Features

Prioritizing Countries for Assistance To Overcome the Digital Divide

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■ Introduction

A spate of recent initiatives and pronouncements by world leaders and development organizations suggest that the issue of unequal global access to information and communications technologies, and especially the Internet, is of increasing concern. The Okinawa Charter and the resulting DotForce initiative, discussed by Bruno Lanvin elsewhere in this journal, is perhaps the most significant recent example.

While a global response is to be welcomed, in order to provide the right type of assistance to the countries that will benefit from it most in the ICT arena, some method of prioritization is required. This paper attempts to take a first step in that direction. This paper will focus on just one element of the digital divide – the gap in access to quality information infrastructure. It will use a measure of access that allows for the income per capita of a country. It will also build on previous econometric studies that have looked at determinants of information infrastructure penetration allowing for, but going beyond, income.

After a brief literature review, it develops two indicators of the present level and quality of ICT access in a country, as well as four indicators (beyond income) of the determinants of access and quality. After testing the determinant indicators to see if they are, indeed, related to the quality and quantity of access, it uses them to suggest priority countries for particular

(*) The views and opinions in this paper are the author's own, and do not necessarily reflect those of the World Bank, its Executive Directors, or the countries that they represent. The paper borrows material from GRACE et al. (2001). Thanks to Christine QIANG for developing the ICT index.

types of donor intervention to overcome to digital divide. The paper then turns to limitations of the proposed approach and conclusions.

■ Literature Review

There are a number of 'Internet readiness rankings' widely available, and widely discussed, that might be considered a good basis for deciding which countries would be prioritised in a strategy to overcome the global digital divide. An example is the World Times Information Society Index (see http://www.worldpaper.com/). These indicators tend to share a number of weaknesses, including the use of arbitrary and unsupported constituent measures, then arbitrarily weighted to form one final 'Internet readiness' score. (Although others, such as McConnell International's E-Readiness Survey (http://www.mcconnellinternational.com/), do provide somewhat more detail for a limited number of countries). Aside from questions of accuracy, the relevance to policy makers of a single score covering such a wide topic has to be questioned – a single score, for example, provides no support as to what type of intervention would be most appropriate.

Perhaps most significantly, the final Internet readiness scores, and most of their constituent measures, are highly correlated with income. Income is correlated with about 80 percent of the variation in the number of telephone lines per capita across countries and a similar percentage of Internet users and hosts, for example. This remains (and probably always will) by far the best predictor of the comparative level of ICT rollout across and within countries. Even with further reform and technological advance, the cost of telephone services means that the majority of the population in developing countries could not afford a telephone in their home – let alone an Internet connection. Given that, it is an unrealistic expectation for countries to expect that, even with the aid of a DotForce, or an Opportunity initiative, they will be able to increase their Internet users per capita or e-commerce per capita to US levels. What is a far more interesting measure of who is falling behind in the race to become digital is a measure that indicates which countries have more or less e-commerce or Internet users per capita than would be expected given their income level. This would be a first step in determining countries for prioritization.

A second step towards providing policy makers with a usable tool for determining strategies to overcome the digital divide would be to provide indicators that suggested the types of intervention which would be most appropriate to support the development of a country's e-economy. This would require focusing on a set of indicators that can be linked to particular policy and investment interventions.

A number of recent econometric studies, including CANNING (1997) WHEELER (2000), KUBOTA (2000), REYNOLDS et al. (2001) and WALLSTEN (1999), have looked at determinants of information infrastructure penetration allowing for, but going beyond, income, looking at rollout of telecommunications in developing countries. Amongst other results, they have found that:

• Privatization is considered a significant determinant of cross-country telephone rollout by Reynolds and Kubota (although Wallsten finds it negatively correlated in the absence of a strong independent regulator). Kubota also argues that privatization reduces the waiting time for a phone to be installed, although privatization had a slightly positive effect on the cost of a local call. Across countries, those that have privatized their telecommunications systems have experienced much faster growth in their telecom service revenues and employment than those that have retained a state monopoly.

• Competition and independent regulation is seen as a significant determinant of rollout by Wallsten (although Kubota finds regulation negatively correlated) – Wallsten also finds that competitive markets have more payphones and cheaper local calls.

