

# FRAND Works

## Facts and Figures on FRAND Licensing

A seminar organized by IP Finance and hosted by Olswang LLP

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# Outline

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- **Persistent questions about FRAND**
- **Issues and allegations**
- **Major FRAND successes**
- **FRAND royalty rates**
- **Competition among suppliers**
- **Consumer choice**
- **Innovation**
- **Determining essentiality for valuation of IPR**
- **Some conclusions**



# Persistent Questions about FRAND

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- **What is FRAND? Should FRAND be further defined?**
  - Set of principles
  - FRAND is voluntary commitment to offer licenses on those terms
  - Bilateral negotiation is key
  - Patent pooling should be voluntary
- **Commercial implications of FRAND violation?**
  - Agreement to offer licenses on FRAND terms requires a bilaterally negotiated license agreement
  - Violation would be a commercial dispute under this contract
  - Courts can resolve matters when parties cannot agree
- **Is FRAND a regulatory tool or a commercial necessity?**
  - FRAND is required to facilitate various business models
  - Innovators deserve market-based financial returns and implementers deserve market-based licensing terms



# Issues and Allegations with Patents in Standards and in ICT in General

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- “Patent Thickets”
- Patent “Hold-Up”
- “Royalty Stacking”
- *Ex-ante:*
  - IPR disclosure
  - Licensing terms
- **Standard refrain from antitrust complainants**
  - Raises prices
  - Limits choice
  - Stifles innovation



# Major FRAND Successes

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- **Video Codecs**

- Widely used in DVDs, broadcast streams, PCs and smartphones
- 29 voluntary licensors and 1,000 licensees to H.264 patent pool
- Efficiently administered by pool supported by patent examiners
- Proprietary and open source software (eg, x.264) implementations
- Aggregate patent royalties averaging approximately \$4 per device

- **Mobile Phones**

- 5 billion phones in a \$1 trillion market including services
- Prices down to \$20 (unsubsidised)
- Most vibrant and innovative market with smartphone revolution
- Data speeds 1,000 faster in 10 years from 56kbps GPRS in 2000
- Hundreds of companies contribute to 3GPP and 3GPP2 standards
- 10 major standards releases by 3GPP and pace increases
- Aggregate royalty rates have declined



# Vendors Who Have Publicly Declared Rates

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|                               | <b>Vendor's Own Estimate of its Essential LTE IPR</b> | <b>Expected Handset Royalty Rate</b> |
|-------------------------------|---|--------------------------------------|
| <b>Nokia</b>                  | <b>20-30%</b>   | <b>1.5% (2%*)</b>                    |
| <b>Nokia Siemens Networks</b> | <b>10-15%</b>   | <b>0.8%</b>                          |
| <b>Ericsson<sup>^</sup></b>   | <b>20-25%</b>   | <b>1.5%</b>                          |
| <b>Motorola</b>               |   | <b>2.25%</b>                         |
| <b>Nortel Networks</b>        |   | <b>1%</b>                            |
| <b>Alcatel-Lucent</b>         |   | <b>≤2%</b>                           |
| <b>Qualcomm</b>               |   | <b>3.25%</b>                         |
| <b>Huawei</b>                 |   | <b>≤1.5%</b>                         |
| <b>ZTE</b>                    |   | <b>≤1%</b>                           |

