

Convergence

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Introduction

- Introduction
- Disruptions
- Broadband
- Multiplay
- The growth of GSM
- A word on roaming
- Conclusions



Disruptions

- New spectrum bands
- New wireless services
- New tariff plans
- Bundling of services
- Changes in fashion

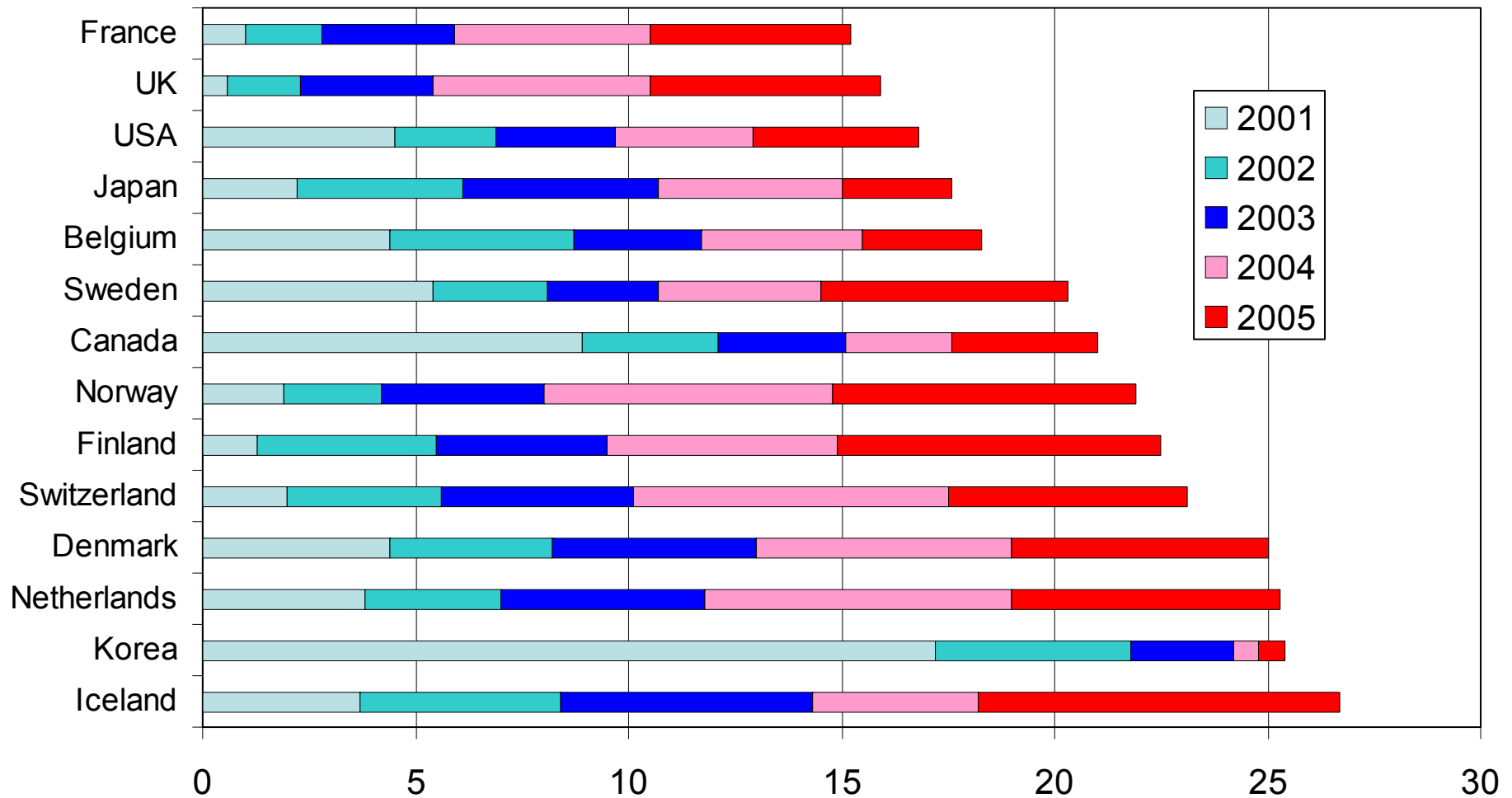


	<i>Fixed</i>	<i>Mobile</i>	<i>Internet</i>	<i>Television</i>
Egypt	13.8	11.0	5.7	95
Sudan	3.1	2.2	0.9	49
Ethiopia	0.7	0.3	0.1	2
Uganda	1.0	10.8	1.5	19
Kenya	0.3	4.5	0.6	6
Tanzania	0.4	5.1	0.7	14
Malawi	0.8	1.2	0.3	2
Mozambique	0.4	4.7	0.5	6
South Africa	10.4	47.1	8.1	54

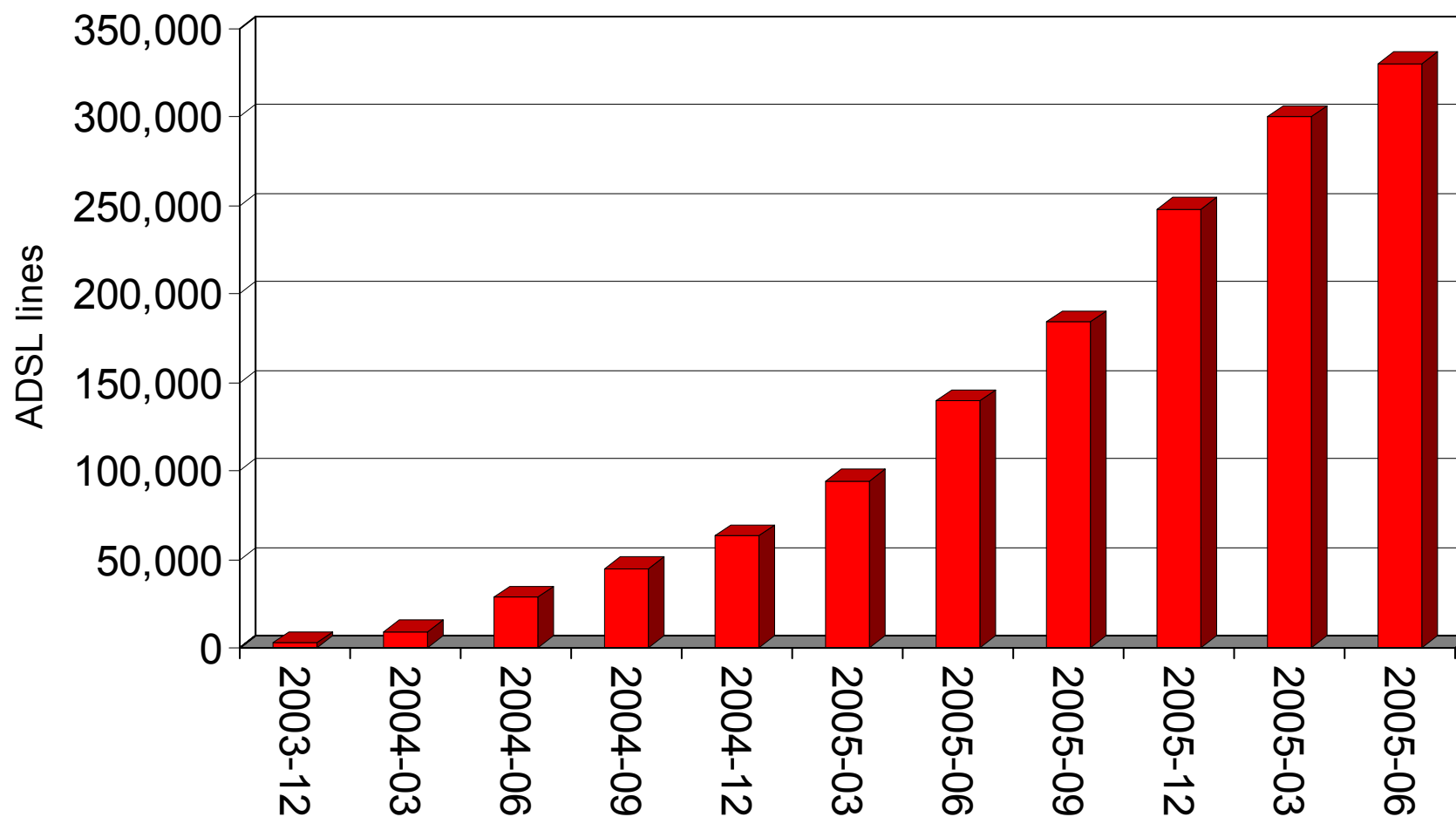
Note: televisions are per 100 households