• Urbanization is found positively correlated with phones per capita by Kubota and Canning (who also found that area when allowing for population (effectively a measure of population diffusion) is negatively correlated with rollout). The same result is found by Wheeler for mobile telephones (although these results are contradicted by Wallsten). A user in an area of low demand density because of sparse population will still tend to have proportionately higher communications costs and lower available functionality. This phenomenon is firmly rooted in the basic cost economics of networks. Telephones in rural areas, requiring smaller exchanges, cost significantly more per line not only because each connection is further from the next, but also because economies of scale in switching cannot be achieved.

• Wheeler finds a broadly pro-competitive macro policy environment is correlated with mobile rollout, a similar result is found for lower expropriation risk by Wallsten. This might be linked with the skewed distribution of foreign direct investment in ICTs – and especially the extremely limited nature of flows to the rural areas of poorer economies.

Although separate studies of the determinants of Internet penetration are rare, those that have been carried out (including Africa Internet Forum, 1998 and WHEELER, 2000) suggest that similar factors are at play in determining hosts and users per capita.

■ Developing Indices of ICT Access, Cost and Quality, and Some Determinants

Building on the work of previous authors looking at determinants of information infrastructure rollout, this prioritization exercise is based on screening criteria used to distinguish between countries with significantly different ICT needs (1).

To identify to what extent a developing country has access to both a telecommunications network and network-enabled computers, Internet and telephone penetration in a country should be measured relative to its income level. The quality and price of provision is also vital, keeping in mind the quality of telecommunications infrastructure in a country largely determines the price of Internet service provision. With such rankings, it is possible to list countries that have both a lower than expected level of ICT provision given their GDP level and a quality and cost of service that is less than satisfactory.

To construct the rankings, as a proxy for Internet and telephone access alone, then, we use an index constructed out of the following three variables:

- Internet users per capita,
- Telephones per capita,
- Mobile telephones per capita (2).

(1) Data sources are World Bank (2000), ITU (2000), ITU (1999), ICRG (International Country Risk Guide, produced by IBC Publications Political Risk Services and *Institutional Investor* magazine's semiannual poll-based ranking of investment risk worldwide.

(2) The technique used is principal component analysys, chosen because the variables are highly correlated.

This index is used to rank countries in their absolute level of provision of ICTs. The absolute provision rankings are listed in the second column of the Annex table below. It is no surprise that this index is highly correlated with GDP per capita (3). More wealthy countries can clearly afford more computers and telephone lines than poorer countries. Given this, it is important to evaluate countries based on the level of ICT provision that would be expected given their income. To this end, countries are scored on a scale according to their actual index value compared to the index value which would be expected given their income levels. The country with the highest percentage score of actual compared to predicted ICT provision (more ICT rollout than would be expected given its income) scores one. Those with lower percentage score of actual compared to predicted ICT provision score higher. The relative provision rankings are listed in the third column of Annex table 3 below.

A second index is constructed to measure the elements of ICT development connected with cost and quality, consisting of the country's cost of local calls expressed as a percentage of the global average cost of a local call plus the country's cost of international calls expressed as a percentage of the average global cost of an international call plus the country's waiting time for the installation of a fixed telephone line as a percentage of the global average waiting time for telephone installation (4). In turn, this index is used to rank countries on service quality and cost. The country with the lowest rank score (best quality and cost) scores one, those with the higher rank scores have worse quality and cost (5). The cost and quality rankings are listed in the fourth column of Annex table 3 below.

The four indicators measuring the determinants of provision (beyond income) are defined as follows: competition, rural needs, small economies and institutional investor. These are discussed in detail below.

(3) The equation (ICT index) = 0.002016*(GDP/capita) - 3.347 has an R-squared of 0.85. In this calculation of 'expected level' of provision, all countries but Luxembourg (a siginificant outlier) with data on PPP GDP/capita and the ICT index were included.

(4) These are costs of a three minute local call, call to the US and waiting time in years (maximum value is ten) from the ITU.

(5) It should be noted that the index is correlated with income a regression of (index score = -1.23*log(gdp per capita) + 12.694) has an R-Squared of 0.53. However, many poor countries score well on the index. Unlike the relationship between telephones per capita and income per capita, then, this relationship is not a necessary feature of the consumption limits of poor populations.

