

# **Interoperability, Standardisation and FRAND Licensing with SEPs**

***IBA Communication and Competition Conference***

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# Outline

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- **Standards: more than just interfaces for interoperability**
- **Licensing methods**
- **Smartphone patent wars**
- **FRAND licensing success story facts and figures**



# Two From Among 27,000 British Standards

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**BS 1363**



**BS 1254**



# ICT Standards Define Entire Complex Systems

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- **Audio and Video Codecs**

- “H.264/MPEG-4 AVC is a block-oriented motion-compensation-based video compression standard developed by the ITU-T Video Coding Experts Group (VCEG) together with the ISO/IEC JTC1 Moving Picture Experts Group (MPEG)” (Wikipedia)
- Many thousands of lines of software code required to implement
- Used in conjunction with other standards (e.g., Blu-Ray, defining color of laser, disk track physical specifications)

- **Mobile Communications**

- “GSM (Global System for Mobile Communications) is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe protocols for second generation (2G) digital cellular networks used by mobile phones.” (Wikipedia)
- >124,000 patented technologies declared to ETSI as essential to 3GPP standards including GSM, WCDMA and LTE
- “Protocols” include radio modulation, audio and data encoding, bit error detection and correction, handover, power control, encryption, interference detection and cancellation etc, etc



# Licensing Methods and Examples

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*The following are not all mutually exclusive:*

- **Royalty-free standards**

- HTML (W3C)
- Bluetooth (Bluetooth Special Interest Group)
- ODF (OASIS)

- **FRAND-based licensing standards**

- H.264 (ITU-T)
- GSM, WCDMA, LTE (3GPP)
- WiFi (IEEE)

- **Patent pooling**

- H.264 (MPEG LA)
- WCDMA (PlatformWCDMA)

- **Open source software**

- x264
- Android



# Smartphone Patent War Considerations

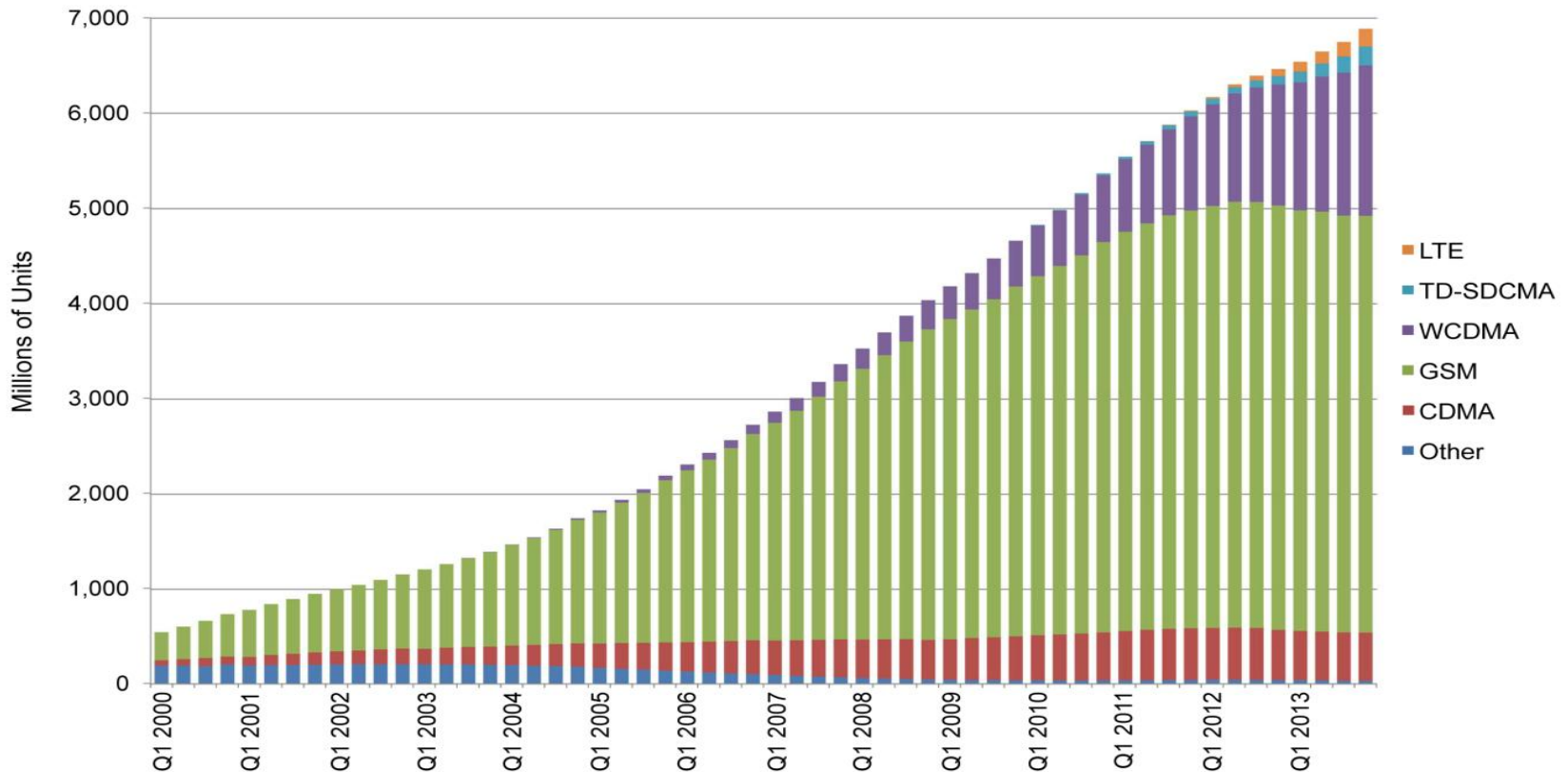
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- **Disputes include SEPs and non-SEPs**
  - Apple: little or nothing in SEPs at the outset
  - Samsung: relative strength in SEPs
- **Rival business models**
  - Technology developer licensors (SEPs in particular)
  - Product implementer licensees
  - Vertically integrated
- **Theories of actual or possible harm**
  - Impede market growth
  - Stifle innovation
  - Inhibit competition and market entry
  - Raise prices



