

*Presentation prepared for KTH IK2555 Mobile and Wireless Network Architectures*

# Mobile telecoms – from technology to market

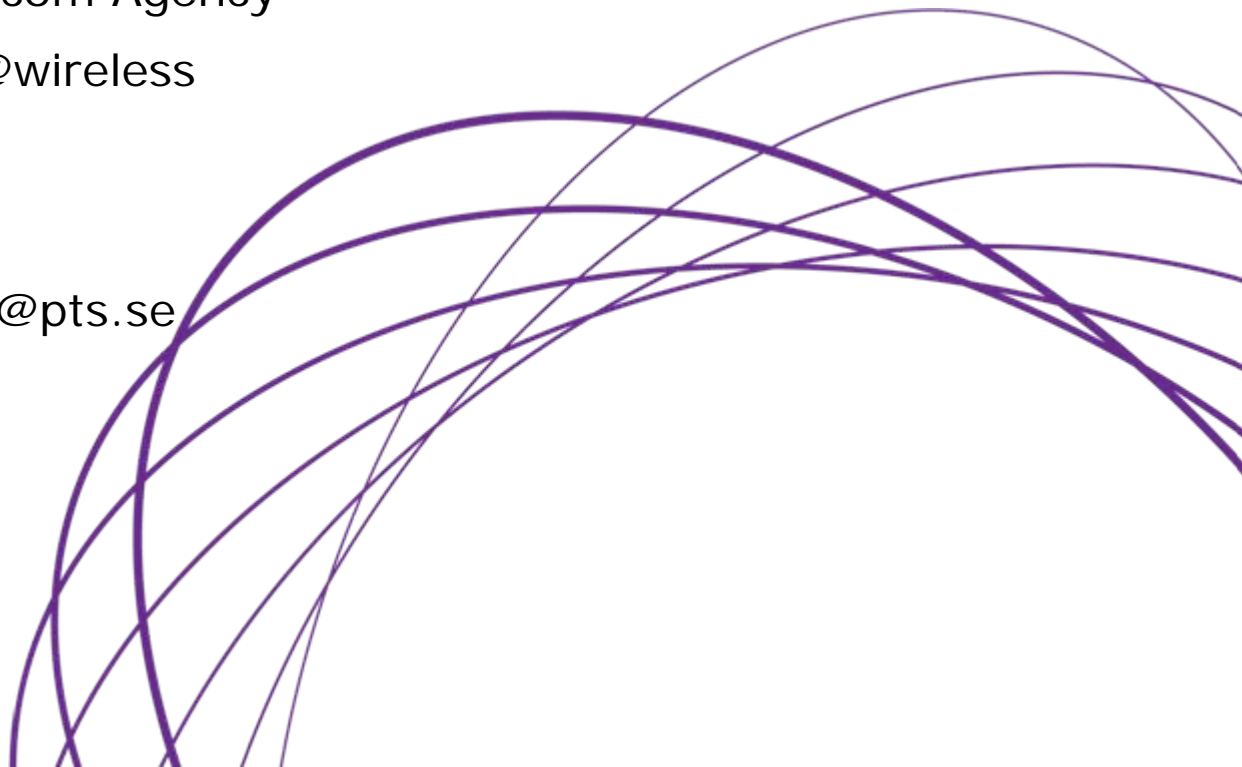
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Swedish Post and Telecom Agency