• *Competition:* Probably the most important policy governments can follow to improve access to ICT is to introduce competition and private participation in the sector. To develop an index measuring reform progress, we develop a score of sector competition – it should be noted, however, that this measure covers only limited segments and provides no insight into the quality of regulation. Countries score one for a duopoly and two for full competition in each of the following sector segments:

- Local fixed telephony,
- Long distance fixed telephony,
- International telephony,
- Mobile analogue,
- Mobile digital.

In turn, this index is used to rank countries. Those countries with the highest index score (most competition) score one, those with lower index scores (least competition) score higher numbers [6]. Because there are only ten possible scores (1 to 10) and many more countries, a number are ranked equally. The competition rankings are listed in the fifth column of Annex table 3 below.

• *Rural needs:* provision of telecommunications services to sparsely populated areas is usually more expensive than to densely populated areas. In order to capture the effect of the higher cost of low-density service provision, an index is constructed using rural population density as a percentage of the global average plus the square of percentage rural population as a percentage of the global average. Those countries with the highest index score (small, dense rural populations) score one, those with lower index scores (large, diffuse rural populations) score higher numbers. The rural rankings are listed in the sixth column of Annex table 3 below.

• *Small economies:* face significant difficulties in exploiting scale economies. Minority language groups are likely to face a lack of local language content on the Internet that might significantly impair the technology's utility. The 'Small' column of Annex table 3 (number seven) below marks the smallest LDCs – those with a GDP of under US$1 billion.

• *Institutional investor:* both investment in the sector and the broader development of e-commerce are dependent on the policy and economic

[6] Data from the ITU.

environment for investment and business. In order to capture the quality of the investment environment, an index is constructed using two commonly accepted investment risk measures – ICRG and the *Institutional Investor* ratings [7]. In turn, this index is used to score countries. The country with the highest index score (most favorable investment environment) scores one, those with lower index scores (less favorable environment) score higher [8]. The Institutional Investor rankings are listed in the last column of Annex table 3 below.

■ Regression Analysis of Determinants of Provision and Quality

The Annex reports on a regression analysys of the four determinant indicators above, used to determine if they are indeed linked to the level, ocst and quality of ICT access in developing countries. A number of results from the ten regressions are worth noting. First, the cost/quality index is far better explained by the four determinant indicators than is the ICT provision index. Seventy five percent of the variation in cost and quality as proxied by the index is explained by the four indicators, compared to just fourteen percent for the provision index. This is in part explained by the fact that the cost/quality index is not correcterd for the influence of income, but it also suggests that institutional factors play a far larger role in determining cost and quality than they do in explaining network rollout. Factors that the four indicators do not account for have the dominant role in explaining the level of ICT provision, a point that we shall return to.

Second, telephony competition does appear to have a large and significant impact on both ICT access and cost/quality. Moving from no

[7] The two rankings are highly correlated. The equation Institutional Investor credit rating = 0.8757*EXP(0.0536*ICRG rating) has an R-Squared of 0.83. Given this, we use the Institutional Investor ranking where it is available, and compute its value from the ICRG rating using the regression coefficients where there is an ICRG rating but no Institutional Investor rating.

[8] As with the ICT index, this ranking is highly correlated with income. An equation GDP/capita = -7746.1*LN(Institutional Investor Score) + 39277 has an R-Squared of 0.8. It is inappropriate to regress the index against GDP/capita and use the residual as an index variable because investors do not care about the risk of a country compared to that which would be expected from its income level, but the *absolute* risk of the country in making investment decisions.

competition in fixed or mobile provision to full competition in both improves a country's relative ranking in provision by 17 places (out of a possible 130) and cost/quality by 14 places (out of a possible 111).

Third, improving the investment climate, as measured by institutional investor rankings, also has a significant impact. Moving from the bottom of the rankings to the top is not feasible for a country, given the high correlation between institutional investor rankings and GNP per capita. However, small changes are possible by improving factors such as macroeconomic management or policies and regulations. The importance of the broad investment climate suggests that sector reform is likely to be limited in its impact unless it is accompanied by a wider set of improvements in the macroeconomic environment – a point returned to later.

