
Show Me the Money: A Mathematical Model of INGO Aid Allocation with Influence Calculations

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PAPER 17

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Abstract:

Aid allocation by international non-governmental organizations (INGOs) is influenced by a number of factors including poverty, population, similarity to the policies of the INGO, and international recognition. Using the AHP, Guiasu, Yen, DS, and SVSM method, INGO aid allocation is determined for 148 nation-states.

Keywords: INGO; Aid Allocation; Analytic Hierarchy Process; Guiasu method; Yen method; DS; SVSM; influence calculations

1. Introduction

The purpose of this paper is to model international non-governmental organizations' (INGO's) allocation of aid to nation-states. From the literature [1,2,3], the poverty, population, similarity to the policies of the INGO, and the international recognition of the recipient nation-state are shown to be important in determining the amount of aid allocated by INGOs. I employ expert opinion to weight the factors as to their importance of determining INGO aid allocation. Using a weighted average approach, I use five different mathematical methods to create linear equations modeling INGO aid allocation. For the first set of calculations, all three experts were weighted the same. For the second set, experts were ranked based on how influential their opinions would be if able to influence each other. The results of can be found in the Appendix.

Aid Allocation Survey

I asked a panel of experts to score the following factors on the interval [0,5] according to their importance in determining INGO aid allocation (μ), where 0 means unimportant and 5 means very important: proximity ($F1$), poverty ($F2$), population ($F3$), and popularity ($F4$). There are three factors comprising proximity ($F1$), namely level of freedom ($F11$), level of capitalism ($F12$), and CPI ($F13$), or corruption perception index. This variable attempts to capture the similarity the receiving nation is to the dominant political and economic culture of the Western world, where most of the INGOs are located. There are two factors comprising popularity ($F4$), namely media attention and presence of disasters. This variable addressing the influx of aid a nation-state receives after a natural disaster occurs. The other variables, poverty and population, are intuitive. The factor tree demonstrating these variables is included in the Appendix.

2. The Linear Equations

AHP 18 19

Each expert has assigned a number to each factor as to its importance with respect to the overarching goal *G*. For the Analytic Hierarchy Process [4,5], the row average of the row of the matrix is determined in order to find the row averages. The row averages are then divided by the sum of the row averages, which yields the weights for each factors for the linear equation of the overarching goal, INGO aid allocation.

$$G^+ = 0.278F1 + 0.222F2 + 0.250F3 + 0.250F4$$

INGO Aid Allocation	<i>E1</i>	<i>E2</i>	<i>E3</i>	Row Average
<i>F1</i>	.2	.5	.3	.333
<i>F2</i>	.3	.1	.4	.267
<i>F3</i>	.5	.2	.2	.3
<i>F4</i>	.1	.5	.3	.3
Col Total	1.1	1.3	1.2	1.2

$$G^+ = 0.2500F11 + 0.3750F12 + 0.3750F13$$

Proximity	<i>E1</i>	<i>E2</i>	<i>E3</i>	Row Average
<i>F11</i>	.2	.3	.1	.2
<i>F12</i>	.2	.5	.2	.3
<i>F13</i>	.2	.3	.4	.3
Col Total	.6	1.1	.7	.8

$$G^+ = 0.6111F41 + 0.388942$$

Popularity	<i>E1</i>	<i>E2</i>	<i>E3</i>	Row Average
<i>F41</i>	.1	.5	.5	.367
<i>F42</i>	.1	.3	.3	.233
Col Total	.2	.8	.8	.6

Guiasu

Dividing each element of the matrix by the column sum normalizes the data described in the matrix for the AHP method, resulting in the Guiasu method [6]. The final step of this method is to calculate the row average for each row to find the weight of each of the factors for the linear equation of the overarching goal, INGO aid allocation.

$$G^+ = 0.272F1 + 0.228F2 + 0.258F3 + 0.242F4$$

INGO Aid	<i>E1</i>	<i>E2</i>	<i>E3</i>	Row Average
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Allocation				
<i>F1</i>	.182	.385	.25	.272
<i>F2</i>	.273	.077	.333	.228
<i>F3</i>	.455	.154	.167	.258
<i>F4</i>	.091	.385	.25	.242
Col Total	.1	.1	.1	.1

$$G^+ = 0.250F11 + 0.358F12 + 0.392F13$$

Proximity	<i>E1</i>	<i>E2</i>	<i>E3</i>	Row Average
<i>F11</i>	.333	.273	.143	.250
<i>F12</i>	.333	.454	.286	.358
<i>F13</i>	.333	.273	.571	.392
Col Total	.1	.1	.1	.1

$$G^+ = 0.583F41 + 0.417F42$$

Popularity	<i>E1</i>	<i>E2</i>	<i>E3</i>	Row Average
<i>F41</i>	.5	.625	.625	.583
<i>F42</i>	.5	.375	.375	.417
Col Total	.1	.1	.1	.1

Yen

For the Yen method [7], a normalized data matrix is needed. If it is not normalized, it is necessary to divide each element of the matrix by the largest value in the column. To yield the weight for each factor, each row average is divided the row average sum.

$$G^+ = 0.276F1 + 0.231F2 + 0.244F3 + 0.25F4$$

INGO Aid Allocation	<i>E1</i>	<i>E2</i>	<i>E3</i>	Row Average
<i>F1</i>	.4	1	.75	.717
<i>F2</i>	.6	.2	.1	.6
<i>F3</i>	1	.4	.5	.633
<i>F4</i>	.2	1	.75	.65
Col Total				2.6

$$G^+ = 0.266F11 + 0.360F12 + 0.374F13$$

Proximity	<i>E1</i>	<i>E2</i>	<i>E3</i>	Row Average
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<i>F11</i>	1	.6	.25	.617
<i>F12</i>	1	1	.5	.833
<i>F13</i>	1	.6	1	.867
Col Total				2.317

$$G^+ = 0.577F41 + 0.423F42$$

Popularity	<i>E1</i>	<i>E2</i>	<i>E3</i>	Row Average
<i>F41</i>	1	1	1	1
<i>F42</i>	1	.6	.6	.733
Col Total				1.733

The Dempster-Shaffer Method

For the DS Method, the values from the Guiasu matrix were used. The rows are multiplied to obtain the row product. To find the weights, the row products were added together and the each row product was divided by the total of the row products.