\*Multi-standard devices

<sup>^</sup>Projected maximum aggregate royalty of 6-8%



# Average Cost of Ownership for Cellular Mobile

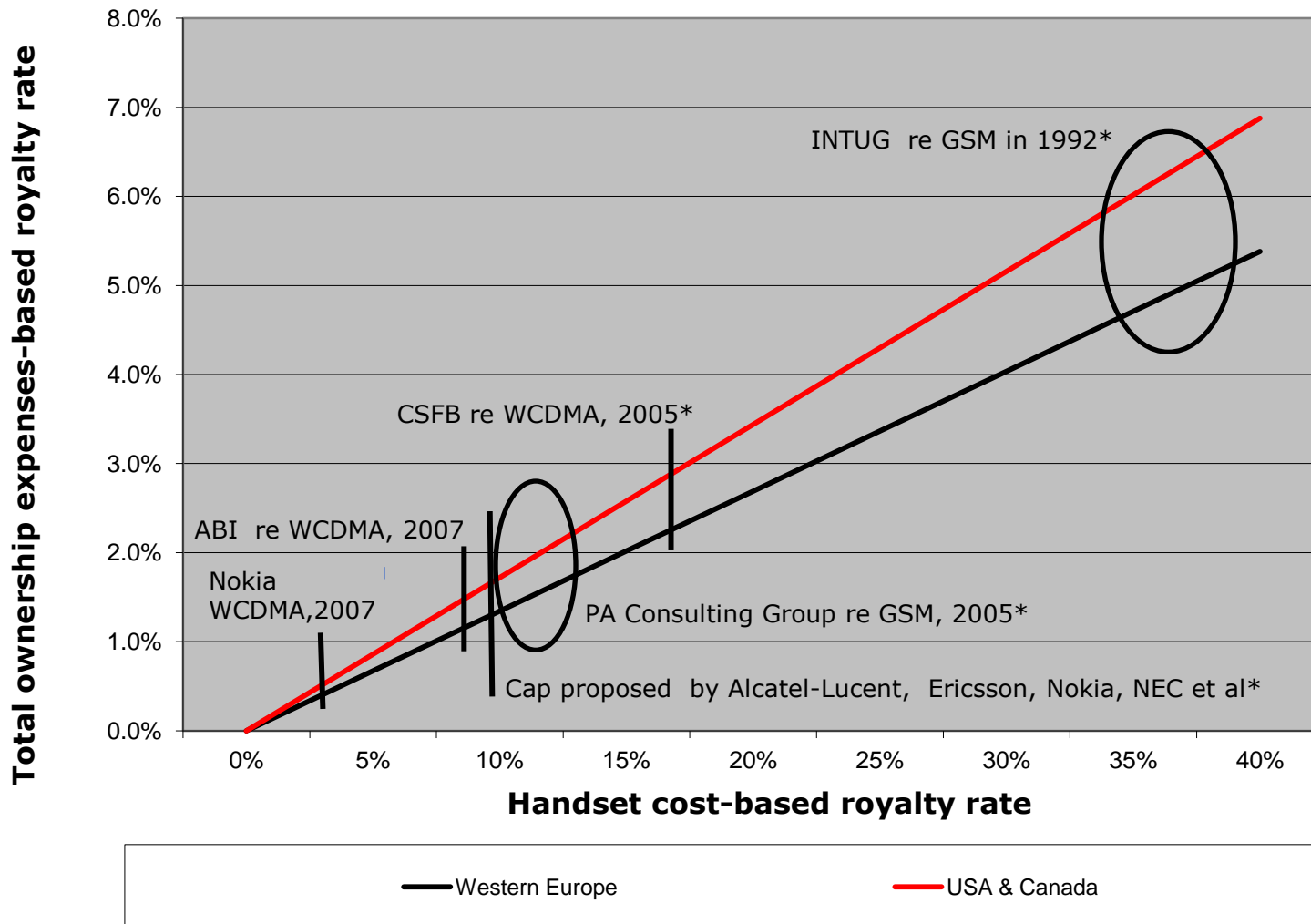
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|  | <b>US and Canada</b> | <b>Western Europe</b> |
|--|----------------------|-----------------------|
| Average service revenue per user (per month) | \$50                 | \$32                  |
| Service life (in months)                     | 20                   | 34                    |
| Total operator services expenditures         | \$1,001              | \$1,087               |
| Average unsubsidised wholesale phone price   | \$207                | \$167                 |
| Total lifecycle expenditures                 | \$1,208              | \$1,254               |
| Handset cost/total expenditures              | 17%                  | 13%                   |