Fourth, small countries do see significantly higher costs of service. Countries with a GNP of under $1billion drop 26 places on the cost/quality index because of this factor alone. Having said that, there is a strong negative correlation between smallness and provision indices, suggesting a positive relationship between small status and rollout. The figures suggest that small economies rise 72 places up the relative provision index (out of a possible 130) due to this factor alone. This might be related to the fact that many of these countries are small island economies with highly concentrated populations.

Finally, a large, highly dispersed rural population does not appear to be connected with lower scores on the relative provision index. This result stands in contrast to results by Kubota, Canning and Wheeler mentioned above. One possible reason for this is that the impact of a large, dispersed rural population is larger on the relative provision of services within a country (with a high concentration in cities and almost (or) no service in rural areas), rather than on relative services across countries. Given the fact that other studies have found rural dispersion a significant problem and the measure used here for provision is ill-designed to capture such internal disparities, the next section assumes that rural dispersion remains a problem.

■ Targeting Strategies Based on the Indices

With some empirical support for the importance of the chosen determinant characteristics on the rollout and quality of ICT infrastructure, we now turn to the policy uses of such indices. Table 1 lists priority countries for various types of support based on this methodology.

Looking first at competition, priority countries in this context would be countries that have not made significant progress toward sector reform, but stand to gain considerably from doing so given their low levels of penetration. Our measure of competition in the telecommunications sector, combined with the measure of ICT penetration, can be used to suggest some of the countries that might receive the maximum benefit from sector reform, and thus be priority countries for donor assistance. The 'Reform' column of Table 1 below marks some of these countries. It lists countries in the lower third of the global absolute ICT score and the lower half of the global reform score.

Turning to the investor index, as noted, this is highly correlated with GDP per capita, suggesting that it is hard to significantly improve it in the short term. Nonetheless, these might also be countries might be those which would gain most from broader institutional reform, and are therefore good targets for broad-based donor technical support as part of a package to support narrowing of the digital divide. These countries are also likely to find it harder to attract private investment to the ICT sector, even if the sector itself is reformed. Countries with more reformed ICT sectors, but poor investor rankings should be priority countries for the private-sector arms of donor institutions such as the IFC and EBRD. The 'Investor' column lists those countries in the top half of the competition ranking and the lower third of Institutional Investor rankings.

The regression analysis provides mixed evidence for the thesis that countries of small size (GDP below US$1billion), suffer from diseconomies of scale in infrastructure. Nonetheless, small economies such as island states are likely to be particularly dependent on a strong ICT sector (to support service exports, for example) and should be able to benefit from regional support from donor organizations to take advantage of economies of scale. The 'small' column of Table 1 below lists those developing countries with a GDP of below $1 billion.

Finally, countries with a large percentage of dispersed population should be a focus of donor support because they are less likely to attract private investment – especially in support of universal access goals in rural areas. These countries should in particular be possible recipients of donor support for universal access funds. This option is, however, predicated on a somewhat open sector (to ensure that universal access funds are used efficiently). The 'Rural' column of Table 1 below marks countries that face

significant rollout barriers due to large, dispersed rural populations, but also have comparatively competitive sectors. The rural column list countries in the lower quarter of the rural ranking and the top half of the competition ranking.

■ Weaknesses with the Prioritization Approach and Conclusions

While the criteria described above might provide a useful first filter for suggesting priority countries and the types of intervention that are likely to maximize the development impact of spending, they are still subject to numerous methodological and theoretical limitations.

• The measures used to construct indices are frequently proxies. For example, the extent of public access is probably a far more important development impact measure than phones per capita, for example. Because the extent of public access is not available, phones per capita is used instead, but in some cases this will be a poor measure of access.

• The measures exclude very important segments of the sector including posts and broadcasting. These segments are hard to quantify, numbers are not available, or their inclusion would over-complicate the approach. Data limitations also mean that a number of countries have to be excluded from the analysis.

• Empirically, and especially for the rollout variable, the measures miss a large percentage of the cause in variation in provision and/or use. This suggests that there are many factors inside the sector (such as the strength of the regulatory regime) or outside the sector (such as the availability of technically literate users) not captured here which are very important in determining rollout and use. This links to the importance of the broad institutional investor ranking in determining ICT provision. No effort to overcome the digital divide can be limited to sector support alone, then.

