

Mobile communication services from a user and traffic perspective



- Mobile services the first 50 years
- Service mix
- Handsets and devices
- Usage and traffic
- Prices and price plans

Jan Markendahl
November 11, 2014

Many thanks to our colleague Östen Mäkitalo
who prepared the first version of this lecture

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Home work 1 deadlines 2014

Activity	Home work 1
Home work is assigned to each student	14-11-04 ; 12.00
Draft report sent to teacher & reviewers filename: "country"_HW1_1.doc	14-11-07; 18.00
Review comments sent to teacher and authors filename: "country"_HW1review_by"name"	14-11-10; 10:59
Review session and discussions in review groups (room 208 available, no teacher present)	14-11-10; 13:00-15:00
Send slides for oral presentation to teacher filename: "country"_HW1.ppt	14-11-17; 07:59
Oral presentation of HW1 Each review group will present together	14-11-17 ; 13:00-15:00 Max 5 min per country
Send final report version to teacher filename: "country"_HW1_2.doc	14-11-21; 11:59
Feedback and HW grading send to student	14-11-28; 12.00 latest

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Home work 1 review groups 2014



- Group A
Austria: Mårten
Ireland: Ali
Portugal: Rachaen
- Group B
France: Istiak
Germany: Pehr
UK: Athanasios
- Group C
Estonia: Sikandar
Denmark: Dusan
Finland: Ganapathy
- Group D
Australia: Ahmad
Mexico: Oscar
Morocco: Menatalla

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Home work 1: Country study

THE TASK

- Each of you will get a country to analyze
- Describe the mobile telecom market i country X
 - Identify key actors and their characteristics
 - Identify the main challenges for the key actors
- Prepare written report according to guideline
- Send draft version for review
- Review other reports
- Prepare short oral presentation and slides
- Prepare the final report



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Home work 1: Country study

THE TASK

HOW WELL?
0 – 5 points

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Home work 1: Country study

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Home work 1: Country study

WHAT TO DO

- Deadlines for review, draft/final report->KTH social
- Prepare a 3-5 minute presentation with 2 slides
 - 1 about "your" country and the market
 - 1 about the most important challenges
- Send the slides to janmar@kth.se
 - Latest November 17 at 07.59
- Oral presentation at seminar
Thursday November 17, 13:00-15:00
 - Compile one ppt file for all countries in the review group; including reviews in summary



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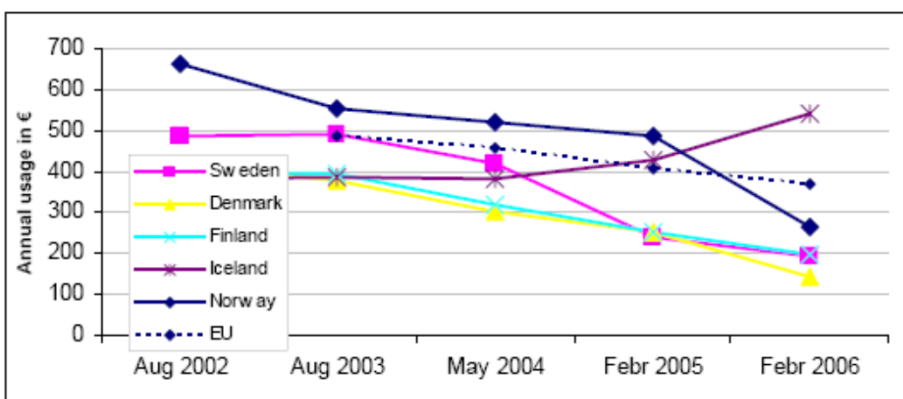
About challenges: Think about the three "C's" consumers, competition and cost



- Can we identify problems for consumers?
 - High prices
 - Bad service availability or quality
- Can we identify problems for the society?
 - No or low broadband penetration
 - No mobile broadband
- What is the focus of the regulator?
 - To "control" big actor(s)
 - To ensure fairness
 - To support market entry

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Example 1. Prices for voice calls in Nordic countries - why did prices at Iceland increase?



