



United Nations Conference on Trade and Development (UNCTAD)

Briefing on the work of the United Nations Conference on Trade and Development in the area of World Telecommunication/ICT Indicators

A ready contribution to the WSIS

The United Nations Conference on Trade and Development (UNCTAD) is working on ICT Indicators. Our activities in this area include: work on benchmarking and technology indicators; individual country case studies; and more long-term policy analysis.

1. ICT Development Indices

In conjunction with the United Nations Commission on Science and Technology for Development (UNCSTD), UNCTAD reviewed and evaluated existing work to measure ICTs from different sources, including academia, the private sector and international organizations (UNDP, UNIDO, OECD and the ITU). On the basis of this work, UNCTAD constructed a theoretical framework from which to approach ICT measurement, comprising indicators of connectivity, access, usage and policy.

(Table 1)

Benchmarking is important in measuring outcomes from policies and monitoring progress in ICT connectivity and access. A standard selection of indicators against which countries can be measured allows comparisons and initial policy conclusions between countries and over time. Although more sophisticated, statistical methods are required for detailed investigation of causation, benchmarking is more straightforward and is an essential input to policy analysis.

ITU (2002) notes in its 2002 World Telecommunications Development Report that "over the last few decades, virtually every country has succeeded in improving its telecommunications sector. Thus, every country can show that its particular blend of policies has been successful. It is only by making ***international comparisons*** that it is possible to show which policies have been more successful than others... For this reason, an approach based on ***comparative rankings*** may be more meaningful than one that uses absolute growth rates". UNCTAD therefore uses a methodology based

on relative rankings, rather than absolute scores (although these may be more appropriate for some purposes e.g. for questions relating to the digital divide).

UNCTAD benchmarked and analysed the diffusion of ICT capabilities across 160-200 countries for 1995-1002. This cross-country study compiles data and ICT Development Indices for: connectivity (Internet hosts, number of PCs, telephone mainlines, mobile phones); wider access to ICTs (literacy, GDP per capita and cost of local calls, as well as actual number of Internet users); usage of ICTs (incoming and outgoing telecom traffic); and policy (presence of a domestic Internet exchange, as well as competition in local loop, domestic long distance and ISP market).

(Table 2)

The study analysed index rankings by regions and by income to identify trends and to classify countries as 'falling behind', 'keeping up' and 'getting ahead'. As a broad generalisation, African and South Asian countries were classified as 'falling behind', Latin American and transition economies as 'keeping up' and OECD countries and S.E. Asian Tigers as 'getting ahead'. Rankings were stable and consistent over time, and in line with expectations based on income. Such stability is consistent with the long-term planning and time horizons required for telecommunications investment. It also implies that these Indices are measuring indicators of central technological development.

2. Digital Divide

UNCTAD has analysed and measured the international digital divide in terms of inequality in the distributions of hardware equipment (Internet hosts, PCs, fixed mainlines, mobiles) and Internet users across countries, using the Gini measure of inequality. Our results show that more recent technologies such as Internet (measured by Internet hosts) are more unevenly distributed relative to older technologies, such as fixed line telephony. Our findings also demonstrate 'leapfrogging' in mobile telephony (with lower inequality, which reduces the fastest), suggesting greater potential for more equally distributed technologies in bridging the digital divide. Overall, these reductions represent only small, incremental reductions in inequality from their high levels of inequality.

3. Policy Work

In future work, UNCTAD plans to analyse best practice cases of ICT development. The experience of different developing countries in the building-up of ICT capacity will be evaluated in order to identify policies that proved successful and those that were less successful. An attempt will be made to understand the reasons for success or failure and to make conclusions from these experiences which could be recommended for application elsewhere. The study will help identify effective ICT initiatives and formulate successful policies for national ICT capabilities to promote greater inclusion of LDCs and DCs in the world economy through ICT capacity building.