• Finally, the measures are based on the idea that it is most important for donor initiatives to assist countries falling behind, when the maximum development impact might in fact be garnered by assisting countries already doing well to do better.

The measures, therefore, are by no means a substitute for a detailed analysis of individual country circumstances, which might suggest a different set of priority countries. For example, due to their past development record, some countries are particularly well suited to take advantage of the networking revolution. While India is in some senses already falling behind in terms of access, its strong technical tertiary education system has provided the basis for a thriving export market in software. With support for further sector reform, India could turn already significant benefits from the global expansion of the ICT sector into countrywide economic growth. Russia, similarly, has a large stock of technical skill that could be used as an engine for development if the broader institutional climate became more attractive. Both these countries have been listed as priorities for donor investment due to other factors, but others might be excluded if 'negative' quantitative rankings were all that were used to judge donor priority countries.

China is another country already exploiting a strong technical skill base to build an internationally competitive IT sector. Although it currently has a fairly advanced ICT infrastructure given its level of income per capita, it risks falling behind and losing opportunities for further expansion of IT exports if it does not reform the II sector. It is not listed above, but China is likely to be a priority country for intervention. Jamaica, a country that could benefit from its proximity to the United States and English-speaking population, is another example.

Having suggested the weaknesses in this prioritization approach compared to detailed country studies, it should be pointed out that this approach does provide a firmer source of guidance than the Internet readiness indices that have been constructed to date. Because they are based on the understanding that absolute country 'readiness' on any of these scales is likely to be highly correlated with income per capita, and that any one measure of 'readiness' is likely to be of little help to donor policy makers in designing programs, the indices developed in this paper present a more nuanced approach that can, at the least, provide a first step towards prioritization.

Table 1: Priority Developing Countries

	Reform	Rural	Small	Invest
Albania	x			
Algeria	x			
Angola	x			
Antigua and Barbuda			x	
Argentina				
Azerbaijan				x
Belarus				x
Belize			x	
Benin	x			
Bhutan			x	
Botswana	x			
Burundi			x	
Cambodia		x		
Cameroon	x			
Cape Verde			x	
Central Af. Rep.		x		
Comoros			x	
Congo, Dem. Rep.				x
Congo, Rep.	x			
Cote d'Ivôire	x			
Djibouti	x		x	
Dominica			x	
Egypt, Arab Rep.	x			
Equatorial Guinea			x	
Eritrea			x	
Ethiopia	x			
Gabon	x			
Gambia, The	x		x	
Georgia				x
Grenada			x	
Guatemala	x			
Guinea				x
Guinea-Bissau			x	
Guyana			x	
Haiti				
Honduras		x		x
India	x			
Kazakhstan		x		
Kenya	x			
Kiribati			x	
Kyrgyz Republic		x		
Lao PDR				
Lesotho	x			
Liberia			x	
Madagascar		x		x
Albania	x			
Maldives			x	
Mali	x			
Marshall Islands			x	
Mauritania	x			
Micronesia, Fed. Sts.			x	
Mongolia	x			
Morocco	x			
Mozambique	x			
Namibia	x			
Nicaragua	x			
Niger		x		
Nigeria		x		x
Pakistan				x
Pala			x	
Papua New Guinea	x			
Russian Federation				x
Rwanda	x			
Samoa			x	
Sao Tome and Principe			x	
Senegal		x		x
Seychelles			x	
Sierra Leone			x	x
Solomon Islands			x	
Somalia				x
South Africa		x		
St. Kitts and Nevis			x	
St. Lucia			x	
St. Vincent and the Grenadines			x	
Sudan		x		x
Suriname			x	x
Swaziland	x			
Tanzania				x
Thailand		x		
Togo	x			
Tonga			x	
Tunisia	x			
Turkmenistan		x		
Uganda		x		x
Ukraine				x
Uzbekistan		x		x
Vanuatu			x	
Yemen, Rep.	x			
Zambia	x			
Zimbabwe		x		x

