

Appendix

I. World Openness Index, 129 Economies, 2008–2022*

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Singapore	0.8875	0.8875	0.8852	0.8864	0.8757	0.8613	0.8576	0.8651	0.8699	0.8704	0.8651	0.8640	0.8586	0.8523	0.8598
Germany	0.8530	0.8617	0.8478	0.8494	0.8478	0.8362	0.8332	0.8315	0.8340	0.8321	0.8271	0.8305	0.8255	0.8210	0.8262
Hong Kong, China	0.8475	0.8524	0.8446	0.8572	0.8646	0.8533	0.8520	0.8551	0.8636	0.8630	0.8554	0.8519	0.8449	0.8258	0.8255
Ireland	0.8393	0.8545	0.8427	0.8410	0.8249	0.8272	0.8269	0.8234	0.8175	0.8043	0.7976	0.7961	0.7875	0.7835	0.7811
Malta	0.8158	0.8142	0.8059	0.8039	0.8020	0.7884	0.7788	0.7747	0.7887	0.7775	0.7800	0.7855	0.7989	0.7965	0.7944
Netherlands	0.8093	0.8065	0.7979	0.8070	0.7911	0.7993	0.7988	0.8097	0.7965	0.8037	0.7919	0.7984	0.7820	0.7858	0.7898
Australia	0.8091	0.8090	0.8082	0.8107	0.8073	0.7962	0.7921	0.7834	0.7726	0.7634	0.7557	0.7540	0.7500	0.7466	0.7440
Switzerland	0.8090	0.8072	0.8061	0.8067	0.8095	0.8043	0.8093	0.8070	0.8046	0.8027	0.8049	0.7961	0.7913	0.7858	0.7785
Cyprus	0.8049	0.8031	0.7851	0.7845	0.7826	0.7576	0.7459	0.7448	0.7430	0.7094	0.7275	0.7620	0.7570	0.7601	0.7567
United Kingdom	0.8033	0.8056	0.8075	0.8186	0.8073	0.8185	0.8055	0.8077	0.8071	0.8105	0.8131	0.8092	0.8090	0.8052	0.8063
Belgium	0.8012	0.7983	0.7856	0.7867	0.7829	0.7768	0.7760	0.7731	0.7773	0.7778	0.7725	0.7772	0.7670	0.7621	0.7691
Canada	0.7980	0.8102	0.8083	0.8036	0.8005	0.7940	0.7866	0.7876	0.7908	0.7865	0.7844	0.7839	0.7785	0.7752	0.7908
France	0.7928	0.7932	0.7861	0.7943	0.7952	0.7873	0.7840	0.7816	0.7845	0.7837	0.7837	0.7828	0.7797	0.7800	0.7869
Korea, Rep. of	0.7894	0.8025	0.7980	0.8036	0.8046	0.7954	0.7919	0.7664	0.7627	0.7555	0.7548	0.7395	0.7166	0.7024	0.7001
Austria	0.7788	0.7786	0.7680	0.7718	0.7675	0.7627	0.7582	0.7569	0.7595	0.7591	0.7546	0.7594	0.7502	0.7481	0.7504
New Zealand	0.7769	0.7813	0.7790	0.7787	0.7782	0.7665	0.7664	0.7672	0.7627	0.7587	0.7571	0.7569	0.7486	0.7481	0.7466
Luxembourg	0.7766	0.8279	0.7964	0.7789	0.7535	0.7865	0.7590	0.7966	0.7869	0.7780	0.7764	0.7428	0.7400	0.7551	0.7116
Sweden	0.7762	0.7745	0.7664	0.7680	0.7638	0.7578	0.7550	0.7542	0.7575	0.7544	0.7523	0.7576	0.7502	0.7489	0.7480
Greece	0.7761	0.7739	0.7604	0.7609	0.7272	0.7160	0.7112	0.7093	0.7371	0.7346	0.7333	0.7335	0.7245	0.7241	0.7264
Denmark	0.7755	0.7748	0.7661	0.7683	0.7655	0.7583	0.7563	0.7546	0.7562	0.7550	0.7515	0.7520	0.7442	0.7420	0.7434
Japan	0.7754	0.7834	0.7845	0.7993	0.7896	0.7813	0.7827	0.7858	0.7845	0.7804	0.7860	0.7927	0.7940	0.7885	0.7998
Italy	0.7753	0.7770	0.7687	0.7757	0.7750	0.7700	0.7655	0.7658	0.7680	0.7664	0.7624	0.7664	0.7630	0.7594	0.7575

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* Due to space limitations, the numbers of the openness index in this table are rounded to only four decimal places.

