

Prepared for IK 2514 Wireless Infrastructure Deployment & Economics

Intro to telecom markets

- From monopoly to oligopoly, de-regulation, liberalization



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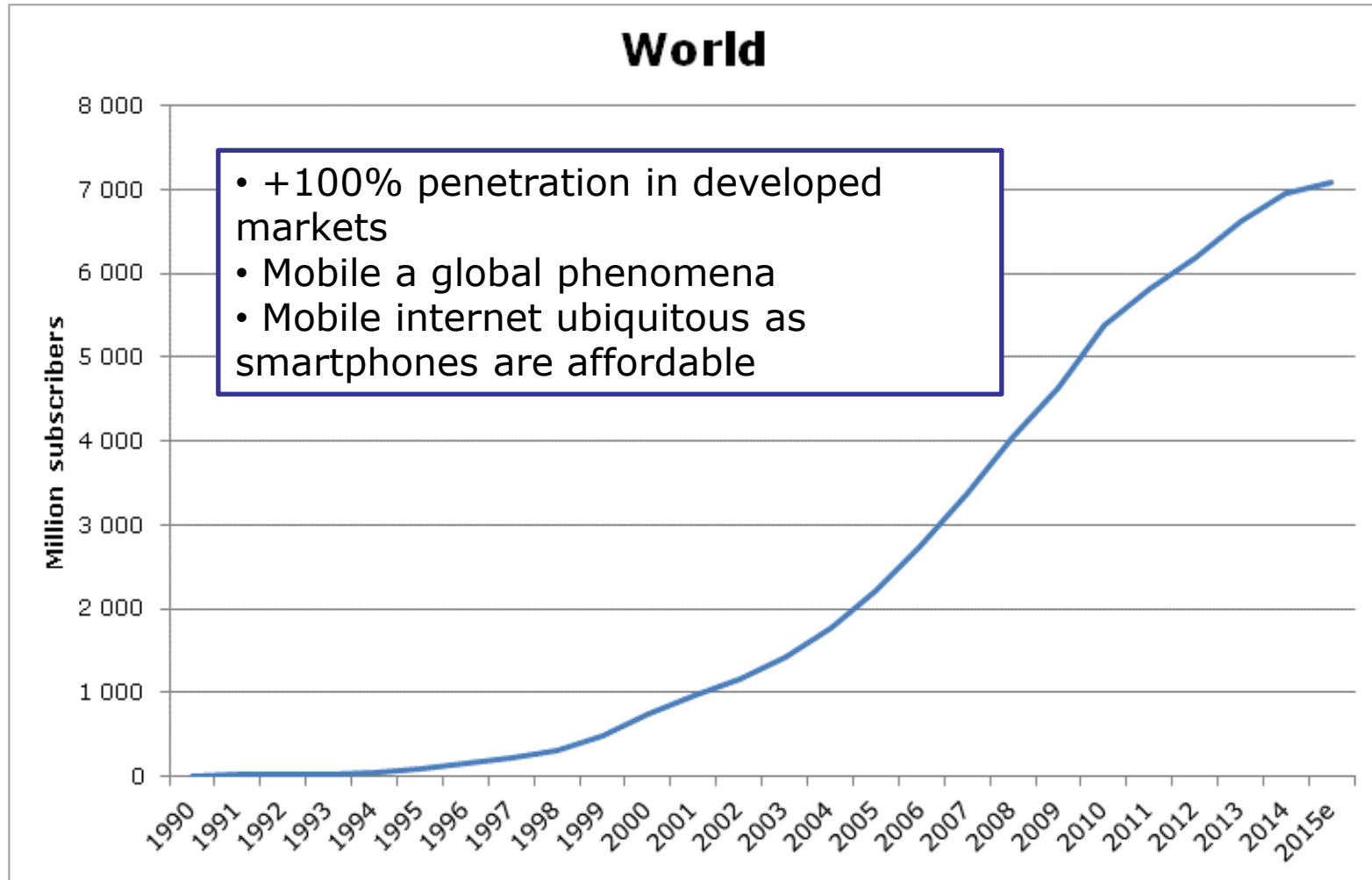
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Agenda



- Telecom market
- Market structure
- Market development
- All IP networks
- Network sharing