# FRAND Licensing Health Check: Market Growth

## Total Numbers of Global Cellular Connections, 2000-2013; by Technology

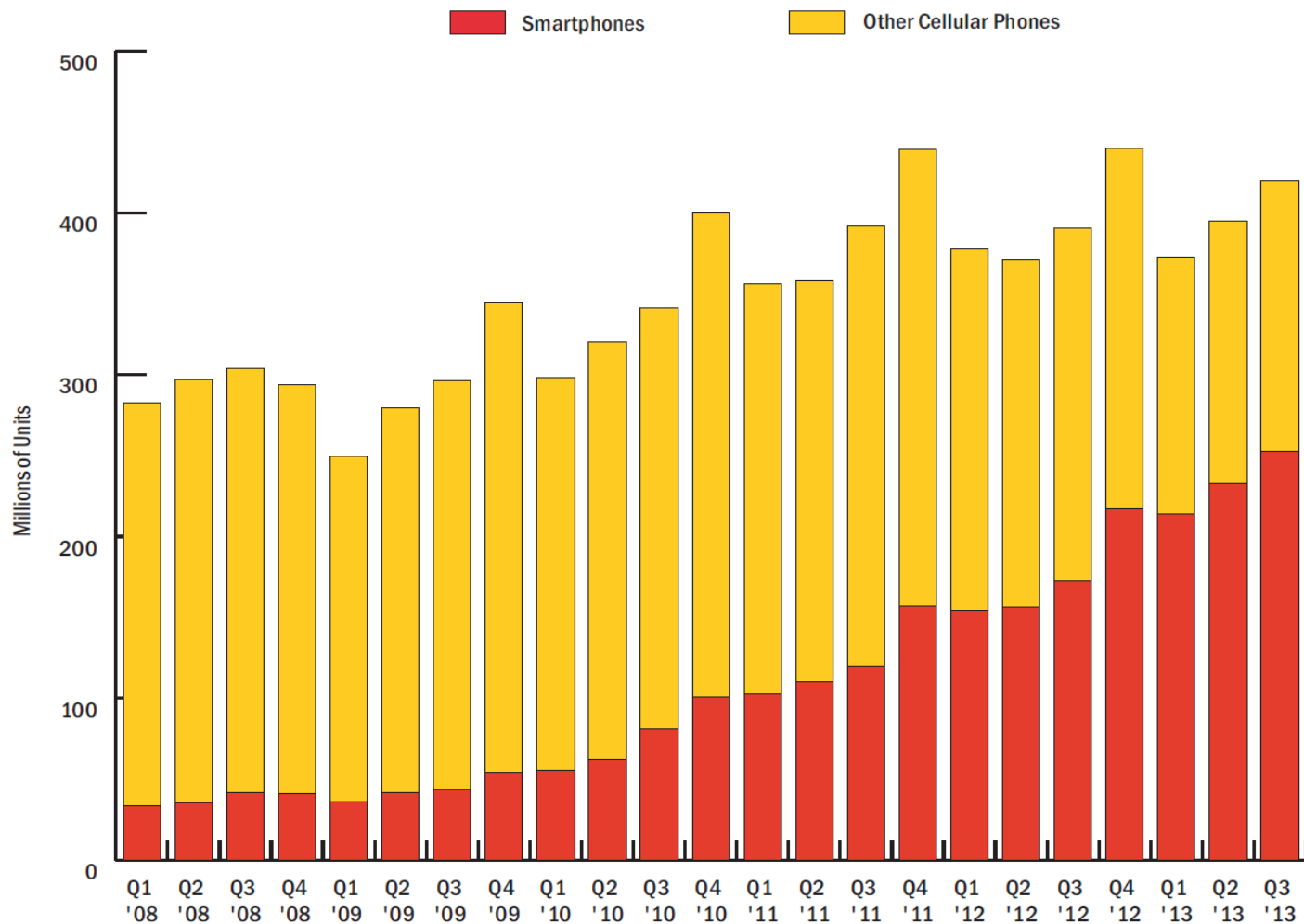