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Annex

Annex Tables 1 and 2, below, list results of testing the determinants indices against our ICT provision and cost and quality indices. Table 1 has the relative provision rank (column three of Annex Table 3) as the dependent variable, Table 2 has the cost/quality rank (column four of Annex Table 3) as the dependent variable. The independent variables in the first column are the determinant indices described above – competition, rural needs, small and institutional investor (columns five through eight of Annex Table 3). Five regressions are run for each dependent variable, with each determinant index alone, and then all determinant indeces together. The fifth regression in the last column of Table 1 is thus a statistical test of the strength of the model:

$$\text{Relative Provision} = (\text{a constant}) + \alpha^{*}(\text{Competition}) + \beta^{*}(\text{Institutional Investor}) + \chi^{*}(\text{Small}) + \delta^{*}(\text{Rural Needs})$$

Where α, β, χ and δ are constant coefficients to be calculated by the regression.

For each regression, the first number listed in each (determinant index) row is the coefficient, the second, smaller italic, number is the t-statistic. The last number in each column is the R-squared value. (For non-statisticians, the coefficient measures how large is the unit change of the dependent variable (ICT provision or cost/quality) for a unit change in the independent variable (the determinant index), the t-statistic measures how reliable is the relationship between the two varaibles (with a t-statisitc of above approximately 1.6 indicating that there is a ninty percent chance or better that changes in the two variables are linked), and the R-squared measures the percentage of variation in the dependent variable that is linked with changes in the independent variable(s) in the regression.)

Table 1: Determinants of ICT Provision

OLS Regression, Dependent variable is relative ICT provision ranking Independent Variable	Regression				
	1	2	3	4	5
Constant	56.35	49.96	66.72	59.11	44.91
	8.87	*7.67*	*20.34*	*8.08*	*5.40*
Competition	0.16				0.15
	1.78				*1.68*
Institutional Investor		0.23			0.24
		3.73			*2.55*
Small			-52.72		-72.23
			-2.44		*-2.03*
Rural Needs				0.08	-0.03
				1.18	*-0.37*
R-Squared	0.03	0.10	0.04	0.01	0.14

Table 2: Determinants of ICT Cost and Quality

OLS Regression, Dependent variable is relative ICT cost/quality ranking Independent Variable	Regression				
Constant	33.97	12.03	53.71	34.87	8.56
	6.11	3.73	*17.00*	*5.66*	*1.94*
Competition	0.35				0.12
	4.83				*2.54*
Institutional Investor		0.68			0.62
		15.64			*11.19*
Small			26.04		24.77
			2.70		*2.05*
Rural Needs				0.25	-0.01
				4.30	*-0.16*
R-Squared	0.18	0.73	0.06	0.15	0.75

Table 3: Full Rankings for All Countries

Country	Provision		Cost/		Rural	Small	Institutional
	Absolute	Relative	Quality	Competition	Needs	State	Investor
Afghanistan				114	180	0	150
Albania	120	105	72	114	127	0	134
Algeria	111	111	93	114	110	0	98
American Samoa					9	0	
Andorra	34		23	114		0	
Angola	137	76		114	166	0	137
Antigua and Barbuda				114	89	1	
Argentina	65	87	59	56	60	0	61
Armenia				114	64	0	121
Aruba	55					0	
Australia	18	53	24	1	81	0	22
Austria	12	47	12	21	86	0	8
Azerbaijan	100	15	110	56	109	0	111
Bahamas, The	63	98		114	22	0	53
Bahrain	45	73	35	114	7	0	46
Bangladesh	146	56		47	29	0	97
Barbados	51			82	32	0	56
Belarus	78	70	77	56	105	0	133