# Royalties Increasingly Reasonable

## Aggregate royalty rates based on total ownership expenses



\* For companies with no IP to cross-license





# Competition: Herfindahl-Hirschman Index

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- **Measures market share concentration**

- The HHI is calculated by squaring the market share of each firm competing in a market, and then summing the resulting numbers
- The HHI number can range from close to zero to 10,000. The closer a market is to being a monopoly, the higher the market's concentration and the lower the level of competition.
- If, for example, there were only one firm in a market, that firm would have 100% market share and the HHI would equal 10,000 (i.e.,  $100 \times 100$ )
- Alternatively, if there were thousands of firms competing, each with close to 0% market share, the HHI would be close to zero, representing near “perfect competition”

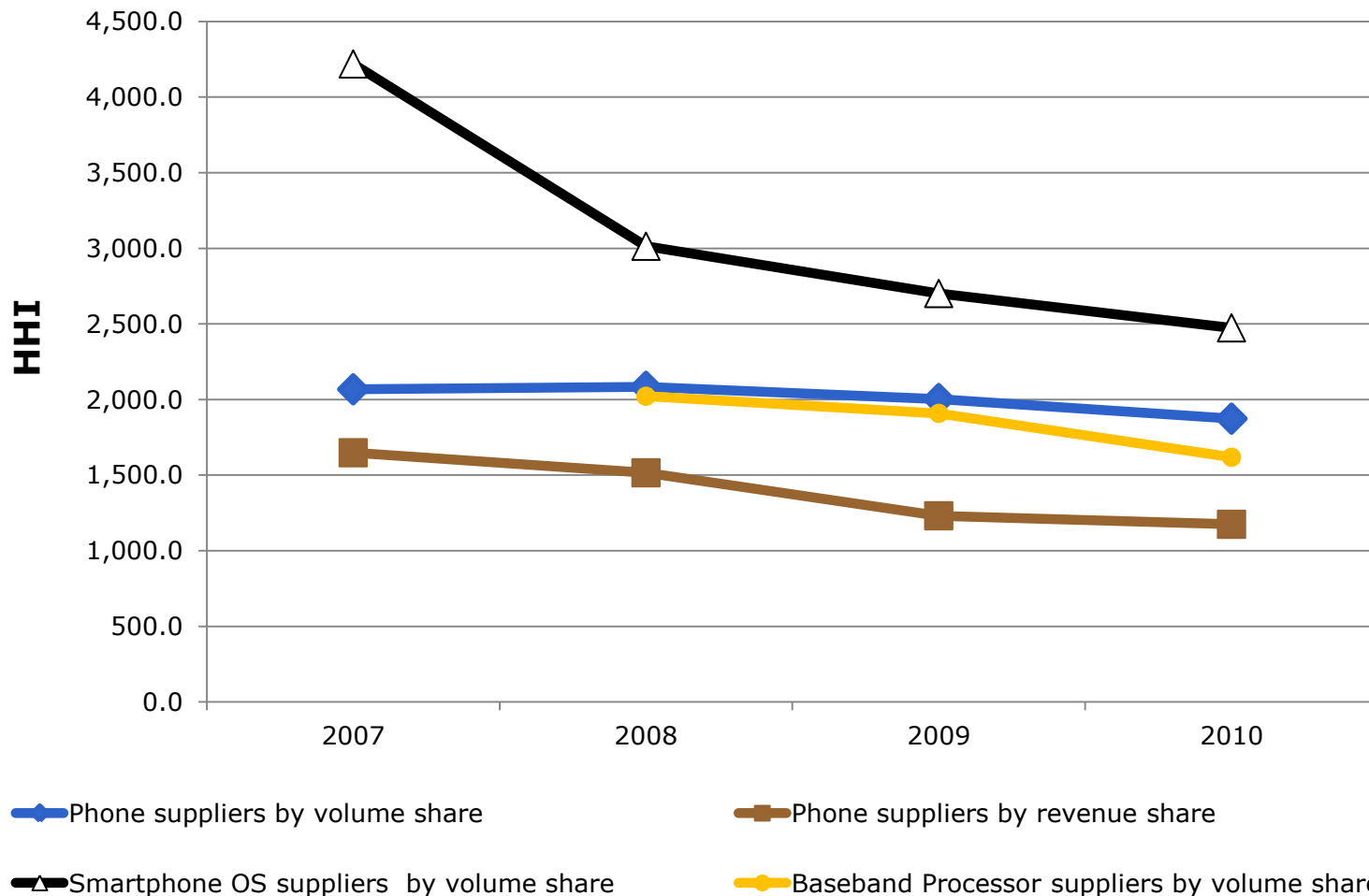
- **According to the U.S. Department of Justice:**

