).

Table A2: Pre-trends in fragmentation

	F(HI)	F(CR3)	Total number of donors (N)	Small donors (N<10%)
<b>Dependent variable: Fragmentation index (t)</b>				
GDP p.c. growth (t)	0.000 [0.001]	0.000 [0.001]	0.012 [0.048]	0.033 [0.040]
GDP p.c. growth (t-1)	0.002* [0.001]	0.001 [0.001]	0.042 [0.031]	0.011 [0.034]
GDP p.c. growth (t-2)	0.001 [0.001]	0.001 [0.001]	0.041 [0.029]	0.027 [0.030]
Adj. R-Squared	0.098	0.153	0.918	0.880
Number of observations	653	653	653	653
<b>Dependent variable: Fragmentation index (t)</b>				
Bureaucratic quality (t)	0.018 [0.016]	0.014 [0.013]	-0.209 [0.269]	-0.535 [0.348]
Bureaucratic quality (t-1)	-0.008 [0.010]	-0.005 [0.011]	-0.258 [0.295]	0.109 [0.435]
Bureaucratic quality (t-2)	0.008 [0.011]	0.005 [0.012]	-0.003 [0.296]	-0.204 [0.381]
Adj. R-Squared	0.044	0.045	0.888	0.842
Number of observations	418	418	418	418
<b>Dependent variable: Fragmentation index (t)</b>				
Primary enrolment (t)	-0.002 [0.003]	0.002 [0.002]	0.111** [0.043]	0.003 [0.003]
Primary enrolment (t-1)	0.001 [0.003]	-0.002 [0.002]	-0.064* [0.036]	-0.002 [0.003]
Primary enrolment (t-2)	-0.004 [0.003]	-0.002 [0.002]	-0.025 [0.057]	0.005** [0.002]
Adj. R-Squared	0.760	0.660	0.930	0.880
Number of observations	165	165	165	165

**Notes:** F(HI): Fragmentation index based on the Herfindahl Index; F(CR3): Fragmentation index based on aid by the three largest donors as a percentage of total aid; N(<10%): Fragmentation index based on the number of donors that cumulatively account for at most 10% of aid inflows. The table examines whether lagged values of (1) growth, (2) bureaucratic quality, and (3) enrolment influence the choice of donors to select recipient countries. Control variables for each regression are as in Table 2. The sample is based on 4-year periods. All regressions include period- and country-fixed effects and instrument initial GDP per capita with its first lag. Standard errors clustered at the country level are reported in brackets. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table A3: Aid, fragmentation and growth (based on Burnside and Dollar), 1974-2013, with squared interaction**

Fragmentation index	F(HI)	F(CR3)	Total number of donors (N)	Small donors (N<10%)
<b>GDP p.c. growth</b>				
Aid	0.223 [0.466]	0.19 [0.172]	0.074 [0.172]	0.024 [0.150]
Aid^2	0.015 [0.019]	0.006 [0.005]	0.004 [0.005]	0.004 [0.004]
Fragmentation	-0.977 [2.182]	-1.191 [2.255]	-0.082 [0.060]	-0.013 [0.054]
Aid x Fragmentation	-0.132 [0.573]	-0.112 [0.395]	0.001 [0.005]	0.004 [0.006]
Aid^2 x Fragmentation	-0.017 [0.023]	-0.013 [0.013]	0.000 [0.000]	0.000 [0.000]
Adj. R-Squared	0.260	0.270	0.250	0.250
Number of observations	715	715	715	715
Number of countries	78	78	78	78
Marginal effect of Aid at				
Frag. 20th percentile	0.181* [0.098]	0.207** [0.098]	0.117 [0.076]	0.097 [0.071]
Frag. 50th percentile	0.133** [0.062]	0.172** [0.072]	0.115* [0.062]	0.108* [0.061]
Frag. 80th percentile	0.106* [0.062]	0.132** [0.066]	0.114** [0.053]	0.126** [0.058]
Marginal effect of Frag. at Aid 50th percentile	-1.411 [1.350]	-1.278 [1.800]	-0.014 [0.053]	0.031 [0.053]