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
US	0.7745	0.7747	0.7673	0.7704	0.7694	0.7950	0.8032	0.8649	0.8956	0.9130	0.9332	0.9410	0.9579	0.9566	0.9649
Hungary	0.7744	0.7741	0.7725	0.7729	0.7635	0.7581	0.7591	0.7550	0.7563	0.7519	0.7490	0.7505	0.7400	0.7356	0.7433
Lithuania	0.7732	0.7692	0.7600	0.7661	0.7552	0.7460	0.7359	0.7219	0.7189	0.7153	0.7126	0.7197	0.7124	0.7133	0.7228
Estonia	0.7729	0.7730	0.7633	0.7629	0.7631	0.7545	0.7506	0.7511	0.7515	0.7577	0.7512	0.7504	0.7375	0.7318	0.7322
Spain	0.7714	0.7710	0.7622	0.7668	0.7643	0.7595	0.7543	0.7540	0.7551	0.7522	0.7477	0.7515	0.7453	0.7430	0.7462
Latvia	0.7707	0.7681	0.7586	0.7613	0.7594	0.7499	0.7489	0.7434	0.7435	0.7401	0.7390	0.7405	0.7285	0.7202	0.7219
Costa Rica	0.7692	0.7690	0.7636	0.7619	0.7614	0.7530	0.7515	0.7466	0.7179	0.7439	0.7306	0.7307	0.6959	0.6944	0.6963
Czech Rep.	0.7655	0.7648	0.7622	0.7649	0.7620	0.7561	0.7535	0.7537	0.7538	0.7475	0.7465	0.7464	0.7375	0.7359	0.7335
Macao, China	0.7651	0.7600	0.7500	0.7681	0.7634	0.7524	0.7436	0.7439	0.7423	0.7342	0.7236	0.7369	0.7295	0.7290	0.7291
Finland	0.7614	0.7599	0.7511	0.7532	0.7503	0.7446	0.7426	0.7405	0.7431	0.7433	0.7406	0.7410	0.7347	0.7318	0.7343
Norway	0.7608	0.7579	0.7567	0.7610	0.7605	0.7556	0.7537	0.7532	0.7530	0.7535	0.7537	0.7562	0.7508	0.7577	0.7655
Portugal	0.7607	0.7616	0.7576	0.7566	0.7485	0.7414	0.7379	0.7363	0.7380	0.7366	0.7329	0.7368	0.7289	0.7276	0.7296
Mexico	0.7601	0.7666	0.7675	0.7664	0.7678	0.7568	0.7535	0.7498	0.7504	0.7473	0.7450	0.7460	0.7427	0.7439	0.7449
Nicaragua	0.7581	0.7563	0.7511	0.7501	0.7498	0.7436	0.7429	0.7423	0.7448	0.7452	0.7320	0.7323	0.7276	0.7230	0.7232
Israel	0.7540	0.7716	0.7693	0.7710	0.7717	0.7655	0.7639	0.7634	0.7656	0.7641	0.7628	0.7628	0.7584	0.7550	0.7543
Romania	0.7534	0.7531	0.7438	0.7521	0.7472	0.7399	0.7370	0.7341	0.7342	0.7298	0.7267	0.7287	0.7228	0.7164	0.7152
China	0.7517	0.7560	0.7511	0.7526	0.7459	0.7413	0.7358	0.7337	0.7323	0.7214	0.7105	0.7019	0.6923	0.6777	0.6789
Peru	0.7517	0.7594	0.7580	0.7587	0.7607	0.7466	0.7265	0.7254	0.7254	0.7245	0.7184	0.7174	0.7102	0.7062	0.6943
Bahrain	0.7515	0.7560	0.7577	0.7545	0.7534	0.7464	0.7488	0.7498	0.7518	0.7527	0.7474	0.7363	0.7378	0.7292	0.7251
Panama	0.7498	0.7511	0.7491	0.7503	0.7469	0.7450	0.7419	0.7470	0.7487	0.7476	0.7406	0.7383	0.7296	0.7250	0.7297
Chile	0.7488	0.7556	0.7537	0.7544	0.7538	0.7384	0.7341	0.7358	0.7334	0.7287	0.7292	0.7365	0.7333	0.7412	0.7511
Slovak Rep.	0.7476	0.7443	0.7349	0.7465	0.7413	0.7354	0.7323	0.7300	0.7291	0.7276	0.7254	0.7255	0.7166	0.7132	0.7100
Uruguay	0.7462	0.7446	0.7442	0.7450	0.7449	0.7369	0.7345	0.7348	0.7347	0.7339	0.7323	0.7303	0.7260	0.7264	0.7281
Guatemala	0.7440	0.7449	0.7399	0.7387	0.7415	0.7334	0.7322	0.7315	0.7328	0.7335	0.7194	0.7205	0.7174	0.7151	0.7160
Poland	0.7431	0.7425	0.7330	0.7350	0.7326	0.7251	0.7215	0.7190	0.6924	0.6923	0.6894	0.6910	0.6850	0.6802	0.6829
Georgia	0.7420	0.7478	0.7454	0.7454	0.7434	0.7180	0.7144	0.7113	0.7114	0.7031	0.6856	0.6300	0.6235	0.6486	0.6675
Iceland	0.7403	0.7383	0.7349	0.7382	0.7313	0.7238	0.6940	0.6658	0.6699	0.6662	0.6613	0.6653	0.6550	0.6534	0.6548
Slovenia	0.7388	0.7358	0.7255	0.7294	0.7246	0.7170	0.7128	0.7107	0.7091	0.7067	0.7050	0.7128	0.7100	0.7123	0.7216
Malaysia	0.7376	0.7363	0.7331	0.7340	0.7366	0.7220	0.7217	0.7224	0.7251	0.6961	0.6937	0.6962	0.6923	0.7137	0.7441
Trinidad and Tobago	0.7355	0.7361	0.7341	0.7342	0.7352	0.7295	0.7452	0.7426	0.7319	0.7322	0.7315	0.7302	0.7246	0.7231	0.7141
Cambodia	0.7348	0.7366	0.7282	0.7298	0.7256	0.7181	0.7186	0.7190	0.6920	0.6884	0.6832	0.6802	0.6764	0.6686	0.6664
Croatia	0.7335	0.7332	0.7207	0.7269	0.7235	0.7139	0.7093	0.7060	0.7046	0.6982	0.6939	0.6942	0.6896	0.6915	0.6943
Mauritius	0.7332	0.7305	0.7171	0.7215	0.7055	0.7138	0.7085	0.7106	0.7091	0.7063	0.7131	0.7277	0.7247	0.7166	0.7142
Jordan	0.7287	0.7286	0.7250	0.7286	0.7277	0.7261	0.7304	0.7293	0.7346	0.7328	0.7321	0.7306	0.7303	0.7315	0.7359
Bulgaria	0.7230	0.7211	0.7121	0.7209	0.7248	0.7429	0.7379	0.7368	0.7384	0.7343	0.7313	0.7322	0.7244	0.7211	0.7257
El Salvador	0.7195	0.7195	0.7156	0.7179	0.7181	0.7098	0.7075	0.7064	0.7074	0.7081	0.7009	0.7058	0.7076	0.7121	0.7202
Oman	0.7189	0.7225	0.7278	0.7346	0.7349	0.7327	0.7317	0.7322	0.7282	0.7278	0.7179	0.7170	0.7182	0.7190	0.7037
Antigua and Barbuda	0.7182	0.7206	0.7128	0.7248	0.7264	0.7234	0.7228	0.7205	0.7267	0.7134	0.7078	0.7097	0.7075	0.6979	0.6889
Kuwait	0.7080	0.7089	0.7119	0.7109	0.7126	0.7065	0.7023	0.7004	0.6962	0.6910	0.6826	0.6830	0.6848	0.6829	0.6776
Botswana	0.7057	0.7078	0.7094	0.7090	0.7082	0.7039	0.7137	0.7052	0.7038	0.6917	0.7039	0.7083	0.7084	0.7063	0.7038
Colombia	0.6921	0.6938	0.6913	0.6899	0.6902	0.6786	0.6689	0.6541	0.6540	0.6516	0.6433	0.6299	0.6255	0.6235	0.6510
Vietnam	0.6905	0.6948	0.6902	0.6830	0.6790	0.6696	0.6664	0.6634	0.6597	0.6573	0.6545	0.6536	0.6507	0.6491	0.6534