- “[M]arkets in which the HHI is between 1,000 and 1,800 points are considered to be moderately concentrated, and those in which the HHI is in excess of 1,800 points are considered to be concentrated”



# Competition: Market Supply is Unconcentrated

## Herfindahl-Hirschman Index Market Share Concentration Tracking in Mobile



# Increasing Choice

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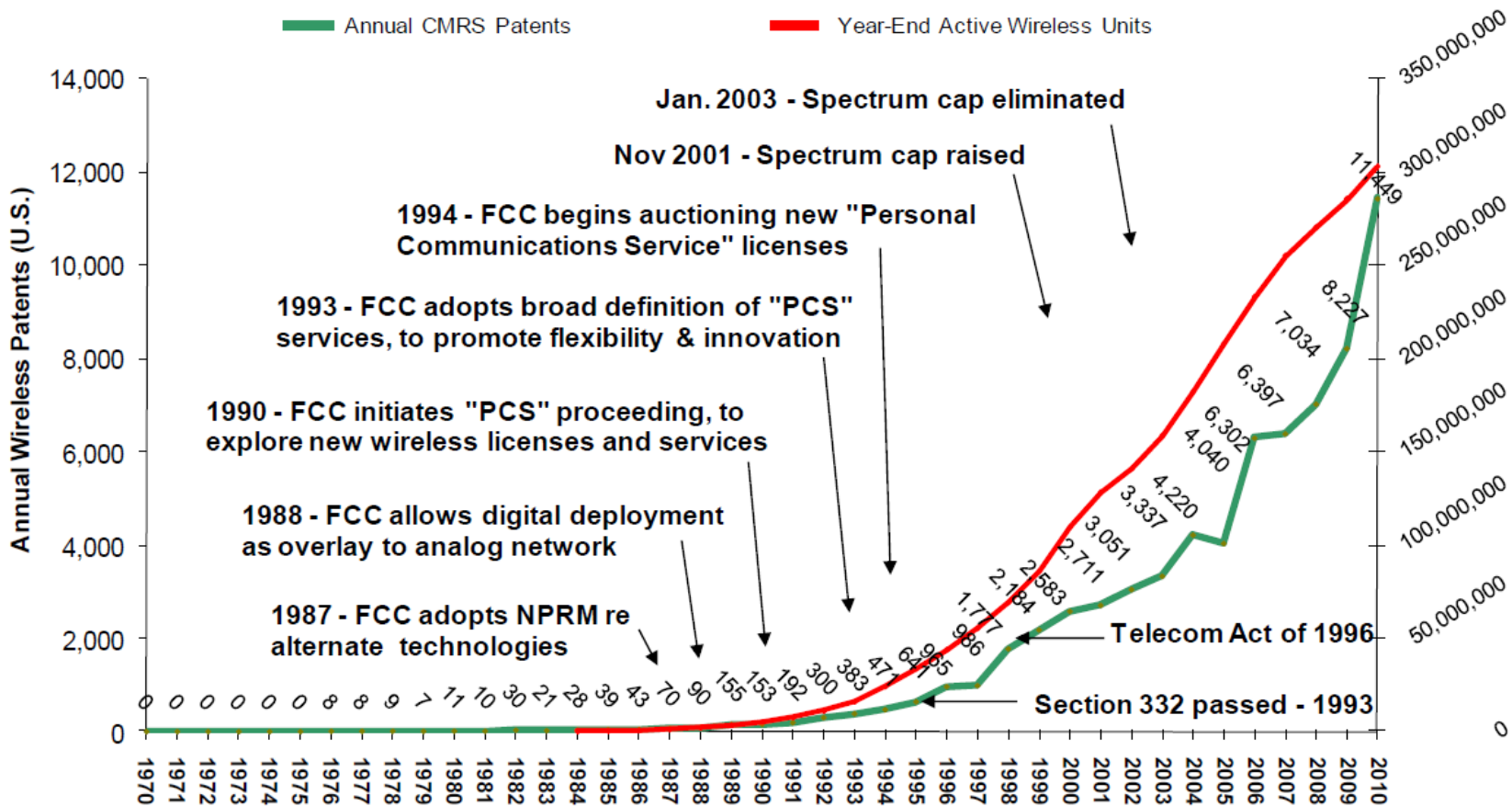
## Handset Manufacturers and Handset Models Offered, U.S., 2006-2010