**Notes:** F(HI): Fragmentation index based on the Herfindahl Index; F(CR3): Fragmentation index based on aid by the three largest donors as a percentage of total aid; N(<10%): Fragmentation index based on the number of donors that cumulatively account for at most 10% of aid inflows. Besides the squared interaction term, the regressions are identical to those in Table 2. Standard errors clustered at the country level are reported in brackets. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table A4: Aid, fragmentation and growth (based on Burnside and Dollar), 1974-2013, sample splits (all main effects)**

	High Bureaucratic Quality	Low Bureaucratic Quality	High Political Alignment	Low Political Alignment	Prior to 1994	Since 1994
<b>GDP p.c. growth</b>						
	F(HI)					
Aid	0.543	2.237*	0.859**	0.463	0.313	1.011
	[0.507]	[1.251]	[0.363]	[0.331]	[0.445]	[0.728]
Aid <sup>2</sup>	-0.017*	-0.002	0.000	0.000	-0.005	0.000
	[0.010]	[0.003]	[0.001]	[0.002]	[0.004]	[0.002]
F(HI)	-2.734	13.903	0.861	-0.445	-3.300	2.875
	[2.750]	[9.009]	[2.527]	[2.331]	[3.193]	[3.083]
Aid x F(HI)	-0.074	-2.248*	-0.851**	-0.442	-0.131	-1.084
	[0.389]	[1.267]	[0.392]	[0.356]	[0.444]	[0.746]
p-value equal coefficients		0.051		0.375		0.197
	F(CR3)					
Aid	0.589	1.067*	0.349	0.364**	0.33	0.434
	[0.403]	[0.583]	[0.214]	[0.182]	[0.257]	[0.385]
Aid <sup>2</sup>	-0.019*	-0.003	0	0	-0.004	-0.001
	[0.010]	[0.004]	[0.001]	[0.001]	[0.004]	[0.002]
F(CR3)	-2.76	8.774	0.38	0.724	-3.836	3.578
	[3.985]	[7.971]	[2.696]	[3.313]	[4.090]	[2.889]
Aid x F(CR3)	-0.208	-1.442*	-0.422	-0.591**	-0.274	-0.656
	[0.492]	[0.768]	[0.358]	[0.288]	[0.392]	[0.533]
p-value equal coefficients		0.114		0.660		0.527

**Table A4 (continued)**

	High Bureaucratic Quality	Low Bureaucratic Quality	High Political Alignment	Low Political Alignment	Prior to 1994	Since 1994
Total Number of Donors (N)						
Aid	0.746** [0.367]	0.610 [0.385]	0.052 [0.128]	0.460 [0.349]	0.836 [0.557]	0.260 [0.240]
Aid^2	-0.016* [0.010]	0.000 [0.002]	-0.001 [0.001]	-0.001 [0.002]	-0.006 [0.004]	0.000 [0.002]
Total Number of Donors (N)	-0.054 [0.102]	0.480 [0.345]	-0.178 [0.118]	-0.032 [0.109]	-0.159 [0.154]	0.120** [0.050]
Aid x Total Number of Donors (N)	-0.011 [0.008]	-0.010* [0.005]	0.005 [0.003]	-0.012 [0.011]	-0.023 [0.020]	-0.006 [0.006]
p-value equal coefficients		0.895		0.065		0.341
Small Donors (N<10%)						
Aid	0.706** [0.340]	0.448 [0.360]	0.078 [0.121]	0.174 [0.322]	0.617 [0.429]	0.178 [0.201]
Aid^2	-0.015 [0.010]	-0.001 [0.003]	-0.001 [0.001]	-0.002 [0.002]	-0.007 [0.004]	0.000 [0.002]
Small Donors (N<10%)	-0.015 [0.088]	0.239 [0.200]	-0.046 [0.102]	-0.057 [0.108]	0.000 [0.188]	0.127** [0.063]
Aid x Small Donors (N<10%)	-0.015 [0.011]	-0.007 [0.005]	0.005* [0.003]	-0.002 [0.015]	-0.022 [0.021]	-0.005 [0.005]
p-value equal coefficients		0.440		0.578		0.352

**Notes:** F(HI): Fragmentation index based on the Herfindahl Index; F(CR3): Fragmentation index based on aid by the three largest donors as a percentage of total aid; N(<10%): Fragmentation index based on the number of donors that cumulatively account for at most 10% of aid inflows. This is the extended form of the regressions in Table 3, displaying all main effects. Standard errors clustered at the country level are reported in brackets. P-values refer to a Wald test of the equality of coefficients for split samples. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table A5: Aid, fragmentation and bureaucratic quality, 1986-2013, split sample (all main effects)**