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Example 2. Prices for voice calls in India + market structure



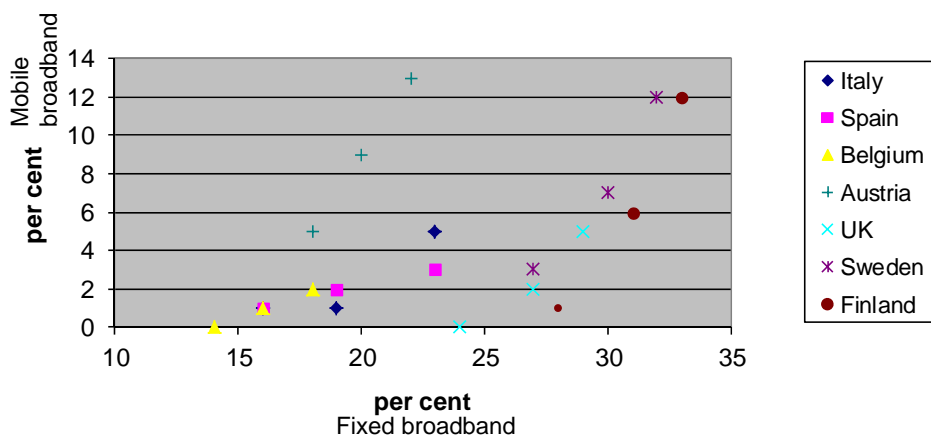
- In India 10-14 operators in each region
- Number of Voice minutes per subscriber = 10 x Sweden
- Minute price for voice calls = Sweden /10
- Many low ARPU users

⇒ High level of competition

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Example 3. Penetration of mobile vs fixed broadband - why is there high/low MBB penetration?

**penetration of mobile broadband versus penetration
for fixed broadband - during three years**



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Example 4. Spectrum allocation



- What is the impact on the competition on the MBB market depending on how spectrum is allocated
- 800 MHz auction in Sweden
 - In total 2*30 MHz
 - Caps 20 or 10 MHz?
 - Operators can get 20, 10, 5 or nothing
- What is the impact for operators on
 - network costs?
 - service offer?
 - Market position

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Example 3 (cont'd): Sweden 3G/4G spectrum allocation



Operator	2.1 GHz	2.6 GHz	800 MHz
Telia	0	20 MHz	10 MHz
Tele2	15->20 MHz	20 MHz	} 10 MHz
Telenor	15->20 MHz	20 MHz	
Tre (3)	15->20 MHz	10 MHz	10 MHz
Orange	15-> 0 MHz	-	-

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About review of the homework reports

- Below is a short check list with key aspects to consider when reviewing the HW reports
 - Are the key aspects of the analysis covered?
 - Is there a relevant methodology section?
 - Are the results and analysis clearly described and supported by a convincing argumentation?
 - Is the report OK when it comes to layout, presentation style and language
 - Are there sections with "cut and paste" material from webpages, reports, etc?
 - Are relevant references used?
 - Is there any self-assessment and is it relevant?
- Each student should reviews 2 other students
- Send your reviews to all in the review group and to Jan (janmar@kth.se)



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Mobile communication services from a user and traffic perspective



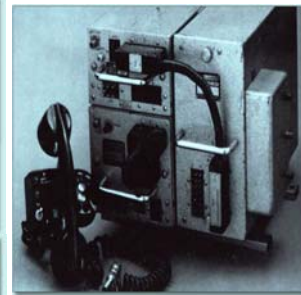
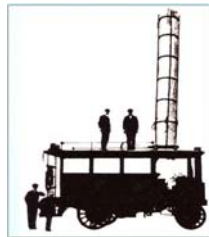
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The first 50 years of mobile telephony.



1956

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Students now and then

- When did you get your first mobile phone?
- When did you get your first smartphone?



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Students now and then

- Mobile telephony when I was a student?
- What to do?