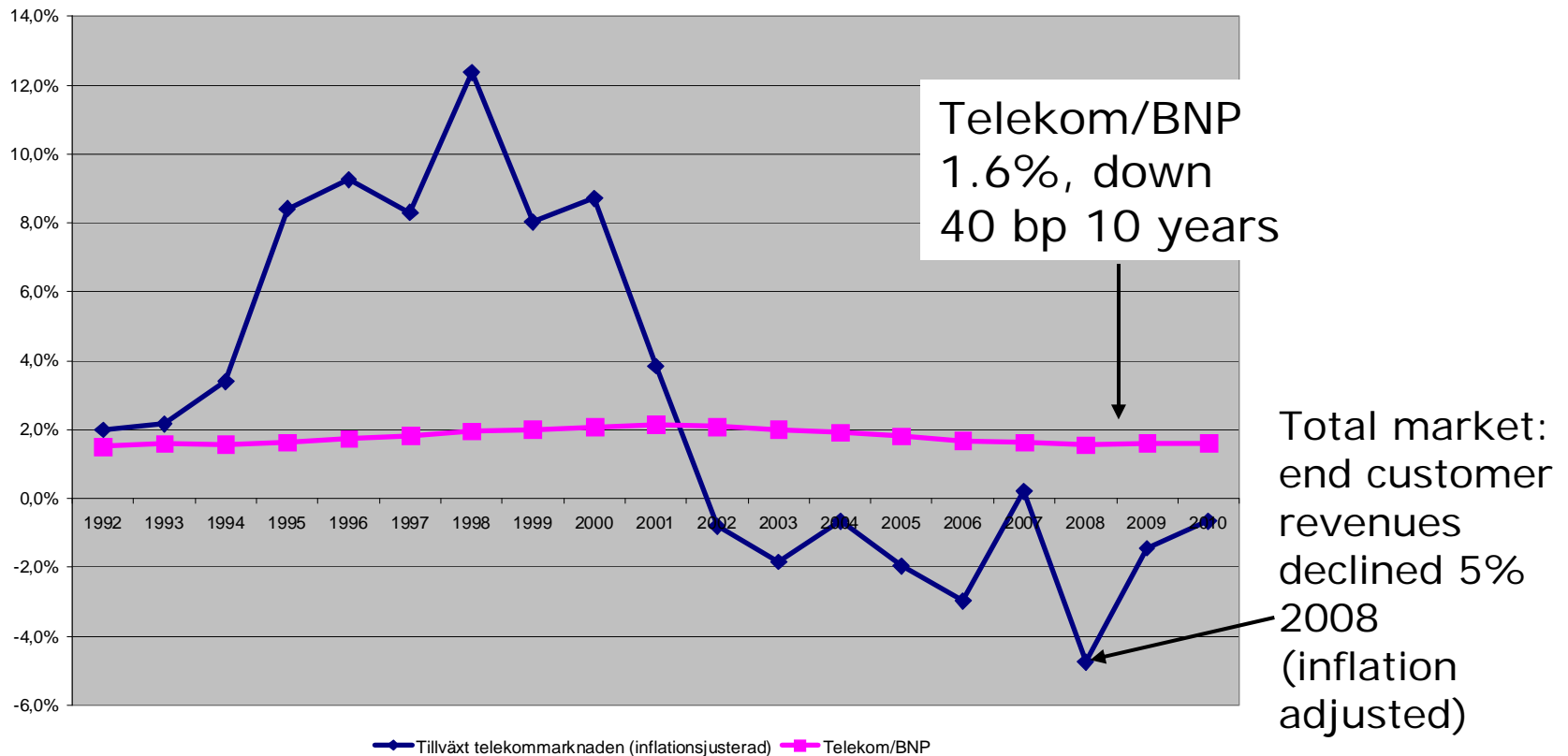
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January 29, 2010

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# Sweden - Stagnating market

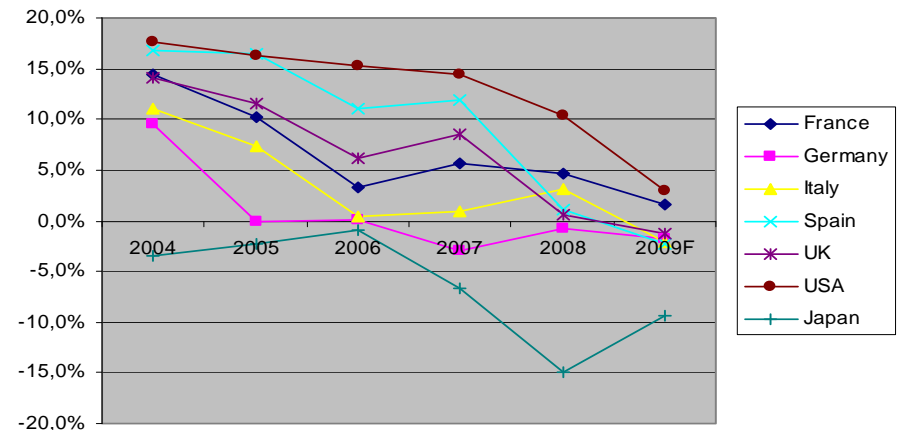


...no value growth on the market for electronic communication, growth of mobile and broadband is not sufficient to offset declining PSTN

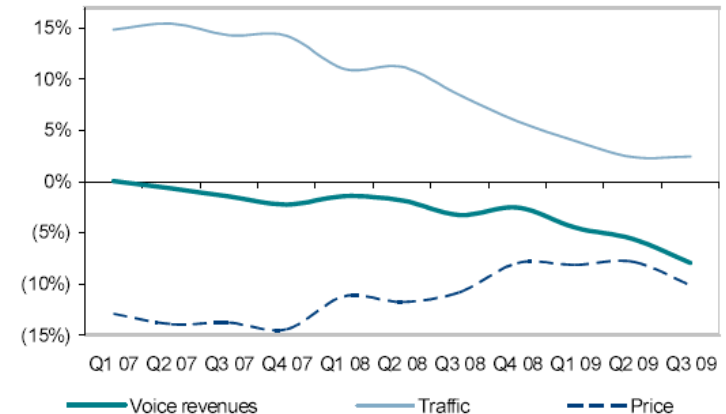
# Global: Similar picture

- European mobile revenues down 3.5% y-o-y during Q309
- Japan is loosing ground
- Market mature, regulation, competition, cyclicity
- Net addition down, voice business stagnating
- ARPU/MoU down 10% y-o-y in Q309
- Voice business deteriorating... continued price pressure, regulation, competition, VoIP...