	High Bureaucratic Quality	Low Bureaucratic Quality	High Political Alignment	Low Political Alignment	Prior to 1994	Since 1994
<b>ICRG Bureaucratic quality</b>						
	F(HI)					
Aid	-0.334** [0.135]	0.099 [0.085]	0.097 [0.124]	-0.052 [0.105]	-0.152 [0.106]	-0.334** [0.135]
Aid^2	0.009 [0.009]	0.000 [0.000]	0.000 [0.000]	0.000 [0.001]	-0.001* [0.001]	0.009 [0.009]
F(HI)	-0.690 [1.230]	3.164*** [0.910]	1.238 [0.791]	0.954 [1.422]	-0.465 [0.472]	-0.690 [1.230]
Aid x F(HI)	0.341 [0.215]	-0.101 [0.095]	-0.143 [0.158]	0.061 [0.131]	0.253* [0.134]	0.341 [0.215]
p-value equal coefficients		0.015		0.183		0.007
	F(CR3)					
Aid	-0.269* [0.136]	0.046 [0.047]	0.055 [0.041]	-0.015 [0.049]	-0.037 [0.044]	0.015 [0.017]
Aid^2	0.009 [0.008]	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	-0.001* [0.001]	0.000 [0.000]
F(CR3)	-0.45 [1.296]	2.285* [1.194]	1.454*** [0.525]	1.111 [1.276]	-0.354 [0.591]	0.051 [0.266]
Aid x F(CR3)	0.451** [0.203]	-0.072 [0.076]	-0.166* [0.097]	0.017 [0.089]	0.198** [0.078]	-0.055 [0.048]
p-value equal coefficients		0.002		0.077		0.000

**Table A5 (continued)**

	High Bureaucratic Quality	Low Bureaucratic Quality	High Political Alignment	Low Political Alignment	Prior to 1994	Since 1994
Total Number of Donors (N)						
Aid	-0.351 [0.228]	0.001 [0.024]	-0.033 [0.046]	-0.021 [0.115]	0.091 [0.099]	-0.014 [0.017]
Aid <sup>2</sup>	0.013 [0.009]	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	-0.001 [0.001]	0.000 [0.000]
Total number of donors (N)	-0.031 [0.026]	0.043 [0.038]	-0.054 [0.037]	0.006 [0.034]	0.038 [0.039]	0.003 [0.005]
Aid x Total number of donors (N)	0.007 [0.007]	0.000 [0.001]	0.000 [0.001]	0.000 [0.004]	-0.002 [0.004]	0.000 [0.000]
p-value equal coefficients		0.171		0.959		0.412
Small Donors (N<10%)						
Aid	-0.217 [0.256]	0.001 [0.022]	-0.024 [0.037]	-0.011 [0.066]	0.169** [0.080]	-0.014 [0.014]
Aid <sup>2</sup>	0.013 [0.010]	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	-0.001 [0.001]	0.000 [0.000]
Small Donors (N<10%)	-0.020 [0.024]	-0.031 [0.035]	-0.037 [0.024]	-0.011 [0.029]	0.028 [0.034]	0.008 [0.006]
Aid x Small Donors (N<10%)	0.001 [0.006]	0.000 [0.001]	0.000 [0.001]	0.000 [0.003]	-0.007* [0.004]	0.000 [0.001]
p-value equal coefficients		0.826		0.807		0.014

**Notes:** F(HI): Fragmentation index based on the Herfindahl Index; F(CR3): Fragmentation index based on aid by the three largest donors as a percentage of total aid; N(<10%): Fragmentation index based on the number of donors that cumulatively account for at most 10% of aid inflows. This is the extended form of the regressions in Table 4, displaying all main effects. Standard errors clustered at the country level are reported in brackets. P-values refer to a Wald test of the equality of coefficients for split samples. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table A6: Aid, fragmentation, and bureaucratic quality (based on Knack and Rahman), cross-section 1982-2001**