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	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Zambia	0.6860	0.6869	0.6886	0.6982	0.6892	0.6816	0.6849	0.6838	0.6905	0.6903	0.6925	0.6917	0.6867	0.6787	0.6750
Gambia, The	0.6857	0.6871	0.6884	0.6885	0.6900	0.6879	0.6843	0.6888	0.6937	0.6892	0.6912	0.6899	0.6881	0.6872	0.6851
Mongolia	0.6826	0.6797	0.6833	0.6853	0.6839	0.6774	0.6770	0.6748	0.6769	0.6802	0.6811	0.6712	0.6587	0.6545	0.6654
Armenia	0.6815	0.6792	0.6746	0.6770	0.6758	0.6670	0.6638	0.6775	0.6802	0.6812	0.6792	0.6823	0.6802	0.6797	0.6762
Guyana	0.6805	0.6955	0.6928	0.7148	0.7060	0.6948	0.7226	0.7204	0.7257	0.7260	0.7220	0.7210	0.7170	0.7113	0.7119
Paraguay	0.6797	0.6783	0.6772	0.6798	0.6775	0.6703	0.6668	0.6660	0.6674	0.6685	0.6664	0.6741	0.6767	0.6787	0.6842
Ecuador	0.6788	0.6841	0.6809	0.6802	0.6903	0.6863	0.6760	0.6786	0.6553	0.6555	0.6559	0.6622	0.6904	0.6929	0.6993
North Macedonia	0.6766	0.6733	0.6695	0.6722	0.6722	0.6691	0.6670	0.6680	0.6675	0.6631	0.6672	0.6681	0.6635	0.6678	0.6709
Argentina	0.6764	0.6790	0.6757	0.6817	0.7355	0.7220	0.6561	0.6406	0.6422	0.6407	0.6365	0.6635	0.6595	0.6571	0.6559
Saudi Arabia	0.6758	0.6839	0.6856	0.6895	0.6909	0.6887	0.6872	0.6893	0.6768	0.6829	0.6800	0.6800	0.6803	0.6755	0.6771
Russia	0.6688	0.6729	0.6705	0.6827	0.6930	0.6937	0.6946	0.7063	0.7139	0.7143	0.7050	0.7103	0.6969	0.6821	0.6853
Thailand	0.6680	0.6824	0.6793	0.6825	0.6583	0.6546	0.6531	0.6528	0.6536	0.6505	0.6517	0.6478	0.6326	0.6373	0.6668
Honduras	0.6680	0.6673	0.6643	0.6667	0.6693	0.6611	0.6584	0.6593	0.6588	0.6567	0.6427	0.6434	0.6385	0.6625	0.6982
Indonesia	0.6653	0.6648	0.6632	0.6619	0.6664	0.6549	0.6573	0.6572	0.6596	0.6586	0.6577	0.6557	0.6788	0.6767	0.6796
Philippines	0.6651	0.6672	0.6675	0.6693	0.6692	0.6669	0.6637	0.6637	0.6640	0.6333	0.6352	0.6334	0.6310	0.6545	0.6576
Dominican Rep.	0.6647	0.6912	0.6865	0.6857	0.6870	0.6760	0.6685	0.6724	0.6804	0.6812	0.6859	0.6923	0.6945	0.6841	0.6823
Lebanon	0.6617	0.6630	0.6489	0.6515	0.6534	0.6493	0.6506	0.6501	0.6829	0.6836	0.6798	0.6834	0.6820	0.6833	0.6869
Barbados	0.6590	0.6613	0.6664	0.6645	0.6671	0.6649	0.6700	0.6655	0.6658	0.6645	0.6614	0.6613	0.6551	0.6473	0.6352
Ukraine	0.6570	0.6518	0.6461	0.6453	0.6507	0.6299	0.6285	0.6284	0.6266	0.6182	0.6192	0.6159	0.6112	0.6060	0.6227
India	0.6563	0.6546	0.6555	0.6608	0.6636	0.6553	0.6542	0.6538	0.6549	0.6561	0.6542	0.6551	0.6457	0.6374	0.6373
Morocco	0.6518	0.6460	0.6443	0.6458	0.6457	0.6438	0.6410	0.6376	0.6357	0.6339	0.6367	0.6320	0.6308	0.6325	0.6317
Uganda	0.6511	0.6712	0.6762	0.6706	0.6716	0.6706	0.6721	0.6715	0.6762	0.6740	0.6740	0.6725	0.6697	0.6656	0.6703
Kyrgyz Rep.	0.6507	0.6545	0.6465	0.6467	0.6500	0.6462	0.6472	0.6203	0.6266	0.6264	0.6340	0.6766	0.6760	0.6742	0.6788
Cabo Verde	0.6498	0.6488	0.6577	0.6413	0.6343	0.6014	0.5682	0.5678	0.5705	0.5689	0.5706	0.5725	0.5697	0.5683	0.5693
Fiji	0.6466	0.6451	0.6383	0.6316	0.6365	0.6301	0.6325	0.6340	0.6333	0.6306	0.6281	0.6232	0.6264	0.6233	0.6290
Bolivia	0.6449	0.6426	0.6409	0.6439	0.6448	0.6428	0.6458	0.6471	0.6518	0.6511	0.6543	0.6531	0.6540	0.6603	0.6682
Moldova	0.6440	0.6410	0.6378	0.6402	0.6418	0.6354	0.6368	0.6361	0.6373	0.6096	0.6090	0.6053	0.6030	0.6046	0.6139
Turkiye	0.6433	0.6408	0.6396	0.6411	0.6414	0.6640	0.6608	0.6621	0.6618	0.6601	0.6572	0.6559	0.6530	0.6494	0.6482
South Africa	0.6414	0.6422	0.6408	0.6412	0.6437	0.6415	0.6410	0.6335	0.6357	0.6349	0.6333	0.6330	0.6289	0.6286	0.6332
Samoa	0.6412	0.6397	0.6327	0.6283	0.6310	0.6252	0.6269	0.6255	0.6238	0.6220	0.6206	0.6225	0.6201	0.6146	0.6145
Egypt	0.6404	0.6409	0.6366	0.6384	0.6426	0.6423	0.6146	0.6157	0.6175	0.6168	0.6510	0.6827	0.6886	0.6968	0.7086
Lesotho	0.6401	0.6425	0.6409	0.6378	0.6299	0.6298	0.6279	0.6168	0.6184	0.6204	0.6157	0.6127	0.6170	0.6203	0.6168
Papua New Guinea	0.6363	0.6410	0.6379	0.6299	0.6313	0.6441	0.6434	0.6739	0.6758	0.7018	0.6764	0.6751	0.6707	0.6616	0.6535
Jamaica	0.6363	0.6352	0.6320	0.6592	0.6547	0.6553	0.6802	0.6840	0.6852	0.6847	0.6826	0.6862	0.6908	0.6958	0.7023
Belize	0.6359	0.6350	0.6317	0.6398	0.6410	0.6374	0.6378	0.6376	0.6396	0.6361	0.6325	0.6318	0.6276	0.6273	0.6256
Kenya	0.6330	0.6426	0.6387	0.6397	0.6419	0.6434	0.6416	0.6445	0.6486	0.6508	0.6510	0.6529	0.6551	0.6547	0.6530
Albania	0.6312	0.6304	0.6290	0.6619	0.6617	0.6589	0.6551	0.6542	0.6534	0.6534	0.6622	0.6658	0.6533	0.6260	0.6192
Bosnia and Herzegovina	0.6307	0.6289	0.6279	0.6251	0.6338	0.6268	0.6246	0.6291	0.6331	0.6556	0.6630	0.6773	0.6580	0.6549	0.6777
Brazil	0.6303	0.6314	0.6392	0.6511	0.6536	0.6493	0.6493	0.6494	0.6764	0.6759	0.6751	0.6761	0.6741	0.6746	0.6758
Mozambique	0.6297	0.6237	0.6217	0.6262	0.6227	0.6245	0.6276	0.6178	0.6242	0.6229	0.6205	0.6098	0.6070	0.6052	0.6054
Tunisia	0.6294	0.6293	0.6258	0.6294	0.6291	0.6285	0.6247	0.6300	0.6340	0.6350	0.6280	0.6281	0.6286	0.6228	0.6284

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	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Namibia	0.6289	0.6273	0.6247	0.6247	0.6205	0.6232	0.6225	0.6175	0.6180	0.6142	0.6123	0.6102	0.6117	0.6121	0.6091
Laos	0.6289	0.6267	0.6260	0.6291	0.6294	0.6255	0.6248	0.6254	0.6255	0.6208	0.6202	0.6135	0.6095	0.6038	0.6018
Azerbaijan	0.6275	0.6279	0.6318	0.6278	0.6271	0.6292	0.6313	0.6257	0.6227	0.6212	0.6213	0.6144	0.6042	0.5973	0.6181
Zimbabwe	0.6245	0.6220	0.6235	0.6229	0.6218	0.6246	0.6230	0.6322	0.6093	0.6037	0.6293	0.6407	0.6309	0.6002	0.5975
Belarus	0.6207	0.6223	0.6161	0.6201	0.6207	0.6160	0.6128	0.5943	0.5922	0.6079	0.6129	0.6120	0.6063	0.6020	0.6043
Kazakhstan	0.6195	0.6183	0.6195	0.6215	0.6155	0.6114	0.6114	0.6085	0.6087	0.6070	0.6072	0.6262	0.6214	0.6202	0.6197
Sudan	0.6190	0.6216	0.6245	0.6210	0.6219	0.6125	0.5865	0.5866	0.5890	0.5835	0.5752	0.5667	0.5594	0.5513	0.5667
Bangladesh	0.6146	0.6148	0.6152	0.6158	0.6164	0.6130	0.6124	0.6166	0.6165	0.6141	0.6126	0.6164	0.6122	0.6100	0.6119
Nigeria	0.6103	0.6098	0.6108	0.6131	0.6127	0.6133	0.6130	0.6139	0.6230	0.6227	0.6222	0.6233	0.6241	0.6216	0.6212
Mali	0.6086	0.6083	0.6078	0.6098	0.6081	0.6061	0.6103	0.6090	0.6090	0.6090	0.6060	0.6037	0.6070	0.6033	0.6039
Madagascar	0.6084	0.6092	0.6077	0.6096	0.6037	0.6029	0.6003	0.6247	0.6280	0.6296	0.6119	0.6114	0.6080	0.6306	0.6261
Algeria	0.6061	0.6073	0.6097	0.6129	0.6129	0.6131	0.6150	0.6157	0.6153	0.6143	0.6128	0.6141	0.6156	0.6144	0.6104
Pakistan	0.6046	0.6053	0.6057	0.6060	0.6072	0.6062	0.6062	0.6080	0.6110	0.6101	0.6106	0.6102	0.6104	0.6067	0.6065
Sri Lanka	0.6046	0.6034	0.6014	0.5994	0.6001	0.6013	0.6032	0.6048	0.6004	0.5970	0.6278	0.6312	0.6283	0.6263	0.6293
Gabon	0.6026	0.6033	0.6058	0.6049	0.6047	0.6020	0.6023	0.6028	0.6027	0.6041	0.6007	0.5986	0.5989	0.5981	0.5918
Tanzania	0.5974	0.6005	0.6012	0.6026	0.6028	0.6015	0.6024	0.6059	0.6131	0.6095	0.6088	0.6078	0.5999	0.6042	0.6069
Ethiopia	0.5949	0.5949	0.5934	0.5929	0.5927	0.5894	0.5903	0.5886	0.5982	0.6001	0.5959	0.5969	0.5959	0.5903	0.5891
Ghana	0.5942	0.5936	0.5938	0.6026	0.6027	0.5933	0.5985	0.5932	0.5916	0.5896	0.5956	0.6106	0.6082	0.6063	0.6060
Malawi	0.5924	0.5929	0.5926	0.5950	0.5941	0.5925	0.5922	0.5882	0.5916	0.5919	0.5708	0.5681	0.5688	0.5665	0.5801
Congo, Rep. of	0.5900	0.5908	0.5926	0.5959	0.5956	0.6039	0.6108	0.6108	0.5957	0.5915	0.5898	0.5931	0.5953	0.6002	0.5918
Nepal	0.5892	0.5919	0.5883	0.5891	0.5921	0.5890	0.5895	0.5889	0.5915	0.5764	0.5856	0.5815	0.5853	0.5854	0.3253
Côte d'Ivoire	0.5890	0.5831	0.5878	0.5880	0.5865	0.5849	0.5876	0.5818	0.5833	0.5844	0.5848	0.5810	0.5832	0.5829	0.5842
Central African Rep.	0.5868	0.5868	0.5870	0.5875	0.5868	0.5858	0.5873	0.5861	0.5870	0.5873	0.5841	0.5844	0.5861	0.5845	0.5828
Burundi	0.5768	0.5782	0.5781	0.5845	0.5729	0.5794	0.5775	0.5762	0.5794	0.5806	0.5804	0.5774	0.5746	0.5699	0.5726