The procedure in the Dempster Shafer Method is based in the following theorem.

Theorem: Let X be a finite set.

Let m_1, \dots, m_n be basic probability assignments on X. Suppose $m_i(\{x\}) > 0$ for all $X \in X$ and $i=1, \dots, n$. Then, for all $\in X$.

$$m_{12 \dots n}(\{X\}) = \frac{m_1(\{x\}), \dots, m_n(\{x\})}{\sum_{x \in X(\{x\}), \dots, m_n(\{x\})}$$

The Set Value Statistical Method

In the SVSM, the values in the matrix are based on the ranking of factors given by the experts. The row averages are calculated and divided by the sum of the row averages. For full discussion of the SVS method, see [8].

3. The Influence Calculations

Influence calculations were used in a second model to demonstrate the effect a more determined expert could have on the others if able. In order to do this, each expert was assigned a series of weights, given the knowledge of each expert. The weights are as follows:

$$\begin{matrix} \mathbf{W1} = & 2/9 & \mathbf{W21} = & 1/3 & \mathbf{W31} = & 1/3 \\ \mathbf{W1} = & 1/3 & \mathbf{W22} = & 2/9 & \mathbf{W32} = & 1/3 \\ \mathbf{W1} = & 4/9 & \mathbf{W23} = & 4/9 & \mathbf{W33} = & 1/3 \end{matrix}$$

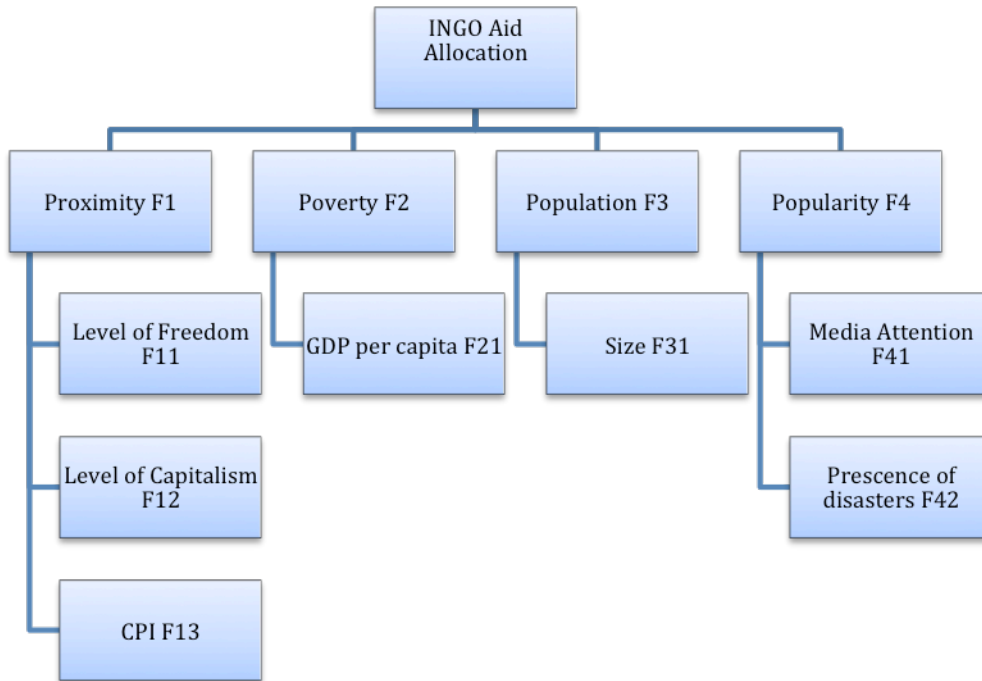
4. Conclusions

Over the last 50 years, INGO aid allocation has become a growing issue in the international community [1]. The first model attempts to capture what nation-states receive aid from international non-governmental organizations using three experts to weight the factors as to how they affect the overarching goal. The factors include proximity with the sub factors level of freedom, level of capitalism, and CPI, poverty, population, and popularity with the sub factors media attention and presence of disasters. In this model, the top three countries to receive aid were China, India, and the United States. The least likely nation states to receive INGO aid are Libya, Equatorial Guinea, and Qatar. The second model took into account the influence experts could have on each other if able by ranking them and weighting them as such. With influence, in this model, the nation states most likely to receive aid were China, India, and the United States as well. The bottom three nation states were the same as well. However, the top ten in both models were affected by the influence. See Appendix for complete listing of nation states' rankings with and without influence. Looking at the results, further research is needed to determine why the United States was in the top three receiving nation states and to control for that. In addition, the popularity variable should be reworked to better capture its intended purpose. In all, these models show the complicated nature of INGO aid allocation and the surrounding fields.

References

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A diagram showing the factors for the overarching goal, INGO aid allocation.