Mobile revenues annual growth rate, 2004-2009



Voice revenue drivers



# Background

- Researcher at EFI, Stockholm School of Economics 1990-99
- Ph.D. Oct 1999 "Entrepreneurship in Technological Systems - The Development of Mobile Telephony in Sweden"
- Analyst with focus on telecom
  - AB Stelacon 1999 – 2001
  - Evli Bank 2001-05
  - Nordea 2005-06
  - Standard & Poor's 2006-07
  - Handelsbanken 2007-09
  - PTS 2009-



# Topics

- SIM – number => termination – regulation - LRIC
- Spectrum – 800 MHz => more spectrum – lower capex
- Mobile broadband – exponential traffic growth => Revenue gap?
- Handset market => Apple shaking up the industry
- Mobile infrastructure => price erosion hitting Ericsson, Nokia
- Concluding

# Mobile Termination

# Subscriber Identity Module (SIM)



+

E.164

ITU recommendation  
for the international  
number plan that are  
used by PSTN

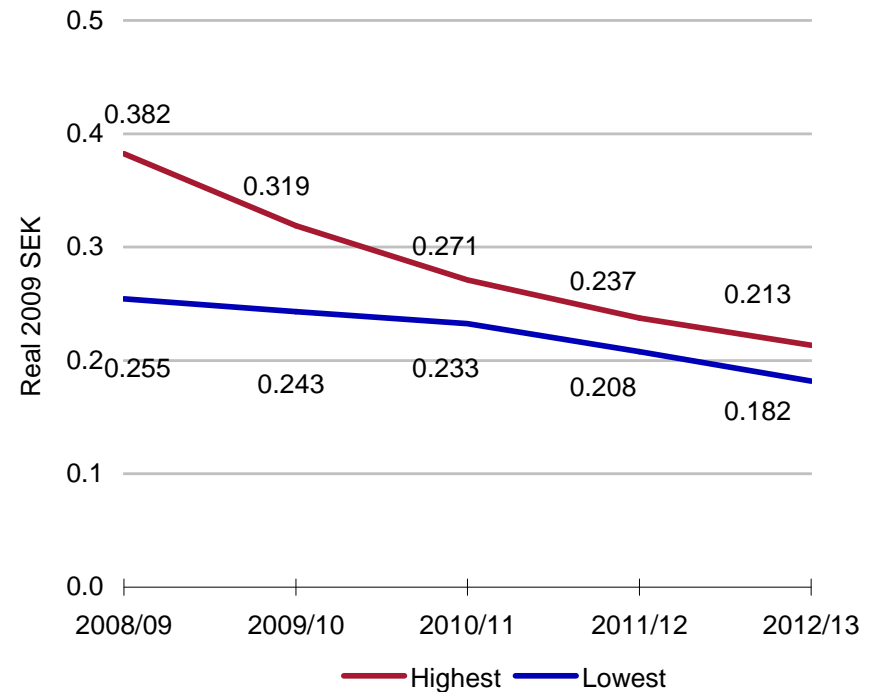
# Mobile termination – price regulation

- Monopoly on terminating calls (controlling the numbers)
- Regulated price to terminate calls
- Way to set the price - LRIC (Long run incremental cost)
- Break through for mobile data change the traffic balance
- EU directive on mobile termination (incremental cost)