II. Ranking of World Openness Index, 129 Economies, 2008–2022

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Singapore	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Germany	2	2	2	3	3	3	3	4	4	4	4	4	4	4	3
Hong Kong, China	3	4	3	2	2	2	2	3	3	3	3	3	3	3	4
Ireland	4	3	4	4	4	4	4	5	5	6	7	7	9	10	11
Malta	5	6	9	9	9	12	14	14	10	14	12	10	6	6	7
Netherlands	6	10	11	7	12	7	8	6	8	7	8	6	10	8	9
Australia	7	8	6	6	7	8	9	12	15	17	18	21	20	22	25

(Continued)

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Switzerland	8	9	8	8	5	6	5	8	7	8	6	8	8	9	12
Cyprus	9	12	15	15	15	25	32	32	34	53	42	16	16	14	16
United Kingdom	10	11	7	5	6	5	6	7	6	5	5	5	5	5	5
Belgium	11	14	14	14	14	16	15	15	14	13	14	13	13	13	13
Canada	12	7	5	11	10	11	11	10	9	9	10	11	12	12	8
France	13	15	13	13	11	13	12	13	13	10	11	12	11	11	10
Korea, Rep. of	14	13	10	10	8	9	10	17	18	21	19	31	47	54	55
Austria	15	18	21	20	21	20	21	20	20	18	20	17	19	20	19
New Zealand	16	17	17	17	16	18	16	16	19	19	17	19	21	21	21
Luxembourg	17	5	12	16	35	14	20	9	11	12	13	28	25	17	49
Sweden	18	22	24	25	24	24	23	23	21	23	22	18	18	19	20
Greece	19	24	30	34	54	58	58	58	38	36	33	37	41	37	36
Denmark	20	20	25	23	22	22	22	22	23	22	23	22	23	25	26
Japan	21	16	16	12	13	15	13	11	12	11	9	9	7	7	6
Italy	22	19	20	18	17	17	17	18	16	15	16	14	14	15	15
US	23	21	23	22	19	10	7	2	1	1	1	1	1	1	1
Hungary	24	23	18	19	25	23	19	21	22	27	25	24	26	28	27
Lithuania	25	28	31	28	33	35	41	50	52	50	51	49	49	47	40
Estonia	26	25	27	30	27	29	29	27	28	20	24	25	28	30	31
Spain	27	27	28	26	23	21	24	24	24	26	26	23	22	24	22
Latvia	28	30	32	32	32	32	30	34	32	34	32	30	36	41	41
Costa Rica	29	29	26	31	29	30	28	31	53	32	40	40	56	58	58
Czech Rep.	30	32	29	29	28	27	26	25	25	29	28	26	29	27	30
Macao, China	31	34	41	24	26	31	34	33	35	38	45	33	34	33	34
Finland	32	35	38	39	37	37	36	37	33	33	30	29	30	29	29
Norway	33	37	36	33	31	28	25	26	26	24	21	20	17	16	14
Portugal	34	33	35	36	39	40	39	39	37	35	34	34	35	34	33
Mexico	35	31	22	27	20	26	27	29	29	30	29	27	24	23	23
Nicaragua	36	38	40	43	38	38	35	36	31	31	37	38	37	39	39
Israel	37	26	19	21	18	19	18	19	17	16	15	15	15	18	17
Romania	38	42	45	41	40	42	40	42	41	43	43	44	43	44	45

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	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
China	39	39	39	40	42	41	42	43	44	49	52	57	58	70	69
Peru	40	36	33	35	30	33	49	48	50	48	48	50	50	53	59
Bahrain	41	40	34	37	36	34	31	28	27	25	27	36	27	32	38
Panama	42	43	42	42	41	36	37	30	30	28	31	32	33	36	32
Chile	43	41	37	38	34	43	44	40	42	44	41	35	31	26	18
Slovak Rep.	44	47	47	44	46	45	45	46	46	46	44	46	48	48	50
Uruguay	45	46	44	46	43	44	43	41	39	39	35	42	38	35	35
Guatemala	46	45	46	47	45	46	46	45	43	40	47	48	45	45	44
Poland	47	48	51	49	51	50	53	53	63	61	62	62	66	66	66
Georgia	48	44	43	45	44	56	55	55	55	57	64	98	102	89	80
Iceland	49	49	48	48	52	51	64	76	75	76	80	80	84	86	86
Slovenia	50	53	54	54	58	57	57	56	56	55	55	52	51	49	42
Malaysia	51	51	50	52	47	53	52	49	51	60	59	58	59	46	24
Trinidad and Tobago	52	52	49	51	49	48	33	35	45	42	38	43	40	38	47
Cambodia	53	50	52	53	56	55	54	54	64	66	65	69	73	75	82
Croatia	54	54	56	56	59	59	59	61	59	59	58	59	62	60	60
Mauritius	55	55	57	58	64	60	60	57	57	56	50	45	39	43	46
Jordan	56	56	55	55	53	49	48	47	40	41	36	41	32	31	28
Bulgaria	57	58	60	59	57	39	38	38	36	37	39	39	42	40	37
El Salvador	58	60	58	60	60	61	61	59	58	54	57	56	53	50	43
Oman	59	57	53	50	50	47	47	44	47	45	49	51	44	42	53
Antigua and Barbuda	60	59	59	57	55	52	50	51	48	52	53	54	54	55	61
Kuwait	61	61	61	62	61	62	62	63	61	63	67	66	67	64	72
Botswana	62	62	62	63	62	63	56	62	60	62	56	55	52	52	52
Colombia	63	65	64	65	68	70	73	84	86	87	90	99	100	99	90
Vietnam	64	64	65	70	73	75	77	79	81	81	84	87	88	88	88
Zambia	65	68	66	64	70	69	66	67	65	64	60	61	65	68	76
Gambia, The	66	67	67	67	69	67	67	65	62	65	61	63	64	61	64
Mongolia	67	72	70	69	72	71	69	70	70	72	68	77	80	85	83
Armenia	68	73	76	76	75	77	78	69	69	71	71	68	70	67	74
Guyana	69	63	63	61	63	64	51	52	49	47	46	47	46	51	48

(Continued)