The following equations were used to compute the rankings for each country:

$$\begin{aligned}
 AHP_G^+ &= 0.0694F1 + 0.1042F2 + 0.1042F3 + 0.2222F4 + 0.2500F5 + 0.1528F6 + 0.0972F7 \\
 Guiasu_G^+ &= 0.0679F1 + 0.0974F2 + 0.1068F3 + 0.2277F4 + 0.2584F5 + 0.1411F6 + 0.1008F7 \\
 Yen_G^+ &= 0.0734F1 + 0.0992F2 + 0.1031F3 + 0.2308F4 + 0.2436F5 + 0.1442F6 + 0.1058F7 \\
 DS_G^+ &= 0.0468F1 + 0.1558F2 + 0.1870F3 + 0.1558F4 + 0.2597F5 + 0.1432F6 + 0.0516F7 \\
 SVSM_G^+ &= 0.0667F1 + 0.1037F2 + 0.0963F3 + 0.2667F4 + 0.2333F5 + 0.1426F6 + 0.0907F7
 \end{aligned}$$

where

- F1-Level of Freedom (Proximity)
- F2-Level of Capitalism (Proximity)
- F3-CPI (Proximity)
- F4- Poverty
- F5- Population
- F6-Media Attention (Popularity)
- F7-Presence of Disasters (Popularity)

G Rankings

Country	AHP	AHP	Guiasu	Guiasu	Yen	Yen	DS	DS	SVSM	SCSM
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	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Albania	0.3383	66	0.3389	66	0.345	66	0.3157	68	0.3769	65
Algeria	0.3056	112	0.3076	111	0.3117	112	0.2783	106	0.3452	112
Angola	0.2715	136	0.2738	135	0.2783	135	0.2275	137	0.3121	134
Argentina	0.3155	103	0.3172	103	0.3232	103	0.278	107	0.3517	105
Armenia	0.3223	90	0.3227	94	0.3281	93	0.2983	83	0.3628	89
Australia	0.4497	5	0.4499	5	0.4568	5	0.4887	5	0.4689	6
Austria	0.3827	26	0.3826	26	0.3876	27	0.4213	19	0.4056	31
Azerbaijan	0.2888	125	0.2902	126	0.2946	127	0.2599	123	0.3283	128
Bahrain	0.3057	111	0.305	115	0.3084	116	0.3294	60	0.3335	120
Bangladesh	0.3657	40	0.3695	38	0.3753	36	0.3091	73	0.4037	33
Belarus	0.273	134	0.2752	134	0.2794	134	0.238	132	0.3116	135
Belgium	0.3699	36	0.3699	35	0.375	37	0.399	24	0.3946	41
Benin	0.329	79	0.3306	79	0.3369	79	0.2891	93	0.3699	75
Bhutan	0.3514	53	0.3539	50	0.358	53	0.3495	45	0.3889	48
Bolivia	0.313	106	0.3151	106	0.3211	105	0.2708	112	0.353	102
Bosnia&Herzeg.	0.32	97	0.3216	95	0.3272	96	0.2896	92	0.3593	97
Botswana	0.3856	25	0.386	24	0.3921	24	0.3905	29	0.4194	24
Brazil	0.4058	16	0.4097	15	0.4157	15	0.3627	40	0.4379	13
Bulgaria	0.3384	65	0.3391	65	0.3454	65	0.3157	67	0.3748	69
Burkina-Faso	0.3194	98	0.3213	97	0.3259	99	0.2928	89	0.3609	94
Burundi	0.2874	127	0.2899	127	0.2952	126	0.2362	134	0.3305	126
Cambodia	0.3108	107	0.3124	107	0.3181	108	0.2682	114	0.3527	103
Cameroon	0.2938	122	0.2961	122	0.3007	122	0.2532	127	0.336	119
Canada	0.4204	11	0.4199	12	0.4248	12	0.4747	8	0.442	12
Cape Verde	0.3799	27	0.3812	27	0.3878	26	0.3657	39	0.4173	25
Ken. African Rep.	0.2729	135	0.2758	133	0.2795	133	0.2317	135	0.3164	133
Chad	0.263	142	0.2659	143	0.2695	143	0.2182	142	0.3066	140
Chile	0.4575	4	0.4545	4	0.4608	4	0.4812	6	0.4861	4
China	0.6465	1	0.6607	1	0.6549	1	0.5856	1	0.6627	1
Colombia	0.3511	55	0.3518	54	0.3577	55	0.3294	59	0.3881	50
Comoros	0.2797	131	0.2826	131	0.2873	131	0.2316	136	0.3226	130
Costa-Rica	0.3786	28	0.3793	28	0.3858	28	0.373	34	0.4133	26
Croatia	0.3325	77	0.3335	77	0.3394	76	0.315	69	0.367	80
Cuba	0.2629	143	0.2679	141	0.2711	142	0.2221	139	0.3014	142
Cyprus	0.3781	29	0.3784	29	0.3839	29	0.3934	27	0.4091	28
Czech Republic	0.3557	47	0.3552	49	0.3619	48	0.3515	44	0.3866	52
Denmark	0.4244	10	0.4241	10	0.4293	10	0.4785	7	0.4466	10
Djibouti	0.291	123	0.2938	123	0.2973	123	0.2635	117	0.3326	123