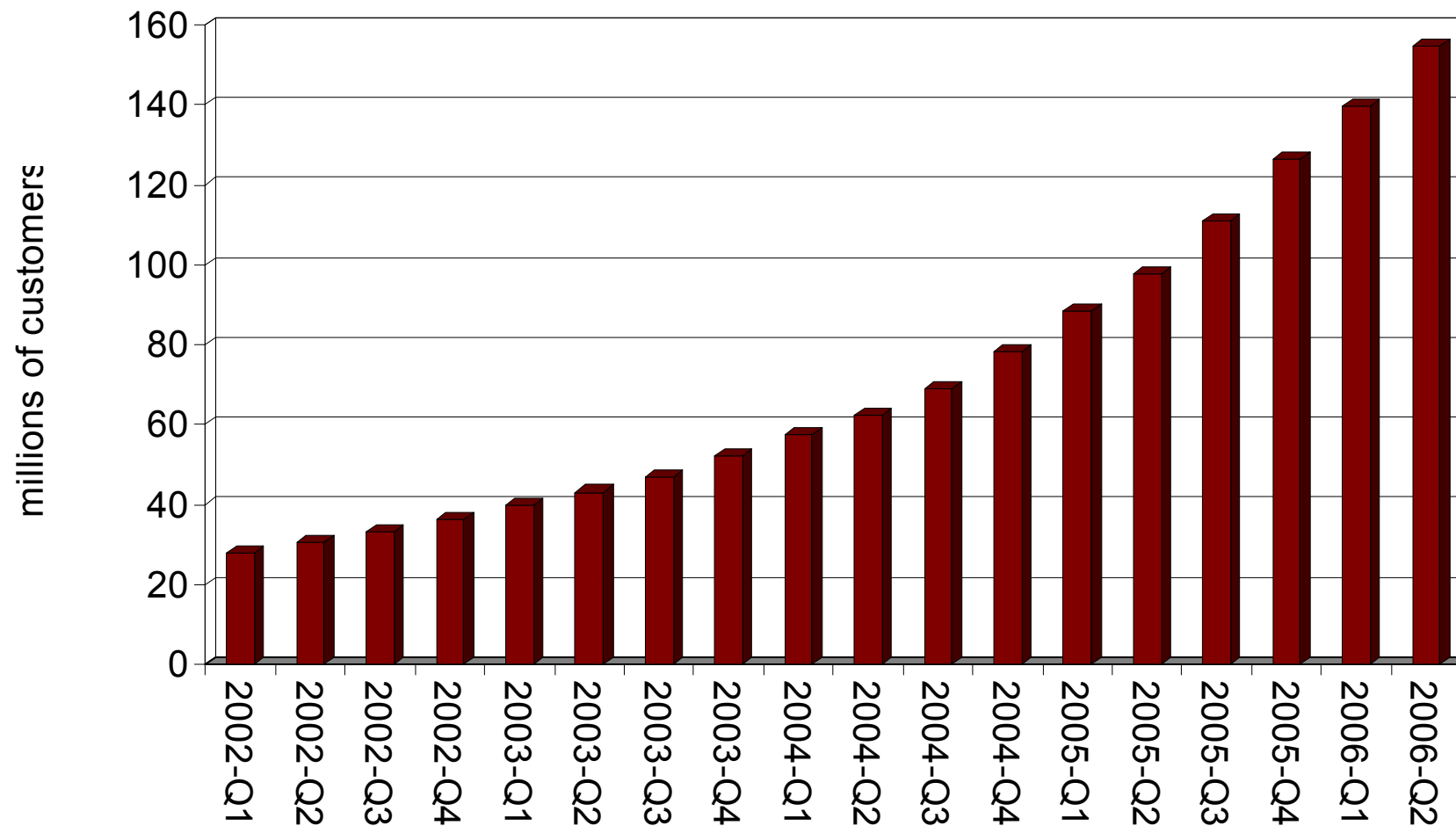
Broadband in the OECD

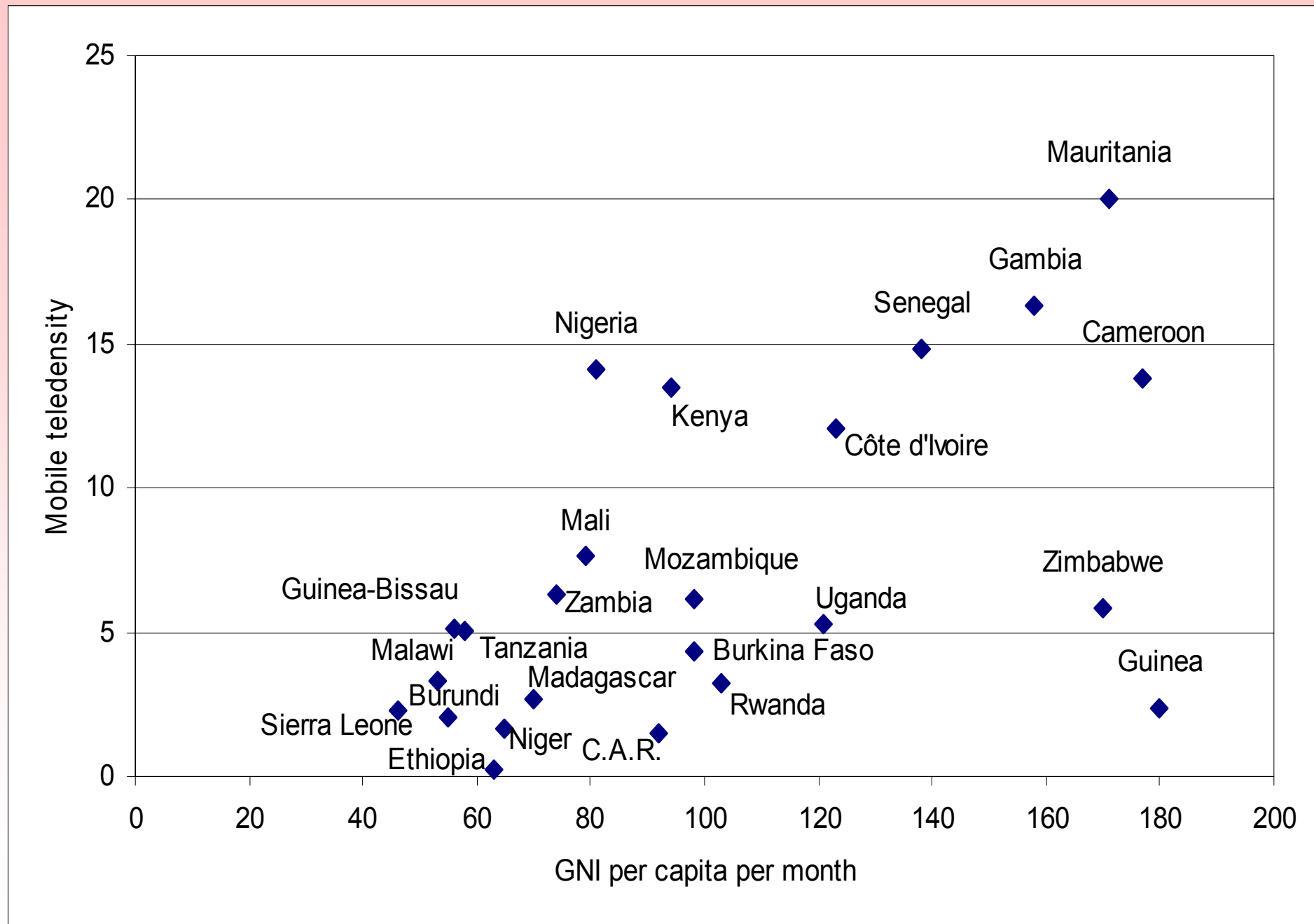


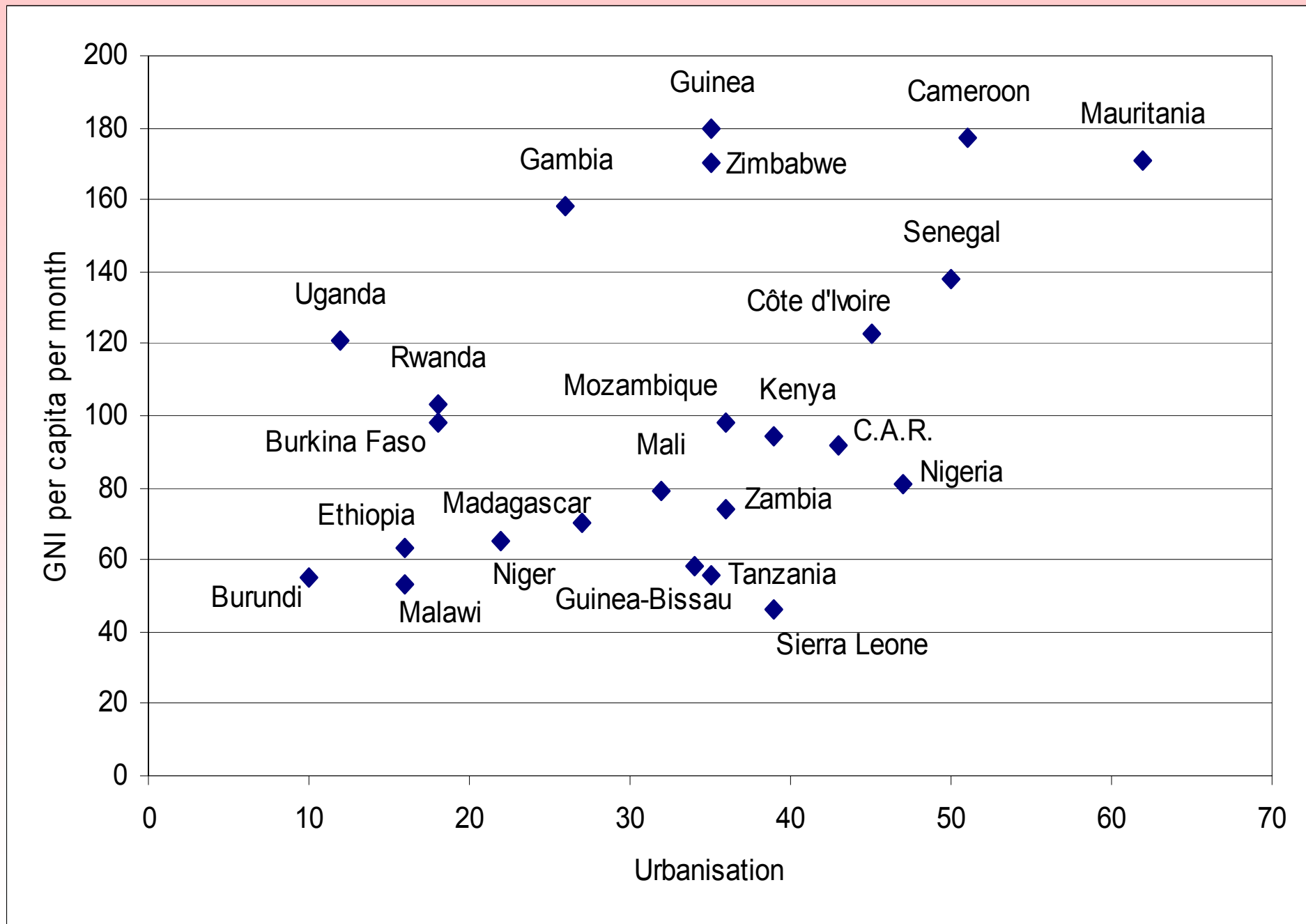
Kingdom of Morocco - ADSL



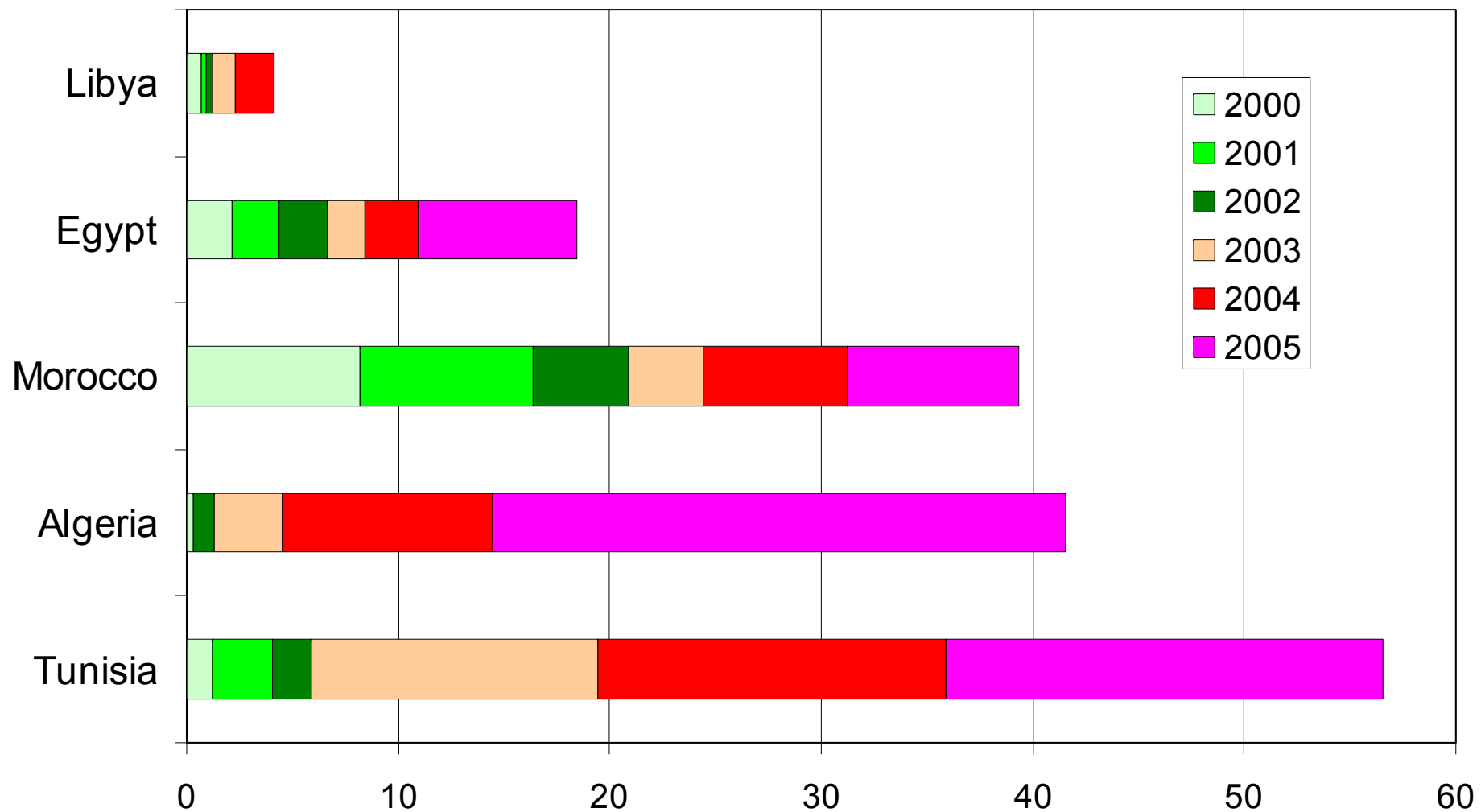
Growth of GSM in Africa



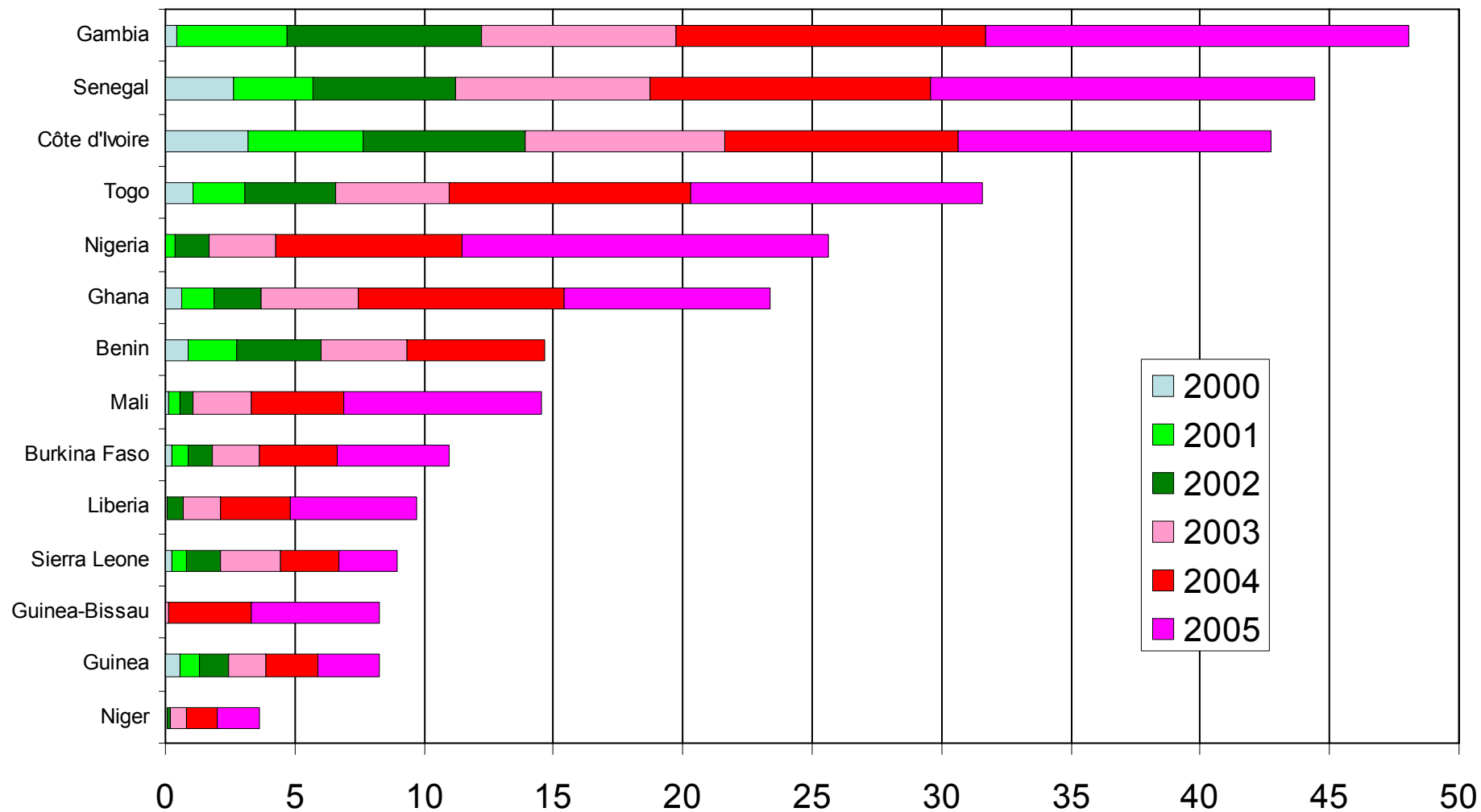




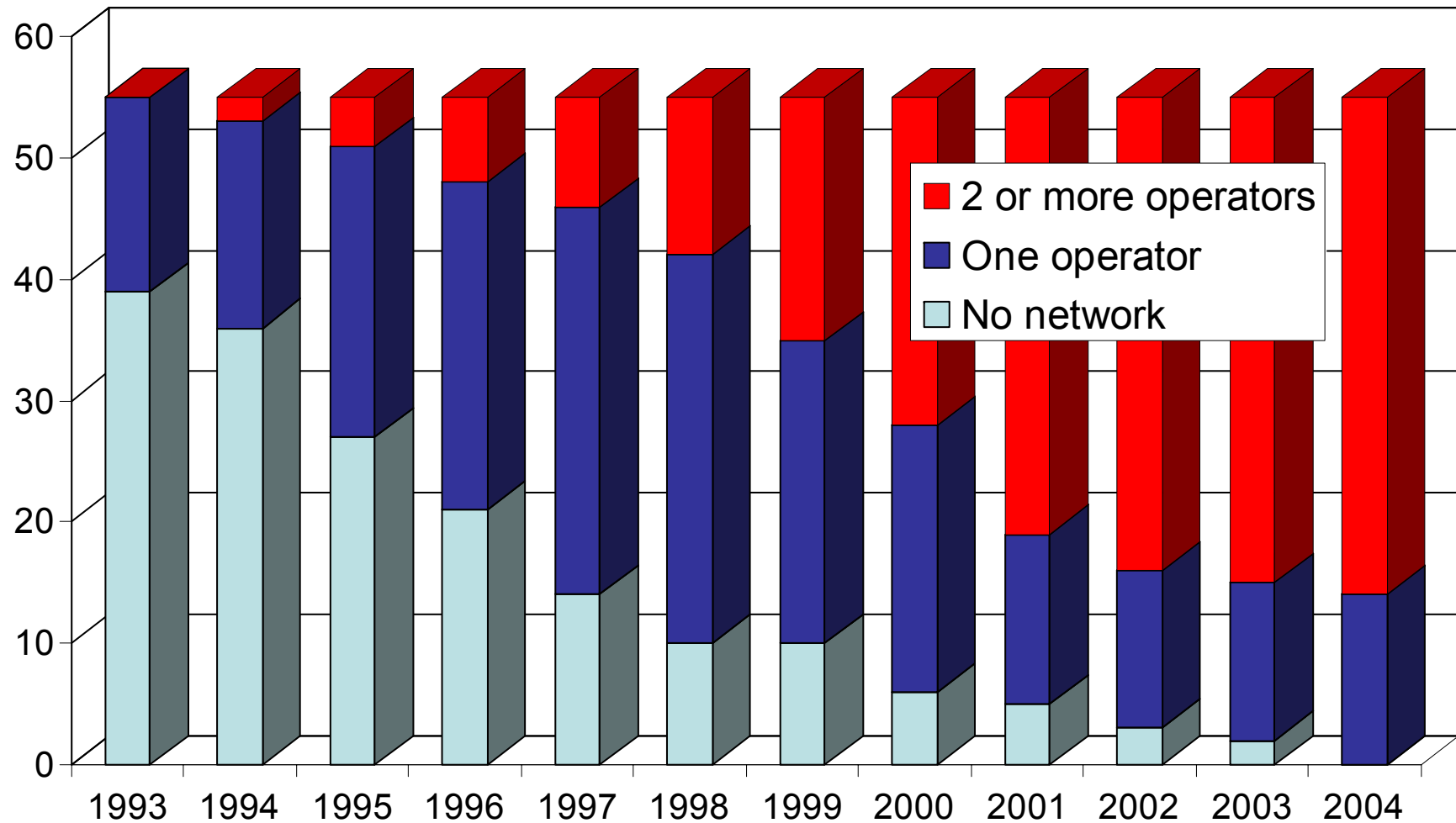
North Africa



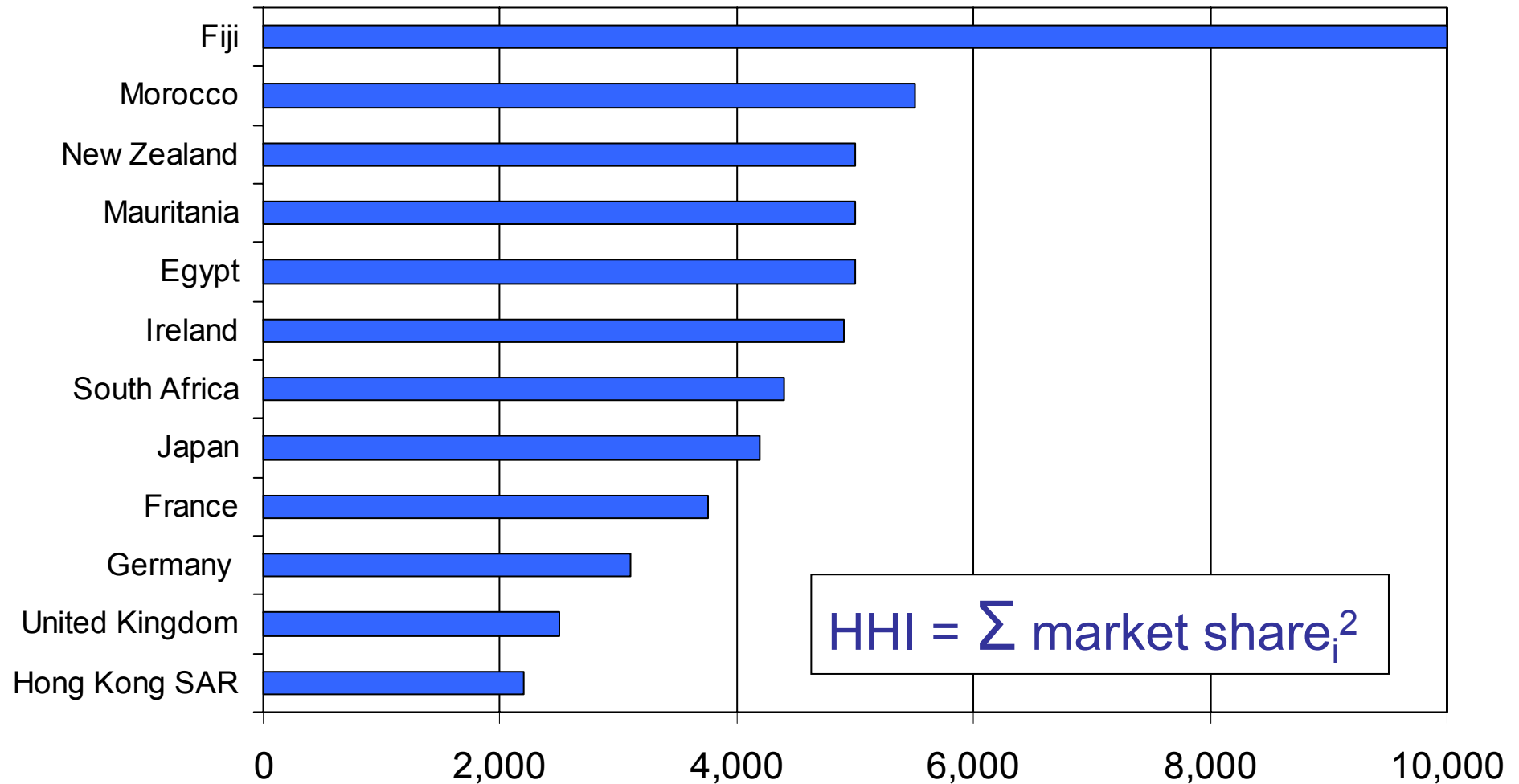
West Africa



The rise of rivalry