Fragmentation index	F(HI)	F(CR3)	Total number of donors (N)	Small donors (N<10%)
<b>ICRG bureaucratic quality</b>				
Aid	0.011 [0.135]	-0.003 [0.061]	0.218* [0.112]	0.008 [0.162]
Fragmentation	-0.362 [1.113]	-0.215 [1.180]	-0.077 [0.062]	0.007 [0.063]
Aid x Fragmentation	-0.055 [0.162]	-0.069 [0.133]	-0.009** [0.004]	-0.003 [0.009]
Adj. R-Squared	0.250	0.250	0.310	0.240
Number of observations	83	83	83	83
Number of countries	83	83	83	83
Marginal effect of Aid at				
Frag. 20% percentile	-0.025 [0.032]	-0.020 [0.031]	-0.019 [0.015]	-0.036* [0.019]
Frag. 50% percentile	-0.032* [0.018]	-0.027 [0.020]	-0.037** [0.015]	-0.042** [0.020]
Frag. 80% percentile.	-0.037** [0.018]	-0.037** [0.017]	-0.048*** [0.018]	-0.045 [0.029]
Marginal effect of Frag. at				
Aid 50% percentile	-0.560 [0.691]	-0.463 [0.888]	-0.109** [0.054]	-0.003 [0.042]

**Notes:** F(HI): Fragmentation index based on the Herfindahl Index; F(CR3): Fragmentation index based on aid by the three largest donors as a percentage of total aid; N(<10%): Fragmentation index based on the number of donors that cumulatively account for at most 10% of aid inflows. The control variables are defined in Table A1. Both aid and fragmentation are lagged by one period. The marginal effect of aid refers to the change in bureaucratic quality for a one percentage point increase in aid as a percentage of GNI at different levels of fragmentation ("Frag."). Standard errors clustered at the country level are reported in brackets. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.



**Table A7: Aid, fragmentation and primary enrolment, 1994-2013 (all main effects)**

	High Bureaucratic Quality	Low Bureaucratic Quality	High Political Alignment	Low Political Alignment
<b>Net enrollment rate (%)</b>				
		F(HI)		
Aid	-5.786*	1.321	-0.696	-1.319
	[2.942]	[1.785]	[1.533]	[2.306]
Aid^2	-0.001	-0.150**	-0.042	0.240
	[0.112]	[0.061]	[0.050]	[0.326]
F(HI)	-11.555*	7.638	-5.506	7.103
	[6.633]	[11.009]	[12.473]	[9.232]
Aid x F(HI)	12.446***	2.515	1.724	1.594
	[3.508]	[2.036]	[2.136]	[3.009]
p-value equal coefficients		0.000		0.953
		F(CR3)		
Aid	-2.618	2.611**	-0.180	0.267
	[1.572]	[1.098]	[0.948]	[2.013]
Aid^2	-0.014	-0.141**	-0.037	0.106
	[0.064]	[0.064]	[0.032]	[0.286]
F(CR3)	-27.627**	40.583	8.831	30.804
	[12.490]	[25.067]	[29.574]	[48.560]
Aid x F(CR3)	23.729***	0.154	2.363	-2.933
	[3.810]	[3.020]	[3.068]	[12.599]
p-value equal coefficients		0.000		0.538

**Table A7 (continued)**

	High Bureaucratic Quality	Low Bureaucratic Quality	High Political Alignment	Low Political Alignment
Total Number of Donors (N)				
Aid	-1.737	2.028	-0.944	-0.010
	[2.530]	[1.251]	[0.920]	[1.812]
Aid^2	-0.179	-0.136	-0.037	0.125
	[0.144]	[0.082]	[0.041]	[0.346]
Total Number of Donors (N)	-0.370	1.921	0.191	1.166
	[0.776]	[1.161]	[0.871]	[1.429]
Aid x Total Number of Donors (N)	0.412	0.017	0.078	-0.028
	[0.307]	[0.076]	[0.056]	[0.277]
p-value equal coefficients		0.011		0.567
Small Donors (N<10%)				
Aid	-5.871	1.543	-1.961	-0.267
	[8.581]	[2.916]	[3.271]	[2.012]
Aid^2	-0.450	-0.167**	0.005	0.163
	[0.441]	[0.064]	[0.040]	[0.317]
Small Donors (N<10%)	-6.789	-13.802	4.211	-2.957
	[9.051]	[16.074]	[16.056]	[6.263]
Aid x Small Donors (N<10%)	12.223	2.158	1.734	0.106
	[14.025]	[3.437]	[3.288]	[1.530]
p-value equal coefficients		0.427		0.404

