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## The Connectivity Scorecard The US Results

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## Previous Measures of 'Connectivity'

- **ITU Digital Opportunity Index**
  - 11 "principal" components
    - Infrastructure and usage
    - Equal weights
    - US ranks 20<sup>th</sup>
- **World Economic Forum Networked Readiness Index**
  - 9 sub-indices, 67 individual metrics
  - US ranks 7<sup>th</sup>
- **Economist Intelligence Unit**
  - 6 Sub-components including infrastructure, business environment, legal environment, etc
  - US ranks 2<sup>nd</sup>

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## What did we do and Why is it different?

- **Use 'economics'**
  - Data and theory to drive index design
- **Economic Growth**
  - Focus on Connectivity as a source of economic growth
- **Business**
  - Given its proper weight
- **Account for infrastructure, usage and complementary services and skills**
  - Weight these factors according to contribution to productivity growth
- **Use different measures for economies at vastly different levels of development**

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## What did we do and Why is it different?

- Modern market economies are "information economies"
  - Even in poorest of economies, lack of information prohibits participation in wider markets
- Scorecard asks: What is the potential for broadband connectivity and mobility to transform...
  - Business growth and efficiency?
  - Government productivity?
  - Quality of life for citizens?
- By use of weights that tie in to economic structure and sources of productivity growth
  - Tie connectivity metrics to their likely role in generating growth (a "first")

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## Methodology in detail: How the Scorecard is constructed

Consumers Business Government

Allocation between pillars based National Accounts

Infrastructure Usage & skills

Share based on final consumer consumption as % of GDP

Share based on intermediate consumption + GFCF as % of GDP

Share based on government consumption as % of GDP

Infrastructure: Lines, Broadband, PCs, mobile

Usage & skills: Literacy, Schooling, Internet

Business: Business lines, Hardware, Enterprise, IP, Business mobile, E-Commerce, Employee

Government: Online services, Government website presence, Website usage, Schools usage

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## Innovation-driven economies

United States	6.97
Sweden	6.83
Japan	6.80
Canada	6.50
Finland	6.10
UK	6.10
Australia	5.93
Germany	5.52
France	5.07
Korea	4.78
Hong Kong SAR	4.46
Italy	3.85
Spain	3.56
Hungary	3.18
Czech Republic	3.11
Poland	2.18

- Top-ranked United States earns only 6.97 out of possible 10
- Korea, typically high scorer on other indexes, ranks 10<sup>th</sup>
- Average is only 5.05

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### Resource and Efficiency Economies

Malaysia	7.59
Russia	6.60
Mexico	5.54
Brazil	5.28
South Africa	5.26
China	4.45
Philippines	3.00
India	1.83
Nigeria	1.07

- Malaysia is first
  - Ranking highly on numerous measures of both infrastructure and usage
  - Broadband penetration, mobile network coverage, overall Internet usage (best-rounded performer)
- China came in sixth
  - Lower scores on business usage (but penetration of broadband is good)
- India was second-last
  - Tech sector excellence still exception rather than rule
- Average score: 4.26

NEW RESULTS

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### Comparability of the Innovation Driven and Resource Driven Indexes

- The two indices, **not comparable**
- Comparable data not available for many developing countries
- Different metrics used
  - Different elements of connectivity are important depending on a country's level of development
- Any "resource and efficiency-driven economy" would score **very poorly** if benchmarked against the leading innovation driven economies

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### Korean result: A surprise?