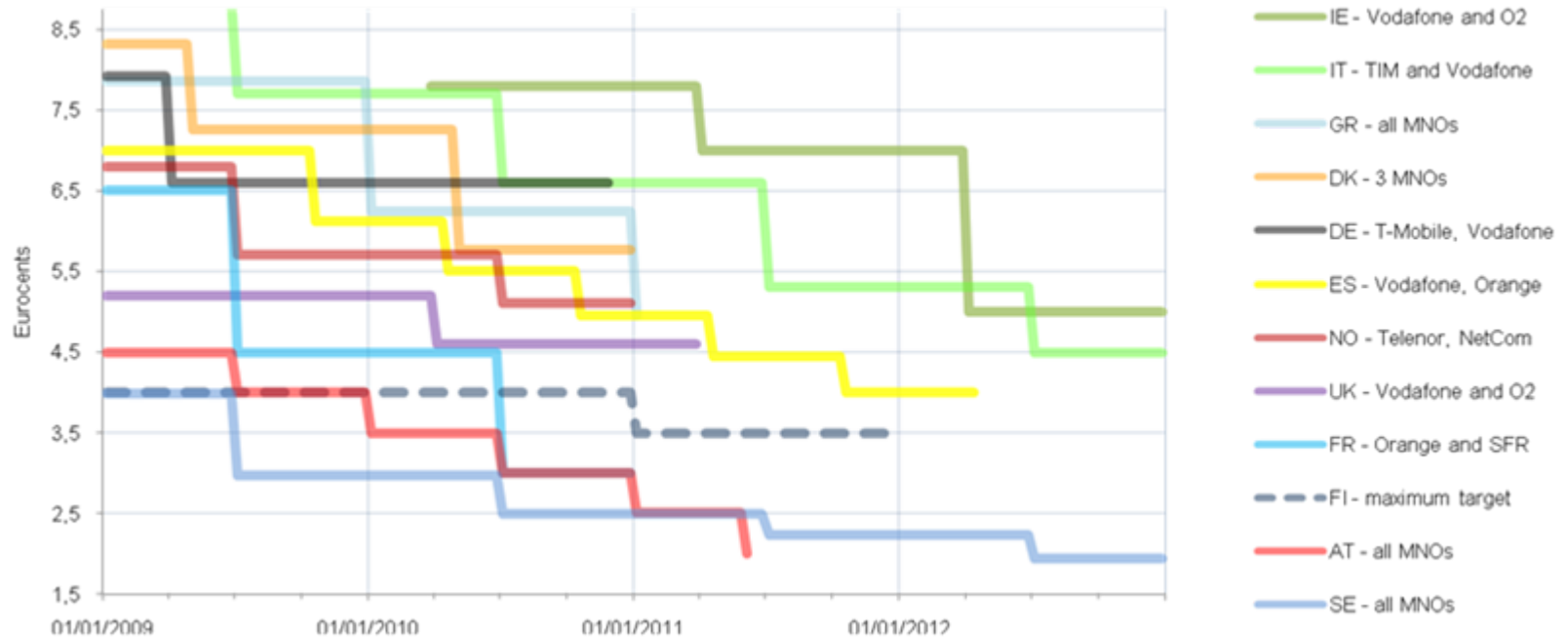


# Mobile termination – glide path

- Updated LRIC model result 0,32 SEK/min
- All operators beside Tele2 adopted the price recommendation from PTS
- High profitability on termination
- Price plans



# Mobile termination going down in Europe



# European Commission is pushing

- EU recommendation on FTR/MTR
- "Common cost" in Swedish law
- Implementation of reviewed EU directives in Swedish law
- Draft calculation 0,10 SEK/min eur 0,015-0,03
- PTS continue to work on long term solution
- Considering different solutions: Bill and keep with fall back solution is one option
- Europe following suit down the glide path...

# Ways to undermine the termination monopoly

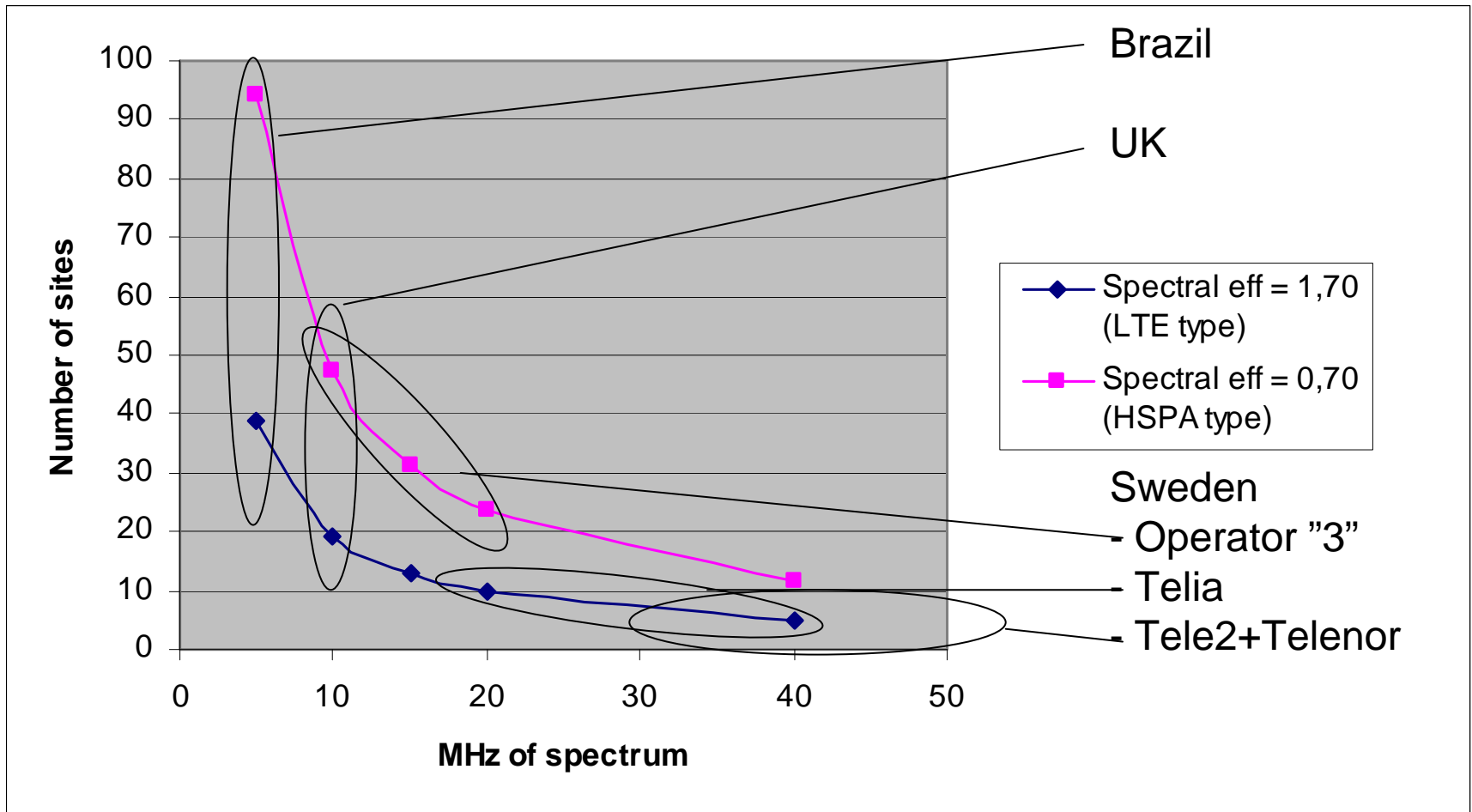
- VoIP (SIP)
- Call back
- UMA
- Multiple SIM cards
- Possibility for receivers to pay
- Other options