Source: GSMA Intelligence database: <https://gsmaintelligence.com>



# FRAND Licensing Health Check: Market Growth

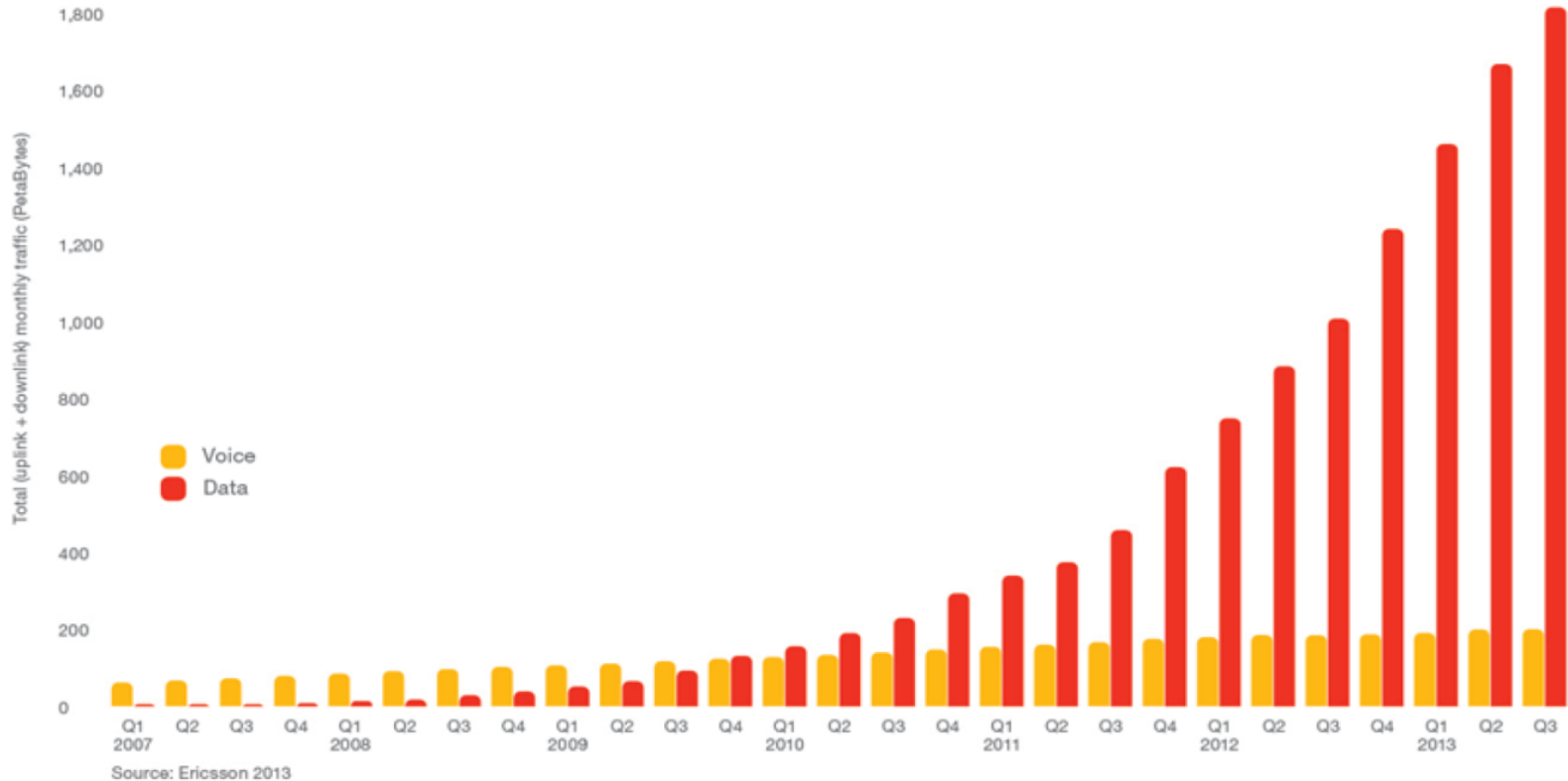
## Cellular Phones Sold Worldwide, 2008-2012





