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International Telecommunication Union

Ensuring the quality of indicators

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Learning Initiatives on Reforms for Network Economies

IDRC CRDI

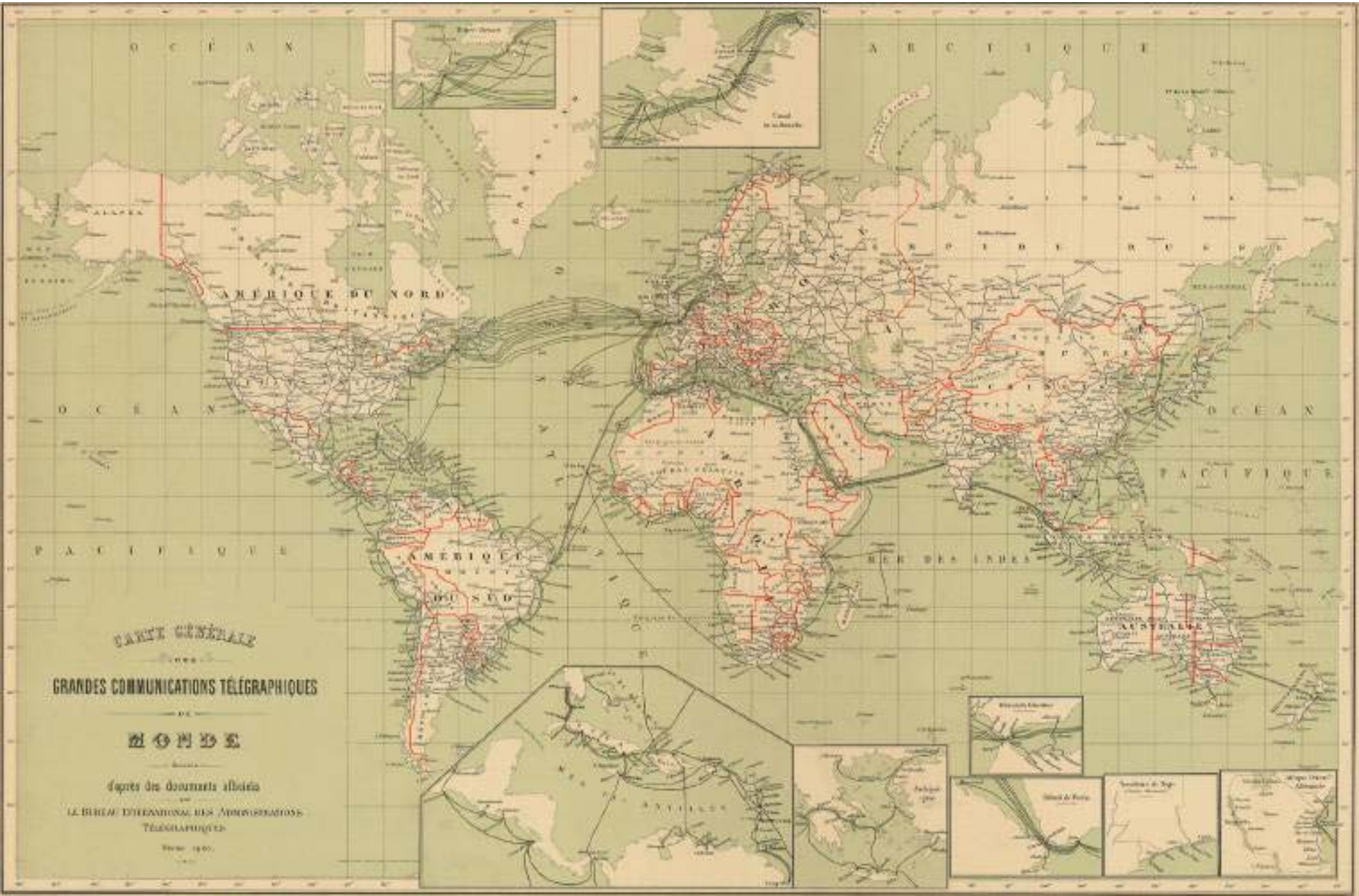
Workshop on benchmarking performance in network and services development
Delhi, 1-3 March 2006

The views expressed in this paper are those of the authors and do not necessarily reflect the opinions of the ITU or its Membership. Dr Tim Kelly can be contacted at tim.kelly@itu.int.