# Spectrum

# Spectrum

- 800 MHz auction during H2, 2010
  - Impact assessment
  - Decision process ongoing
- 900 MHz
  - Licenses awarded (decision appealed)
  - Refarming ok, GSM directive not yet altered
- 1800 MHz
  - process ongoing

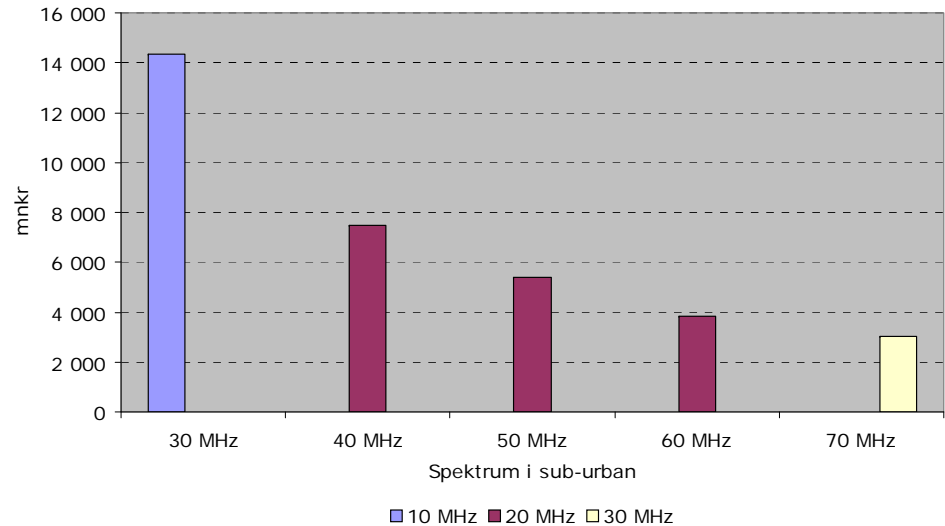
# The impact of amount of spectrum



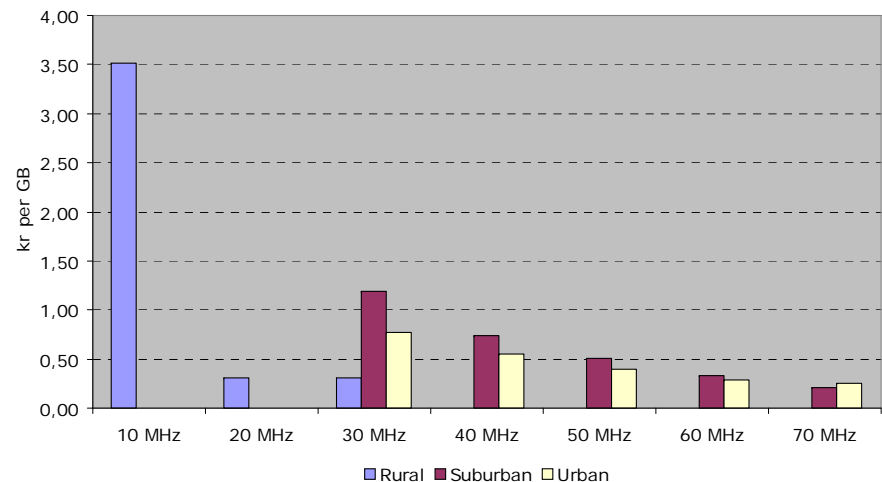
# Spectrum lowers capex

- Assumes 100 GB per user and month, 38% market share, 85% penetration
- Capex drop with SEK 6.8bn going from 10 to 20 MHz i rural
- Production cost drops with 91% going from 10 till 20 MHz
- In Suburban and Urban lowers capex with ca 30% for every 10 MHz

TeliaSonera Capex



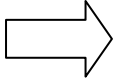
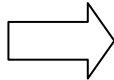
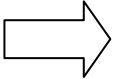
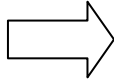
TeliaSonera - Annuitet capex per GB



