

Online Supplementary Appendix: “Disentangling the efficiency drivers in country-level global health programs: an empirical study”

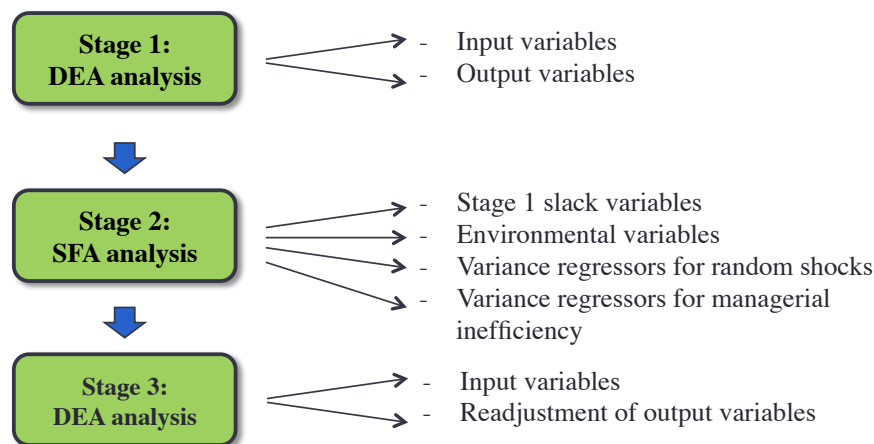


Figure S1: 3-stage model framework with all types of variables at every stage.

Table S1: Summary statistic of input and output variables.

	Landed cost per capita	Supply timeliness	CPR
Mean	0.246	51	25.055
St. dev.	0.256	15.007	17.249
Minimum	0.002	1	3.9
Maximum	1.474	74	63.5

Table S2: Summary statistic of independent variables.

	GDP per capita	Female lit. rate	Landlock	Public health expenditure	LPI	Merchandise	Population	Density	HHI
Mean	1872.849	65.242	0.341	47.15	2.463	66.445	19111211	96.295	0.671
St. dev.	2614.517	18.187	0.479	15.206	0.388	25.935	28863153	130.605	0.251
Minimum	231.024	28.7	0	18	1.61	24.605	168526	3	0.289
Maximum	11113.885	92.235	1	74.1	3.8	152.502	162470737	634	1

Table S3: Stochastic Frontier Estimation results with number of donors as an alternative funding concentration measure.

	CPR slacks		Supply timeliness slacks	
	Parameter	Std. error	Parameter	Std. error
Environmental variables				
Constant	15.446***	2.221	0.643	0.643
GDP	-0.071	0.166	-0.002	0.026
Female literacy	-2.946***	0.466	0.038	0.051
Landlock	0.070	0.296	0.355***	0.136
Public health	-1.444***	0.338	-0.177**	0.082
LPI	-0.503	0.315	-0.137***	0.056
Merchandise	1.213***	0.356	0.137*	0.072
Variance regressors for random shocks (v)				
Population	0.559**	0.228	2.942***	0.144
Density	-0.800***	0.237	-0.877***	0.222
Variance regressors for managerial inefficiency (u)				
Number of donors	1.309*	0.707	5.511***	2.053
Λ	0.625	N/A	0.007	N/A
$E(\sigma_u)$	0.653	N/A	0.021	N/A
Log-L	-61.761	N/A	-43.253	N/A
Observations	44	N/A	44	N/A

The asterisks *, **, and *** indicate significance levels of 10%, 5% and 1% or better, respectively.

Table S4: Stochastic Frontier Estimation results with Gini coefficient instead of female literacy rate.

	CPR slacks		Supply timeliness slacks	
	Parameter	Std. error	Parameter	Std. error
Environmental variables				
Constant	12.686***	3.628	-0.076	0.942
GDP	-0.594**	0.231	-0.068	0.075
Gini	-1.454*	0.847	0.128	0.249
Landlock	-0.389	0.446	0.277***	0.078
Public health	-1.426***	0.544	-0.019	0.094
LPI	-0.121	0.514	-0.171	0.152
Merchandise	0.812	0.530	0.126	0.125
Variance regressors for random shocks (v)				
Population	0.712***	0.261	6.123***	0.595
Density	-0.940***	0.268	-6.156***	0.693
Variance regressors for managerial inefficiency (u)				
Funding concentration	-2.529*	1.437	-2.703**	1.109
Λ	1.223	N/A	0.456	N/A
$E(\sigma_u)$	1.607	N/A	0.433	N/A
Log-L	-79.675	N/A	-15.906	N/A
Observations	44	N/A	44	N/A

The asterisks *, **, and *** indicate significance levels of 10%, 5% and 1% or better, respectively.