Index	UNCTAD (2002)	Mosaic Group (1998)	Mosaic Group (1996)	McConnell International (2001, 2000)	Economist (EIU) (2001, 2000)	Harvard University	ITU
<i>Perspective</i>	Tech. Development	General IT	Defence	Commercial	Commercial	Sociological	Telecoms
<i>Item measured</i>	ICT diffusion	Global Diffusion of Internet	IT capability	E-Readiness	E-Readiness	Networked Readiness	Internet Access
1. Connectivity (physical capacity; infrastructure)	Internet hosts; Tel. Mainlines; PCs; Mobile subscribers.	Pervasiveness; Connectivity Infrastructure.		Connectivity Infrastructure pricing	Connectivity (30%) fixed & mobile, narrow band/broadband	Info Infrastructure Software & Hardware	Hosts; servers; telephones; PCs.
2. Access	Internet users; Literacy; Average revenue; call costs.	Pervasiveness Geographical dispersion	Pervasiveness	Access	Cost of access Availability Affordability	Availability Affordability	Users; subscribers.
3. Policy environment	Competition: Local loop, long distance; Internet exchange.	Organisational infrastructure	Depth of Development	E-Leadership; E-Business Climate	Legal and Regulatory Env't (15%) Business Env't (20%)	Legal Environment: Telecom & Trade policy	ISPs; Prices; Traffic
4. Usage	Telecom traffic: incoming; outgoing.	Sectoral Absorption Sophistication of use	Sophistication of usage	Information Security	E-commerce (20%); consumer/business use; e-services (10%)	Content B2B education B2C Ecommerce;	
Additional Factors			Proximity to Tech. Frontier, Indigenisation	Human Capital	Social/cultural infrastructure 5%, Education/literacy	IT Sector ICT Training	