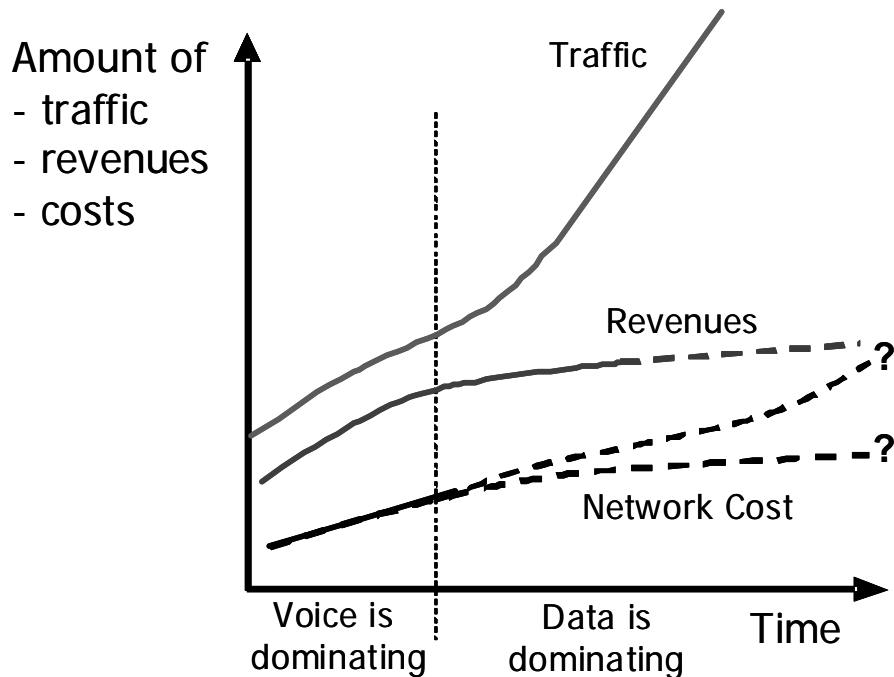


# Mobile broadband Revenue gap?

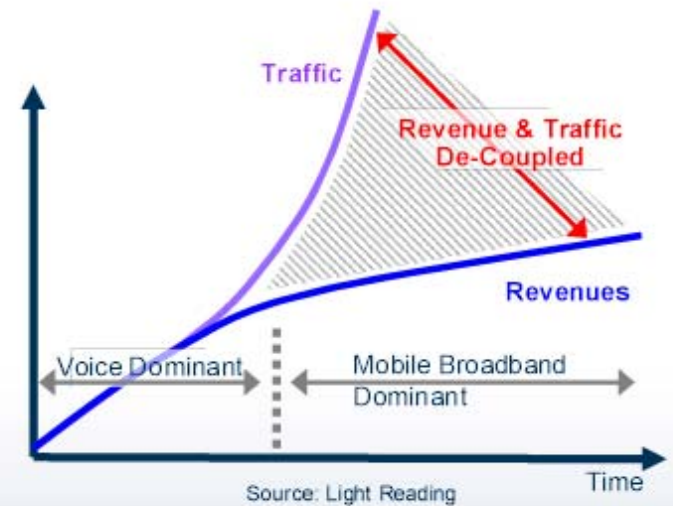
# Findings from current development

- Mobile broadband unable to drive revenues  ~1% of the price per MB  
Compared to voice
- Operators forced to look for new revenue streams  ~10% annual price erosion for voice
- Lower termination fees puts pressure on ARPU  26% cut in Sweden
- Lower free cash flow restricts capex  priority to hold up FCF, funding is now normalized

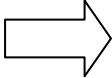

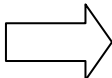
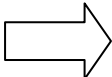

# Mobile broadband: revenue gap?



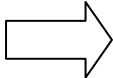
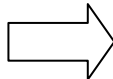

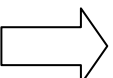
Use the solutions available  
subscriber at a reasonable



# Operator options

- Network sharing  ~ 20-40% saving
- Spectrum refarming  ~ 40-60% saving
- Offloading heavy data traffic to local networks  Femtocell, WiFi (hot spots)  
(reduce need to upgrade)
- Pricing strategies and service differentiation  Raise prices, caps,  
reduce usage
- New types of services and revenues  From access to VAS

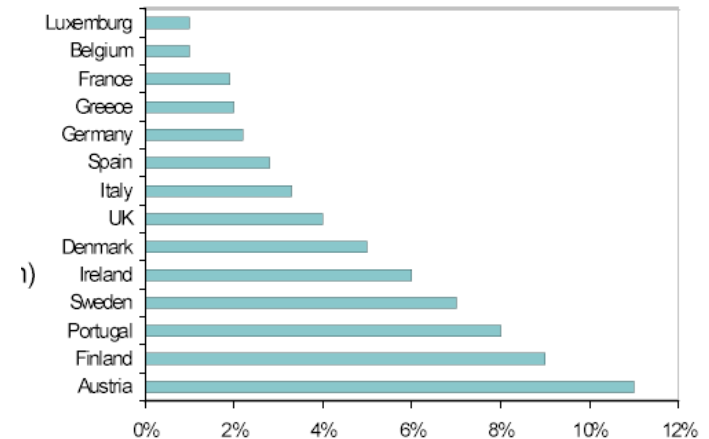
# Operator challenges

- Flat rate subscriptions  €20 tipping point
- Scalability of cellular systems  Coverage vs capacity, peak load (busy hour)
- Cost structure of cellular systems  Radio, core, backhaul
- Changes in the business landscape  Telecom vs Internet view