| Reporting Handset Manufacturers                  | 2006<br>(Nov) | 2007<br>(Nov) | 2008<br>(Dec) | 2009<br>(June) | 2010<br>(June) |
|--|---------------|---------------|---------------|----------------|----------------|
| <i>Total Number</i>                              | 8             | 12            | 12            | 16             | 21             |
| Total Number Offering Ten or More Handset Models | 5             | 8             | 8             | 9              | 11             |
| Total Number of Handset Models Offered           | 124           | 168           | 316           | 260            | 302            |

*Source: U.S. Federal Communications Commission, 2011*



# Patented Innovation



Sources: U.S. Patent Office, CTIA Research



# Smartphone IP Lies (and Truth) Everywhere

| Layer   | Functions   | Implementation  | Notable IP owners  |
|---|---|---|--|
| <b>Radio</b>  | Modem protocols including GSM, CDMA, HSPA, LTE                    | Dedicated silicon baseband processors running microcode or software defined radios on more general purpose processors                               | Ericsson, Nokia, Qualcomm, InterDigital, Motorola/Google, Samsung, LG (the list of claimants is growing)                     |
| <b>Multimedia</b>                                   | Speech vocoders, video recording/playing codecs, graphics engines | Dedicated silicon Graphics Processing Units with hardware acceleration or software acceleration   | Various ICT companies. Patent pool administrator <a href="#">MPEG LA</a> lists 29 licensors for the AVC/H.264 video standard |
| <b>Operating System Platform and User Interface</b> | The device's management system and human interface                | Software on general purpose applications processors with voice recognition, text-to-speech and innovative hardware such as touch-screen controllers | Google (Android*), Apple iOS, Windows Phone (Microsoft), Nokia (Symbian), RIM, WebOS   |
| <b>Applications</b>                                 | Various   | Software that is typically obtained in the aftermarket  | Numerous. Rovio's Angry Birds is a popular game  |
| <b>Physical design</b>                              | Aesthetic style, ergonomics                                       | Hardware form factor and layout   | Handset manufacturers. Apple is asserting its design IP  |
| <b>System design</b>                                | Apps stores, content delivery, service management, billing        | External to device including network, service provisioning and third party content providers  | Various, including Apple, Google and mobile operators  |

*\*Open source software has nominally somewhat common ownership. However, it can be under significant control of its leading sponsor(s) while being fragmented with vendor-specific implementations (e.g., with Motorola's proprietary Motoblur UI replacement, HTC's Sense and Kindle Fire)*