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The mobile dream



- The first automatic systems (1956, 1966) showed the potential of mobile telephony, and gave birth to two dreams (1968)
 - A mobile phone as every persons property
 - With a mobile phone you can reach anybody - anytime and anywhere
- The NMT system launched 1981 was designed to met requirements enabling the dreams
 - Automatic service
 - Wide area coverage, Handover
 - Roaming
 - High capacity
 - Affordable cost
 - Easy to use and handy terminals

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Important milestones for the development of GSM and its followers



2G /GSM

- The GSM group was established (1982)
- Basic requirements for GSM (1985)
- GSM system trials in Paris (Dec 1986)
- GSM specifications finalized (1987-1988)
- GSM in commercial service (1991 – 1992)

3G/UMTS/WCDMA

- ITU starts the work with UMTS (1987)
- WCDMA chosen as "3G" standard (1998)
- UMTS taken into commercial use (2001)

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Further development



- GSM originally aimed for speech/low speed data.
- Up to 1990 the users were mainly professional-**Why?**
- UMTS from 1987 was intended to become a global system for telephony.
- GSM however solved this task.
- The development of UMTS was therefore during the 90 ´s refocused to the possibilities to offer **higher speeds and new services**
- UMTS has been further developed to HSPA
- LTE = 3G Long term evolution agreed 2005

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For how long time have we used different types of services (Sweden) ?

- Fixed telephony: > 100 years
- Mobile telephony: 30 years
- SMS services: ~20 years
- Phones with cameras and MP3 players: ~ 10 years
- SMS payments: ~5 years
- Smartphones and mobile Apps: < 5 years



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TeliaSonera.s view on the mobile content business – what year is this ??

Step 1- Manage the end-user interface in TeliaSonera's mobile channels

- Take ownership of the mobile interface using customer-friendly Clients and Softkeys to our services



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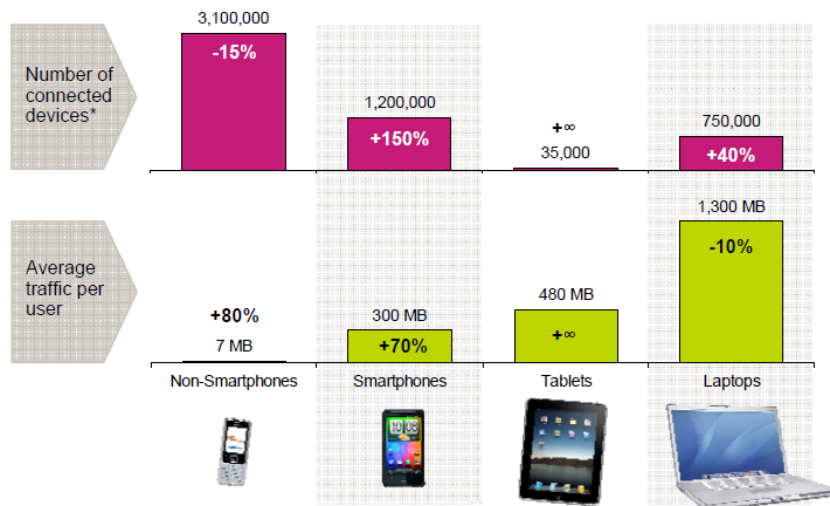
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More devices get connected



Active devices measured, Sweden April 2011 compared to last year
 * M2M not included

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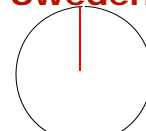
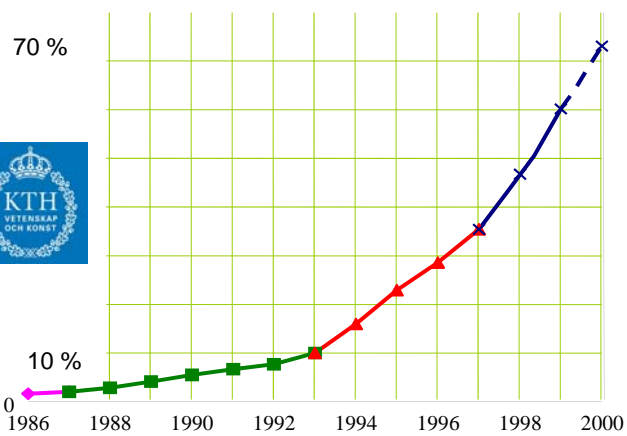
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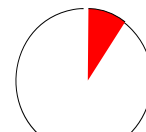
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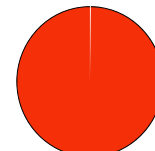
Mobile telephony penetration in Sweden