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Paraguay	70	75	73	75	74	74	76	75	77	75	76	75	72	69	65
Ecuador	71	69	71	74	67	68	70	68	84	85	83	82	61	59	56
North Macedonia	72	76	78	77	76	76	75	74	76	78	75	78	78	76	77
Argentina	73	74	75	73	48	54	83	91	91	91	93	81	79	81	85
Saudi Arabia	74	70	69	66	66	66	65	64	71	69	69	70	69	72	73
Russia	75	77	77	71	65	65	63	60	54	51	54	53	55	65	63
Thailand	76	71	72	72	84	86	86	86	87	90	87	90	91	92	81
Honduras	77	79	81	80	78	81	81	81	83	82	91	91	90	78	57
Indonesia	78	81	82	82	81	85	82	82	82	80	81	85	71	71	68
Philippines	79	80	79	79	79	78	79	78	79	96	94	93	92	84	84
Dominican Rep.	80	66	68	68	71	72	74	72	68	70	63	60	57	62	67
Lebanon	81	82	85	86	87	88	87	87	67	68	70	65	68	63	62
Barbados	82	83	80	81	80	79	72	77	78	77	79	83	82	90	93
Ukraine	83	86	87	90	88	99	99	100	101	106	107	106	109	111	101
India	84	84	84	84	82	84	85	85	85	83	86	86	89	91	92
Morocco	85	88	88	89	90	91	93	93	95	95	92	95	94	93	95
Uganda	86	78	74	78	77	73	71	73	73	74	74	76	77	77	78
Kyrgyz Rep.	87	85	86	88	89	89	89	105	100	99	95	72	74	74	70
Cabo Verde	88	87	83	92	99	121	129	129	129	129	129	127	127	127	127
Fiji	89	89	95	100	98	98	97	95	97	97	99	103	99	100	97
Bolivia	90	91	90	91	91	93	90	89	89	88	85	88	85	80	79
Moldova	91	94	97	95	95	97	96	94	93	112	115	118	118	113	108
Turkiye	92	97	92	94	96	80	80	80	80	79	82	84	87	87	91
South Africa	93	93	91	93	92	95	94	96	94	94	96	94	95	95	94
Samoa	94	98	99	104	102	105	102	102	104	102	104	104	104	105	107
Egypt	95	96	98	98	93	94	109	110	109	107	88	67	63	56	51
Lesotho	96	92	89	99	103	100	100	108	107	105	108	110	105	103	106
Papua New Guinea	97	95	96	101	101	90	91	71	74	58	72	74	76	79	87
Jamaica	98	99	100	85	85	83	68	66	66	67	66	64	60	57	54
Belize	99	100	102	96	97	96	95	92	92	92	97	96	98	96	100

(Continued)

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Kenya	100	90	94	97	94	92	92	90	90	89	89	89	83	83	89
Albania	101	102	103	83	83	82	84	83	88	86	78	79	86	98	104
Bosnia and Herzegovina	102	104	104	107	100	103	105	99	98	84	77	71	81	82	71
Brazil	103	101	93	87	86	87	88	88	72	73	73	73	75	73	75
Mozambique	104	108	110	106	107	107	101	106	103	100	105	116	115	112	115
Tunisia	105	103	106	102	105	102	104	98	96	93	100	100	96	101	98
Namibia	106	106	107	108	111	108	107	107	108	109	112	115	108	107	111
Laos	107	107	105	103	104	104	103	103	102	104	106	109	111	115	118
Azerbaijan	108	105	101	105	106	101	98	101	106	103	103	107	117	121	105
Zimbabwe	109	110	109	109	109	106	106	97	114	118	98	92	93	119	119
Belarus	110	109	112	112	110	109	111	120	121	115	109	111	116	117	116
Kazakhstan	111	112	111	110	113	114	113	115	116	116	117	101	103	104	103
Sudan	112	111	108	111	108	113	127	125	125	126	127	129	129	129	128
Bangladesh	113	113	113	113	112	112	112	109	110	110	111	105	107	108	109
Nigeria	114	114	114	114	115	110	110	112	105	101	102	102	101	102	102
Mali	115	116	116	116	116	116	115	114	115	114	118	119	114	116	117
Madagascar	116	115	117	117	119	118	120	104	99	98	113	112	113	94	99
Algeria	117	117	115	115	114	111	108	111	111	108	110	108	106	106	110
Pakistan	118	118	119	118	117	115	116	116	113	111	114	114	110	109	113
Sri Lanka	119	119	120	122	122	122	117	118	118	120	101	97	97	97	96
Gabon	120	120	118	119	118	119	119	119	117	117	119	120	120	120	121
Tanzania	121	121	121	121	120	120	118	117	112	113	116	117	119	114	112
Ethiopia	122	122	123	125	125	125	123	123	119	119	120	121	121	122	122
Ghana	123	123	122	120	121	123	121	121	123	123	121	113	112	110	114
Malawi	124	124	124	124	124	124	122	124	122	121	128	128	128	128	125
Congo, Rep. of	125	126	125	123	123	117	114	113	120	122	122	122	122	118	120
Nepal	126	125	126	126	126	126	124	122	124	128	123	124	124	123	129
Côte d'Ivoire	127	128	127	127	128	128	125	127	127	125	124	125	125	125	123
Central African Rep.	128	127	128	128	127	127	126	126	126	124	125	123	123	124	124
Burundi	129	129	129	129	129	129	128	128	128	127	126	126	126	126	126

III. Brief Introduction to the World Openness Index

This section includes the following contents: concept and theory of opening-up to the outside world, indicator system, weight setting and sources of data, and nondimensionalization of indicators.

1. Concept and Theory of Opening-Up to the Outside World

The basic meaning of “opening-up to the outside world” is clear and consistent; that is, the specific entities of at least two economies carry out exchanges at the economic, social, and cultural levels to lead to the flow of goods, services, personnel, capital, information, knowledge, and technology. The subject of “opening-up to the outside world,” mentioned in this report, mainly refers to the macro-level economy, that is, a specific economy. This means that the openness index takes the entire economy as the basic unit of observation.

The openness index measures cross-border economic openness and the related cross-border social openness and cross-border cultural openness.

In the field of economic openness, cross-border exchanges undoubtedly have the longest history, including, but not limited to, cross-border trade. Economic opening-up has long been dominated by the opening-up of cross-border trade, and cross-border trade has long been dominated by goods. In recent decades, the proportion of services has gradually increased, and it has almost become predominant in some economies. Foreign trade in goods has long been dominated by primary and final products, although the intermediate products have accounted for an increasing proportion and even become the main part of cross-border trade in some economies. Cross-border trade is actually a direct manifestation or extension of a country’s endowment of resources (including natural resources and human resources) and production technology endowments. This is exactly the basic principle discussed in the classical theory of international trade. Therefore, this report uses the cross-border trade theory as a starting point to construct a theoretical model of opening-up to the outside world.

Based on the summary of various frontier mainstream cross-border trade models by Costinot & Rodríguez-Clare (2014),* the price of a product of Economy i in Economy j can be expressed as a function of a number of variables, including those directly related to cross-border opening-up, such as the fixed and variable costs of entry of one economy into another. Those costs and the areas of cross-border opening-up that influence the costs are as follows:

—Variable trade costs: variable trade costs for the export of final products are mainly influenced by trade opening-up policies of the importing economy, and variable trade costs for imports of intermediate goods are mainly influenced by trade opening-up policies of the importing economy.

* A. Costinot and A. Rodríguez-Clare, “Trade Theory with Numbers: Quantifying the Consequences of Globalization,” *Handbook of International Economics* 4 (2014): 197–261.

—Productivity of production enterprises is subject to the influence of the host economy's investment opening-up policies.

—Fixed costs of enterprises' exports and cross-border investments are subject to the influence of financial opening-up policies.

—Total factor productivity is subject to the influence of cross-border diffusion of knowledge and technology.

—The variable costs of corporate decisions are influenced by the quality of institutions, such as contractual improvement and property rights protection.

Accordingly, the areas affecting cross-border trade and economy can be put in the following three categories. First, it is economic openness, mainly trade openness, investment openness, and financial openness. Second, it is social openness, mainly tourism, studying abroad, and immigration opening-up. Third, it is cultural opening-up, mainly cultural trade and cultural exchange. Those three types of openness all include the opening-up of corresponding systems.