Country	Provision		Cost/		Rural	Small	Institutional
	Absolute	Relative	Quality	Competition	Needs	State	Investor
Belgium	28	78	20	1	47	0	12
Belize	71	22	27	114	137	1	
Benin	136	122	70	114	158	0	124
Bermuda	6	29				0	
Bhutan			87	114	171	1	
Bolivia	89	6		82	104	0	89
Bosnia and Herzegovina	98		83	114	97	0	
Botswana	103	109	53	82	133	0	39
Brazil	80	81		47	75	0	72
Brunei	49	92		104	6	0	13
Bulgaria	62	10		114	108	0	82
Burkina Faso				114	182	0	118
Burundi			108	56	113	1	
Cambodia	132	128		40	184	0	
Cameroon	142	91	98	114	161	0	125
Canada	14	60	4	1	98	0	15
Cape Verde			78	56	50	1	
Cayman Islands	30					0	
Central African Republic			68	56	169	0	
Chad			91	104	183	0	
Channel Islands						0	
Chile	59	54	29	1	55	0	30
China	97	55	51	40	65	0	38
Colombia	73	61	47	33	33	0	60
Comoros				114	124	1	
Congo, Dem. Rep.	149	115		1	122	0	141
Congo, Rep.	135	126		114	27	0	146
Costa Rica	72	68	40	114	34	0	65
Cote d'Ivoire	119	9	81	82	136	0	100
Croatia	47	16	58	56	128	0	66
Cuba				114	88	0	135
Cyprus	33	65	54	114	79	0	34
Czech Republic	42	51	33	79	87	0	31
Denmark	7	36	16	1	70	0	11
Djibouti	127			104		1	
Dominica	66	17		114	25	1	
Dominican Republic				1	66	0	80
Ecuador	94	32	42	82	68	0	108
Egypt, Arab Rep.	106	84	90	104	20	0	55
El Salvador	87	44		1	56	0	73
Equatorial Guinea				114	155	1	

Country	Provision		Cost/		Rural	Small	Institutional
	Absolute	Relative	Quality	Competition	Needs	State	Investor
Eritrea			103	56	78	1	
Estonia	38	8	64	79	118	0	51
Ethiopia	148	116	106	114	160	0	128
Faeroe Islands	31					0	
Fiji	91	79	44	114	144	0	
Finland	4	20	15	21	111	0	14
France	24	71	5	19	85	0	3
French Polynesia	68	110			12	0	
Gabon	115	114		114	72	0	107
Gambia, The	123	3	104	114	139	1	74
Georgia	92	93		40	82	0	139
Germany	26	74	9	21	54	0	2
Germany, F.R. (former)						0	
Ghana	130	101		33	123	0	81
Greece	25	27	28	82	116	0	32
Greenland	37		43			0	
Grenada				114	11	1	127
Guam	46				16	0	
Guatemala	108	96		82	95	0	90
Guinea	138	112	69	56	99	0	129
Guinea-Bissau				114	172	1	140
Guyana				82	173	1	96
Haiti			105	114	42	0	138
Honduras	110	57	102	56	141	0	115
Hong Kong, China	8	30	25			0	28
Hungary	44	48	22	104	126	0	36
Iceland	3	25	13	82	30	0	25
India	124	102	61	82	148	0	59
Indonesia	116	94		47	48	0	95
Iran, Islamic Rep.	95	97	75	114	114	0	92
Iraq				114	80	0	144
Ireland	27	77		82	135	0	16
Isle of Man						0	
Israel	15	24	31	56	45	0	40
Italy	20	49	21	1	74	0	19
Jamaica	70	7	86	56	39	0	87
Japan	19	66	30	1	23	0	10
Jordan	96	72		114	35	0	70
Kazakhstan	99	88		19	162	0	84
Kenya	133	125	100	114	106	0	102
Kiribati				114		1	

Country	Provision		Cost/		Rural	Small	Institutional
	Absolute	Relative	Quality	Competition	Needs	State	Investor
Korea, Dem. Rep.				114	43	0	148
Korea, Rep.	21	21	8	1	28	0	37
Kuwait	56	99	74	79	15	0	33
Kyrgyz Republic			111	40	168	0	
Lao PDR			67	114	152	0	
Latvia	48	13	71	104	115	0	64
Lebanon	52			104	38	0	77
Lesotho	128	63		114	143	0	
Liberia				114	19	1	142
Libya				114	62	0	86
Liechtenstein				114		0	
Lithuania	57	19	65	47	121	0	68
Luxembourg	1	18	10	21		0	6
Macao, China	35		19			0	
Macedonia, FYR	77	26	63	114	117	0	
Madagascar	145	119	99	1	154	0	103
Malawi	141	120	109	114	140	0	112
Malaysia	58	43	38	1	46	0	44
Maldives			80	114	1	1	
Mali	147	117		114	178	0	131
Malta	40	67	34	114	31	0	27
Marshall Islands				114		1	
Mauritania	104	1		114	102	0	
Mauritius			48	82	49	0	42
Mayotte						0	
Mexico	81	90	26	21	84	0	49
Micronesia, Fed. Sts.	79		62	56		1	
Moldova	88	5	92	82	164	0	130
Monaco				114		0	
Mongolia	117	4		114	132	0	93
Morocco	107	85	39	114	138	0	58
Mozambique	144	121		114	131	0	116
Myanmar				114	165	0	122
N. Mariana Islands						0	
Namibia	101	104		114	179	0	69
Nepal				114	130	0	94
Netherlands	16	52	1	1	44	0	4
Netherlands Antilles	53				24	0	
New Caledonia	64		50		21	0	
New Zealand	22	37	2	21	67	0	24
Nicaragua	112	64		82	153	0	136
Niger				56	185	0	99