- Relatively low score
  - In contrast to good scores highly on most other indices
- Korea's (government supported) broadband infrastructure ranks very highly, but
  - Some business usage metrics do not stack up well
  - Cross-checked our data on business enterprise telephony spending with other estimates from other sources
    - Apparently low spending by Korean business on IP enterprise telephony, PBX systems, VoIP
    - Look at Korean productivity: still less than 50% of European and US levels (GDP/Hour Worked) despite extensive FTTH/Broadband

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### Surprising results – India vs. China

- On WEF "Networked Readiness Index"
  - India outperforms China
- On every dimension of connectivity of our scorecard
  - China outperforms India
- India scores poorly both in terms of infrastructure and in terms of usage
  - Limited infrastructure at relatively high prices?
  - Literacy and gender access are major issues

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### US Results - Detail

Component	Score	Weight
Consumer Infrastructure	0.44	0.18
Consumer Usage/Skills	0.78	0.18
Business Infrastructure	0.83	0.38
Business Usage/Skills	0.57	0.15
Government Infrastructure	0.75	0.07
Government Usage/Skills	0.54	0.03

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### US Results- "Distance from frontier"

Legend: Best Performing Country (blue line), United States (red line)

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**The US could be a lot better....**

- **The US scores only 0.44 on the consumer infrastructure sub-index:**
  - The average score is 0.48, the best score is 0.92 (Korea!)
  - If the US had Korean levels of residential broadband and 3G penetration and usage, **it's score would be 7.75**
- **In fact, if the US scored as highly as the best country on each of the six sub-components, it's score would be 8.34**

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**A Call to Arms**

- **All countries have a long way to go in exploiting Connectivity to its fullest potential**
- E.g., US has room for significant improvement on many infrastructural metrics
- Connectivity is central to the development debate–
  - Connectivity could drive demand for literacy and numeracy in developing countries!
  - Higher literacy and numeracy will increase the “bang” that countries get from their buck spent on Connectivity.

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**A Call to Arms**

- **Existing connectivity is like Web 1.0**
- **We are in the infancy of using networked technologies**
  - **“Failure of imagination”– is business investment in ICT rendered ineffective by this?**
- **Other countries are smartening up their acts– USA's leadership is precarious**

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**Appendix**

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**Attributes of connectivity**

Consumers		Business	
<b>Infrastructure</b>	Number of 3G subscribers per 100 inhabitants Main telephone lines per 100 inhabitants Broadband subscribers per 1,000 inhabitants	<b>Infrastructure</b>	PCs per 1000 Business data access lines per 1,000 Ratio of Bus VoIP/Bus PSTN Lines Adjusted Business software and hardware spending per capita
<b>Usage &amp; Skills</b>	Internet users per 1000 people Internet banking Adjusted software spending by consumers % of mobile revenue from data services SMS messages per user per month	<b>Usage &amp; Skills</b>	Application secure internet servers per million E-commerce as % of total turnover of enterprises Adjusted Total Managed Data Services Revenue per capita Adjusted Web-Hosting Revenue per capita Adjusted Value-Added IP Services Revenue per capita % of persons employed with ICT user skills % of persons employed with ICT specialist skills Mobile e-mail composite (Business users) Mobile internet composite (Business users)
<b>Government</b>	e-Government ranking Online services provided by Government Number of computers connected per 100 pupils % of schools with broadband access Adjusted Government software and hardware spending per capita		
<b>Usage &amp; Skills</b>	% of population using e-Government services % of enterprises using e-Government services Adjusted computer services spending by Government per capita		

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**Role of Mobile in Scorecard**

- **Mobile subscribers (per 1000 people)**
- **Mobile e-mail composite usage index (Business users)**
- **Mobile internet composite usage index (Business users)**
- **Internet banking**
- **% of mobile revenue from data services**
- **SMS Messages per User per Month**
- **3G subscribers per 100 inhabitants**

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## Importance of Broadband and IP

- Broadband subscribers per 1,000 inhabitants
- Business data access lines per 1,000
- Ratio of Business VoIP/Business PSTN Lines
- Application secure internet servers per million
- E-commerce as % of total turnover of enterprises
- Adjusted Total Managed Data Services
- Web-Hosting Revenue per capita
- Value-Added IP Services Revenue per capita
- % of persons employed with ICT user skills
- % of persons employed with ICT specialist skills
- e-Government ranking
- Online services provided by Government
- Number of computers connected per 100 pupils
- % of schools with broadband access
- % of population using e-Government services
- % of enterprises using e-Government services
- Adjusted computer services spending by Government per capita