Connectivity Scorecard 2011

China

China
2.72

	Score	Weight
Consumer Infrastructure	0.51 (0.88)*	0.08
Consumer Usage and Skills	0.63 (0.70)*	0.08
Business Infrastructure	0.22 (0.64)*	0.67
Business Usage and Skills	0.14 (0.71)*	0.11
Public sector Infrastructure	0.31 (0.83)*	0.05
Public sector Usage and Skills	0.32 (0.68)*	0.01

*The score of the leading performer for this component

Table 1: Component Scores & Weights 2011

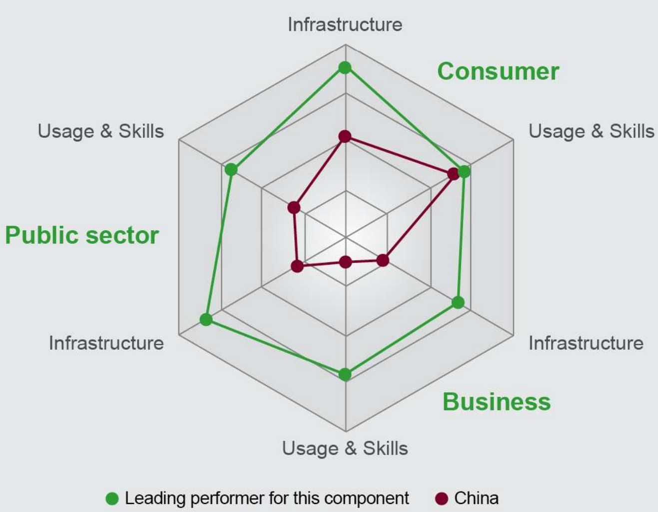

Fig 1: Component Scores 2011

Overview performance

With a score of 2.72, China climbs three places to finish 14th amongst the resource and efficiency-driven[1] economies on the Connectivity Scorecard 2011 In 2010, China finished 17th, but with a higher score of 3.14. The rise in the ranking accompanied by a fall in the actual score suggests that the use of additional metrics in the Connectivity Scorecard this year had the effect of creating significantly more inequality in the scores between countries. In particular, this was true of the "business usage" component where certain countries were very well ahead of the rest of the pack on some of the indicators.

Strengths and Weaknesses

China's strongest performance is in the "consumer usage and skills" component, propelled mainly by relatively strong uptake of data messaging services by mobile users, as well as by reasonable or at least moderate performances on other components. It should be noted that since the adult literacy rate was one of the metrics used, this actually had an equalising effect on the dispersion of scores between countries.

China's performance on the two business components of the Scorecard appears rather weak. However, this weakness is explained to some degree by the fact that the median scores for these two components is a mere 0.20 and 0.29 respectively. We explain this in greater detail when we discuss the business-related components of the Scorecard later. Similarly, the inclusion of data from WITSA's Digital Planet publication on ICT spending in government, healthcare and education does not work to China's advantage, at least in terms of achieving a high score.

[1] As defined by The World Economic Forum www.weforum.org

Detailed discussion

Consumer infrastructure

China's score on this component is quite respectable. Indeed China appears to have leapfrogged dial-up Internet and gone straight to broadband, where in terms of household broadband penetration it is one of the better performers. China also does well in terms of fixed-line penetration. Somewhat surprisingly China is not a particularly strong performer (although certainly not weak) on the two measures of mobile penetration that we included—we included both "unique user" penetration rates and the more conventional (but more misleading) "mobile subscribers per 100 population" measure.[2] On both measures, China lags well behind Latin American countries and some others.

Consumer usage

On consumer usage, China performs very strongly. The reason for this is that the country has respectable performances on almost all metrics, a very strong performance on data messaging usage among mobile subscribers, and like many countries has adult literacy above 90 percent. Consequently, China's overall score on consumer usage reflects a consistent performance, with one or two areas of strength. Further, China benefits from the "equalising" influence of including the adult literacy measure in consumer usage. The purpose behind including this measure is that in many countries, a large portion of adults might conceivably lack even the basic skills required to use even basic forms of ICT. However, at least as far as adult literacy is concerned, there is increasing universality of literacy in the sample of countries that we have included.