Country	AHP Score	AHP Rank	Guiasu Score	Guiasu Rank	Yen Score	Yen Rank	DS Score	DS Rank	SVSM Score	SCSM Rank
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Dominican-Republic	0.3288	80	0.3298	80	0.336	80	0.298	85	0.3673	78
Ecuador	0.3038	116	0.3058	114	0.3117	113	0.2601	122	0.3433	115
Egypt-Arab-Rep.	0.3208	94	0.3228	93	0.3262	97	0.2979	86	0.36	96
El-Salvador	0.3551	49	0.3553	48	0.3617	49	0.3366	55	0.3933	43
Equatorial-Guinea	0.2129	147	0.2143	147	0.2173	147	0.1867	147	0.2452	147
Eritrea	0.264	141	0.2683	140	0.2717	139	0.2169	143	0.3069	139
Estonia	0.393	21	0.393	22	0.3988	22	0.4113	22	0.4243	23
Ethiopia	0.3244	87	0.3267	87	0.3307	87	0.2869	95	0.3649	83
Finland	0.4202	12	0.4205	11	0.4256	11	0.4692	10	0.4439	11
France	0.3718	33	0.3728	33	0.3772	34	0.3922	28	0.3976	38
Gabon	0.2835	130	0.2851	130	0.2893	130	0.2574	124	0.3215	131
Georgia	0.3464	59	0.347	59	0.3522	59	0.3344	56	0.3858	56
Germany	0.4016	19	0.4022	19	0.4064	19	0.4387	18	0.4251	22
Ghana	0.3555	48	0.3572	47	0.3628	46	0.3338	57	0.3949	40
Greece	0.3207	95	0.3205	98	0.3272	95	0.3023	76	0.3515	106
Guatemala	0.3372	67	0.3384	67	0.3445	67	0.308	74	0.3766	66
Guinea	0.2855	128	0.2878	128	0.2922	128	0.2433	131	0.3285	127
Guinea-Bissau	0.2658	138	0.2691	138	0.2728	138	0.2207	140	0.3092	136
Guyana	0.3064	110	0.3085	110	0.3146	110	0.2628	119	0.346	109
Haiti	0.4491	6	0.4397	7	0.448	6	0.3956	26	0.4814	5
Honduras	0.3203	96	0.3215	96	0.3278	94	0.2807	103	0.361	93
Hong-Kong-SAR,-China	0.3871	24	0.3857	25	0.3891	25	0.4543	13	0.4087	29
Hungary	0.3532	50	0.3536	51	0.3596	50	0.3471	46	0.3864	53
Iceland	0.4307	8	0.4284	9	0.4346	9	0.4717	9	0.4516	9
India	0.6213	2	0.6326	2	0.6297	2	0.5626	2	0.6421	2
Indonesia	0.4278	9	0.4321	8	0.4387	8	0.3663	37	0.4611	8
Iran,-Islamic-Rep.	0.2651	139	0.2686	139	0.2711	141	0.2262	138	0.3044	141
Ireland	0.4052	17	0.4042	17	0.4097	18	0.4501	14	0.4287	18
Israel	0.3608	45	0.361	45	0.3664	44	0.3749	33	0.3893	47
Italy	0.3335	73	0.3337	75	0.3396	75	0.3202	65	0.3632	88
Jamaica	0.3483	58	0.3486	57	0.3556	56	0.3217	64	0.3862	55
Japan	0.4115	14	0.4123	13	0.4159	14	0.4492	16	0.4351	15
Jordan	0.3444	61	0.346	61	0.35	62	0.3415	50	0.3831	59
Kazakhstan	0.2993	119	0.3006	120	0.3048	119	0.2777	108	0.3376	118
Kenya	0.3163	101	0.3179	102	0.3233	102	0.2747	109	0.358	99

Country	AHP Score	AHP Rank	Guiasu Score	Guiasu Rank	Yen Score	Yen Rank	DS Score	DS Rank	SVSM Score	SCSM Rank
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Kyrgystan	0.3184	99	0.3188	100	0.3247	101	0.2792	105	0.36	95
Latvia	0.3521	52	0.3524	53	0.3587	52	0.34	51	0.3872	51
Lebanon	0.308	109	0.3087	109	0.3148	109	0.2747	110	0.3455	110
Lesotho	0.3245	86	0.3271	85	0.3329	86	0.2871	94	0.3649	82
Liberia	0.3131	105	0.3161	105	0.3213	104	0.2742	111	0.3544	101
Libya	0.243	146	0.2462	146	0.2495	146	0.2024	145	0.2823	146
Lithuania	0.3675	39	0.3676	39	0.3737	39	0.3662	38	0.4014	35
Luxembourg	0.3357	68	0.3337	74	0.3381	77	0.4013	23	0.3452	111
Madagascar	0.3227	89	0.324	90	0.329	90	0.2925	90	0.3645	85
Malawi	0.3346	70	0.3367	69	0.3424	69	0.3009	77	0.3752	68
Malaysia	0.3486	57	0.3495	56	0.3549	57	0.3392	52	0.3836	57
Mali	0.3257	85	0.3273	84	0.3337	84	0.2852	98	0.367	79
Malta	0.3649	41	0.365	41	0.3713	40	0.369	36	0.3951	39
Mauritania	0.2957	121	0.2979	121	0.3029	121	0.2545	125	0.3378	117
Mauritius	0.392	23	0.3916	23	0.3983	23	0.3962	25	0.4259	19
Mexico	0.3922	22	0.3939	21	0.4012	21	0.3544	43	0.4253	21
Moldova	0.3268	83	0.3285	83	0.3349	81	0.2867	96	0.3674	77
Mongolia	0.3325	76	0.3335	76	0.3402	73	0.2953	88	0.373	73
Montenegro	0.3402	63	0.3409	64	0.347	63	0.3197	66	0.3777	64
Morocco	0.3221	91	0.324	89	0.3283	92	0.2998	80	0.3619	92
Mozambique	0.3212	93	0.3231	92	0.3286	91	0.2841	101	0.3627	90
Namibia	0.3521	51	0.3533	52	0.3591	51	0.3368	54	0.3897	46
Nepal	0.3049	113	0.3071	112	0.3122	111	0.2618	120	0.347	108
New-Zealand	0.4422	7	0.4418	6	0.4472	7	0.4961	4	0.4672	7
Nicaragua	0.3231	88	0.3243	88	0.3306	88	0.284	102	0.3641	87
Niger	0.3017	117	0.3041	117	0.3086	115	0.2651	116	0.344	114
Nigeria	0.3622	43	0.3623	43	0.3662	45	0.3258	61	0.4001	36
Norway	0.3703	35	0.3697	37	0.3748	38	0.4198	20	0.3864	54
Oman	0.3738	32	0.3734	32	0.3808	32	0.3712	35	0.4035	34
Pakistan	0.34	64	0.3429	63	0.3464	64	0.3008	78	0.3796	63
Panama	0.3443	62	0.3446	62	0.3513	61	0.3225	63	0.3806	62
Papua-New-Guinea	0.3178	100	0.3192	99	0.3261	98	0.2683	113	0.359	98
Paraguay	0.3262	84	0.3269	86	0.3338	83	0.2853	97	0.3666	81
Peru	0.3512	54	0.3517	55	0.3578	54	0.3312	58	0.3887	49
Poland	0.3612	44	0.3623	44	0.3675	43	0.3599	41	0.3936	42
Portugal	0.369	37	0.3697	36	0.3755	35	0.3752	32	0.3994	37
Qatar	0.1684	148	0.1655	148	0.1648	148	0.2657	115	0.1613	148