1981



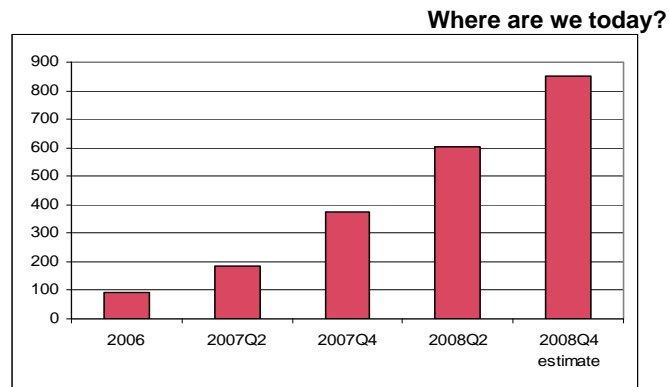
1991



2004

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Mobile broadband subscriptions in Sweden (thousands)



Will Mobile broadband penetration graphs make sense in the future?

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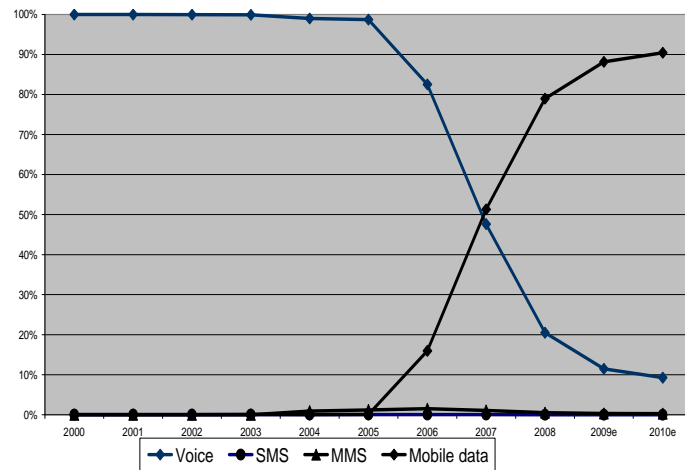
Amount of data – orders of magnitude (GB per month and person)



- Voice traffic 0,01-0,02 GB
- Smartphones now 0,10-1,00 GB
- Smartphones later on ??
- Laptop MBB as complement 1 – 5 GB
- Laptop MBB as substitute 2 – 20GB

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Mobile broadband share of total traffic (Sweden)



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Present status of mobile communications



- 6-7 Billions of users
- About 1 Billion fixed phones
- 300 networks in 200 countries
- More than 1 Billion terminals sold/year

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Broadband subscriptions (globally)



- 2007 - 2014 the number is expected to grow from 400 to ~3400 millions.
- The share of mobile broadband grows from ~ 100 millions to ~2800 millions
- This implies that "broadband" will mean "mobile broadband" for most people

The mobile phone becomes a persons 24 hour a day servant

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Demand & price - Observations

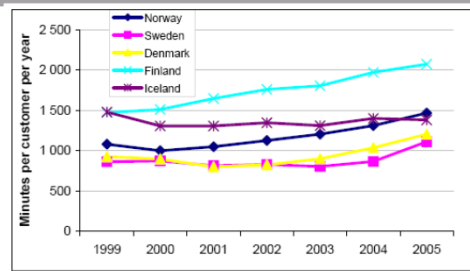


Figure 3 Number of traffic minutes per customer per year.