Country	Provision		Cost/		Rural	Small	Institutional
	Absolute	Relative	Quality	Competition	Needs	State	Investor
Nigeria				21	150	0	123
Norway	5	35	3	33	77	0	9
Oman	86			114	4	0	43
Pakistan				56	129	0	113
Palau					101	1	
Panama	75	45	56	104	100	0	62
Papua New Guinea	129	113		114	2	0	78
Paraguay	85	46		82	149	0	79
Peru	93	83	49	21	69	0	71
Philippines	105	86	76	1	40	0	52
Poland	60	42	60	47	112	0	35
Portugal	23	28	18	56	96	0	21
Puerto Rico	39				5	0	
Qatar	50			114	26	0	45
Romania	76	62	88	82	145	0	88
Russian Federation	82	80		33	94	0	117
Rwanda	143			114	90	0	
Samoa				114	181	1	
Sao Tome and Principe			85	114	3	1	
Saudi Arabia	83	106	79	114	58	0	41
Senegal	125	129	57	56	146	0	106
Seychelles			73		8	1	85
Sierra Leone				56	63	1	149
Singapore	13	58	14	40		0	17
Slovak Republic	43	39	52	104	125	0	63
Slovenia	32	41	45	104	73	0	29
Solomon Islands				114	76	1	
Somalia				40	93	0	145
South Africa	69	82		47	157	0	54
Spain	29	50	17	21	83	0	18
Sri Lanka	114	100	94	21	17	0	76
St. Kitts and Nevis					120	1	
St. Lucia				114	10	1	
St. Vincent + Grenadines			55	114	13	1	
Sudan	139	2	107	56	176	0	147
Suriname			95	47	61	1	110
Swaziland	113	108		114	156	0	83
Sweden	2	14	7	1	71	0	20
Switzerland	9	59	11	21	36	0	1
Syrian Arab Republic			112	114	142	0	105

Country	Provision		Cost/		Rural	Small	Institutional
	Absolute	Relative	Quality	Competition	Needs	State	Investor
Taiwan, China	11	34				0	23
Tajikistan				82	103	0	
Tanzania	140	118	97	33	59	0	114
Thailand	90	95	46	47	174	0	48
Togo	118	130	96	82	175	0	126
Tonga				114	134	1	
Trinidad and Tobago	74	89	37	82	37	0	57
Tunisia	102	107	66	114	107	0	47
Turkey	61	23	36	82	92	0	67
Turkmenistan				40	163	0	
Uganda	134	127		56	177	0	109
Ukraine	84	12		33	119	0	120
United Arab Emirates	36	69	32	114	14	0	26
United Kingdom	17	40	6	1	51	0	7
United States	10	75		1	91	0	5
Uruguay	54	38	41	56	57	0	50
Uzbekistan	109	11		33	147	0	119
Vanuatu				114	159	1	
Venezuela, RB	67	33		47	52	0	75
Vietnam	122	31		56	41	0	91
Virgin Islands (U.S.)	41				18	0	
West Bank and Gaza			84			0	
Yemen, Rep.	126	124		82	53	0	104
Yugoslavia, FR			89	21	151	0	143
Zambia	131	123	101	82	170	0	132
Zimbabwe	121	103	82	56	167	0	101