# FRAND Licensing Health Check: Market Growth







## Worldwide Mobile Voice and Data Traffic, 2007-3Q2013



Source: Ericsson, 2013: <http://www.ericsson.com/mobility-report>



# FRAND Licensing Health Check: Innovation (2G/3G)

Introduced	2001	2001	2002	2003	2004	2007	2011
							
Model	Motorola V60	Ericsson T68	Nokia 7210	BlackBerry 7230	Motorola RAZR V3	Apple iPhone 2G	Apple iPhone 4S
Display(s)	Monochrome graphic 96 x 64 pixels Second: monochrome	1.7" STN 256 colors 101 x 80 pixels	1.5" CSTN 4,096 colors 128 x 128 pixels (121 ppi)	2.6" TFT reflective 65,000 colors 240 x 160 pixels (111 ppi)	2.2" TFT 256,000 colors: 176 x 220 pixels Second: CSTN 4,096 colors	3.5" TFT capacitive touchscreen 16,000,000 colors 320 x 480 pixels (165 ppi)	3.5" LED-backlit IPS TFT, capacitive touchscreen 16,000,000 colors 690 x 960 pixels (330 ppi)
Data	2G GPRS 32-40 kbps	2G GPRS 24-36 kbps	2G GPRS 24-36 kbps	2G GPRS (<56kbps)	2G GPRS (38-42 kbps)	2G EDGE (<300kbps) WiFi	3G HSDPA 14.4 Mbps 3G HSUPA 5.8Mbps WiFi
Features	SMS, WAP 1.1 browser, games	SMS, MMS, Email, WAP 1.2.1	SMS, MMS, WAP 1.2.1 browser, games	SMS, Email, BlackBerry HTML browser Qwerty keyboard	SMS, MMS, Email, WAP 2.0/ xHTML browser Video player 0.3MP camera	SMS, Email, HTML Safari Video player 2MP camera 412 MHz CPU	SMS, Email, HTML Safari HD 1080p video @ 30 fps 8MP camera Dual core 1GHz CPU



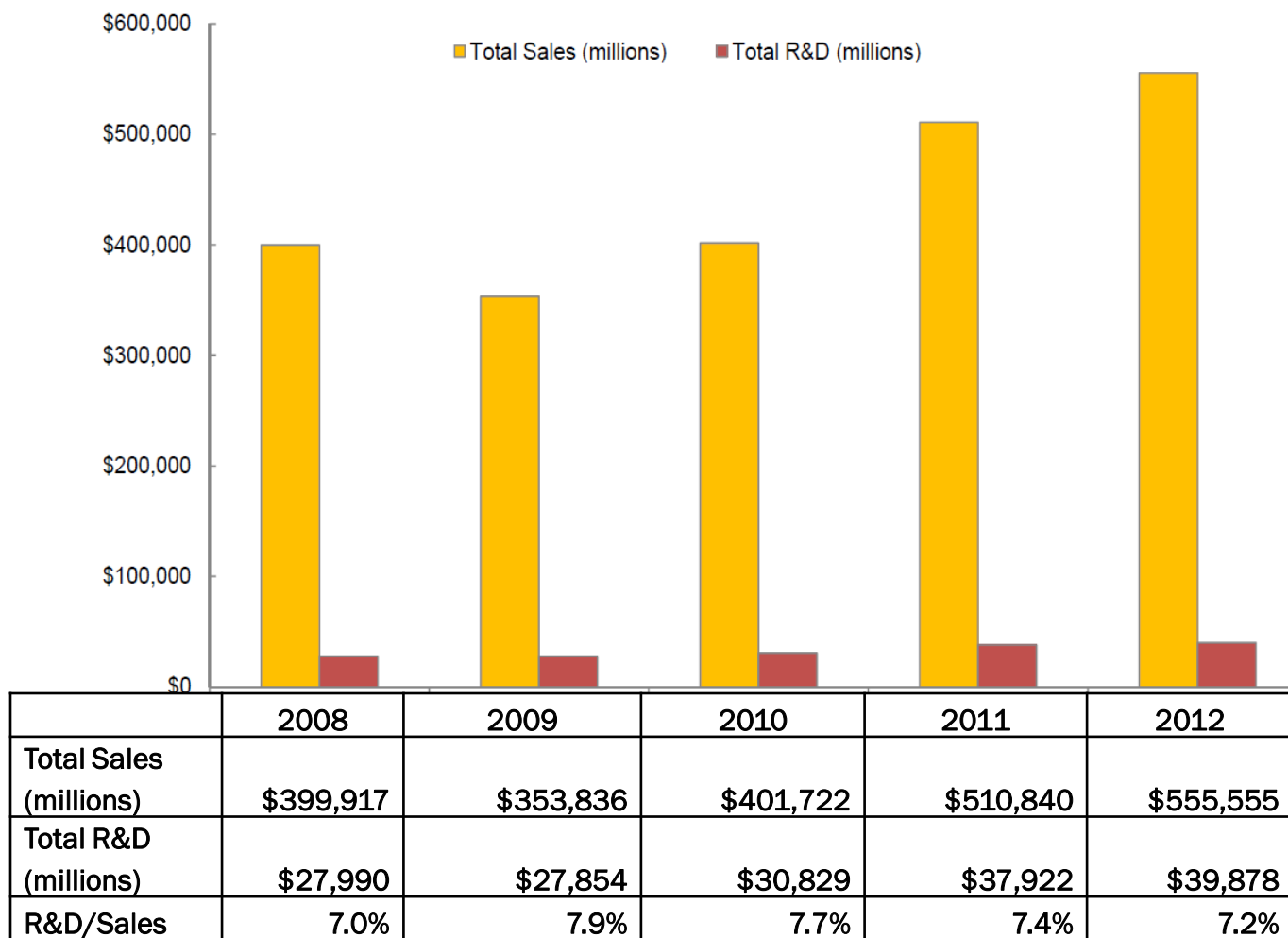
# FRAND Licensing Health Check: Innovation (4G)