Herfindahl-Hirschman Index



2.5 G

- Adding data to voice and SMS
- IP interface
- Requires upgrading of:
 - network infrastructure
 - handsets
- Requires development of new business models:
 - raw IP access
 - value-added services
- Extending the value chain to include:
 - service providers
 - content aggregators
 - Mobile Virtual Network Operators (MVNOs)



GSM Association

- m-commerce has particular benefits in emerging economies
- Capturing the unofficial cash float
- Eliminating the need to carry cash
- Reducing exposure to robbery
- Enabling the advancement of micro-loans
- Facilitating loan repayments
- Enabling the payment of utility bills
- Minimizing money-laundering opportunities

http://www.gsmworld.com/documents/services/micro_payment.pdf



Mobile payments

- Payment:
 - add to monthly bill
 - deduct from stored credit
 - link to a credit card
- By means of:
 - RFID tag
 - SMS
- The alternative is to use Internet payment systems
- India
 - Tata and ICICI
- Japan
 - DoCoMo and Sony
- South Korea
 - Moneta
- Malaysia
 - Nokia and Visa
- USA and UK
 - PayPal



Mobile content

- Sport
- Games
- Betting
- News
- Music (downloads and streaming)
- Television (broadcasts and “mobisodes”)
- The content that nobody talks about