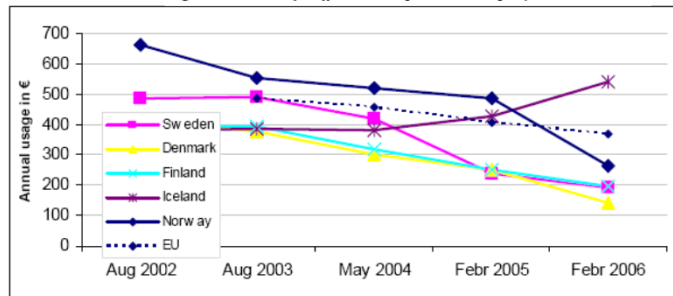
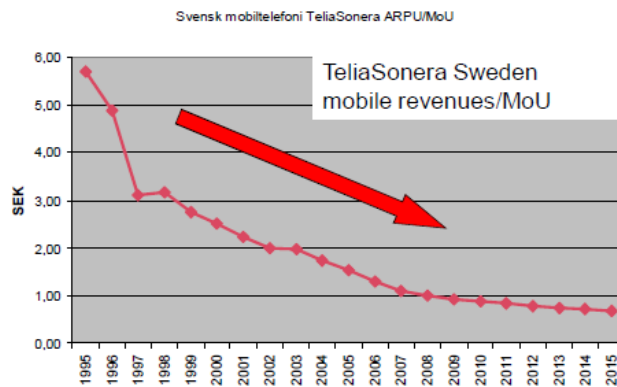


Figure 5 Changes in the price of typical normal usage.

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Competition pushing down prices



Revenues per minute has declined ~12% per year since 1995

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Development of prices

Wireless Internet and mobile broad band access



- Telia Homerun -2006
 - Hot spot WLAN service
 - 150 € per month
- 3 Mobile broad band 2006
 - UMTS 3G card for laptop
 - 40 € per month
- Telia ConnectPro 2007
 - WLAN, GPRS, UMTS
 - 30 – 55 € per month
- Mobile Broad band 2011
 - Super 3G, Turbo 3G, 4G,
 - 5 – 50 € per month

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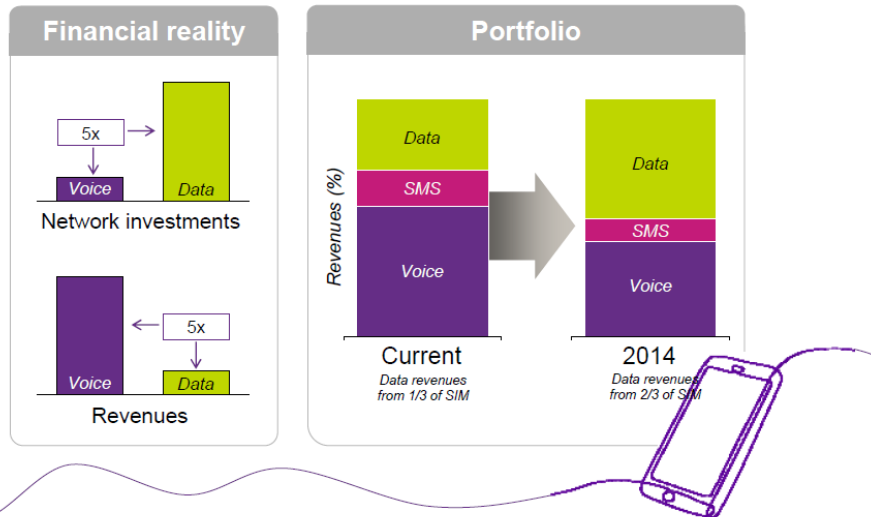
Revenues (2008)



- | | |
|--------------------|--------------------------|
| • Voice | 60 % (declining) |
| • SMS | 12 % (increasing) |
| • Mobile broadband | 3 % (rapidly increasing) |
| • Other | 25 % |

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Rebalancing of pricing model needed (2011)



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TeliaSonera

Components in Mobile broad band offers

For the "dongle" business

- Length of contract
- Price
- Data rate
- Amount of data
- Fee for dongle or not
- Conditions when data limit is exceeded



Smartphones?