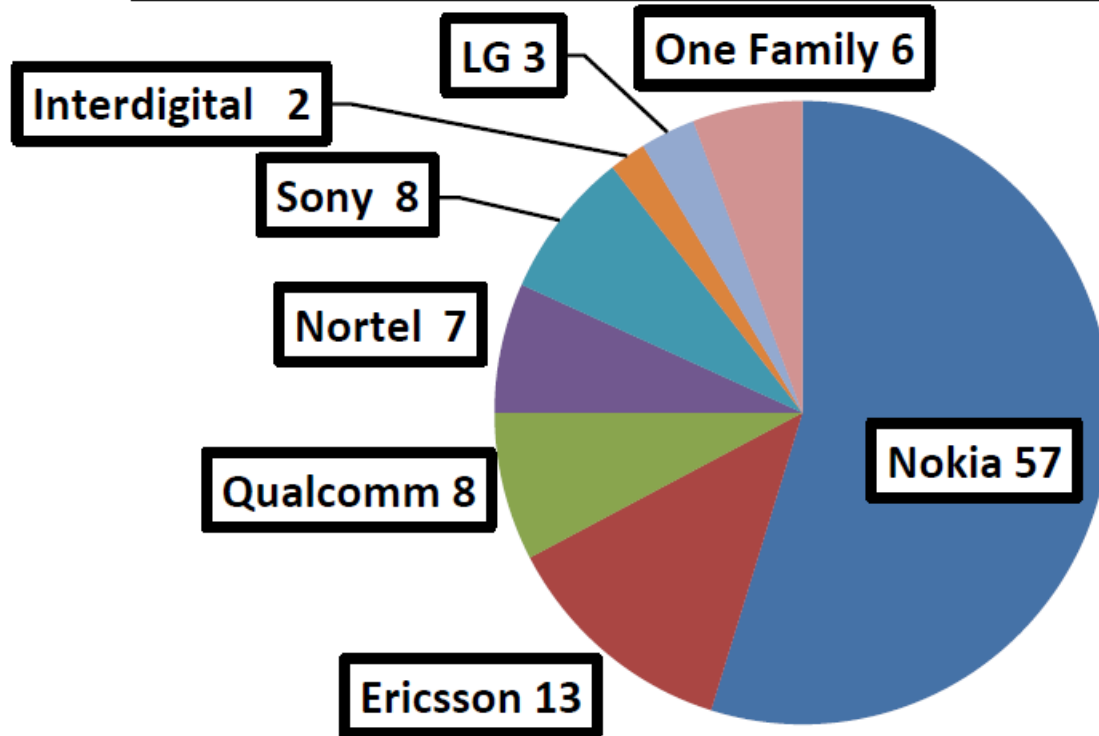
# Two “Essentiality” Assessment Studies on LTE

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- **Fairfield Resources – counts patent families judged essential**
  - *“Fairfield Resources has for more than six years, with support from Nokia and other wireless industry leaders, been studying the extent to which patents declared as essential to wireless standards actually are essential, as determined by a team of experienced wireless engineers.*
  - *The present report, using substantially the same team of experts as in our previous studies, extends our reviews to patents declared as essential to two fourth generation cellular technologies, LTE (the radio access interface) and SAE (the core network)”*
- **Jefferies & Company – counts patents judged essential**
  - *“In valuing the essential LTE patent portfolios of major players in the wireless space, we utilized outside industry experts that included physics PhDs, wireless engineers, patent legal specialists, and former patent office employees.*
  - *Our work began by first screening tens of thousands of patents and then determined a level of essentiality based on individually examining over 1,400 patents related to LTE”*