To highlight cross-border institutional openness, cross-border openness is divided into cross-border openness performance and complimentary openness policies, each covering economic, social, and cultural openness.

2. Indicators, Weights, and Data

(1) Indicators

The indicator system of external openness measurement is the core content of constructing the world openness index, and its setting principles follow the following principles:

- The principle of scientificity, including the two-way openness balance, the objectivity of openness data, and the heterogeneity of openness contents
- The principle of representativeness, including the representativeness of openness areas and the representativeness of openness subject
- The principle of sustainability, characterized by high data accessibility, stable data sources, high quality of data, and broad prospects for expansion and application

Based on the above-mentioned concepts, theories, and principles, the indicator system constituting the world openness index is divided into four levels, among which the details of the indicators of the second, third, and fourth levels are shown in the table below.

Compared with other openness indicators, the world openness index, based on the aforementioned indicator system, has the following characteristics. First, it measures economic openness and social and cultural openness that is intertwined with economic openness. Second, it focuses on both internal openness and external openness. Third, it focuses on both openness performance and openness policy.

(2) Weights

The weight setting of the indicator system at each level is based on an expert survey. Based on a questionnaire survey of 41 Chinese experts in international economics, the weight setting of the indicator system is shown in the tables below.

The weights in Table A1 are shares of dimension and indicators in 1, visually displaying the relationship among dimensions and indicators, which can be directly comparable with these weights.

Table A1 Components of openness index and weights

Dimension Indicators	Policy indicators and their weights		Performance indicators and their weights		Subtotal			
	Indicators	Weights	Indicators	Weights	Indicators	Weights		
Economic openness	Trade	Weighted applied tariff rate	0.1756	Import of goods	0.0562	15	0.7988	
		Non-tariff measures initiated by reporting economy	0.1342	Export of goods	0.0562			
		Inbound openness of concerned free trade agreement(s)	0.0264	Import of services	0.0535			
		Outbound openness of concerned free trade agreement(s)	0.0264	Export of services	0.0535			
	Subtotal		0.3626		0.2194			
	Direct Investment	Inbound openness of concerned international investment agreement(s)	0.0259	Foreign direct investment	0.0469			
		Outbound openness of concerned international investment agreement(s)	0.0259	Overseas direct investment	0.0469			
	Subtotal		0.0518		0.0938			
	Portfolio investment	Financial opening-up policy	0.0518	Inbound portfolio investment	0.0096			
				Outbound portfolio investment	0.0096			
Subtotal		7	0.4662	8	0.3326			
Social openness	Cross-border visa opening-up policy	0.0518	Inbound tourists	0.0155	7	0.1337		
			Outbound tourists	0.0155				
			Inbound students	0.0176				
			Outbound students	0.0176				
			Immigrants	0.0078				
			Emigrants	0.0078				
Subtotal		1	0.0518	6	0.0819			

(Continued)

Dimension Indicators		Policy indicators and their weights		Performance indicators and their weights		Subtotal	
		Indicators	Weights	Indicators	Weights	Indicators	Weights
Cultural openness	...	<i>(Applicable at appropriate time)</i>	...	Import of IPR services	0.0123	7	0.0675
				Export of IPR services	0.0123		
				Patent applications by non-residents	0.0115		
				Patent applications by residents	0.0115		
				International citation of science literature	0.0074		
				Cultural goods import	0.0061		
				International citations of science literature	0.0061		
Subtotal		7	0.0675		
Total		8	0.5180	21	0.4820	29	1.0000

The weights of dimensions and indicators are set at each level, as shown in Table A2.

Table A2 Dimensions and indicators of openness index and their weights by tiers

Dimensions at the 2nd tier		Dimensions and weights at the 3rd tier		Indicators and weights at the 4th tier	
Dimensions	Weights	Dimensions	Weights	Indicators	Weights
Opening-up policies	0.518	Economic opening-up policies	0.90	Weighted applied tariff rate	0.3390
				Non-tariff measures initiated by reporting economy	0.2590
				Inbound openness of concerned free trade agreement(s)	0.0510
				Outbound openness of concerned free trade agreement(s)	0.0510
				Inbound openness of concerned international investment agreement(s)	0.0500
				Outbound openness of concerned international investment agreement(s)	0.0500
				Financial opening-up policy	0.1000
		Social opening-up policies	0.10	Cross-border visa opening-up policy	0.1000
Cultural opening-up policy	...	<i>(Applicable at appropriate time)</i>	...		

(Continued)

Dimensions at the 2nd tier		Dimensions and weights at the 3rd tier		Indicators and weights at the 4th tier	
Dimensions	Weights	Dimensions	Weights	Indicators	Weights
Opening-up performance	0.482	Economic opening-up performance	0.69	Import of goods	0.1690
				Export of goods	0.1690
				Import of services	0.1610
				Export of services	0.1610
				Foreign direct investment	0.1410
				Overseas direct investment	0.1410
				Inbound portfolio investment	0.0290
				Outbound portfolio investment	0.0290
		Social opening-up performance	0.17	Inbound tourists	0.1896
				Outbound tourists	0.1896
				Inbound students	0.2150
				Outbound students	0.2150
				Immigrants	0.0954
				Emigrants	0.0954
		Cultural opening-up performance	0.14	Import of IPR services	0.1830
				Export of IPR services	0.1830
				Patent applications by non-residents	0.1710
				Patent applications by residents	0.1710
				International citation of science literature	0.1100
				Cultural goods import	0.0910
				Cultural goods export	0.0910

Since 2022, the World Openness Index has begun to employ the data on GDP at 2015 constant price to weight economies. However, the data on GDP at 2015 constant price for some economies in recent year(s) have not yet been released, which has to be estimated on the basis of its/their last GDP data points and the available growth rate of real GDP in national currency from IMF's WEO databases.

Compiling the openness index of economic group(s) may encounter too many changes in the components of some group(s). For example, the increase or decrease of the members of countries involved in the BRI or the members of high-income economies, upper-middle-income economies, lower-middle-income economies, and low-income economies will change the sample of openness indexes of the corresponding group(s), thus reducing the comparability of these indexes. It is necessary to develop an openness index based on the adjusted grouping in order for readers to timely track the fresh changes in certain groupings.

(3) Data

Sources of underlying indicator data include the World Bank, WTO, IMF, UNCTAD, World Tourism Organization, UNESCO, United Nations Department of Economic and Social Affairs, and WIPO, among others. The detailed breakdown is shown in the following table.

Table A3 Data sources of indicators of openness index

Sources	Indicators
International Monetary Fund/ World Bank (IMF/WB)	Import of goods
	Export of goods
	Import of services
	Export of services
	Foreign direct investment
	Overseas direct investment
	Inbound portfolio investment
	Outbound portfolio investment
	Import of IPR services
	Export of IPR services
United Nations Department of Economic and Social Affairs (UN DESA)	Immigrants
	Emigrants
United Nations Conference on Trade and Development (UNCTAD)	Inbound openness of concerned international investment agreement(s)
	Outbound openness of concerned international investment agreement(s)
United Nations Educational, Scientific, and Cultural Organization (UNESCO)	Inbound students
	Outbound students
	Cultural goods import
	Cultural goods export
World Bank (WB)	Weighted applied tariff rate
World Intellectual Property Organization (WIPO)	Patent applications by non-residents
	Patent applications by residents
World Tourism Organization/ World Bank (UNWTO/WB)	Inbound tourists
	Outbound tourists
World Trade Organization (WTO)	Non-tariff measures initiated by reporting economy
	Inbound openness of concerned free trade agreement(s)
	Outbound openness of concerned free trade agreement(s)
https://web.pdx.edu/~ito/Chinn-Ito_website.htm	Financial opening-up policy
Henley & Partners	Cross-border visa opening-up policy
SCImago	International citation of science literature

Despite the above sources, some values of some underlying indicators remain missing. The following approach was adopted to make up for those missing values.