Agenda

- Then and now
  - Why we know less now than we did in 1900
  - Does it matter?
- When indicators go wrong: A cautionary tale
  - Role of faulty indicators in inflating and deflating the Internet bubble
  - Using proxies to estimate unknowns
- Doing it right: An exemplary tale
  - Hong Kong's system of ICT indicators reporting
  - The value of benchmarking and inter-country competition in stimulating better performance
- Some issues for discussion

The Telecoms World in 1900



What we knew in 1900 and what we think we know now

In 1900:

- Bilateral data for annual flow of telecom traffic:
  - Domestic telegrams
  - International telegrams
  - Priority telegrams
  - International telephone
- Number of subscribers:
  - Public call offices
  - Private subscribers
- Details of operators in each country/territory
- Bilateral relations between operators

In 2006:

- We can only guess at the volume of telecom traffic
  - (to the nearest order of magnitude)
- We can estimate the number of subscribers
  - but it increasingly involves guesswork, e.g., pre-paid mobile, Internet users
- No reliable data on split between business, residential and government traffic
- Operators come and go, so we can never be sure that data for all operators is being recorded

Does our lack of knowledge matter?

Yes!

- Information economy is large chunk of the overall economy
- Good data assists with regulation, competition policy, benchmarking and consumer protection
- Data transparency
  - Attracts investment
  - Guides sensible investment decisions
- Data on traffic flows makes it easier to track tax payments and avoid tax evasion

No!

- Data transparency may hinder market behaviour in a competitive market
  - Ease of market entry and exit
  - Competitive secrecy
- Data reporting may impose bureaucratic burden
- Market data has a commercial market value, which can be bought and sold
- "Real" data is financial data
  - Turnover and profitability
  - Share price