Table 1: Review of Existing Work

Table 2:2001 Index of ICT Diffusion by Ranking

RANKING	COUNTRY	2000 CONNEC	2000 ACCESS	2001-2 POLICY	2000 ICT DIFFUSION	RANKING	COUNTRY	2000 CONNEC	2000 ACCESS	2001-2 POLICY	2000 ICT DIFFUSION	RANKING	COUNTRY	2000 CONNEC	2000 ACCESS	2001-2 POLICY	2000 ICT DIFFUSION
1	United States	0.8005	0.8462	1.0000	0.8234	58	Argentina	0.1382	0.4221	1.0000	0.2801	115	Tunisia	0.0512	0.2729	0.2500	0.1620
2	Iceland	0.7065	0.9138	1.0000	0.8101	59	Philippines	0.0555	0.5027	1.0000	0.2791	116	Syria	0.0402	0.2564	0.0000	0.1483
3	Norway	0.6690	0.8838	1.0000	0.7764	60	Trinidad and Tobago	0.1432	0.4138	0.2500	0.2785	117	Lesotho	0.0082	0.2847	0.0000	0.1465
4	Luxembourg	0.7028	0.7754	1.0000	0.7391	61	Venezuela	0.1207	0.4346	0.7500	0.2776	118	Kenya	0.0092	0.2837	0.6250	0.1464
5	Sweden	0.6918	0.7847	1.0000	0.7383	62	Armenia	0.0446	0.4959	0.2500	0.2703	119	Zambia	0.0075	0.2633	0.2500	0.1354
6	Denmark	0.6203	0.7859	1.0000	0.7031	63	Lebanon	0.0479	0.4856	0.0000	0.2667	120	Liberia	0.0010	0.2652	0.0000	0.1331
7	Switzerland	0.5857	0.7909	1.0000	0.6883	64	Honduras	0.0274	0.5036	0.0000	0.2655	121	Comoros	0.0056	0.2583	0.0000	0.1320
8	Finland	0.6402	0.7220	1.0000	0.6811	65	Fiji	0.0795	0.4493	0.0000	0.2644	122	Tanzania	0.0056	0.2561	0.2500	0.1308
9	Hongkong	0.5556	0.7826	1.0000	0.6691	66	Peru	0.0565	0.4711	1.0000	0.2638	123	Grenada	0.1715	0.0885	0.0000	0.1300
10	Japan	0.4918	0.8396	1.0000	0.6657	67	Cuba	0.0224	0.4877	0.2500	0.2551	124	Algeria	0.0209	0.2248	0.0000	0.1228
11	Netherlands	0.6528	0.6731	0.7500	0.6630	68	Paraguay	0.0726	0.4368	0.2500	0.2547	125	Ghana	0.0074	0.2365	0.5000	0.1220
12	United Kingdom	0.5396	0.7131	1.0000	0.6263	69	Botswana	0.0841	0.4252	0.2500	0.2546	126	Morocco	0.0564	0.1784	0.2500	0.1174
13	Australia	0.5814	0.6396	1.0000	0.6105	70	Maldives	0.0493	0.4531	0.0000	0.2512	127	Uganda	0.0054	0.2266	0.5000	0.1160
14	Singapore	0.5491	0.6617	1.0000	0.6054	71	Saudi Arabia	0.1011	0.3953	0.5000	0.2482	128	Belize	0.1325	0.0975	0.0000	0.1150
15	New Zealand	0.5281	0.6810	0.8750	0.6045	72	Turkey	0.1713	0.3245	0.2500	0.2479	129	Mozambique	0.0052	0.2173	0.2500	0.1112
16	Germany	0.4995	0.6874	1.0000	0.5935	73	Macedonia, FYR	0.1372	0.3527	0.2500	0.2450	130	Lao P.D.R.	0.0053	0.2101	0.0000	0.1077
17	Austria	0.4904	0.6728	1.0000	0.5816	74	Bolivia	0.0475	0.4419	0.2500	0.2447	131	Togo	0.0168	0.1974	0.2500	0.1071
18	Canada	0.4385	0.7179	1.0000	0.5782	75	Mexico	0.1230	0.3655	0.7500	0.2443	132	India	0.0134	0.1937	1.0000	0.1035
19	Ireland	0.5018	0.6393	1.0000	0.5706	76	El Salvador	0.0671	0.4197	0.7500	0.2434	133	Malawi	0.0030	0.2020	0.7500	0.1025
20	Belgium	0.4717	0.6444	0.8750	0.5580	77	Indonesia	0.0211	0.4592	0.5000	0.2401	134	Sudan	0.0063	0.1937	0.7500	0.1000
21	France	0.4596	0.6296	1.0000	0.5446	78	Sri Lanka	0.0251	0.4494	0.5000	0.2373	135	Vanuatu	0.0147	0.1765	0.0000	0.0956
22	Israel	0.4790	0.5796	0.5000	0.5293	79	Jamaica	0.1449	0.3294	0.2500	0.2371	136	Djibouti	0.0099	0.1793	0.0000	0.0946
23	Korea (Rep. of)	0.4023	0.6522	0.8750	0.5273	80	Romania	0.1113	0.3609	0.5000	0.2361	137	Chad	0.0017	0.1816	0.0000	0.0916
24	Italy	0.4370	0.6056	1.0000	0.5213	81	Oman	0.0711	0.3930	0.0000	0.2321	138	Cote d'Ivoire	0.0190	0.1633	0.2500	0.0912
25	United Arab Emira	0.3786	0.6247	0.2500	0.5017	82	Swaziland	0.0379	0.4251	0.2500	0.2315	139	Belarus	0.1106	0.0714	0.3333	0.0910
26	Malta	0.3470	0.6423	0.5000	0.4947	83	Russia	0.1012	0.3578	0.5000	0.2295	140	Yemen	0.0090	0.1575	0.2500	0.0832
27	Slovenia	0.4298	0.5501	0.2500	0.4900	84	South Africa	0.1168	0.3397	0.3333	0.2283	141	Senegal	0.0330	0.1319	0.2500	0.0825
28	Cyprus	0.3447	0.6219	0.5000	0.4833	85	Guyana	0.0548	0.3939	0.0000	0.2244	142	Burundi	0.0022	0.1613	0.6667	0.0817