What is paid by the consumer and the operator?

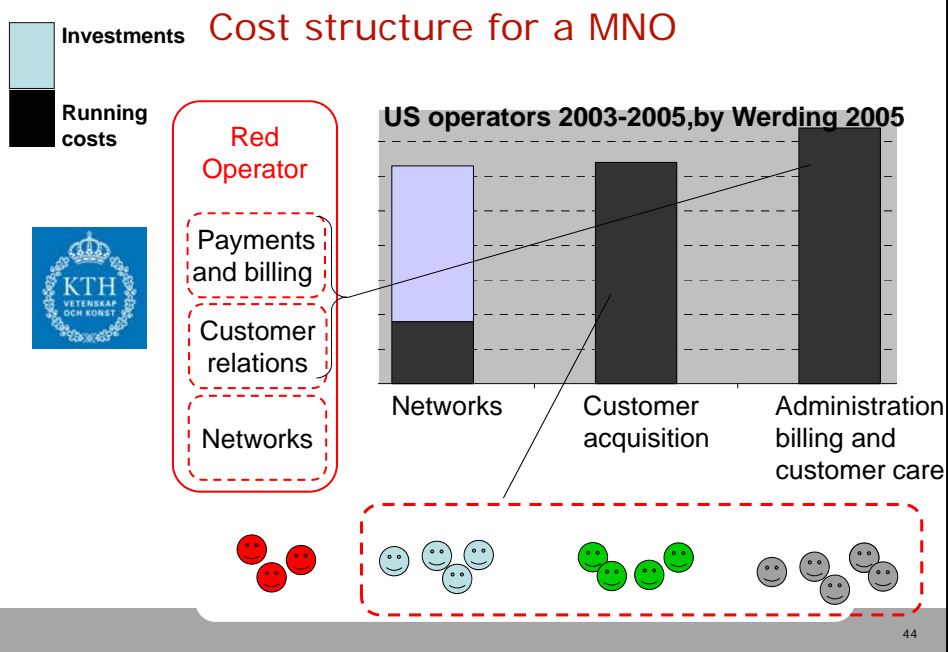
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Subsidies and "lock in" periods



- Handset subsidies is a very large part of the operator costs for customer acquisition
- There are differences between countries
 - In Finland it has not been used (until recently)
 - In Denmark the lock in period is max 6 month
 - In Sweden the lock in period is max 24 month
- A two minute question (discuss 2 and 2)
 - Estimate the handset subsidies payed one year in Sweden by the operator Telia?
 -

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Prices Internet access



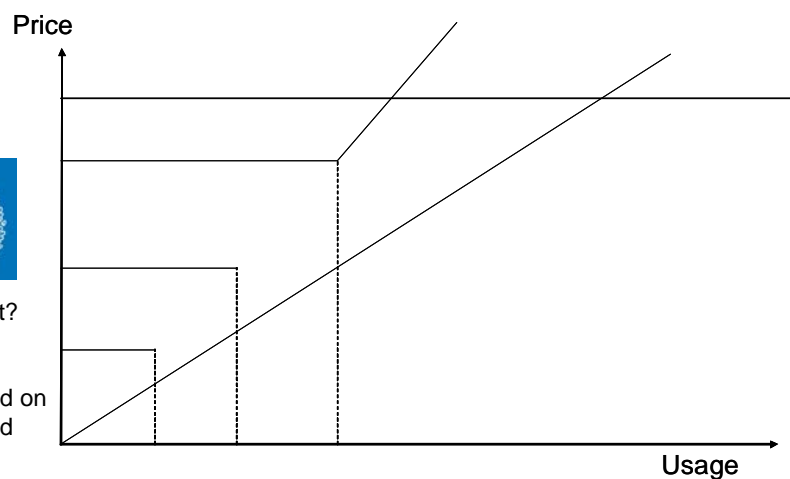
- Fixed broadband to homes
Flat rate 10 – 30 € per month; up to 100 Mbps
- Wireless broad band – business hot spots
10 € per hour or 30 € per 24 hours
- Wireless broad band – “consumer” hot spots
For free of included in other service
- Wireless broad band – cellular
Flat rate/Box pricing 10 – 30€ per month;
[0,5 – 16 Mbps] [1 – 20GB per month]
Flat rate 50€ (30€); up to 80 Mbps