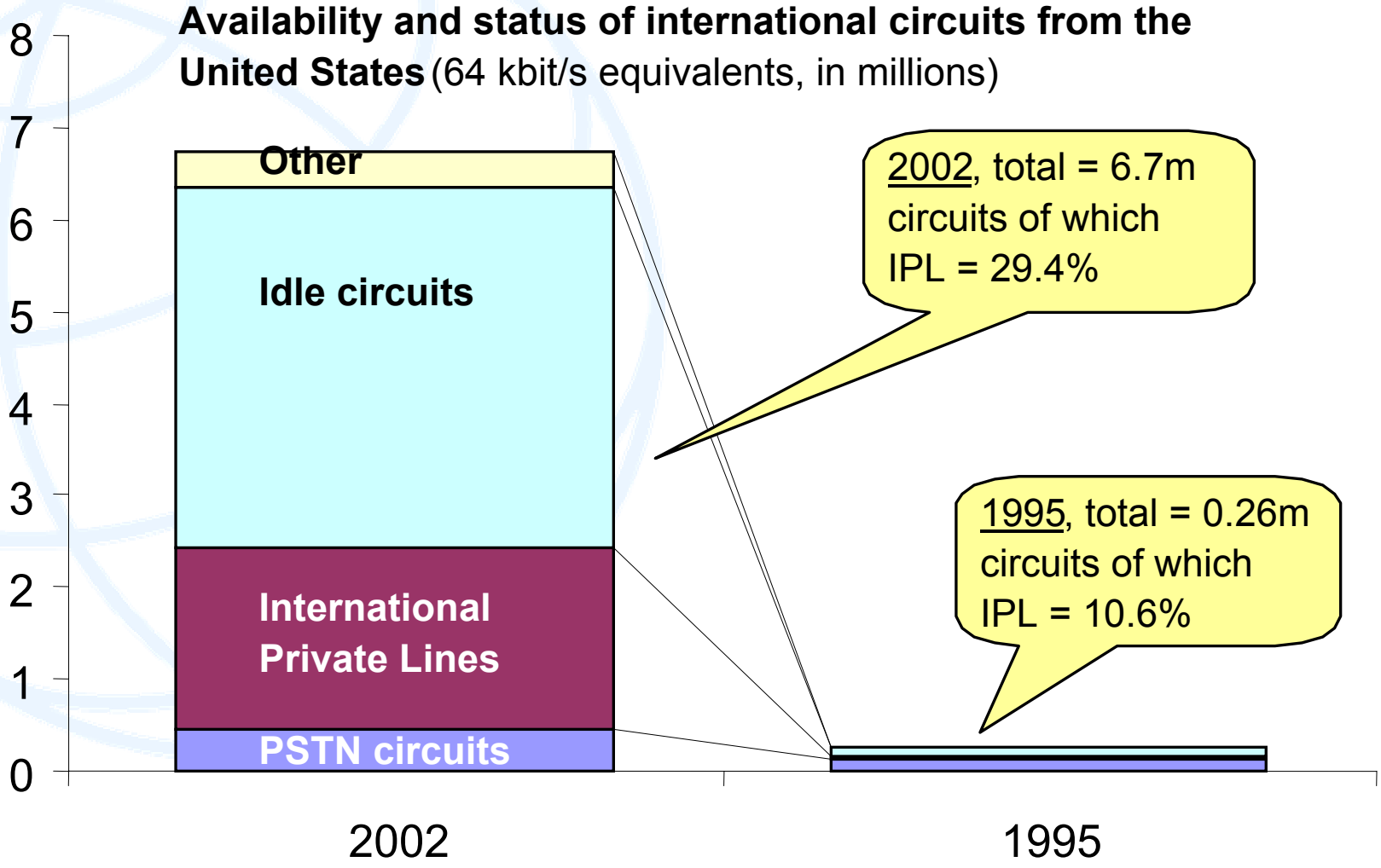
A cautionary tale of a faulty indicator

"Traffic on the Internet is doubling every 90 days"

- **Claim by Reed Hundt, FCC Chair, 2000 and repeated by many others as "urban myth"**
- **Original source: Bernie Ebbers, WorldCom**
- **Would imply traffic growing more than 16-fold each year**
- **Unspoken assumption: Sustained growth at exponential rates**
- **Reality**
  - **May have been true for one network (WorldCom) on one route (trans-atlantic) for one quarter (1995/6)**
  - **Was false long before Internet bubble burst**