Business Infrastructure and Business usage and skills

China does not register a high score on these two components of the Scorecard. But part of the explanation for this is because of data constraints relating to other indicators in the business infrastructure and business usage and skills components, we included data on ICT exports of goods (under infrastructure), and ICT imports of goods and exports of services (under usage). The justification for these seemingly idiosyncratic choices is as follows: high levels of ICT exports are likely to be quite correlated with the development of a reasonably strong ICT ecosystem. Similar to the car industry, ICT manufacturing in one area is likely to spawn spill-over

Rank [*]	Country	Connectivity Score
1 [1]	Malaysia	6.61
2 [3]	Chile	6.21
3 [5]	Russia	5.68
4 [7]	Turkey	5.51
5 [4]	Argentina	5.46
6 [6]	Brazil	5.14
7 [8]	Mexico	4.87
8 [10]	Ukraine	4.81
9 [2]	South Africa	4.68
10 [9]	Colombia	4.06
11 [12]	Thailand	3.68
12 [13]	Tunisia	2.79
13 [15]	Vietnam	2.73
14 [17]	China	2.72
15 [14]	Iran	2.41
16 [19]	Philippines	2.15
17 [n/a]	Syria	2.11
18 [20]	Indonesia	2.01
19 [16]	Sri Lanka	2.01
20 [18]	Egypt	1.89
21 [21]	India	1.25
22 [25]	Pakistan	1.14
23 [23]	Nigeria	1.09
24 [22]	Kenya	0.95
25 [24]	Bangladesh	0.90

*last year's rank in parenthesis

Table 2: Connectivity Scorecard 2011 Results – Resource & Efficiency-driven Economies

effects into ICT in other manufacturing and ICT investment in complementary areas (for instance, an initial advantage in computer assembly might lead to the location of mobile handset assembly in the country. This in turn will likely have positive spill-over effects into the wider economy). Not all countries are ICT exporters or need to have ICT or export-led growth strategies, however. Here high levels of ICT imports might suggest a high level of domestic demand for ICT and thus be correlated with high levels of usage.[3] High levels of ICT service exports are very likely to correlate with the presence of a critical mass of ICT user skills in the economy, which in turn could enable countries to support strong ICT sectors despite large sections of the population without ICT skills. Such is the case

[2] The rationale for including both metrics is that there was a good deal of missing data for many countries on the "unique user" metric, thus we compensated for that missing data by using a second measure.

[3] In fact, a good argument could be made that the "ICT imports" indicator should be stuck under the "business infrastructure" component since they could also be correlated with business investment. This does not, however, make much of a difference to the overall scores.

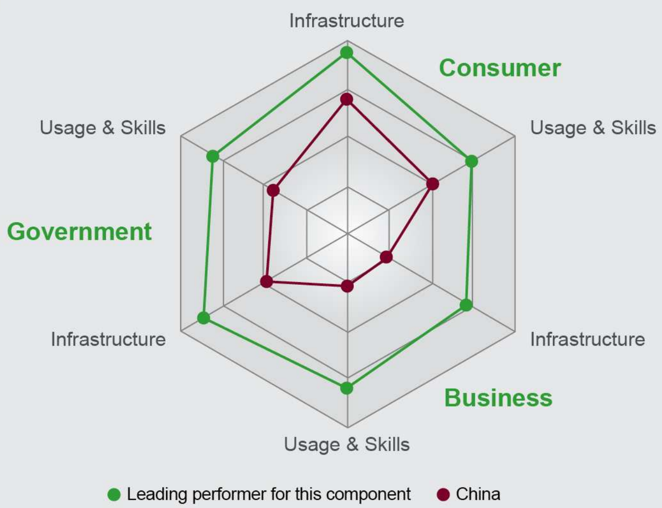

Fig 2: Component Scores 2010

for India, but not for China. While China is actually one of the leading ICT exporters and importers (measured on a $ per capita basis), it is far below Malaysia (the leading country on both these measures). The same is true when one looks at ICT services exports, where China exports very little comparative to India. For this reason, China's overall score suffers on the business usage and skills as well as the business infrastructure component of the Scorecard.

Other than these measures of ICT trade, on the business usage component (where China registers its weakest performance) telecom revenue per capita (although this reflects both business and consumer revenues) is relatively low, and so is spending on IT services. Further, on other spending metrics China lags well behind Malaysia and South Africa (which tends to be strong on business-oriented spending metrics, fuelled by a sophisticated corporate sector).