Country	AHP Score	AHP Rank	Guiasu Score	Guiasu Rank	Yen Score	Yen Rank	DS Score	DS Rank	SVSM Score	SCSM Rank
Rwanda	0.3275	81	0.3297	81	0.3337	85	0.3112	71	0.3683	76

Saudi-Arabia	0.3001	118	0.3016	118	0.3037	120	0.3097	72	0.3334	121
Senegal	0.3217	92	0.3236	91	0.3293	89	0.285	99	0.3627	91
Serbia	0.3273	82	0.3287	82	0.3346	82	0.3	79	0.3646	84
Sierra-Leone	0.2985	120	0.3011	119	0.3064	118	0.2529	128	0.3407	116
Singapore	0.3677	38	0.3663	40	0.3688	41	0.4495	15	0.3833	58
Slovakia	0.3487	56	0.3484	58	0.3548	58	0.342	49	0.3813	61
Slovenia	0.3622	42	0.3628	42	0.3682	42	0.3762	31	0.3907	45
Solomon-Islands	0.275	132	0.2785	132	0.2821	132	0.2365	133	0.317	132
South-Africa	0.3704	34	0.3715	34	0.3777	33	0.3545	42	0.4057	30
Spain	0.3762	30	0.3764	30	0.3818	30	0.3903	30	0.404	32
Sri-Lanka	0.3349	69	0.3366	70	0.3428	68	0.2991	82	0.3741	71
Swaziland	0.3041	114	0.3061	113	0.3102	114	0.2803	104	0.3449	113
Sweden	0.4121	13	0.4122	14	0.4173	13	0.462	12	0.4338	16
Switzerland	0.4089	15	0.4079	16	0.4131	16	0.4629	11	0.43	17
Tajikistan	0.2842	129	0.2865	129	0.2907	129	0.2453	130	0.327	129
Tanzania	0.3339	72	0.3355	71	0.3413	71	0.2969	87	0.3747	70
Thailand	0.3743	31	0.3751	31	0.3815	31	0.3456	48	0.4101	27
Timor-Leste	0.3161	102	0.3183	101	0.3252	100	0.2633	118	0.3568	100
Togo	0.2887	126	0.2915	125	0.2961	125	0.2454	129	0.3312	124
Trinidad-and-Tobago	0.3309	78	0.3308	78	0.3373	78	0.3141	70	0.3644	86
Tunisia	0.3144	104	0.3166	104	0.3199	106	0.3063	75	0.3525	104
Turkey	0.3563	46	0.3577	46	0.3622	47	0.3466	47	0.3915	44
Turkmenistan	0.2461	144	0.2491	145	0.2527	144	0.1984	146	0.2881	144
Uganda	0.3344	71	0.3354	72	0.3411	72	0.2994	81	0.3756	67
Ukraine	0.3099	108	0.3123	108	0.3182	107	0.2612	121	0.3493	107
United-Arab-Emirates	0.3039	115	0.3048	116	0.3066	117	0.3384	53	0.3306	125
United-Kingdom	0.4014	20	0.4014	20	0.4059	20	0.4395	17	0.4257	20
United-States	0.4854	3	0.4883	3	0.4932	3	0.4982	3	0.4992	3
Uruguay	0.4031	18	0.4039	18	0.4097	17	0.4185	21	0.4355	14
Uzbekistan	0.2648	140	0.2676	142	0.2712	140	0.219	141	0.3078	137
Venezuela,-RB	0.2685	137	0.2715	137	0.2767	136	0.2141	144	0.3071	138
Vietnam	0.3329	74	0.3371	68	0.3418	70	0.2847	100	0.3717	74
Yemen,-Rep	0.2909	124	0.2931	124	0.2972	124	0.2541	126	0.3331	122
Zambia	0.3325	75	0.3341	73	0.34	74	0.2981	84	0.3733	72
Zimbabwe	0.2436	145	0.2492	144	0.2524	145	0.1831	148	0.2867	145

The G ranks are computed for a second model using scores calculated after influence.