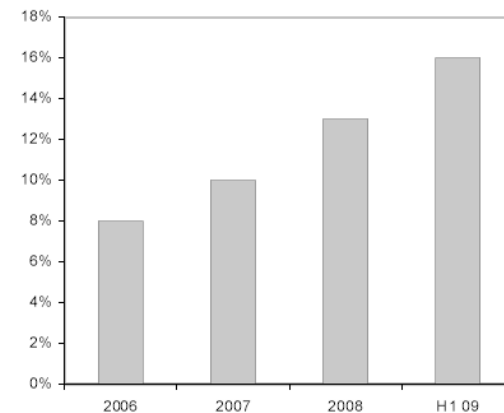
# Support from mobile internet

- SMS is maturing, non-SMS data ARPU, Boosting the sector by ~2%
- Mobile internet in Europe is rather smartphones rather than dongles
- Vodafone Europe: 20% of handsets are smartphones, aiming for 30-40% 2010
- Only 10% of customers pay a data bundle
- Vodafone Europe mobile internet revenues +30% y-o-y in H1 FY 2010
- US explosive growth of data, revenues fuelled by 3G dongles and smart phones

Mobile broadband % of pop. (Q4 08)



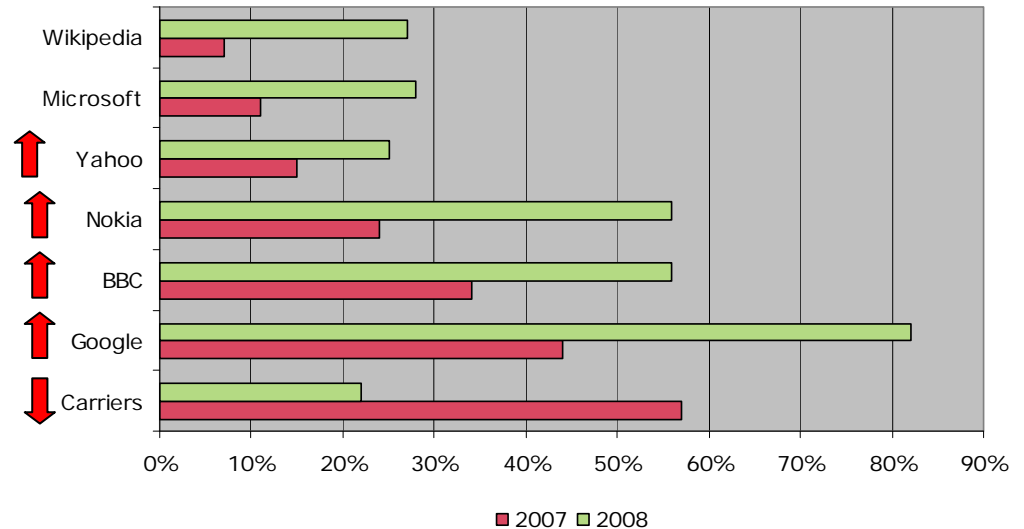
Smartphone sales % of handsets



# Operators loosing ground

- Operators loosing ground in the Apps battle
- Handset and Apps developers gaining ground, but ongoing battle on open vs closed systems
- Access to one Internet in focus, giving US firm an advantage
- ...but it is also a question of innovation...where Europe is laggards

Mobile web sites share of UK mobile internet users



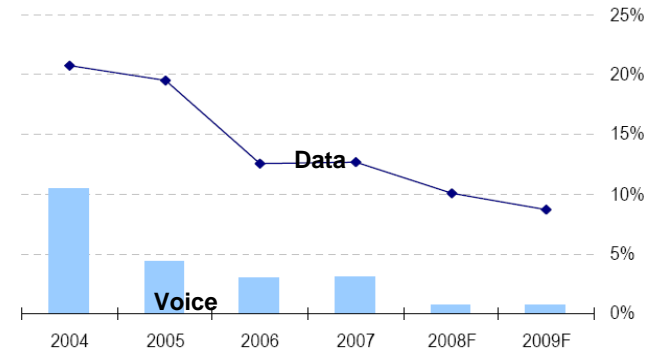
## Revenues from applications

	Previous	Now
Developer	20%	70%
Publisher	20%	0%
Aggregator	20%	0%
Operator	40%	0%
Handset supplier	0%	30%

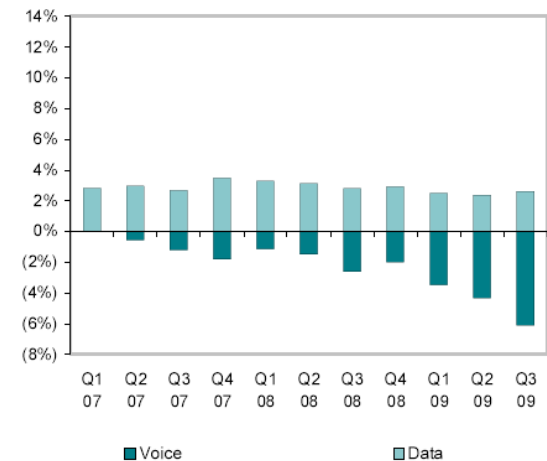
# Focus on access and/or services

- Operators focusing on services or only access?
- A myriad of services: each being small versus operators' revenues
  - Digital content, music, social networks, location based, apps
- Different business models: more complex to handle for operators
  - Pay-by-click, subscription, ads
- Many new competitors with established brands: operators market share will be small
  - Web and software players, hardware, content
- Enabler, 3rd party service