29	Portugal	0.3908	0.5603	1.0000	0.4755	86	Libya	0.0455	0.4027	0.0000	0.2241	143	Bhutan	0.0029	0.1591	0.0000	0.0810
30	Bahrain	0.2560	0.6660	0.0000	0.4610	87	Seychelles	0.2737	0.1704	0.0000	0.2221	144	Central African Rep.	0.0022	0.1556	0.0000	0.0789
31	Macau	0.2934	0.6274	0.0000	0.4604	88	Egypt	0.0433	0.3895	0.2500	0.2164	145	Gambia	0.0208	0.1289	0.2500	0.0748
32	Spain	0.3700	0.5243	1.0000	0.4472	89	French Polynesia	0.1861	0.2460	0.0000	0.2161	146	Mauritania	0.0080	0.1373	0.3333	0.0726
33	Greece	0.3817	0.4692	1.0000	0.4254	90	Congo	0.0159	0.4154	0.6667	0.2157	147	Guinea	0.0042	0.1405	0.2500	0.0723
34	Kuwait	0.1850	0.6555	0.1667	0.4203	91	Equatorial Guinea	0.0144	0.4164	0.0000	0.2154	148	Bangladesh	0.0027	0.1399	0.0833	0.0713
35	Czech Republic	0.3844	0.4525	1.0000	0.4184	92	Thailand	0.0683	0.3619	0.6250	0.2151	149	Mali	0.0027	0.1362	0.5000	0.0694
36	Estonia	0.3217	0.5113	0.7500	0.4165	93	Myanmar	0.0022	0.4251	0.0000	0.2137	150	Benin	0.0083	0.1280	0.0000	0.0682
37	Greenland	0.3172	0.5042	0.0000	0.4107	94	Ukraine	0.0810	0.3409	0.0833	0.2110	151	Ethiopia	0.0019	0.1310	0.0000	0.0664
38	Slovak Republic	0.2511	0.5661	0.5000	0.4086	95	Jordan	0.0883	0.3335	0.2500	0.2109	152	Guinea-Bissau	0.0037	0.1264	0.7500	0.0650
39	Puerto Rico	0.2310	0.5795	0.0000	0.4053	96	Colombia	0.0847	0.3350	1.0000	0.2098	153	Sierra Leone	0.0039	0.1219	0.5000	0.0629
40	Brunei Darussalam	0.0950	0.6903	0.0000	0.3926	97	Gabon	0.0096	0.4020	0.3750	0.2058	154	Georgia	0.0817	0.0102	0.7500	0.0460
41	Hungary	0.2858	0.4917	0.5000	0.3887	98	Guatemala	0.0485	0.3616	0.5000	0.2050	155	Marshall Islands	0.0523	0.0345	0.0000	0.0434
42	Croatia	0.2368	0.5379	0.5000	0.3874	99	Moldova	0.0638	0.3391	0.2500	0.2014	156	Burkina Faso	0.0036	0.0791	0.2500	0.0414
43	Malaysia	0.1949	0.5627	0.6250	0.3788	100	Cameroon	0.0087	0.3939	0.0000	0.2013	157	Bosnia and Herz.	0.0618	0.0207	0.2500	0.0413
44	Bahamas	0.2171	0.4701	0.0000	0.3436	101	Dominican Rep.	0.0889	0.3091	0.7500	0.1990	158	Samoa	0.0482	0.0310	0.0000	0.0396
45	Qatar	0.2315	0.4552	0.0000	0.3433	102	Rwanda	0.0039	0.3909	0.0000	0.1974	159	Azerbaijan	0.0664	0.0094	0.1667	0.0379
46	Costa Rica	0.1538	0.5274	0.0000	0.3406	103	Ecuador	0.0558	0.3273	0.1250	0.1915	160	Sao Tome and Pri.	0.0205	0.0503	0.0000	0.0354
47	Barbados	0.0754	0.6007	0.0000	0.3381	104	China	0.0759	0.3026	0.8750	0.1892	161	Albania	0.0500	0.0161	0.5000	0.0331
48	Lithuania	0.1871	0.4821	0.2500	0.3346	105	Pakistan	0.0097	0.3517	0.8750	0.1807	162	Turkmenistan	0.0456	0.0121	0.3333	0.0288
49	Chile	0.1944	0.4532	1.0000	0.3238	106	Nepal	0.0051	0.3452	0.2500	0.1752	163	Niger	0.0008	0.0552	0.6667	0.0280
50	Suriname	0.1378	0.4950	0.5000	0.3164	107	Namibia	0.0491	0.3009	0.2500	0.1750	164	Mongolia	0.0385	0.0158	0.5000	0.0272
51	Panama	0.1117	0.5007	0.5000	0.3062	108	Tajikistan	0.0138	0.3315	0.0000	0.1726	165	Kiribati	0.0195	0.0233	0.0000	0.0214
52	Latvia	0.2216	0.3904	0.5000	0.3060	109	Cape Verde	0.0782	0.2667	0.2500	0.1725	166	Uzbekistan	0.0256	0.0107	0.1667	0.0181
53	Uruguay	0.1776	0.4312	0.1250	0.3044	110	Nicaragua	0.0157	0.3255	0.2500	0.1706	167	Solomon Islands	0.0247	0.0103	0.0000	0.0175
54	Brazil	0.1352	0.4706	0.7500	0.3029	111	Iran (Islamic Rep. of)	0.0701	0.2704	0.0000	0.1702	168	Angola	0.0038	0.0110	0.6250	0.0074
55	Poland	0.1927	0.4129	0.8750	0.3028	112	Zimbabwe	0.0174	0.3183	0.7500	0.1679	169	Cambodia	0.0056	0.0034	0.3750	0.0045
56	Bulgaria	0.2092	0.3755	0.5000	0.2924	113	Viet Nam	0.0189	0.3156	0.2500	0.1673	170	Madagascar	0.0043	0.0045	0.7500	0.0044
57	Mauritius	0.1850	0.3152	0.0000	0.2804	114	Nigeria	0.UUU4 / U.UUU4	0.UUU4 / U.UUU4	0.UUU4 / U.UUU4	0.UUU4 / U.UUU4	171	Eritrea	0.UUU31 / U.UUU31	0.UUU38 / U.UUU38	0.UUU35 / U.UUU35	0.UUU35 / U.UUU35