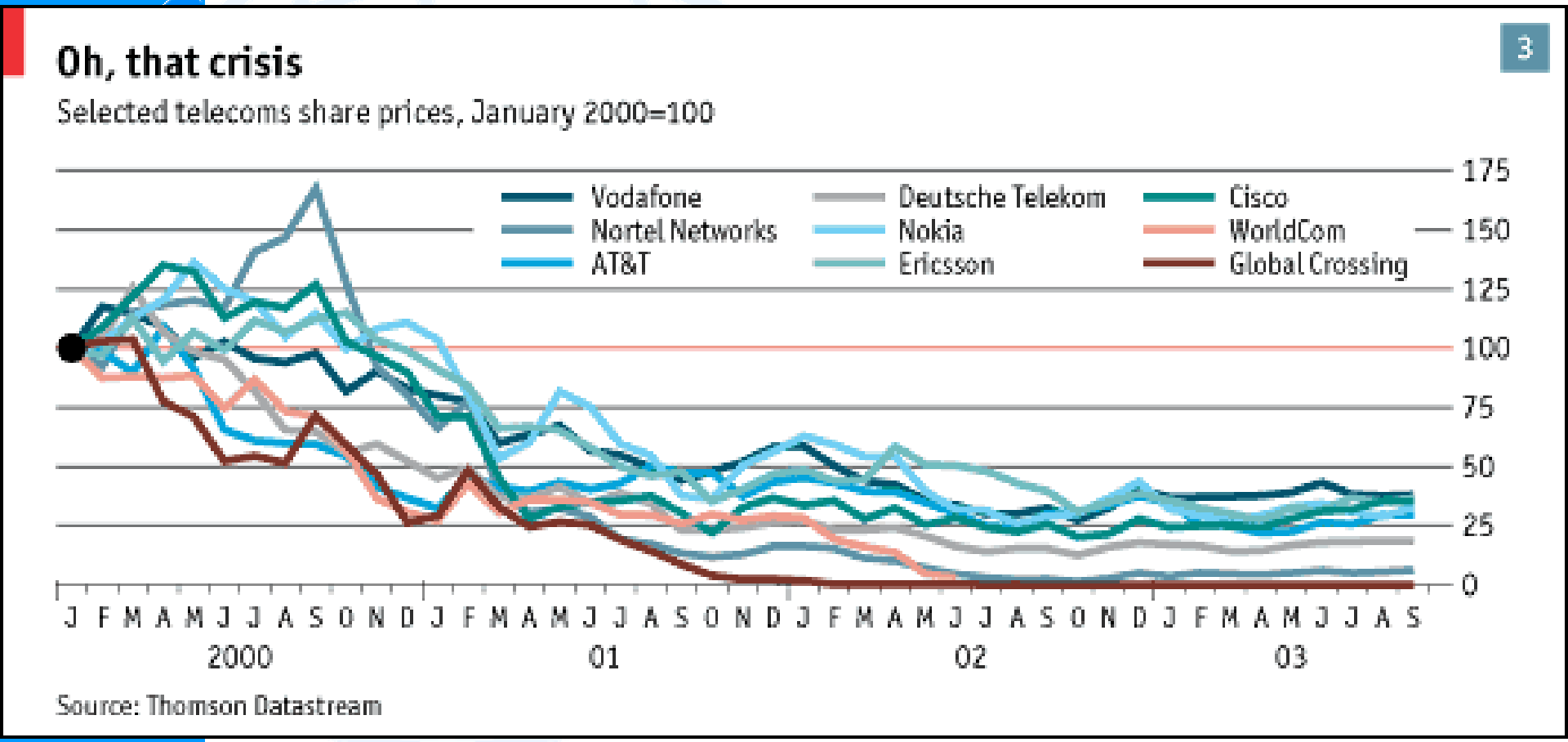
Source: Andrew Odlyzko: A refutation of Metcalfe's Law.

The consequence of faulty data: Overinvestment and overcapacity



Source: ITU, adapted from FCC Circuit Status Report.

Consequences of overinvestment and overcapacity: Share price meltdown



Source: Economist, 9 October 2003: "Beyond the Bubble"

Other examples of faulty data assumptions

- **Assuming traffic growth = revenue growth**
  - In reality, revenue growth is much smaller than traffic growth because of tariff cuts, productivity gains etc
- **Assuming website traffic = revenue**
  - In reality, much website traffic is from search engines, or other automated visits
- **Assuming today's growth rates will continue tomorrow**
  - In reality, most markets follow an S-curve with early growth rates (from a low base) not sustained; esp. ARPU
- **Comparing "users" (e.g., Internet) with subscribers**
  - Subscribers generate revenue whereas many "users" are free-riders
- **Assuming all pre-paid users are active**
  - Leads to inflated subscriber counts for mobile, above 100 per 100 inhabitants

If you can't measure it precisely, try using proxies

- If you can't measure traffic, measure circuits
  - FCC data on international circuit status are an underutilised resource
- If you can't measure real prices, divide revenue by minutes
  - Dividing revenue by minutes gives a measure of the effective revenue from a service where operators are offering price discounts
- If you can't forecast the market, estimate the ceiling and work backwards
  - Forecasting backwards from the theoretical market ceiling can help to avoid problems of unrealistic forecasts based on growth projections