G Rankings with Influence Calculations

<i>Country</i>	<i>AHP Score</i>	<i>AHP Rank</i>	<i>Guiasu Score</i>	<i>Guiasu Rank</i>	<i>Yen Score</i>	<i>Yen Rank</i>	<i>DS Score</i>	<i>DS Rank</i>	<i>SVSM Score</i>	<i>SVSM Score</i>
Albania	0.3571	65	0.357	65	0.3578	65	0.359	67	0.3848	64
Algeria	0.327	110	0.327	110	0.3277	110	0.3326	104	0.3544	110
Angola	0.2929	135	0.2929	135	0.2937	135	0.2892	140	0.315	136
Argentina	0.3326	106	0.3326	106	0.3334	106	0.3235	113	0.3529	112
Armenia	0.342	95	0.3419	95	0.3427	94	0.3454	88	0.3715	82
Australia	0.4627	6	0.4627	6	0.4625	6	0.4865	7	0.4912	6
Austria	0.3974	27	0.3975	27	0.3974	28	0.4313	22	0.4314	25
Azerbaijan	0.3094	127	0.3094	127	0.3101	127	0.313	125	0.336	126
Bahrain	0.3214	117	0.3213	118	0.3216	119	0.3499	78	0.3558	105
Bangladesh	0.3837	38	0.3837	38	0.3846	38	0.3586	68	0.3986	52
Belarus	0.2941	134	0.2942	134	0.2949	134	0.2961	136	0.3174	134
Belgium	0.3848	37	0.3848	37	0.3848	37	0.4129	27	0.4171	33
Benin	0.3492	77	0.3491	77	0.35	77	0.3432	93	0.3727	78
Bhutan	0.3759	47	0.3761	47	0.3762	47	0.4024	34	0.409	42
Bolivia	0.3335	105	0.3335	104	0.3343	104	0.3275	110	0.3553	108
Bosnia-and-Herzeg.	0.3405	96	0.3405	96	0.3412	96	0.342	94	0.3659	97
Botswana	0.4041	24	0.4041	24	0.4045	24	0.422	24	0.4366	23
Brazil	0.421	17	0.421	17	0.4218	17	0.3968	38	0.4347	24
Bulgaria	0.356	68	0.3559	68	0.3566	68	0.356	70	0.3815	68
Burkina-Faso	0.3421	93	0.3421	93	0.3428	92	0.3497	80	0.3712	83
Burundi	0.3097	126	0.3098	126	0.3106	126	0.3022	132	0.3314	129
Cambodia	0.3312	107	0.3311	107	0.332	107	0.3243	112	0.355	109
Cameroon	0.3161	122	0.3162	123	0.3169	122	0.3152	124	0.3409	123
Canada	0.4345	12	0.4345	12	0.4344	12	0.4756	11	0.4731	11
Cape-Verde	0.4001	26	0.4001	26	0.4006	26	0.4088	29	0.4288	27
Central-African-Rep.	0.2977	133	0.2978	133	0.2985	133	0.302	133	0.3233	133
Chad	0.2874	141	0.2875	141	0.2882	141	0.2891	141	0.312	140
Chile	0.4765	4	0.4764	4	0.4764	4	0.52	3	0.5086	3
China	0.6482	1	0.6489	1	0.6498	1	0.5741	1	0.6499	1
Colombia	0.3684	55	0.3683	55	0.3691	55	0.3681	60	0.3955	58
Comoros	0.3033	131	0.3034	131	0.3041	131	0.3007	134	0.3257	131
Costa-Rica	0.3969	28	0.3969	28	0.3974	27	0.4079	31	0.4264	28
Croatia	0.3502	76	0.3502	76	0.3508	76	0.3544	72	0.3756	75
Cuba	0.2886	138	0.2889	138	0.2892	139	0.2964	135	0.3085	142
Cyprus	0.396	29	0.396	29	0.3963	29	0.4201	25	0.4295	26

<i>Country</i>	<i>AHP Score</i>	<i>AHP Rank</i>	<i>Guiasu Score</i>	<i>Guiasu Rank</i>	<i>Yen Score</i>	<i>Yen Rank</i>	<i>DS Score</i>	<i>DS Rank</i>	<i>SVSM Score</i>	<i>SVSM Score</i>
Czech Republic	0.3697	52	0.3696	52	0.3702	52	0.3747	56	0.3968	56
Denmark	0.4398	10	0.4398	10	0.4396	10	0.483	8	0.4782	7