Introduced	2012	2012
		<p>Apple iPad 3</p> 
Model	Motorola DROID 4	Apple iPad 3
Display	4.00" TFT 16M colors 540 x 960 pixels (275ppi)	9.7" IPS LCD capacitive touchscreen 16M colors 2048 x 1536 pixels (264 ppi)
Processors	Dual core, 1.2GHz TI OMAP4430	Dual core, 1 GHz, Apple A5X and Quad core PowerVR SGX543MP4 for graphics
Data	LTE 700 MHz Class 13, CDMA EV-Do Rev A	LTE 700 MHz Class 17, 1700/2100 MHz HSDPA+ (42.2Mbps), UMTS, EDGE, GPRS
Features	Android 2.3.5, HTML5, Flash, 8MP and 1.3MP cameras, accelerometer, gyroscope and barometer	iOS 5.1, HTML5, 5MP and 0.3MP cameras, accelerometer, gyroscope, compass and voice commands



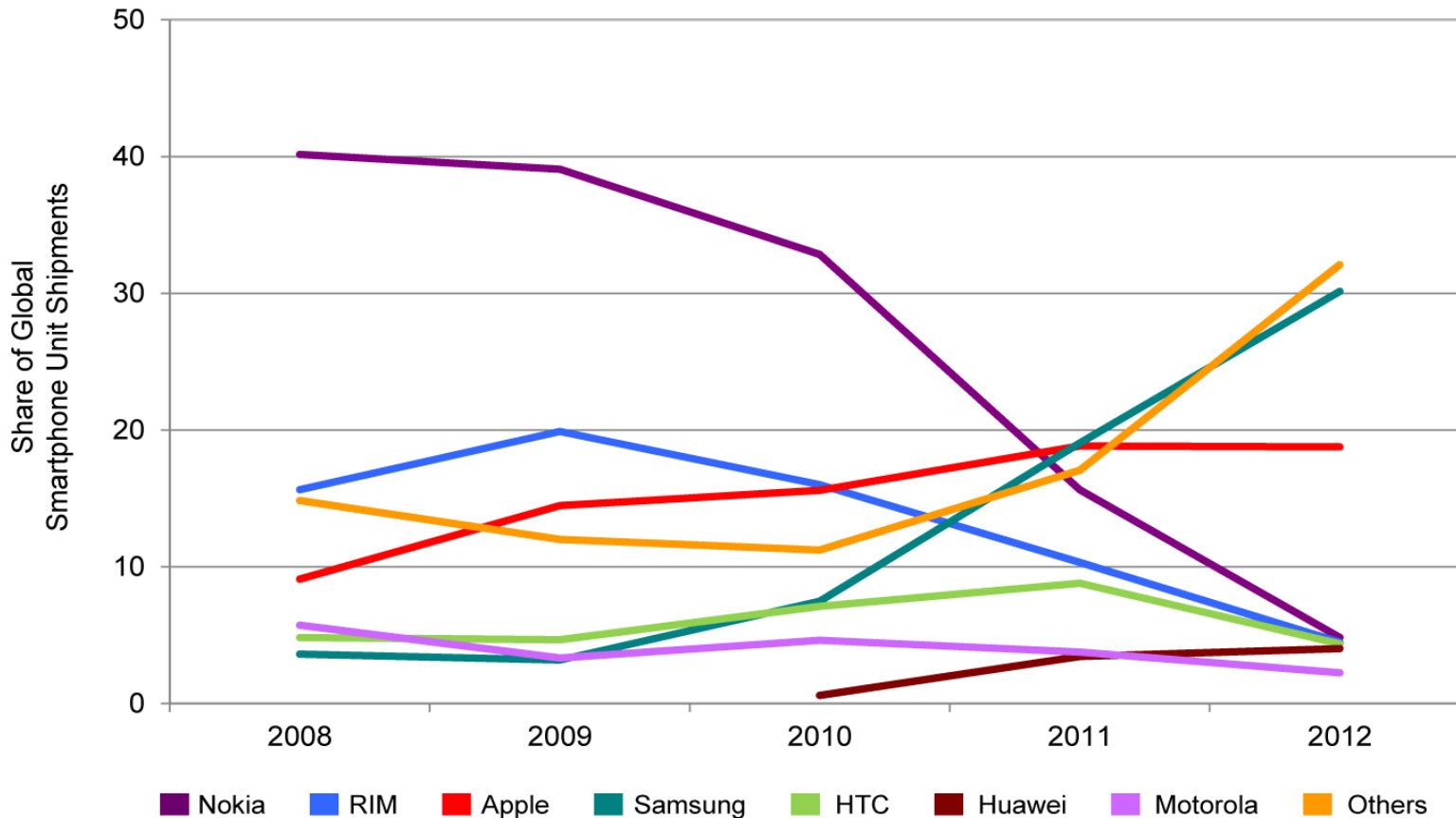
# FRAND Licensing Health Check: Innovation (R&D)

Total Sales and R&D for Leading Cellular Technology Companies (US \$)