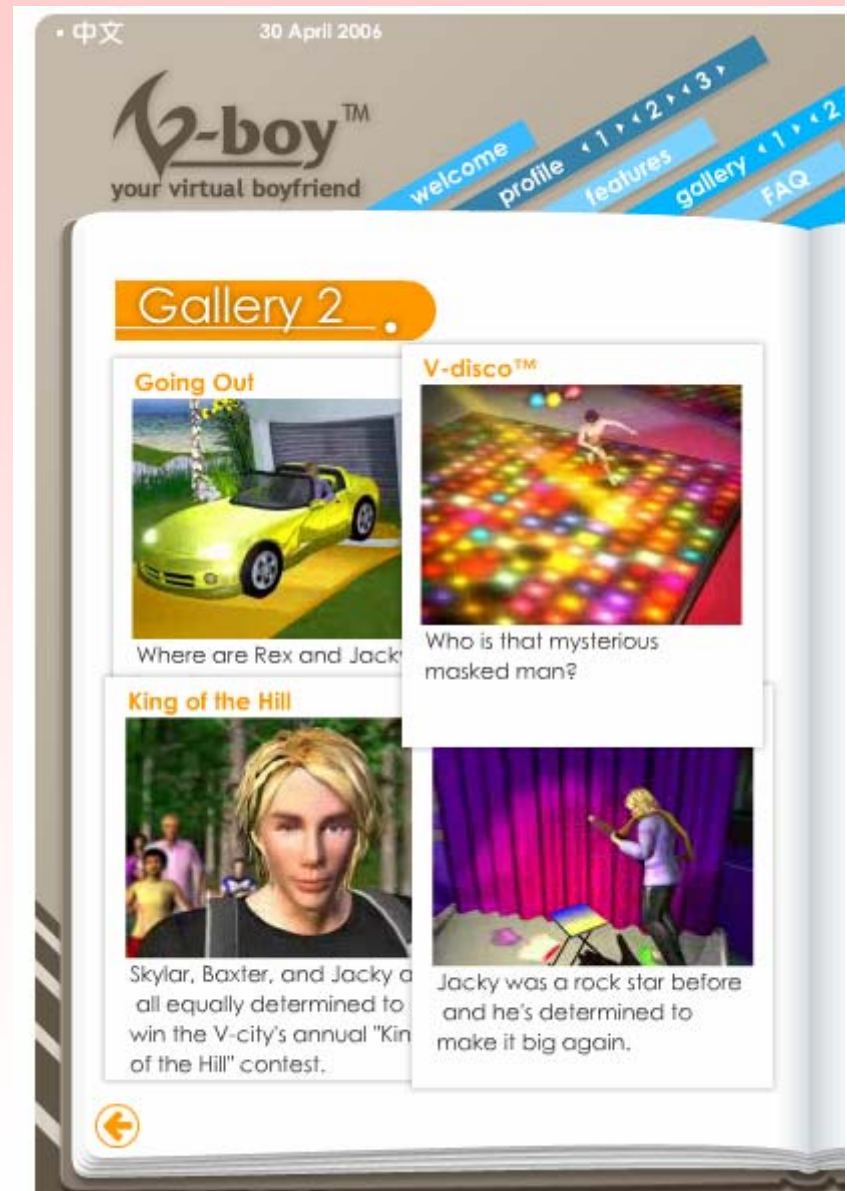
Is it one device or many? iPod or cellphone?



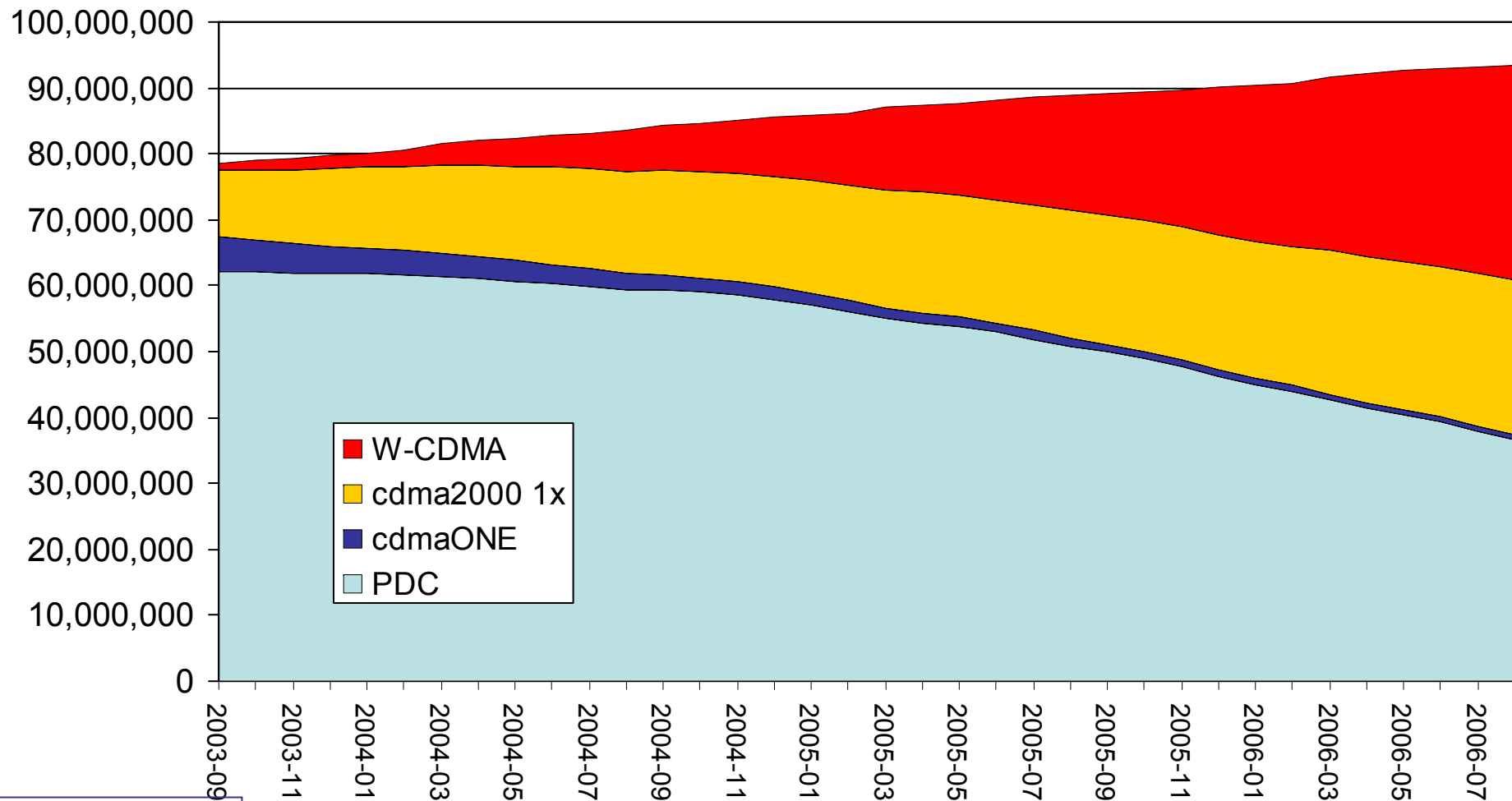
Artificial Life

- Developer of games:
 - standalone
 - multi-user games
- Games within games
- Examples:
 - Virtual Girlfriend
 - Virtual Boyfriend
 - Virtual Emperor Penguin
- Launched with MNOs in:
 - Brunei
 - China
 - Hong Kong, SAR
 - Malaysia
 - Singapore
 - Taiwan

<http://www.artificial-life.com/>
<http://mobileindustry.biz/>



Japan switches to 3G



<http://www.tca.or.jp/>

China

- Beijing Olympics opening on 08/08/08 will be a showcase for 3G
- Everyone is waiting for the licences
- Ministry of Information Industries (MII) seems undecided between:
 - technology neutrality
 - support for TD-SCDMA
- A lot of foreign and domestic lobbying
- Forecasts of 50 to 100 million customers by 2010
- Will drive the export market
- Many emerging and developing markets will copy



3G

- Games, Gambling and Girls
- Greed, Gullibility and Grief
- Location Based Services (LBS)
- Entertainment:
 - streamed audio
 - streamed video

Competition with mobile television?