Djibouti	0.316	123	0.3162	122	0.3167	123	0.3292	107	0.3445	119
Dominican Republic	0.3473	78	0.3472	78	0.348	78	0.344	91	0.372	81
Ecuador	0.3235	115	0.3235	115	0.3243	115	0.3154	123	0.3443	120
Egypt, Arab Rep.	0.342	94	0.3421	94	0.3427	93	0.3504	77	0.3711	85
El Salvador	0.3732	49	0.3731	49	0.3739	49	0.376	54	0.4022	48
Equatorial Guinea	0.2303	147	0.2303	147	0.2309	147	0.2338	147	0.2512	147
Eritrea	0.2904	137	0.2907	137	0.2912	137	0.2948	137	0.3127	138
Estonia	0.4107	21	0.4107	21	0.4109	21	0.4356	21	0.4455	20
Ethiopia	0.3464	81	0.3465	81	0.3472	81	0.3489	82	0.371	86
Finland	0.4371	11	0.4372	11	0.4369	11	0.48	10	0.475	10
France	0.3873	34	0.3874	33	0.3875	34	0.4111	28	0.4182	32
Gabon	0.3042	130	0.3042	130	0.3048	130	0.3104	127	0.3301	130
Georgia	0.3671	57	0.367	57	0.3676	57	0.3793	51	0.3995	51
Germany	0.4163	19	0.4163	19	0.4163	19	0.4481	18	0.451	18
Ghana	0.3766	46	0.3766	46	0.3773	45	0.3832	48	0.4052	45
Greece	0.3337	104	0.3335	105	0.3343	105	0.3288	108	0.3556	107
Guatemala	0.3566	66	0.3566	66	0.3574	66	0.3556	71	0.3827	67
Guinea	0.3086	128	0.3087	128	0.3094	128	0.3085	130	0.3337	127
Guinea Bissau	0.2909	136	0.2911	136	0.2917	136	0.2938	138	0.3148	137
Guyana	0.3265	111	0.3266	111	0.3274	111	0.3193	117	0.3473	118
Haiti	0.4725	5	0.472	5	0.4723	5	0.5129	4	0.4756	9
Honduras	0.3396	97	0.3396	97	0.3405	97	0.3324	105	0.3633	99
Hong Kong SAR, China	0.402	25	0.4019	25	0.4017	25	0.454	16	0.4455	21
Hungary	0.3701	51	0.37	51	0.3706	51	0.3791	52	0.3984	53
Iceland	0.4455	8	0.4454	8	0.4452	8	0.4878	6	0.4768	8
India	0.6219	2	0.6224	2	0.6237	2	0.5502	2	0.6293	2
Indonesia	0.4429	9	0.443	9	0.4438	9	0.4061	32	0.4506	19
Iran	0.2873	142	0.2875	142	0.2881	142	0.2893	139	0.3106	141
Ireland	0.4192	18	0.4191	18	0.4191	18	0.4546	15	0.4562	16
Israel	0.377	45	0.3769	45	0.3772	46	0.3981	36	0.4077	44
Italy	0.3462	83	0.3461	84	0.3468	84	0.3438	92	0.3694	92
Jamaica	0.3656	59	0.3655	59	0.3664	59	0.362	64	0.3913	60
Japan	0.4257	14	0.4258	14	0.4258	14	0.4569	14	0.4615	13
Jordan	0.3674	56	0.3675	56	0.3679	56	0.3903	43	0.402	49
Kazakhstan	0.3196	120	0.3196	120	0.3203	120	0.3273	111	0.3478	117
Kenya	0.3363	102	0.3363	102	0.3372	101	0.3295	106	0.3608	100
Kuwait	0.2872	143	0.2871	143	0.2873	143	0.3092	129	0.3161	135
Kyrgystan	0.3388	98	0.3387	98	0.3396	98	0.3368	101	0.3634	98
	<i>AHP</i>	<i>AHP</i>	<i>Guiasu</i>	<i>Guiasu</i>	<i>Yen</i>	<i>Yen</i>	<i>DS</i>	<i>DS</i>	<i>SVSM</i>	<i>SVSM</i>
<i>Country</i>	<i>Score</i>	<i>Rank</i>	<i>Score</i>	<i>Rank</i>	<i>Score</i>	<i>Rank</i>	<i>Score</i>	<i>Rank</i>	<i>Score</i>	<i>Score</i>
Latvia	0.3696	53	0.3695	53	0.3701	53	0.3758	55	0.3976	54
Lebanon	0.3253	113	0.3252	113	0.3261	113	0.3193	118	0.3484	115