# FRAND Licensing Health Check: Competition

## Global Shares of Leading Smartphone Industry Participants

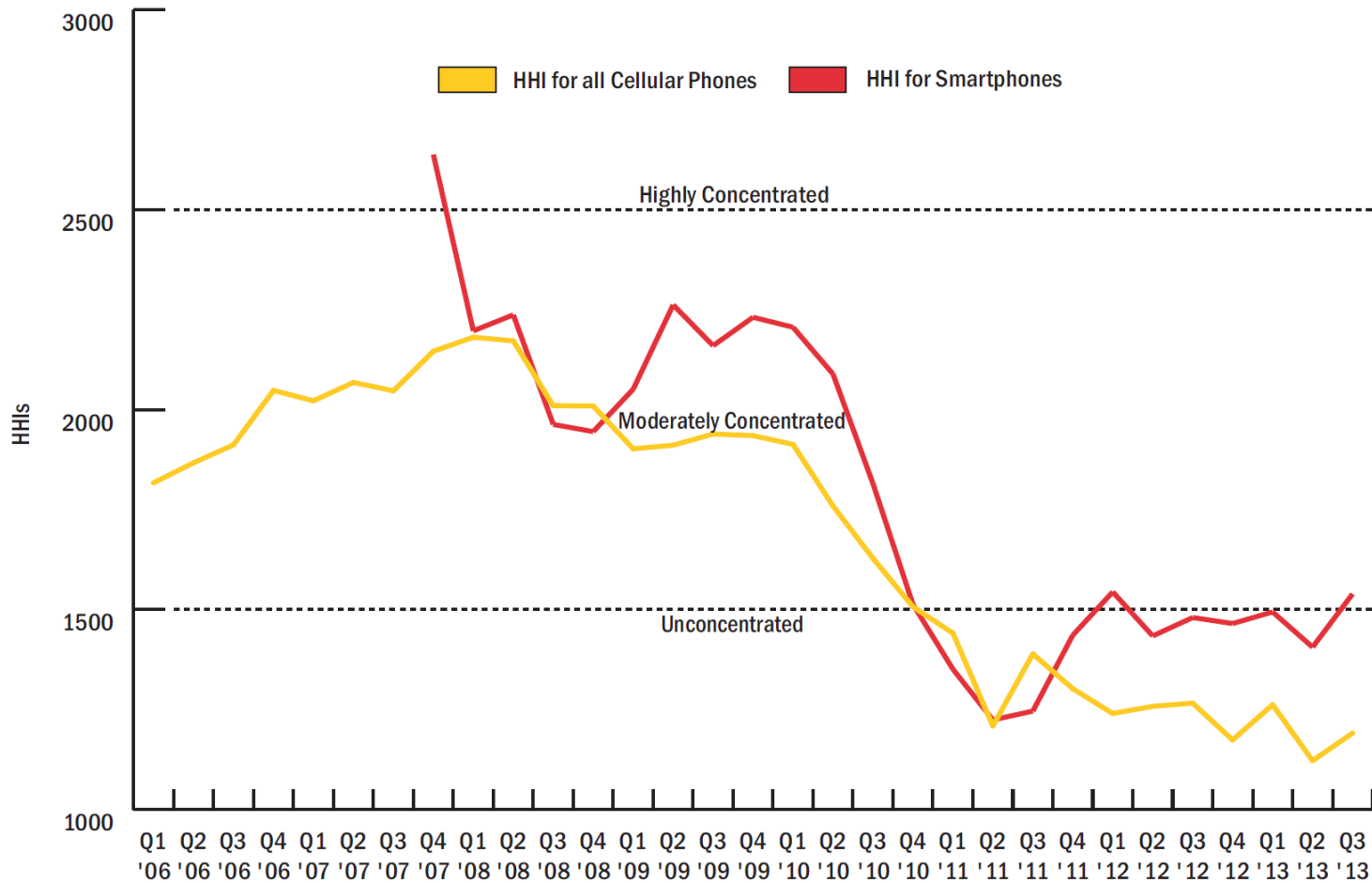


Sources: Bloomberg Finance, IDC



# FRAND Licensing Health Check: Competition

## Herfindahl–Hirschman Index Market Concentration, 2006-2013

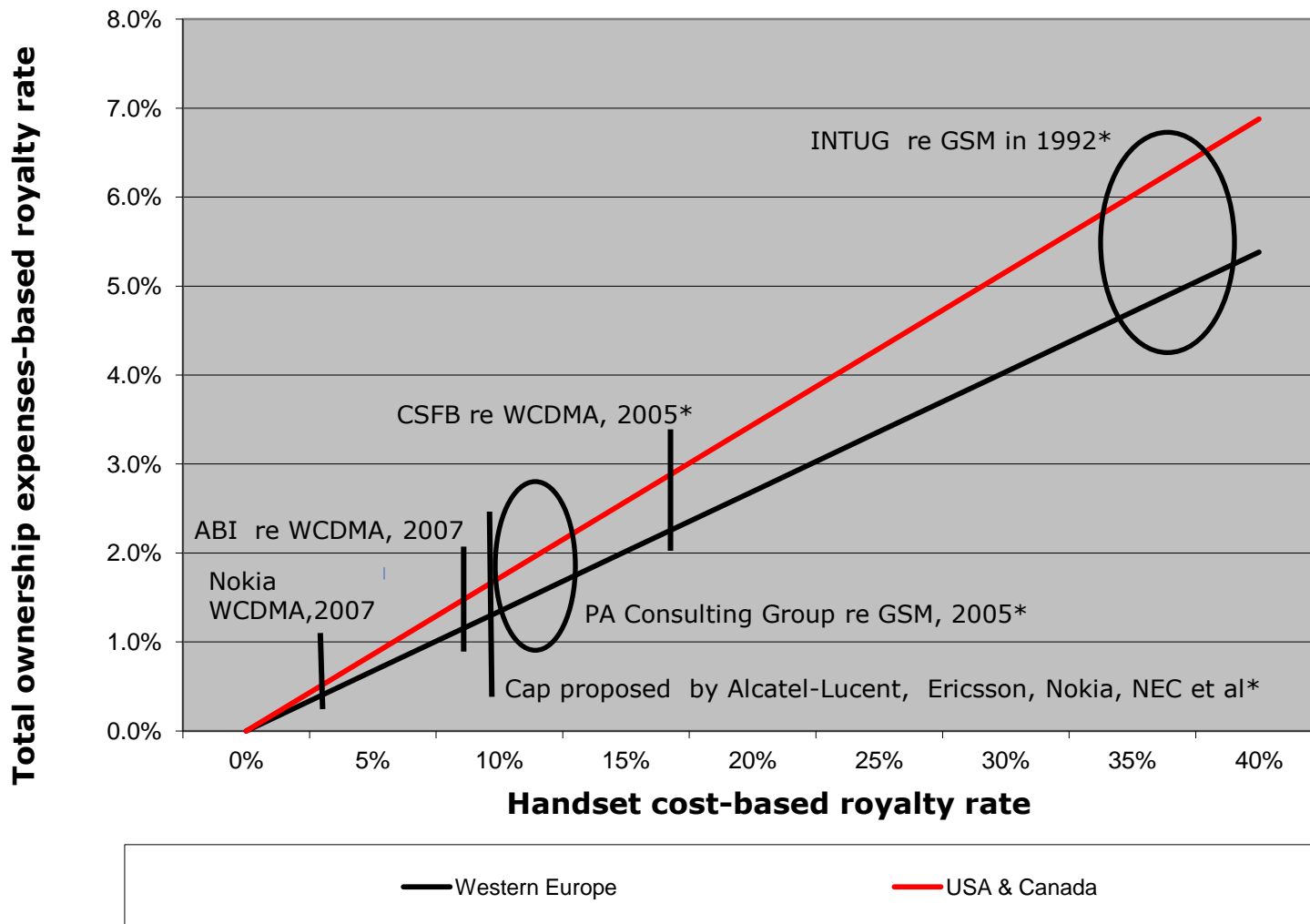


Herfindahl–Hirschman Index calculated from published vendor market share figures



# Royalties More and More Reasonable

## Aggregate royalty rates based on total ownership expenses





\* For companies with no IP to cross-license





# So Much More for your Money Now

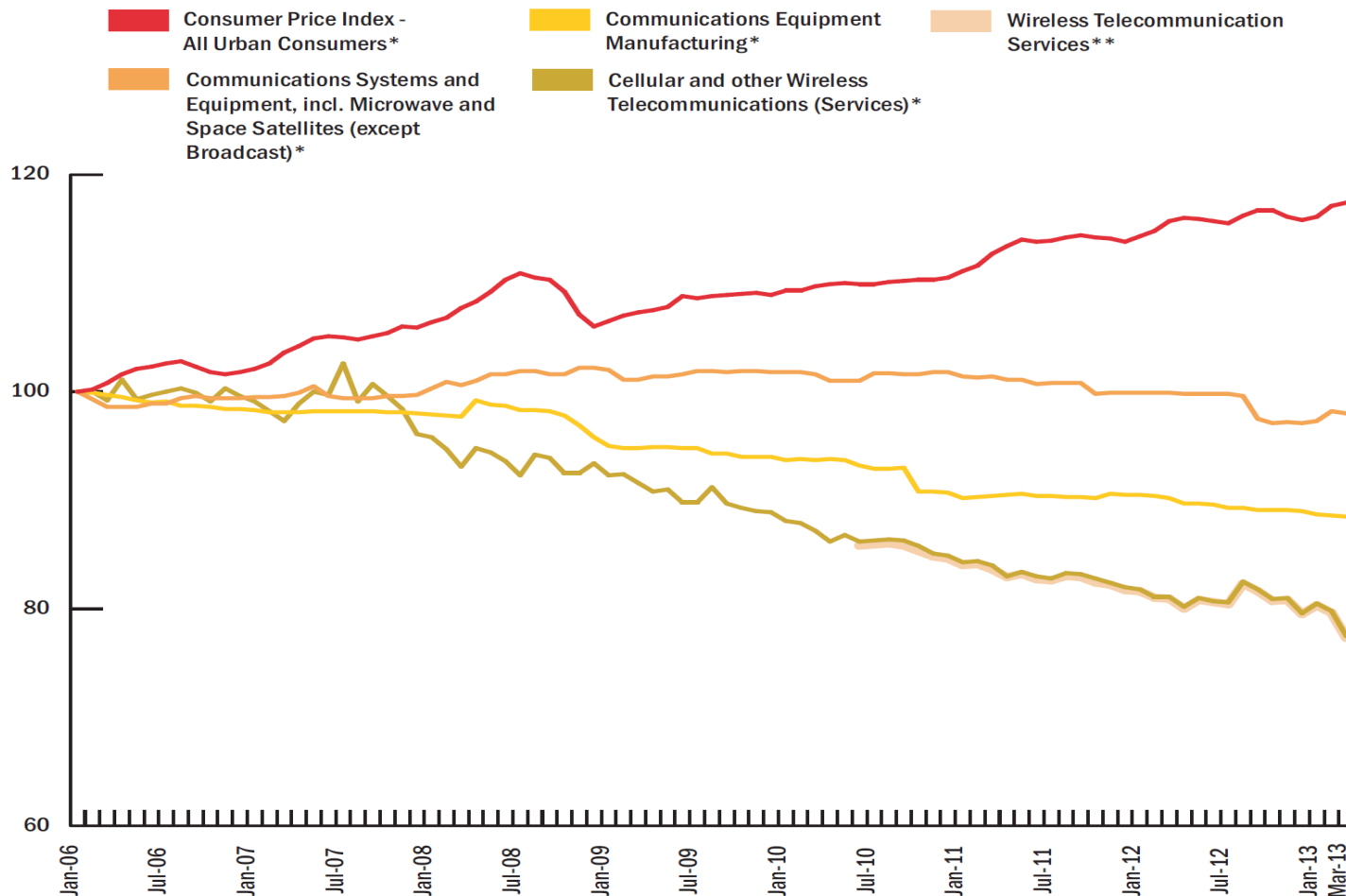
Model	Nokia N93 (2006)	Samsung Galaxy S III (2013)
Images not to scale		
2G Network	GSM 900/1800/1900	GSM 850/900/1800/1900
3G Network	UMTS (WCDMA) 2100	HSDPA 850/900/2100
4G Network	No	LTE 700/2100 or LTE 800/1800/2600*
Data Speed	384 kbps (3G)	50 Mbps (LTE)
Chipset	Nokia/TI baseband processor and Texas Instruments OMAP 2420 Applications Processor	Qualcomm MSM 8960 or Exynos 4412 Quad*
Central processor	332 MHz Dual ARM 11	Dual core 1.5 GHz or Quad core 1.4 GHz Cortex-A9*
Graphics processor	3D Graphics hardware accelerator	Adreno 225 or Mali-400MP*
Operating System	Symbian OS 9.1, Series 60 3 <sup>rd</sup> edition UI	Android OS v4.0 (Ice Cream Sandwich) or Android OS v4.1.1 (Jelly Bean)*