Location Based Services

- Originally the big hope for 3G revenues
- Adoption has been painfully slow
- Now there are many alternatives:
 - Global Positioning System (GPS)
 - Bluetooth
 - Ultra Wide Band (UWB)
 - Radio Frequency Identification (RFID) tags
 - Wi-Fi
 - identification of the mobile cell
 - embedded systems in cars

<http://www.oecd.org/dataoecd/19/7/34884388.pdf>



Audio and video streaming

- Some material is:
 - on-demand
 - interactive
- Broadcasting for news, sports and music:
 - satellite
 - terrestrial
- Wi-Fi and WiMAX where demand is not immediate:
 - residential
 - public hot-spot



Digital broadcasting

- Competing standards:
 - Digital Audio Broadcast (DAB)
 - Digital Multimedia Broadcast (DMB)
 - Digital Video Broadcast (DVB)
- Satellite and terrestrial
- Can carry vast amounts of entertainment and other services
- Very much cheaper than cellular for delivery to customers



Wireless VoIP

- Multiple possible devices:
 - lap-top computer
 - Personal Digital Assistant (PDA)
 - Skype phone
- Wi-Fi chips are cheap and easily added to consumer electronic devices (n.b., games consoles)
- New multimode handsets
- Dedicated Wi-Fi phones



Wireless VoIP

Nokia E-Series handsets

- Wi-Fi when in:
 - corporate offices worldwide
 - Home
 - Hotels, etc.
- SIP client
- Otherwise GSM
- Being combined with iPASS, a global Wi-Fi supplier

France Iliad “free.fr”

- Any Wi-Fi hotspot with “freebox”:
 - your home
 - your neighbours
 - people in the next street, village or town
 - Free calls to fixed networks in France and 14 countries
 - €29.99 per month
- <http://adsl.free.fr/>



VoIP over 3G

- Theoretically possible, but questions of:
 - pricing
 - download limits
 - operators filtering out VoIP
- Some deals for Skype over 3G:
 - Hutchison Whampoa (a.k.a. Three)
 - E-Plus (KPN)
- Enormous reluctance of 3GSM operators:
 - but how long can they resist the pressure?
- For the present, roaming charges make VoIP very expensive to use over 3G



WiMAX

- Unlicensed bands:
 - often still not opened for use
 - 2.4 GHz and 5.8 GHz
- Licensed bands (e.g., 3.5 GHz):
 - very few issued so far
- Economies of scale not yet achieved
- A big push from Intel “World Ahead”

<http://www.intel.com/go/worldahead>



Not cellular mobile alone

- Fixed Network Operators told by financial markets to:
 - spin-off MNOs
 - re-absorb MNOs
- Quadruple play (telephony, television, Internet, mobile)
- Comcast Cable (USA) now offers a bundle with cellular voice and data
- Vodafone is looking to add broadband, using wholesale offers from TOs and ISPs



Multiple networks

- Personal Area Networks (PANs)
- Car networks
- Residential networks
- Cellular
- Other wireless networks
- Fibre optic cables for high bandwidth



Ubiquitous Network Society

- The view from Japan and Korea
- Industry and government
- A focus on economic development
- A big push for manufacturing and services
- Multiple networks
- NGN plus RFID plus Ubiquitous Sensor Network (USN)



Recent handset features

- Camera
(create video clips for YouTube and MySpace)
- Stored music and video
- Receiver for digital mobile radio and television
 - satellite and terrestrial
- RFID for identification:
 - access controls
 - payments

These can, but often do not, generate network traffic.



Devices

- Sony Mylo (my life online)
 - Wi-Fi, Keyboard, memory (music and video)
 - web browser, instant messaging and Skype
- Moneta:
 - stored credit
 - credit card
 - with RFID
 - all on a mobile phone
- Slingbox:
 - bridges your cable or satellite TV to Internet
 - remote access for fixed or mobile device
 - can be linked to Personal Video Recorder (PVR)



Classes of convergence

- Packets
- Devices
- Services:
 - servers
 - programming
- Offers to customers
- Companies