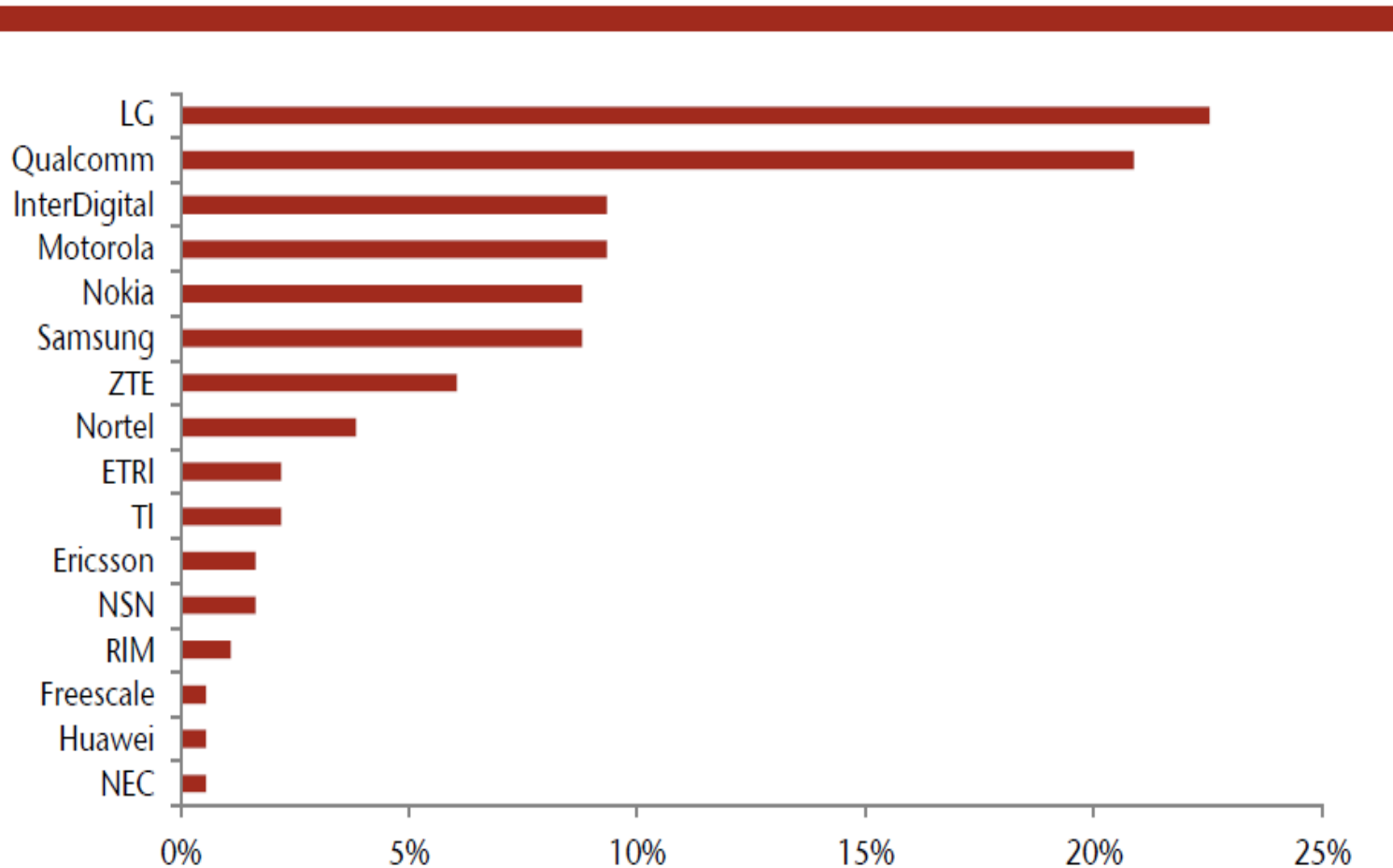
# Families Judged Essential to LTE/SAE (105)