Public Sector Components

Again, China's performance on metrics of public sector spending and investment in ICT suffers from the inclusion of new data from WITSA'S Digital Planet dataset, as already mentioned. As best we can tell, reported levels of government, educational and healthcare spending are generally fairly weak in relation to the countries that come at the top for these metrics. However, China registers a reasonable score on the e-Participation metric used by the United Nations as part of its E-Government index; but it does not perform particularly well on the "online service index" that is also part of the U.N.'s measurement effort.

Comparison of 2011 and 2010 results

In 2010, China finished 17th, but with a higher score of 3.14 compared with 14th and a score of 2.72 this year. For the Resource and Efficiency economies, two major differences drive the difference in scores and rankings this year[4]. First, there is the use of new weights that have a particular effect on the split between "infrastructure" and "usage and skills" in the business and government components of the Scorecard. Using Conference Board data we are able to obtain weights specifically for the relative contributions of ICT capital and labour force improvements to economic growth, from which the split between infrastructure (capital) and usage and skills is derived. In general, this change has resulted in more weight put on the "business infrastructure" component than in previous Scorecards. For the Resource and Efficiency economies, we were not able to previously split the weights between infrastructure and usage and skills using data that specifically measures the contribution of ICT.

Further, the inclusion of new indicators has made a significant difference to countries' relative performance on the business components of the Scorecard. This, however, has been discussed in detail above.

Had we used 2010 weights, China would have obtained a ranking of 14th, and a score of 2.95. Further, the difference in scores on different components of the Scorecard is shown in Table3.

	2011 Score	2010 Score
Consumer Infrastructure	0.51	0.69
Consumer Usage and Skills	0.63	0.50
Business Infrastructure	0.22	0.23
Business Usage and Skills	0.14	0.27
Public Sector Infrastructure	0.31	0.48
Public Sector Usage and Skills	0.32	0.43

Table 3: Changes in Component Scores between 2010 and 2011

The Connectivity Scorecard is based on comparative scores between countries, and, therefore, each country's performance is measured in relation to the best performing nation in each component at a given point of time. As

[4] For more information download the Connectivity Scorecard 2011 Report from www.connectivityscorecard.org

with other indices of relative rankings, it is therefore hard to interpret the Connectivity Scorecard in terms of absolute “improvements” or “deteriorations” and to make comparisons of scores over time.

The Broader Context

Perspective on China’s performance

The fact that China has always lagged behind countries such as Malaysia, Chile and Turkey on the Connectivity Scorecard has been perhaps a source of surprise for some. On the other hand, it is well to remember that for the most part, China has been playing catch-up to these countries economically. In nominal dollar terms, Chinese per capita GDP is now just over 50% of that of Malaysia and much less than 50% of the level of Chile. Thus it is not surprising that the country has something of a two-tier economic identity: that of a major economic power with enormous scale, and that of a developing, although fast-growing country, with striking regional and urban-rural disparities. Further, there is likely a difference between large businesses in coastal cities which are fast approaching the sophistication of their foreign peers, and a vast tail of smaller businesses for whom ICT adoption cannot be expected to be a priority.

China’s broadband efforts

China, however, has characteristically high ambitions in the broadband field. For one thing, China claims to have more than 450 million broadband users, easily dwarfing the United States (it is unclear, however, what is being counted as a broadband user, since most other countries report data in terms of broadband *subscribers* and Internet *users* (this is the case for most data reported by the ITU). It is also unclear whether, for example, someone who uses Wi-Fi access occasionally in cafes and the like gets counted as a broadband user—indeed the measurement concept seems decidedly odd. Interestingly, mobile Internet users make up the majority of Internet users in China, some two-thirds.[5]

More understandable and comparable data confirms the massive growth in broadband subscriptions in China. Thus China passed the U.S. in broadband subscribers in late 2008 and has roared well ahead, accounting for a very high share (perhaps as much as 40%) of total broadband additions worldwide. Even more interesting, China’s authorities are not content with basic broadband and are committed to building out next-generation networks. Again, the merits of diverting large amounts of public money into ultra-broadband networks are questionable. But the ambitions that China has in this regard are striking too. In February 2011, China Telecom announced that it planned to deploy fibre-optic networks in every city in China and to convert all copper lines to fibre. Further, the Chinese government apparently aims to invest CNY 2 trillion (or roughly $300 billion) in all forms of telecommunications networks over the course of China’s current five-year plan. These are staggering sums of money, far eclipsing the very modest commitments made to broadband investment in the U.S. stimulus package (which was under $10 billion). More interestingly, China Telecom sees itself as a comprehensive telecommunications services provider—it thus plans to increase its offers of cloud computing and other services.[6]

In broadband deployment as in so many other things, then, China is beating its own path. While most advanced nations have lengthy debates and extensive analysis of the merits of such large-scale government intervention, China has been characteristically decisive. Further, given the country’s rapid economic growth, it is all but certain that private investment too will be abundant. Despite its large base of broadband and mobile Internet subscribers in absolute terms, in relative terms, China lags well behind in Internet and broadband uptake. Given the vast untapped market in China, it surely should not be too difficult to tap private investment.