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Different pricing strategies



What is what?
-Flat rate
-Box pricing
-Box with add on
-usage based



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Pay monthly plan	Mobile Broadband Pay Monthly plans	Laptop Packages	Mobile Broadband Pay As You Go plans	Wireless Router	Your total monthly cost
Broadband Lite 1GB <small>Plan detail</small>	1 GB of data allowance every month 24 month contract		Free modem on this plan		£10 a month Pick
Broadband Lite 1GB <small>Plan detail</small>	1 GB of data allowance every month 18 month contract		Free modem on this plan		£10 a month Pick
Broadband Lite 1GB <small>Plan detail</small>	1 GB of data allowance every month Modem costs from £48.53 12 month contract				£10 a month Pick
Broadband 5GB <small>Plan detail</small>	5 GB of data allowance every month 24 month contract		Online exclusive Free iPod shuffle		£15 a month Pick
Broadband 5GB <small>Plan detail</small>	5 GB of data allowance every month 18 month contract		Online exclusive Free iPod shuffle		£15 a month Pick
Broadband Plus 3GB <small>Plan detail</small>	3 GB of data allowance every month 12 month contract		Free modem on this plan		£15 a month Pick
Broadband Max 7GB <small>Plan detail</small>	7 GB of data allowance every month 12 month contract		Free modem on this plan		£25 a month Pick
Broadband 15GB <small>Plan detail</small>	15 GB of data allowance every month 24 month contract		Online exclusive Free iPod shuffle		£30 a month Pick
Broadband 15GB <small>Plan detail</small>	15 GB of data allowance every month 18 month contract		Online exclusive Free iPod shuffle		£30 a month Pick

Mobile Broadband on Pay As You Go

Share your Broadband

Just plug your USB Modem into our shiny Wireless Router and anyone in your house can get instant internet access. No handless and no more fighting to get online.

It's easy (and we thought we'd mention) cheap web access for up to four people. And if you want to be on the move, just pull out your USB Modem and get your broadband to go.