Source: Fairfield Resources Study, 2010



# (Judged) Essential LTE Patents



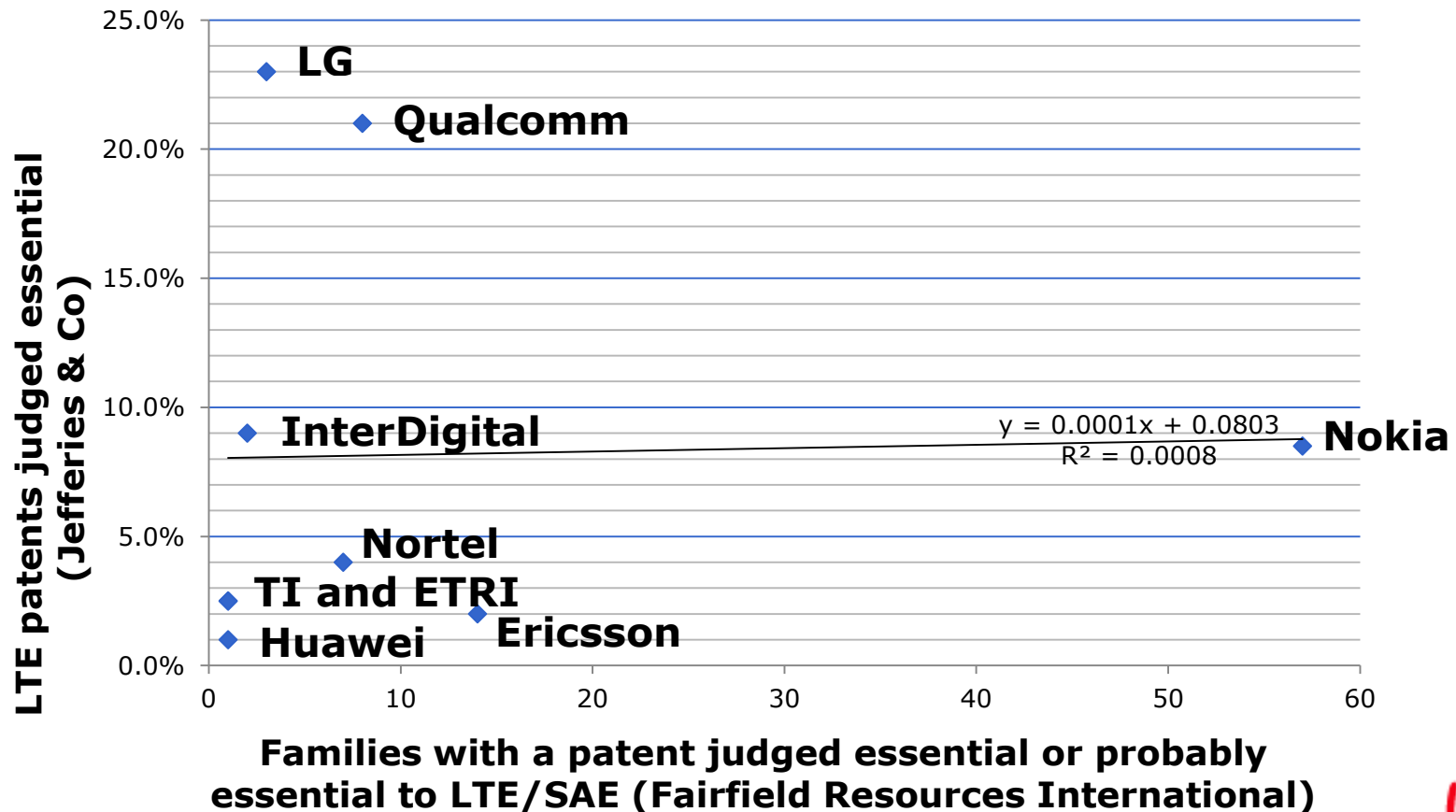
Source: Jefferies & Co, September 2011





# The Peril of Imposing Valuation Methods

**Disagreement on LTE Essential Patent Determinations: Regression shows extremely weak correlation between two studies' results ( $R^2=0.0008$ )**



*Nine companies including Motorola, Samsung, RIM and ZTE are absent because they were only registered as having essential patents in one of the two studies*



# Some Conclusions

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- **FRAND already fosters significant innovation, market growth and declining prices in some very competitive markets**
- **SSOs can and should be free to pursue a variety of different IPR policies of their own choosing on the basis of the European Commission's Horizontal Guidelines**
- **Regulated IPR rates would be a tourniquet to innovation incentives**
- **Mandatory "ex-ante" auctions would distort competition and encourage buyer cartel**
- **Patent pools should be voluntary and subject to various other antitrust/competition safeguards**



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# FRAND Works



# Thank You

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