A best practice example of data collection and reporting: Hong Kong

- **Statistical data collection to support clear goals:**
  - Digital 21 Strategy, to make HK a leading digital city in the globally connected world of 21st Century
  - Established in 1998, reviewed in 2001 and 2004
- **Actions in eight areas:**
  - Government leadership
  - Sustainable e-government programme
  - Infrastructure and business environment
  - Institutional review
  - Business development
  - IT industry
  - Human resources in the knowledge economy
  - Bridging the digital divide

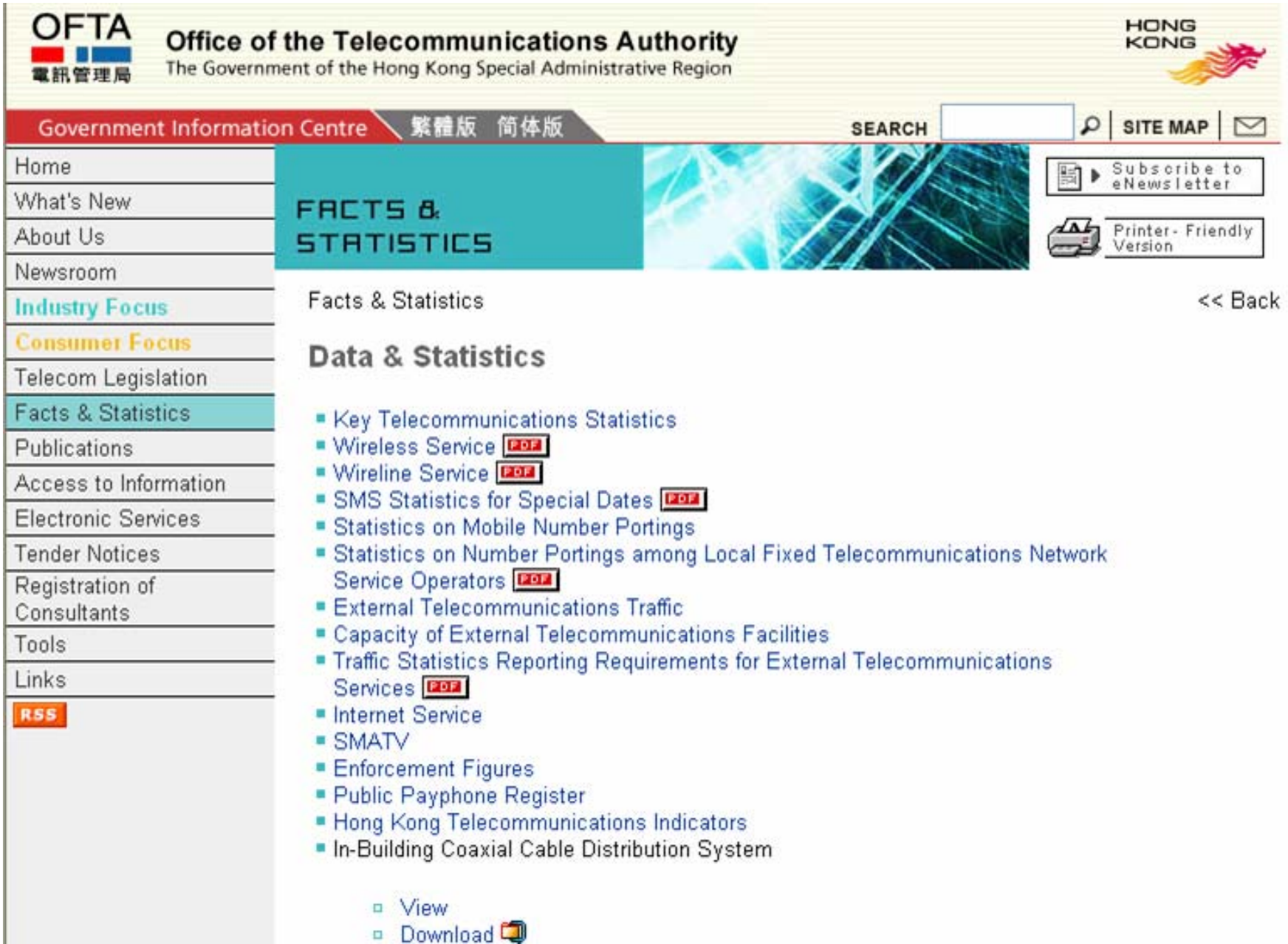
Coordinated data collection

- **Office of the Government Chief Information Officer (OGCIO)**
  - **Policy and strategy advisor on IT matters**
  - **Works with C&SD on survey design**
- **Census and Statistics Department (C&SD), national statistics office**
  - **Conducts or commissions surveys of businesses, households and individuals**
  - **Conducts data processing and analysis and releases reports**
- **Office of Telecommunications Authority (OFTA)**
  - **Collects data from telecom operators**
  - **Reports data via website and to ITU**

Available surveys

1. Thematic **Household Survey**
   - Started in 2000, conducted annually
   - Around 13'000 households surveyed
2. **Survey on Information Technology Usage and Penetration in the Business sector (Establishment survey)**
   - Around 5'000 establishments surveyed
3. **ICT availability in education and government agencies, collected by Education and Manpower Bureau and OGCIO**
4. Other **independent surveys**
   - e.g., by City University of HK, since 2000

OFTA website (www.ofta.gov.hk/en/datastat)



OFTA 電訊管理局

Office of the Telecommunications Authority
The Government of the Hong Kong Special Administrative Region

HONG KONG

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Key features of OFTA statistics

- Good range of statistical and regulatory information
- Covers fixed, wireless and broadcast networks
- Presentation of data on monthly basis
- Up-to-date (2-3 months in arrears)
- Detailed breakdowns