However, China is not a trouble-free zone when it comes to the telecommunications industry. The long-standing restrictions against foreign participation have gradually (but certainly not completely) been lifted. 3G licenses were issued only in early 2009, and the entire country has three domestically oriented mobile operators. Further, the Chinese government continues to attempt to foster domestic communications standards, even though the adoption of such might isolate China from the benefits of global development (to be fair, China permits multiple standards for 3G including WCDMA and CDMA2000, but it also issued a license for the indigenous TD-SCDMA standard). It is unclear whether such intervention produces the best results for consumers. Certainly, the delay in issuing 3G licenses was at least partly related to the government’s attempts to promote the indigenous standard, and this delay in 3G and mobile broadband adoption unambiguously hurt both Chinese consumers and the wider Chinese economy.

Further, China’s industrial policy approach in telecommunications might end up wasting large amounts of capital. In urban areas, especially those with the density of population of China’s urban areas, there may

[5] Source: Stacey Higginbotham, “Oh It’s Fast: China’s Broadband Growth, That is”, Gigaom.com, January 24th 2011.

[6] See, for example, http://www.telecompaper.com/news/china-telecom-unveils-fibre-broadband-plans.

be no need to provide as much government investment as is being provided, and where private investment might be subject to the disciplines of investors who demand returns, government investment in large-scale infrastructure projects are not always efficient. Indeed, Professor Michael Pettis of Guanghua University argues that China as a whole wastes capital on a massive scale. His argument is that artificially low capital costs and political incentives to push prestigious infrastructure projects lead to tremendous misallocation of capital. Projects that would not pass any sort of cost-benefit test in many countries might go ahead in the current bullish environment in China, for instance.[7]

In the short-term, China's economy can continue to grow because there are still "low-hanging" fruit to be plucked in China, unlike the United States. China still has Internet not-spots to fill up, it still has large pools of underutilised human capital, it still can earn very high returns from modest investments in improving labour force participation and quality. These factors likely mean that the misallocation of capital and the lack of any cost-benefit analyses around the merits of large-scale public spending on fibre-optic broadband networks are not immediate issues.

However, at some point in its growth process, China will have to allocate capital more parsimoniously and more discreetly. In the short-term, China's eye-catching efforts in the telecommunications world certainly look impressive, but in the longer term they might prove more questionable. Government intervention designed to boost certain technologies at the expense of others might not just hurt consumers, but it may misdirect valuable investment resources at ultimately unviable projects. A more market-oriented approach, one that allows competition and consumers and businesses to determine the optimal technological standard and the optimal mix between different types of broadband platforms (fixed, wireless, fibre, part-fibre), might be appropriate to consider. In fact, given the good track record of private investment in deploying advanced wireless (particularly) and broadband infrastructure in most parts of the world, government intervention might be more usefully targeted at the other element that the Connectivity Scorecard dwells upon: improving adoption, usage and user skills, especially in non-urban areas and especially in smaller services sector firms.

About Connectivity Scorecard

The Connectivity Scorecard is a global ICT index which, unlike other available research, is the first of its kind to rank countries in terms of "useful connectivity". That is, not only on the deployment of ICT infrastructure but also to measure the extent to which consumers, businesses and the public sector "make use" of connectivity technologies to enhance social and economic prosperity. This "useful connectivity" is defined as the bundle of infrastructure, complementary skills, software and informed usage that makes ICT the key driver of productivity and economic growth.

Commissioned by Nokia Siemens Networks, the study was created by Professor Leonard Waverman, Dean, Haskayne School of Business, University of Calgary, and Fellow, London Business School. The study was conducted by the consulting firms Berkeley Research Group and Communicea.

For more information on the Connectivity Scorecard, visit www.connectivityscorecard.org

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[7] See for example, Michael Pettis, China Financial Markets Newsletter, March 7th, 2011 for example. See also http://www.businessinsider.com/michael-pettis-chinese-infrastructure-2011-2#ixzz1Imi3zKUz