—When an economy has a value for only one year in the entire sample period, this value is used for all other years.

—When an economy has a value for more than one uninterrupted year in the whole sample period, the data for the other years are taken in accordance with the principle of proximity. For example, if only the values of 2011 and 2012 are available, then the value of 2011 is used for the year before 2011, and the value of 2012 is used for the year after 2012.

—For an economy that has a value in more than one year during the whole sample period and there is an interruption, the values between the two interrupted years are taken according to the principle of proximity (e.g., when only 2011 and 2014 have values, the value of 2011 is taken for 2012 and that of 2014 is taken for 2013); when the values are missing for an odd number of years, the value of the middlemost year is taken as the average of the two values at the two ends (e.g., when only values of 2011 and 2015 are available, the value of 2011 is taken for 2012, the value of 2015 is taken for 2014, and the average of the values of 2011 and 2015 is taken for 2013).

—For a country that has no values during the entire sample period, another country that is most similar to it in terms of economic development, social and cultural conditions, institutional characteristics, and geographical features should be picked so that the values of that country can be taken for the country with missing values.

3. Nondimensionalization of Indicators

(1) Principles

Dimensionless treatment is a necessary step for underlying index data processing. It should abide by the following principles: the design of the treatment method should be based on the economic principle of supply and demand.

The opening-up to the outside world is a two-way process. First, it is inward opening-up. That is, Economy A opens its market to other economies to meet A's own needs, which is reflected by Economy A importing goods, capital, technology, and personnel from other economies. Second, it is the outward opening-up of other economies. That is, other economies open themselves to Economy A to meet their own needs, which is reflected by Economy A exporting goods, capital, technology, and personnel to those economies.

Such a principle is, in essence, to make the openness indicators dimensionless based on market supply and demand conditions. First, if the value of Economy A on a certain inward opening-up indicator is an absolute one, it should be divided by the total value of this indicator for Economy A. Second, if the value of Economy A on one certain outward opening-up indicator is an absolute one, it should be divided by the global value of the indicator after deducting the value of Economy A. In this report, it is stipulated that the “corresponding aggregate indicator” for the openness indicator in the economic value category is GDP, and the “corresponding

aggregate indicator” for the openness indicator in the headcount category is total population, and the rest can be deduced in the same vein.

(2) Specific methods

- Outflow measured by value

Such an indicator system includes six indicators, namely, export of goods, export of services, outbound direct investment, outbound portfolio investment, export of IPR services, and cultural product export.

It is calculated as follows:

$$y_{it} = \frac{x_{it}}{\sum_{j \neq i} GDP_{jt}}$$

In the equation, y_{it} is the final value of the indicator of Economy i during period t ; x_{it} is the original value of the indicator, and $\sum_{j \neq i} GDP_{jt}$ is the GDP summation of all the other economies in the world.

- Inflow measured by value

Such an indicator system includes six indicators, namely, import of goods, import of services, foreign direct investment, foreign portfolio investment, import of IPR service, and cultural product import.

It is calculated as follows:

$$y_{it} = \frac{x_{it}}{GDP_{it}}$$

In the equation, y_{it} is the final value of the indicator of Economy i during period t ; x_{it} is the original value of the indicator.

- Outflow measured by headcount

Such an indicator system includes three indicators, namely, outbound tourists, outbound students, and emigrants.

It is calculated as follows:

$$y_{it} = \frac{x_{it}}{\sum_{j \neq i} POP_{jt}}$$

In the equation, y_{it} is the final value of the indicator of Economy i during period t ; x_{it} is the original value of the indicator; and $\sum_{j \neq i} POP_{jt}$ is the summation of the population of all the other economies in the world.

- Inflow measured by headcount

Such an indicator system includes three indicators, namely, inbound tourists, inbound students, and immigrants.

It is calculated as follows:

$$y_{it} = \frac{x_{it}}{POP_{it}}$$

In the equation, y_{it} is the final value of the indicator of Economy i during period t ; x_{it} is the original value of the indicator; and POP refers to population.

- Patent application

It includes two indicators: residents applying for patents abroad (*patex*) and non-residents applying for patents within the reporting economy (*patim*).

patex is calculated as follows:

$$patex_{it} = \frac{abroad_{it}}{\sum_{j \neq i} (resi_{jt} + nonr_{jt})}$$

In the equation, $abroad_{it}$ refers to the number of patent applications of Economy i filed in other economies in period t ; $\sum_{j \neq i} (resi_{jt} + nonr_{jt})$ refers to the total number of patent applications approved by countries other than Economy i (*resi* refers to residents and *nonr* refers to non-residents).

patim is calculated as follows:

$$patim_{it} = \frac{nonr_{it}}{resi_{it} + nonr_{it}}$$

In the equation, $nonr_{it}$ is the number of patent applications by non-residents (those from abroad) in Economy i ; $resi_{it} + nonr_{it}$ is the total number of patent applications in Economy i .

- Cross-border citations of science papers

It is calculated as follows:

$$paper_{it} = \frac{Citations_{it} - Selfcitations_{it}}{\sum_{j \neq i} Documents_{jt}}$$

In the equation, $Citations_{it}$ refers to the total citations of science papers of Economy i in period t ; $Selfcitations_{it}$ refers to self-citations; and $\sum_{j \neq i} Documents_{jt}$ is the total number of science papers of all the other economies except Economy i .

- External openness based on international trade and investment agreements

There are two indicators, and it is calculated as follows:

$$T_{it} = \sum_p T_{ipt} \frac{GDP_{pt}}{\sum_{j \neq i} GDP_{jt}}$$

In the equation, T_{it} is the openness of Economy i in period t , based on trade or investment agreements; GDP_{pt} is the GDP of the contracting partner; $\sum_{j \neq i} GDP_{jt}$ is the total GDP of all the other economies except Economy i ; T_{ipt} is a dummy variable; it takes 1 when the agreement is effective for Economy i and p in period t ; otherwise it takes 0.

- Internal openness of concerned international trade and investment agreements

There are two indicators, which are calculated as follows:

$$T_{it} = \frac{GDP_{it}}{\sum_p T_{ipt} * GDP_{pt}}$$

In the equation, T_{it} is the openness of Economy i in period t , based on trade or investment agreements; GDP_{it} is GDP of Economy i ; GDP_{pt} is the GDP of the contracting partner; T_{ipt} is a dummy variable; it takes 1 when the agreement is effective for Economy i and p in period t ; otherwise it takes 0.

- Non-tariff measures

It is calculated as follows:

$$X_{it} = ntb_{it} * hs_{it}$$

In the equation, X_{it} refers to non-tariff barriers imposed by Economy i in period t ; ntb_{it} refers to the number of non-tariff measures; hs_{it} refers to the quantity of concerned products.

- Indicators not requiring additional treatment

They include three indicators, namely, weighted tariff rate, financial openness index, and passport convenience index.

(3) Centralized treatment of indicators

To achieve consistency in standard indicator dimensions, indicators have been processed as follows:

$$y_{it} = \frac{x_{it} - \min(x)}{\max(x) - \min(x)}$$

In the equation, y_{it} is the indicator of Economy i in period t after the centralization process; x_{it} is the pre-centralization indicator; $\max(x)$ and $\min(x)$ are the maximum value and minimum value, respectively, of indicator x during the entire sample period.

For some inverse indicators, such as weighted tariff rate and non-tariff measures, the larger the value is, the lower the level of openness; it is calculated as follows:

$$y_{it} = 1 - \frac{x_{it} - \min(x)}{\max(x) - \min(x)}$$

This calculation method projects all indicators on [0, 1].