Lesotho	0.3467	80	0.3468	80	0.3474	80	0.3465	84	0.3701	88
Liberia	0.3364	101	0.3366	101	0.3372	102	0.3379	100	0.3601	101
Libya	0.2662	146	0.2664	146	0.2669	146	0.2697	145	0.288	146
Lithuania	0.3849	36	0.3848	36	0.3853	36	0.3973	37	0.4155	35
Luxembourg	0.3424	91	0.3423	92	0.342	95	0.3815	50	0.3736	76
Madagascar	0.3438	88	0.3438	88	0.3446	87	0.3461	86	0.3724	80
Malawi	0.356	67	0.3561	67	0.3568	67	0.3563	69	0.3813	69
Malaysia	0.3669	58	0.3668	58	0.3674	58	0.3764	53	0.3959	57
Mali	0.3461	84	0.3461	83	0.347	82	0.3402	98	0.3698	91
Malta	0.3806	42	0.3806	42	0.381	41	0.3939	39	0.4094	41
Mauritania	0.318	121	0.318	121	0.3188	121	0.3166	120	0.3423	122
Mauritius	0.4089	22	0.4087	22	0.4093	22	0.4227	23	0.4415	22
Mexico	0.4062	23	0.4061	23	0.4069	23	0.3835	47	0.4225	30
Moldova	0.347	79	0.347	79	0.3479	79	0.3412	96	0.3701	89
Mongolia	0.3516	75	0.3515	75	0.3524	74	0.345	89	0.3758	74
Montenegro	0.3589	63	0.3589	63	0.3596	63	0.3625	63	0.3862	63
Morocco	0.344	87	0.344	86	0.3446	88	0.3531	73	0.3731	77
Mozambique	0.3424	92	0.3424	91	0.3432	91	0.3404	97	0.3678	93
Namibia	0.3724	50	0.3724	50	0.373	50	0.382	49	0.4015	50
Nepal	0.3264	112	0.3264	112	0.3272	112	0.3218	115	0.3503	114
New Zealand	0.4591	7	0.4591	7	0.4589	7	0.5039	5	0.5002	5
Nicaragua	0.3428	90	0.3427	90	0.3436	90	0.3366	102	0.3669	96
Niger	0.3248	114	0.3249	114	0.3256	114	0.3277	109	0.351	113
Nigeria	0.3822	39	0.3822	39	0.3829	39	0.3892	44	0.4047	46
Norway	0.3813	40	0.3813	40	0.3811	40	0.4163	26	0.4125	39
Oman	0.3874	33	0.3872	34	0.3878	33	0.3919	41	0.4134	38
Pakistan	0.3584	64	0.3584	64	0.3594	64	0.3493	81	0.3833	66
Panama	0.3613	62	0.3612	62	0.362	62	0.3606	65	0.3872	62
Papua New Guinea	0.3368	100	0.3368	100	0.3378	100	0.3229	114	0.3574	103
Paraguay	0.3441	86	0.344	87	0.345	86	0.3331	103	0.3673	95
Peru	0.3688	54	0.3687	54	0.3695	54	0.3699	57	0.3968	55
Poland	0.3789	44	0.3789	44	0.3793	43	0.3925	40	0.4082	43
Portugal	0.3861	35	0.3861	35	0.3864	35	0.4031	33	0.4156	34
Qatar	0.1686	148	0.1686	148	0.1677	148	0.2249	148	0.1965	148
Romania	0.3631	61	0.3631	61	0.3638	61	0.3649	62	0.39	61
Rwanda	0.3517	74	0.3518	74	0.3522	75	0.3688	59	0.3835	65
Saudi-Arabia	0.3213	118	0.3215	117	0.3216	118	0.3514	75	0.3557	106
Senegal	0.3429	89	0.3429	89	0.3437	89	0.3412	95	0.3677	94
Serbia	0.3463	82	0.3463	82	0.3469	83	0.3464	85	0.3708	87
	<i>AHP</i>	<i>AHP</i>	<i>Guiasu</i>	<i>Guiasu</i>	<i>Yen</i>	<i>Yen</i>	<i>DS</i>	<i>DS</i>	<i>SVSM</i>	<i>SVSM</i>
<i>Country</i>	<i>Score</i>	<i>Rank</i>	<i>Score</i>	<i>Rank</i>	<i>Score</i>	<i>Rank</i>	<i>Score</i>	<i>Rank</i>	<i>Score</i>	<i>Score</i>
Sierra Leone	0.321	119	0.3211	119	0.3218	117	0.317	119	0.3436	121

Singapore	0.3809	41	0.3809	41	0.3804	42	0.441	20	0.4238	29
Slovakia	0.364	60	0.3638	60	0.3645	60	0.3697	58	0.3918	59
Slovenia	0.3791	43	0.3792	43	0.3793	44	0.4016	35	0.4096	40
Solomon Islands	0.3003	132	0.3005	132	0.301	132	0.3077	131	0.3251	132
South Africa	0.3878	32	0.3878	32	0.3884	32	0.3907	42	0.4149	36
Spain	0.3909	31	0.3908	31	0.3911	31	0.4083	30	0.4214	31
Sri Lanka	0.3544	70	0.3544	70	0.3552	70	0.3498	79	0.3777	73
Swaziland	0.3274	109	0.3275	109	0.328	109	0.3389	99	0.3567	104
Sweden	0.4276	13	0.4277	13	0.4274	13	0.469	12	0.4639	12
Switzerland	0.4225	16	0.4224	16	0.4223	16	0.4627	13	0.4602	14
Tajikistan	0.3075	129	0.3075	129	0.3083	129	0.3097	128	0.3334	128
Tanzania	0.3537	72	0.3537	72	0.3545	72	0.3485	83	0.3787	71
Thailand	0.3916	30	0.3915	30	0.3922	30	0.3875	45	0.414	37
Timor-Leste	0.3359	103	0.3359	103	0.3368	103	0.3216	116	0.3543	111
Togo	0.3123	125	0.3124	125	0.3131	125	0.3124	126	0.3361	125
Trinidad & Tobago	0.3461	85	0.3459	85	0.3467	85	0.3458	87	0.3711	84
Tunisia	0.3379	99	0.338	99	0.3383	99	0.3597	66	0.37	90
Turkey	0.3747	48	0.3748	48	0.3753	48	0.3845	46	0.4045	47
Turkmenistan	0.2697	145	0.2699	145	0.2705	145	0.2691	146	0.2917	144
Uganda	0.3543	71	0.3542	71	0.3551	71	0.3516	74	0.3803	70
Ukraine	0.329	108	0.3291	108	0.3299	108	0.3164	121	0.3482	116
United Arab Emirates	0.3233	116	0.3235	116	0.3232	116	0.3665	61	0.3599	102
United Kingdom	0.4158	20	0.4158	20	0.4158	20	0.4474	19	0.4517	17
United States	0.492	3	0.492	3	0.4921	3	0.4827	9	0.508	4
Uruguay	0.4225	15	0.4225	15	0.4227	15	0.4482	17	0.457	15
Uzbekistan	0.2883	140	0.2884	140	0.2891	140	0.2877	142	0.3123	139
Venezuela RB	0.2885	139	0.2886	139	0.2894	138	0.2759	143	0.3046	143
Vietnam	0.355	69	0.3552	69	0.3557	69	0.3442	90	0.3726	79
Yemen Rep.	0.3136	124	0.3137	124	0.3144	124	0.316	122	0.34	124
Zambia	0.3531	73	0.3531	73	0.3539	73	0.3512	76	0.3786	72
Zimbabwe	0.2711	144	0.2715	144	0.2719	144	0.2702	144	0.2885	145