Notes: F(HI): Fragmentation index based on the Herfindahl Index; F(CR3): Fragmentation index based on aid by the three largest donors as a percentage of total aid; N(<10%): Fragmentation index based on the number of donors that cumulatively account for at most 10% of aid inflows. This is the extended form of the regressions in Table 7, displaying all main effects. Standard errors clustered at the country level are reported in brackets. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Table A8: Aid, fragmentation and primary enrolment (based on Birchler and Michaelowa), 1996-2010

Fragmentation index	F(HI)	F(CR3)	Total number of donors (N)	Small donors (N<10%)
<b>Net enrolment rate (%)</b>				
Aid	-0.041 [0.049]	0.024 [0.025]	0.015 [0.064]	0.126* [0.073]
Fragmentation	-1.451 [6.414]	8.621 [11.634]	1.001** [0.450]	0.859 [0.554]
Aid x Fragmentation	0.135* [0.079]	0.125 [0.116]	0.001 [0.003]	-0.006 [0.005]
Adj. R-Squared	0.490	0.490	0.490	0.490
Number of observations	257	258	258	258
Number of countries	110	110	110	110
Marginal effect of Aid at				
Frag. 20th percentile	0.007 [0.034]	0.026 [0.032]	0.017 [0.071]	0.116 [0.090]
Frag. 50th percentile	0.039* [0.023]	0.036 [0.024]	0.019 [0.052]	0.098 [0.073]
Frag. 80th percentile	0.061** [0.029]	0.056** [0.026]	0.023 [0.028]	0.068 [0.045]
Marginal effect of Frag. at				
Aid 50th percentile	0.586 [8.247]	10.506 [14.611]	1.009* [0.605]	0.767 [0.756]

**Notes:** F(HI): Fragmentation index based on the Herfindahl Index; F(CR3): Fragmentation index based on education aid by the three largest donors as a percentage of total education aid; N(<10%): Fragmentation index based on the number of donors that cumulatively account for at most 10% of aid inflows. The control variables are defined in the appendix, Table A1. Both aid and fragmentation are lagged by one period. The sample is based on 5-year periods. All regressions include period- and country-fixed effects. The marginal effect of aid refers to the change in the net primary enrolment rate if education aid increases by one dollar at different levels of fragmentation ("Frag."). Standard errors clustered at the country level are reported in brackets. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table A9: Aid, fragmentation and primary enrolment (based on Birchler and Michaelowa), 1996-2010, sample splits**

	High Bureaucratic Quality	Low Bureaucratic Quality	High Political Alignment	Low Political Alignment
Aid x F(HI)	0.771*	0.214	-0.042	0.257
	[0.403]	[0.910]	[0.348]	[0.528]
p-value equal coefficients		0.182		0.298
Aid x F(CR3)	0.524	0.748	-0.079	0.016
	[0.356]	[0.977]	[1.410]	[0.456]
p-value equal coefficients		0.598		0.745
Aid x Total number of donors	0.020	0.033**	0.003	-0.002
	[0.013]	[0.015]	[0.046]	[0.015]
p-value equal coefficients		0.171		0.558
Aid x Small donors (N<10%)	0.006	0.025	0.043	-0.020
	[0.020]	[0.019]	[0.047]	[0.020]
p-value equal coefficients		0.163		0.000

**Notes:** F(HI): Fragmentation index based on the Herfindahl Index; F(CR3): Fragmentation index based on aid by the three largest donors as a percentage of total aid; N(<10%): Fragmentation index based on the number of donors that cumulatively account for at most 10% of aid inflows. The regressions are based on Table A8. Samples are split at the 50<sup>th</sup> percentile. Standard errors clustered at the country level are reported in brackets. P-values refer to a Wald test of the equality of coefficients for split samples. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table A10: Aid, fragmentation and primary enrolment (based on Birchler and Michaelowa), 1996-2010, sample splits (all main effects)**