  - E.g,, stats for different mobile networks
  - post and pre-paid subscribers
  - different traffic types (incl. SMS)

Key Telecommunications Statistics

Telecommunications Services	Quantity
Mobile network operators (Jan 2006)	6
Wireline-based local fixed telecommunications network services (FTNS) operators (Jan 2006)	10
Wireless-based local FTNS operators (Jan 2006)	1
FTNS operators for distribution of domestic free TV programme service (Jan 2006)	2
Satellite-based external FTNS operators (Jan 2006)	6
Cable-based external FTNS operators (Jan 2006)	20
External telecommunications services operators (Jan 2006)	226
Household fixed line penetration rate (Nov 2005)	92%
Mobile subscriber penetration rate (Nov 2005)	121.1%
Mobile subscribers (Nov 2005)	8,410,852
2.5G and 3G mobile subscribers (Nov 2005)	1,829,169

Internet Services	Quantity
Internet service providers (Jan 2006)	186
Registered customer accounts with dial-up access (estimated) (Nov 2005)	977,549
Registered customer accounts with broadband access (estimated) (Nov 2005)	1,665,770
Household broadband penetration rate (Nov 2005)	66.6%

Source: OFTA, http://www.ofta.gov.hk/en/datastat/main.html.

How comparative benchmarking promotes better performance

- Race between Rep of Korea and Japan to be #1 in broadband
- Competition between Singapore and HK to be #1 digital city
- Rivalry in Scandinavia to be #1 in mobile penetration
- Concerns in USA that it is not ranked in top 15 for broadband
- South Africa's high prices for broadband forces review of industry structure and regulation

Issues for discussion

- Understanding why benchmarking matters
- Which is the correct peer group for statistical benchmarking in SE Asia?
- What are the indicators that will demand the attention of press and policy-makers?
  - Tariff comparisons
  - Broadband penetration
  - Mobile usage
- Using indicators to counter “urban myths”
- Using proxies in absence of reliable data
- Developing “best practice” data collection and reporting

Thank you

www.itu.int/spu

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