Table S5: Stochastic Frontier Estimation results with the corruption index instead of gdp per capita.

	CPR slacks		Supply timeliness slacks	
	Parameter	Std. error	Parameter	Std. error
Environmental variables				
Constant	17.206***	1.822	1.340***	0.231
Corruption	-0.576	0.374	0.285***	0.058
Female literacy	-2.959***	0.323	-0.038	0.034
Landlock	0.150	0.250	0.657***	0.067
Public health	-1.573***	0.286	-0.274***	0.026
LPI	-0.564**	0.279	-0.328***	0.022
Merchandise	1.376***	0.292	-0.091*	0.048
Variance regressors for random shocks (v)				
Population	0.644***	0.197	3.210***	0.149
Density	-0.733***	0.195	-0.785***	0.223
Variance regressors for managerial inefficiency (u)				
Funding concentration	10.971*	6.405	-25.638***	7.187
Λ	0.347	N/A	0.026	N/A
$E(\sigma_u)$	0.377	N/A	0.080	N/A
Log-L	-59.968	N/A	-34.760	N/A
Observations	44	N/A	44	N/A

The asterisks *, **, and *** indicate significance levels of 10%, 5% and 1% or better, respectively.

Table S6: Donor's share of total landed cost spent per country.

DMU Name	UNFPA	USAID	IPPF	DFID	Others
Angola	0.088	0.908	0.003	0	0
Benin	0.166	0.66	0.007	0	0.167
Botswana	0.24	0.68	0	0	0.08
Burkina Faso	0.782	0.213	0.0005	0	0.005
Burundi	0.874	0.092	0	0.033	0
Cameroon	0.416	0.572	0.011	0	0
Central African Republic	0.988	0	0.012	0	0
Chad	0.674	0	0.013	0	0.313
Comoros	1	0	0	0	0
Congo, Rep.	0.929	0	0.022	0	0.05
Congo, Dem. Rep.	0.301	0.685	0	0	0.013
Cote D'Ivoire	0.423	0	0.0007	0	0.576
Djibouti	1	0	0	0	0
Eritrea	1	0	0	0	0
Ethiopia	0.588	0.339	0.0001	0	0.0726
Gabon	0.842	0	0.016	0	0.141
Gambia, The	1	0	0	0	0
Ghana	0.223	0.569	0	0.113	0.096
Guinea	0.395	0.284	0.009	0	0.313
Guinea-Bissau	0.966	0	0.006	0	0.028
Kenya	0.194	0.353	0.0002	0.06	0.392
Lesotho	0.088	0.866	0.002	0	0.044
Liberia	0.347	0.565	0.02	0	0.068
Madagascar	0.538	0.462	0.0005	0	0
Malawi	0.31	0.613	0	0	0.077
Mali	0.8	0.088	0.025	0	0.088
Mauritania	1	0	0	0	0
Mauritius	1	0	0	0	0
Mozambique	0.81	0.13	0.0003	0	0.06
Namibia	1	0	0	0	0
Niger	0.988	0	0	0	0.012
Nigeria	0.342	0.291	0.0004	0.294	0.0723
Rwanda	0	0.999	0.001	0	0
Sao Tome and Principe	0.896	0	0.019	0	0.085
Senegal	0.288	0.71	0.002	0	0
Sierra Leone	0.961	0.005	0.034	0	0
South Africa	0.356	0.148	0	0	0.497
Sudan	0.937	0.044	0.015	0	0.004
Swaziland	1	0	0	0	0
Tanzania	0.365	0.511	0.001	0	0.123
Togo	0.281	0.412	0.003	0.187	0.118
Uganda	0.504	0.496	0	0	0
Zambia	0.336	0.586	0.003	0	0.075
Zimbabwe	0.388	0.612	0	0	0