	High Bureaucratic Quality	Low Bureaucratic Quality	High Political Alignment	Low Political Alignment
<b>Net enrollment rate (%)</b>				
	F(HI)			
Aid	-0.444*	-0.075	-0.344	-0.089
	[0.248]	[0.629]	[0.423]	[0.409]
F(HI)	1.827	-16.091	-91.680	8.256
	[11.816]	[55.018]	[191.732]	[12.908]
Aid x F(HI)	0.771*	0.214	-0.042	0.257
	[0.403]	[0.910]	[0.348]	[0.528]
p-value equal coefficients		0.182		0.298
	F(CR3)			
Aid	-0.049	-0.152	-0.328	0.092
	[0.063]	[0.306]	[1.217]	[0.166]
F(CR3)	19.898	-81.436	-206.873	18.937
	[35.647]	[89.387]	[1332.585]	[20.460]
Aid x F(CR3)	0.524	0.748	-0.079	0.016
	[0.356]	[0.977]	[1.410]	[0.456]
p-value equal coefficients		0.598		0.745

**Table A10 (continued)**

	High Bureaucratic Quality	Low Bureaucratic Quality	High Political Alignment	Low Political Alignment
	Total Number of Donors (N)			
Aid	-0.438 [0.291]	-0.652 [0.412]	-0.419 [1.632]	0.127 [0.369]
Total Number of Donors	1.694* [0.943]	-0.444 [1.093]	6.541 [27.742]	0.736 [1.190]
Aid x Total Number of Donors	0.020 [0.013]	0.033** [0.015]	0.003 [0.046]	-0.002 [0.015]
p-value equal coefficients		0.171		0.558
	Small Donors (N<10%)			
Aid	-0.105 [0.360]	-0.185 [0.386]	-1.307 [1.157]	0.435 [0.375]
Small Donors (N<10%)	1.889 [1.261]	-3.161 [3.905]	14.956 [10.545]	-0.483 [1.845]
Aid x Small Donors (N<10%)	0.006 [0.020]	0.025 [0.019]	0.043 [0.047]	-0.020 [0.020]
p-value equal coefficients		0.163		0.000

**Notes:** F(HI): Fragmentation index based on the Herfindahl Index; F(CR3): Fragmentation index based on aid by the three largest donors as a percentage of total aid; N(<10%): Fragmentation index based on the number of donors that cumulatively account for at most 10% of aid inflows. This is the extended form of the regressions in Table A9, displaying all main effects. Standard errors clustered at the country level are reported in brackets. P-values refer to a Wald test of the equality of coefficients for split samples. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table A11: Aid, fragmentation and primary enrolment, 1994-2013, commitments**

Fragmentation index	F(HI)	F(CR3)	Total number of donors (N)	Small donors (N<10%)
<b>Net enrollment rate (%)</b>				
Aid	0.039 [0.048]	0.041 [0.040]	0.001 [0.047]	-0.059 [0.132]
Aid^2	-0.000*** [0.000]	-0.000** [0.000]	-0.000*** [0.000]	-0.000** [0.000]
Fragmentation	4.238 [4.864]	12.515 [10.865]	0.639 [0.554]	-5.123 [5.231]
Aid x Fragmentation	0.151** [0.075]	0.322*** [0.114]	0.008** [0.004]	0.215 [0.166]
Adj. R-Squared	0.519	0.585	0.558	0.482
Number of observations	208	208	208	208
Number of countries	69	69	69	69
<b>Marginal effect of Aid at</b>				
Frag. 20th percentile	0.050 [0.049]	0.036 [0.047]	-0.001 [0.054]	-0.036 [0.133]
Frag. 50th percentile	0.096** [0.039]	0.046 [0.044]	0.023 [0.044]	0.037 [0.069]
Frag. 80th percentile	0.130*** [0.043]	0.091*** [0.034]	0.077** [0.035]	0.092** [0.040]
<b>Marginal effect of Frag. at</b>				
Aid 50th percentile	5.587 [6.064]	13.246 [12.846]	0.931 [0.726]	-3.453 [7.588]

**Notes:** F(HI): Fragmentation index based on the Herfindahl Index; F(CR3): Fragmentation index based on aid by the three largest donors as a percentage of total aid; N(<10%): Fragmentation index based on the number of donors that cumulatively account for at most 10% of aid inflows. The table is identical to Table 6, but with commitments instead of disbursements for education aid. Standard errors clustered at the country level are reported in brackets. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.