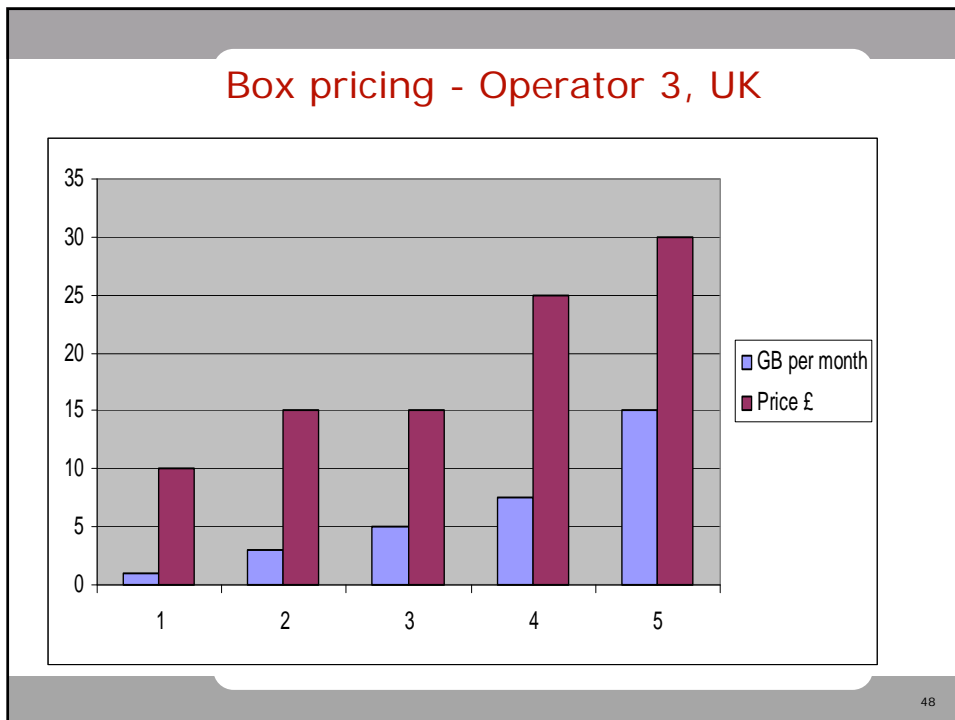
Wireless Router

Get 25% off.

Already a 3 contract customer? Let us know when you Checkout (in Your Basket - see below) and we'll make sure you get 25% off Mobile Broadband each month. Lucky you.

Already a 3 customer?
Take the most of these offers...

Just have your 3 mobile number and account number handy and you'll get the discount. Easy.
Terms & Conditions apply



International roaming

- One "regulated market"
 - Origination and termination of international calls
- Status
 - All operators have roaming agreements, globally more than 25 000 bi-lateral agreements
 - International calls have been very expensive,
 - 0,3€ - 2€ per minute for international calls
 - compare 0,05 – 0,2 € for national calls
 - EU have stated maximum prices for mobile calls
 - 0,5€ outgoing calls and 0,2€ for incoming calls
- It is still VERY expensive for mobile data!!



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Example - International roaming User costs, price per minute (2006)

Outgoing calls

lowest price of visited network highest price of visited network

Grekland				Cypern			
Telia	9,69	12,19	5,50	Telia	12,19	12,19	5,50
Tele2/Comviq	5,61	12,18	4,50	Tele2/Comviq	3,79	4,29	4,50
Telenor	8,95	10,29	5,25	Telenor	8,95	8,95	5,25
Tre	9,50	9,50	5,00	Tre	9,50	9,50	5,00

Källa: Operatörernas nätverk, 2006-01

Home operator

Incoming calls

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Costs for mobile data abroad

Sms:a, mms:a och surfa

För muspekaren över roamingzonen för att se vilka länder och operatörer som ingår i zonen eller se [version för utskrift](#). Priserna gäller från 1 apr 2008 och anges i SEK/meddelande för sms och mms samt SEK/MB för surfa. Priserna är inklusive moms.

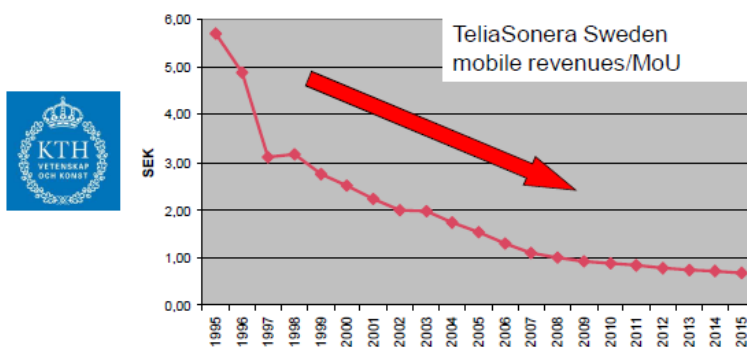
SEK/MB

Zoner	Skicka sms	Ta emot sms	Skicka mms	Ta emot mms	Surfa**
Zon 1	2,50	0	5	3,50	25
Zon 2a - UOp	3	0	8	6,50	40
Zon 2a	3	0	8	6,50	85
Zon 2b	3	0	9	7,50	120
Zon 3	4	0	10,50	9	145
Zon 4	4	0	9	7,50	120
Zon 5	4	0	10,50	9	145
Övriga länder	*	0	10,50	9,50	145

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Competition pushing down prices

Svensk mobiltelefoni TeliaSonera ARPU/MoU



Revenues per minute has declined ~12% per year since 1995

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