Display	TFT, 256K colours, 240 x 320 pixels, 2.4 inches, 36 x 48mm, 167 pixels per inch	Super AMOLED, 16M colours, 720 x 1,280 pixels, 4.8 inches, 306 pixels per inch
Touchscreen	No	Capacitive multitouch
Memory	50MB storage +64 MB RAM +128 MB miniSD Card	16GB storage, 2GB RAM, up to 64 GB microSD
Cameras	3.15 megapixels, VGA @30 fps: secondary CIF videocall camera	8MP, autofocus, LED flash: secondary 1.9MP, 720p @30 fps
Price without subsidy	Euro 550 x \$1.26 = \$693	\$599-\$649 (24% cheaper with 14% cumulative inflation)





# FRAND Licensing Health Check: Prices

## Cellular Prices Flat or Falling versus Rising CPI



\*Rebased to January 2006 \*\*Rebased to coincide with cellular index in June 2010

Source: U.S. Bureau of Labor Statistics Indices

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# Vibrant Mobile Markets in Devices and Network Services

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- **7 billion subscribers, \$1.2 trillion for operators and \$400 bn for manufacturers annually in only 30 years**
  - Smartphone market revolution with increasing product choice, changing vendor market shares, market entry without SEPs
  - Data speeds with 4G LTE 1,000 times faster than 56kbps for 2G GPRS only one decade ago
  - Hundreds of companies including SMEs contribute to and implement 3GPP (ETSI is a partner) standards
  - 124,000 patents declared possibly essential to 3GPP standards
  - Relentless innovation: a major 3GPP release every 1-2 years
  - Aggregate royalty rates at around 10% with minimal pooling
  - Low-end (unsubsidised) prices of <\$20 for phones and <\$100 for smartphones



# Thank You



## **Keith Mallinson**

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WiseHarbor helps its clients solve commercial problems using market research and analysis.

Keith Mallinson is a regular columnist with IP Finance (<http://ipfinance.blogspot.com>) "where money issues meet IP rights". This weblog looks at financial issues for intellectual property rights. Keith Mallinson writes on the subject of intellectual property in standardised technologies such as those used in 2G, 3G and 4G mobile communications.

Here are links to a couple of articles on matters discussed here  
<http://ipfinance.blogspot.co.il/2013/05/theories-of-harm-with-sep-licensing-do.html>  
<http://ipfinance.blogspot.co.uk/2013/11/absurd-frand-licensing-rate.html>

Articles written for IP Finance and other in cellular communications trade publications are listed and linked on the WiseHarbor web site: <http://www.wiseharbor.com/publications.html>