IV. Groupings of Economies Gauged by World Openness Index (Sorted by Alphabet)

Economy	Grouping by region							Grouping by income				Others								
	North America	East Asia & Pacific	Latin America & Caribbean	South Asia	Europe & Central Asia	Sub-Saharan Africa	Middle East & North Africa	High income	Upper Middle Income	Lower Middle Income	Low income	WTO members	Belt and Road economies	Advanced economies	EU	EA	G20	G7	BRICS	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1	Albania				√				√			√	√							
2	Algeria						√		√				√							
3	Antigua and Barbuda			√					√			√	√							
4	Argentina			√						√		√	√					√		
5	Armenia				√				√			√	√							
6	Australia		√						√			√		√				√		
7	Austria				√				√			√	√	√	√	√				
8	Azerbaijan				√					√			√							
9	Bahrain						√		√			√	√							
10	Bangladesh				√						√	√	√							
11	Barbados			√					√			√	√							
12	Belarus				√				√		√		√							
13	Belgium				√				√			√		√	√	√				
14	Belize			√					√			√								
15	Bolivia			√							√	√	√							
16	Bosnia and Herzegovina				√					√			√							
17	Botswana					√			√			√	√							
18	Brazil			√					√			√	√					√		√
19	Bulgaria				√				√			√	√			√				
20	Burundi					√						√	√							
21	Cabo Verde					√					√	√	√							
22	Cambodia		√								√	√	√							
23	Canada	√							√			√		√				√	√	√
24	Central African Rep.					√					√	√	√							
25	Chile			√					√			√	√							
26	China		√							√		√	√					√		√
27	Colombia			√						√		√								
28	Congo, Rep. of					√					√	√	√							
29	Costa Rica			√						√		√	√							
30	Côte d'Ivoire					√					√	√	√							
31	Croatia				√				√			√	√					√		
32	Cyprus				√				√			√	√	√	√	√				
33	Czech				√				√			√	√	√	√					
34	Denmark				√				√			√	√	√	√					
35	Dominican Rep.			√						√		√	√							
36	Ecuador			√						√		√	√							
37	Egypt						√				√	√	√							
38	El Salvador			√							√	√	√							
39	Estonia				√				√			√	√	√	√	√				
40	Ethiopia					√					√	√	√							

	Economy	Grouping by region							Grouping by income				Others							
		North America	East Asia & Pacific	Latin America & Caribbean	South Asia	Europe & Central Asia	Sub-Saharan Africa	Middle East & North Africa	High income	Upper Middle Income	Lower Middle Income	Low income	WTO members	Belt and Road economies	Advanced economies	EU	EA	G20	G7	BRICS
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
41	Fiji		√						√			√	√							
42	Finland					√		√				√		√	√	√				
43	France					√		√				√		√	√	√	√	√		
44	Gabon						√		√			√	√							
45	Gambia						√				√	√	√							
46	Georgia					√			√			√	√							
47	Germany					√		√				√	√	√	√	√	√	√		
48	Ghana						√			√		√	√							
49	Greece					√		√				√	√	√	√					
50	Guatemala			√					√			√	√							
51	Guyana			√					√			√	√							
52	Honduras			√						√		√	√							
53	Hong Kong, China		√						√			√		√						
54	Hungary					√		√				√	√		√					
55	Iceland					√		√				√	√	√						
56	India				√						√	√	√				√		√	
57	Indonesia		√								√	√	√				√			
58	Ireland					√		√				√	√	√	√	√				
59	Israel							√	√			√	√	√						
60	Italy					√		√				√	√	√	√	√	√	√		
61	Jamaica			√						√		√	√							
62	Japan		√						√			√	√	√			√	√		
63	Jordan							√		√		√	√							
64	Kazakhstan					√			√			√	√							
65	Kenya						√				√	√	√							
66	Korea, Rep. of		√					√				√	√	√			√			
67	Kuwait							√	√			√	√							
68	Kyrgyz					√					√	√	√							
69	Laos		√								√	√	√							
70	Latvia					√		√				√	√	√	√	√				
71	Lebanon							√		√		√	√							
72	Lesotho						√				√	√	√							
73	Lithuania					√		√				√	√	√	√	√				
74	Luxembourg					√		√				√	√	√	√	√				
75	Macao, China		√						√			√	√	√						
76	Madagascar						√				√	√	√							
77	Malawi						√				√	√	√							
78	Malaysia		√							√		√	√							
79	Mali						√				√	√	√							
80	Malta							√	√			√	√	√	√	√				
81	Mauritius						√		√			√	√							
82	Mexico			√					√			√	√					√		
83	Moldova					√					√	√	√							
84	Mongolia		√								√	√	√							
85	Morocco							√			√	√	√							
86	Mozambique						√				√	√	√							
87	Namibia						√			√		√	√							
88	Nepal				√						√	√	√							
89	Netherlands					√		√				√	√	√	√	√				
90	New Zealand		√						√			√	√	√						
91	Nicaragua			√							√	√	√							
92	Nigeria						√				√	√	√							
93	North Macedonia					√			√			√	√							
94	Norway					√		√				√	√	√	√					
95	Oman							√	√			√	√							
96	Pakistan				√					√		√	√							
97	Panama			√				√				√	√							
98	Papua New Guinea		√							√		√	√							

	Economy	Grouping by region							Grouping by income				Others							
		North America	East Asia & Pacific	Latin America & Caribbean	South Asia	Europe & Central Asia	Sub-Saharan Africa	Middle East & North Africa	High income	Upper Middle Income	Lower Middle Income	Low income	WTO members	Belt and Road economies ^a	Advanced economies	EU	EA	G20	G7	BRICS
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
99	Paraguay			√						√			√							
100	Peru			√						√			√	√						
101	Philippines		√								√		√	√						
102	Poland					√			√				√	√			√			
103	Portugal					√			√				√	√		√	√			
104	Romania					√				√			√	√		√				
105	Russia					√				√			√	√				√		√
106	Samoa		√							√			√	√						
107	Saudi Arabia								√	√			√	√					√	
108	Singapore		√							√			√	√		√				
109	Slovak					√			√				√	√		√	√			
110	Slovenia					√			√				√	√		√	√			
111	South Africa						√			√			√	√				√		√
112	Spain					√			√				√			√	√			
113	Sri Lanka				√					√			√	√						
114	Sudan						√						√							
115	Sweden					√			√				√			√	√			
116	Switzerland					√			√				√			√				
117	Tanzania						√					√	√	√						
118	Thailand		√							√			√	√						
119	Trinidad and Tobago			√					√				√	√						
120	Tunisia								√				√	√						
121	Turkiye					√				√			√	√					√	
122	Uganda						√						√	√						
123	Ukraine					√							√	√						
124	United Kingdom					√			√				√			√			√	√
125	US	√							√				√			√			√	√
126	Uruguay			√					√				√	√						
127	Vietnam		√										√	√						
128	Zambia						√						√	√						
129	Zimbabwe						√						√	√						
	Subtotal	2	19	23	5	43	25	12	49	39	30	11	122	98	36	27	19	19	7	5
	Global Total ²	3	37	42	8	58	48	21	80	54	54	28	164	149	40	27	19	19	7	5

Source: (i) The groupings by region or by income from the World Bank, see <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>; (ii) The list of WTO members from the World Trade Organization, see https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm; (iii) The list of economies along the “Belt and Road” from the official website of China’s Belt and Road network, see <https://www.yidaiyilu.gov.cn/country>; (iv) The members of the advanced economies. EU, European Area (EA), or Group of Seven (G7) from the IMF, see <https://www.imf.org/en/Publications/WEO/weo-database/2023/April/select-country-group>; (v) The list of Group of Twenty (G20) from the G20 Summit, see <https://g20.org/about-the-g20/#about>.

Note: 1. The list of the economies along the “Belt and Road” is as of August 18, 2023; 2. The number of global economies is 217 in the *World Development Indicators* of the World Bank, 196 in the *World Economic Outlook* of the IMF, and 217 in UNCTAD dataset *Output and Income* (see <https://unctadstat.unctad.org>), respectively. Compared with part IV of Appendix of the *World Openness Report 2022*, the total number of high-income economies has increased from 80 to 82 in 2023, while the number of low-income economies has decreased from 28 to 26. The number of lower-middle-income and upper-middle-income economies is still 54, respectively. The World Openness Index in this report does not follow the above changes so as to keep the time series of indexes as stable as possible. Please refer to the data source (i) for relevant grouping details. The total number of developed economies has increased from 40 to 41 (including Croatia), and the relevant grouping details can be found in the data source (iii).