Comparison of annual growth rates for mobile voice and data revenue, EU 2004-2009



Voice & data contributions – Europe





# Mobile infrastructure

# Network infrastructure market

- Networks and related services will decline 10-15% y-o-y in 2009 (EUR)
- NSN forecasts a flat market for 2010 (including services), skeptics expect the market to decline 5-10%.
- Telenors 4G deal (EUR 50m) replacing its entire mobile infrastructure in Norway (GSM, 3G, 4G) and a path to migrate to IP



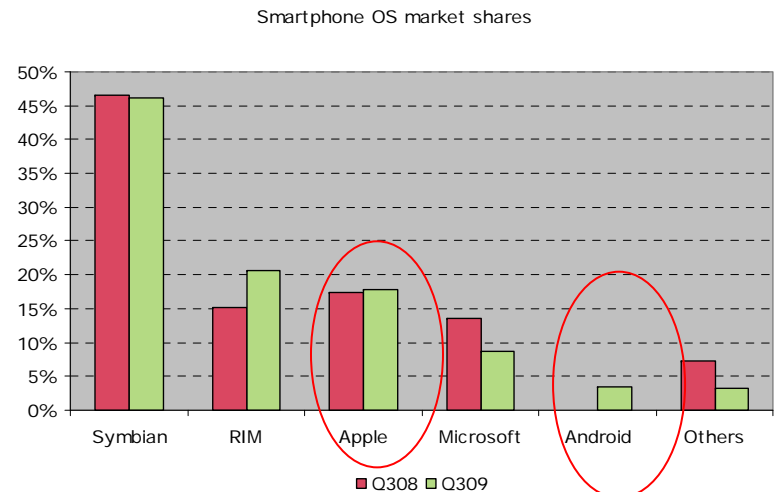
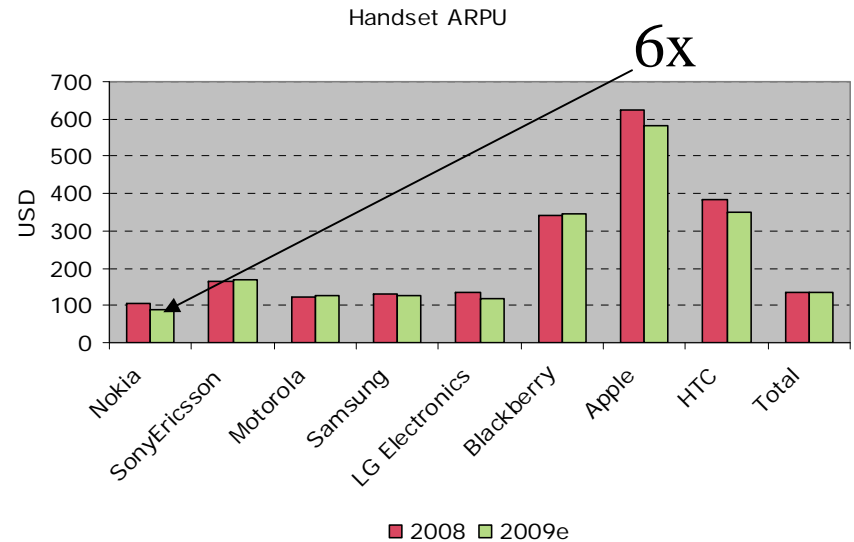
Cisco goes after mobile infrastructure market with \$US2.9b Starent purchase (Oct 2009)

"global mobile data traffic to more than double every year through 2013, with a 66-fold increase in mobile data traffic between 2008-2013. Service providers need a completely new approach to deliver these new services and build efficient mobile networks for this enormous growth in traffic.

# Mobile handsets

# Nokia aiming to strike back

- Iphone has fundamentally shaken up the industry (8.7m Iphone sold, compared to 126m by Nokia during Q409)
- Continued severe price pressure in all segments, but Nokia expect its ASP will decline less than the industry average, but ARPU for smartphones EUR 186)
- Symbian is under pressure, Nokia aiming to strike back plan to launch smartphones based on Symbian 4 in H2 2010
- Microsoft losing ground...
- Apple, Android and RIM gaining ground



# ...but is by far the largest

- Industry expect 10% y-o-y volume growth and 5% y-o-y value growth for the overall handset industry in 2010
- Focus on smartphones, customers want touch screens...



# Concluding

- Termination charges coming down – going towards Bill and Keep. And new technology undermining termination monopoly
- Spectrum will be key when migrating to LTE (lower equipment prices)
- Mobile broadband reshaping the operator business
- Operators loosing the mobile Apps race and is focusing on network enhancements in order to make a business on mobile access
- Differentiate access services, bundling and QoS in order to generate revenues...

# Q&A

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