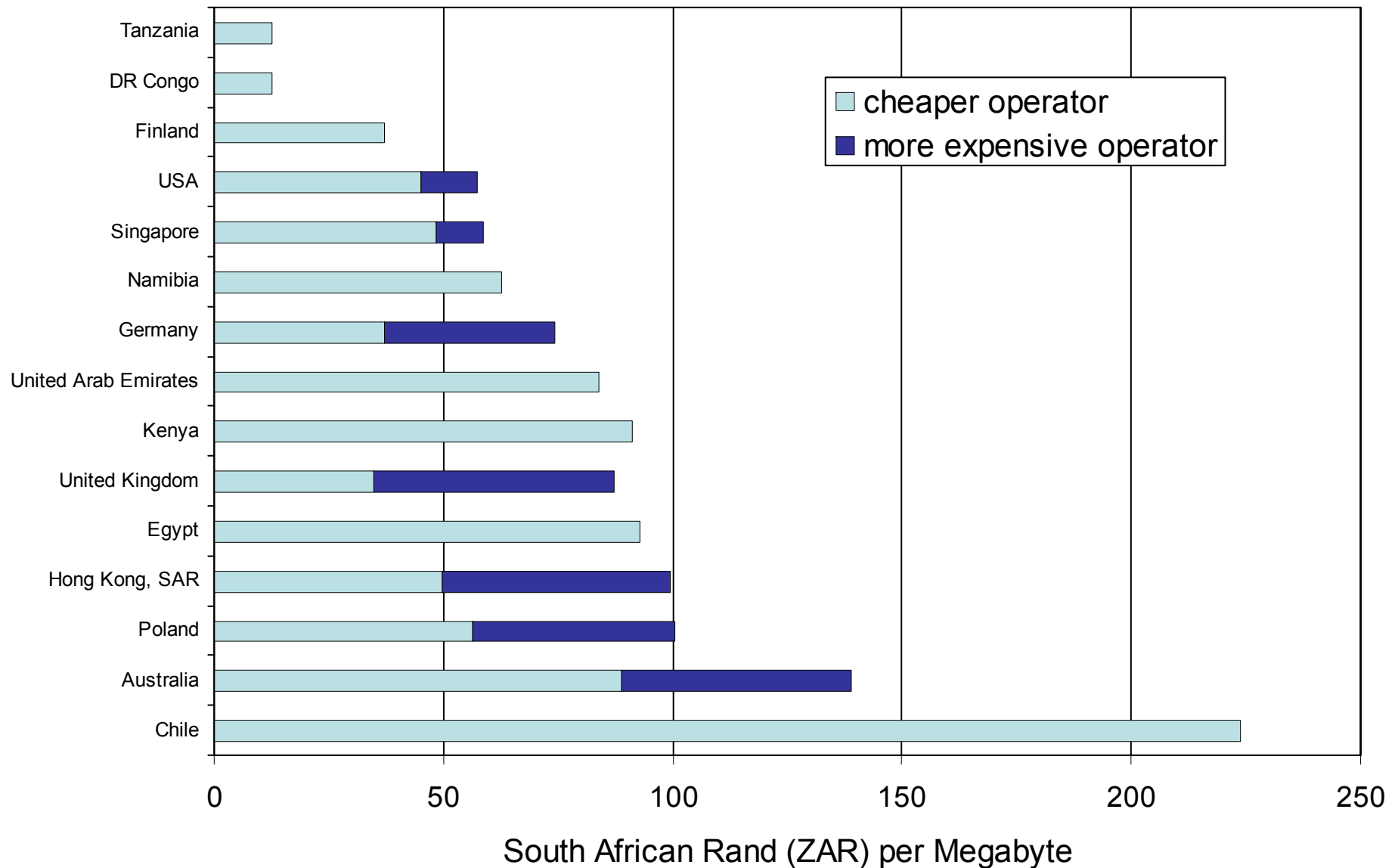


An American roaming from Cape to Cairo

	Cingular standard	Cingular World Traveler	Sprint	T-Mobile USA	Verizon Global Phone
South Africa	\$2.49	\$1.69	\$1.50	\$1.49	\$2.49
Mozambique	\$3.49	\$3.49	\$1.50	\$1.99	\$1.29
Malawi	\$4.99	\$4.99	-	\$1.99	\$1.29
Tanzania	\$3.99	\$3.99	\$1.50	\$4.99	\$1.29
Kenya	\$3.49	\$3.49	\$1.50	\$4.99	\$4.99
Ethiopia	\$3.49	\$3.49	-	-	-
Sudan	\$3.49	\$3.49	-	-	-
Egypt	\$2.49	\$2.49	\$1.50	\$1.99	-

South African data roamers

US\$ 1 = ZAR 7.76



Hong Kong, SAR

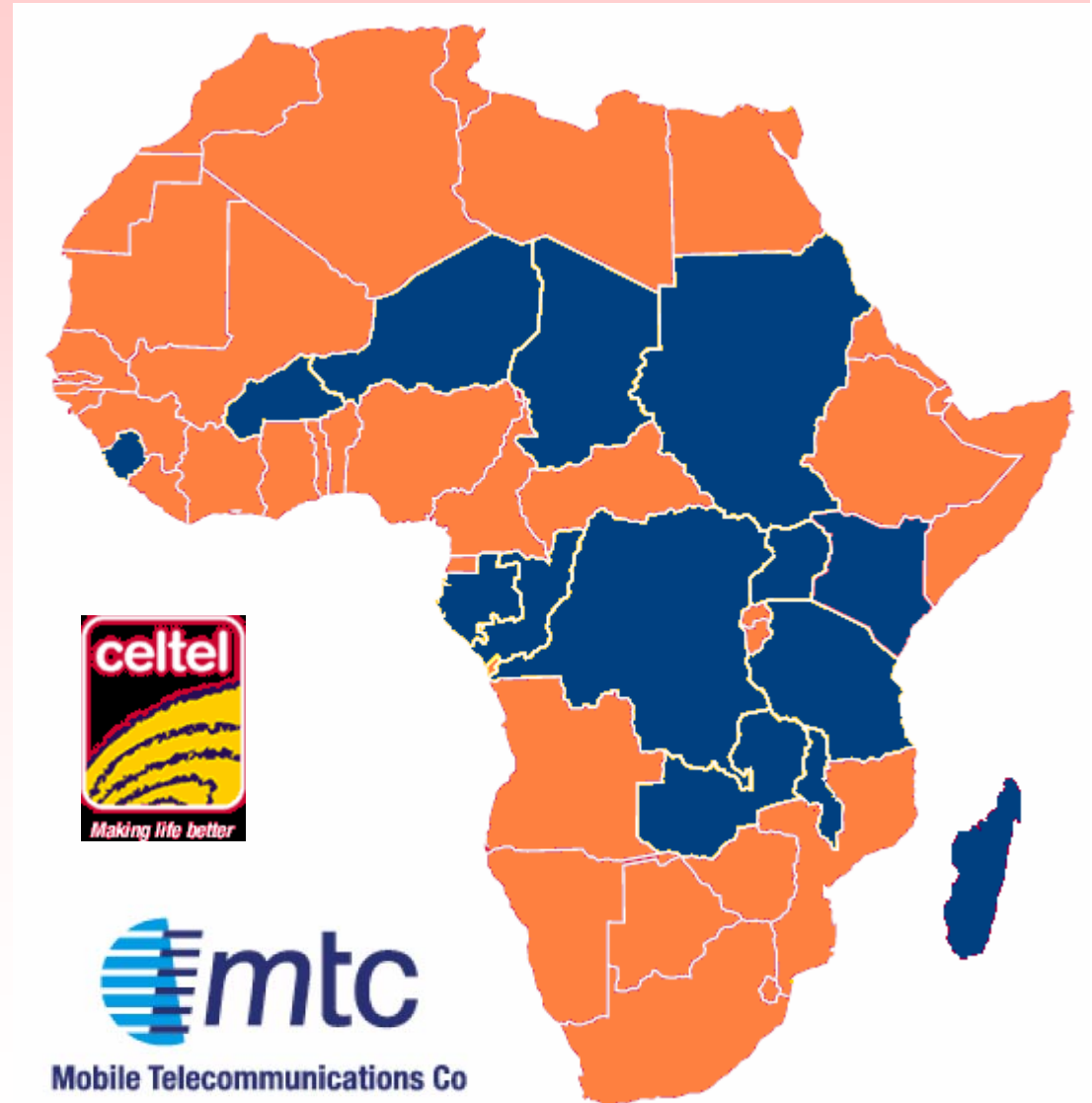
- One country, two systems
- One SIM card, two numbers:
 - Hong Kong, SAR
 - China
- Calls handled on the intelligent network
- Can be called on either number at any time
- Can make calls at national rates in both countries



Celtel

- 14 countries
- 8.5 M users
- 270 M citizens (lots of growth)
- Owned by MTC of Kuwait

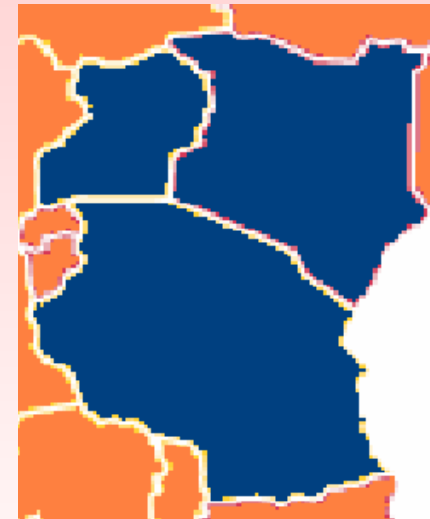
<http://www.celtel.com/>



Celtel – One network



- Elimination of roaming charges:
 - Kenya
 - Tanzania
 - Uganda
- One network:
 - local rates while abroad
 - no charge for incoming calls
 - can top-up with locally purchased cards
- Will be further expanded



Conclusions

- Enormous uncertainty about demand for:
 - data services
 - value added services
- Enormous uncertainty about access to networks by value-added service providers
- There are non-cellular routes to markets
- The pre-paid business model worked well for voice, but does not look plausible for value-added services



Thank you

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