More than 7 bn mobile subscribers

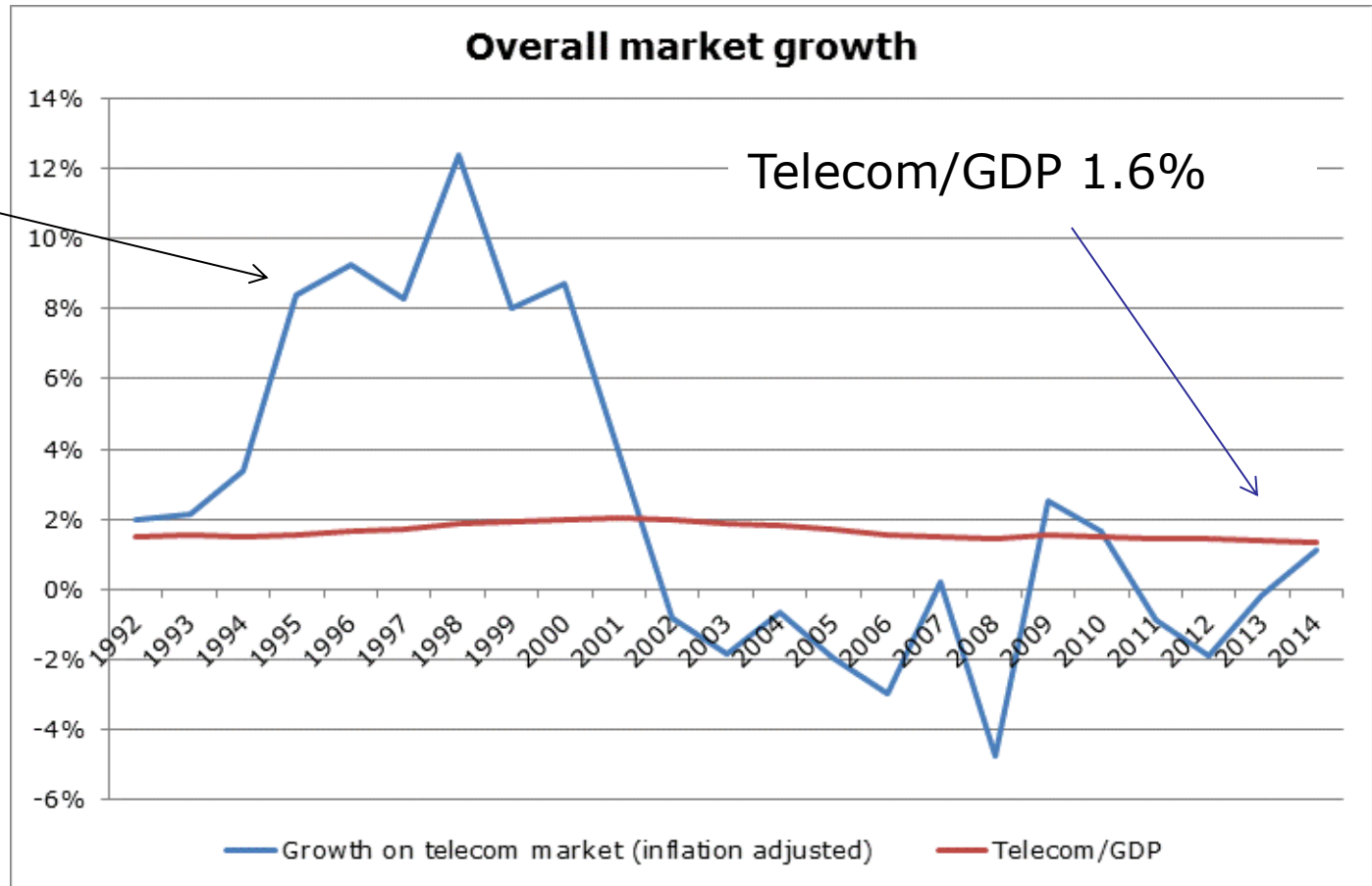


Source: ITU

Concept	Definition
ARPU	Average Revenue per User
Capex	Funds used to acquire physical assets
Free cash flow	Operating cash flow minus capex
GDP	Gross Domestic Product
EBITDA	Earnings before interest, taxes, depreciation and amortization
EBIT	Earnings before interest and taxes
Gearing/leverage	Difference between fixed-interest capital and equity capital
Market cap	The company's worth calculated as outstanding shares multiplied by the price per share,
MoU	Minutes of Use
Net debt	Netting the value of a company's liabilities and debts with its cash and other liquid assets
Revenues	The amount of money that a company actually receives during a specific period

Sweden: A mature market

Growth of telecom revenues* (inflation adjusted)

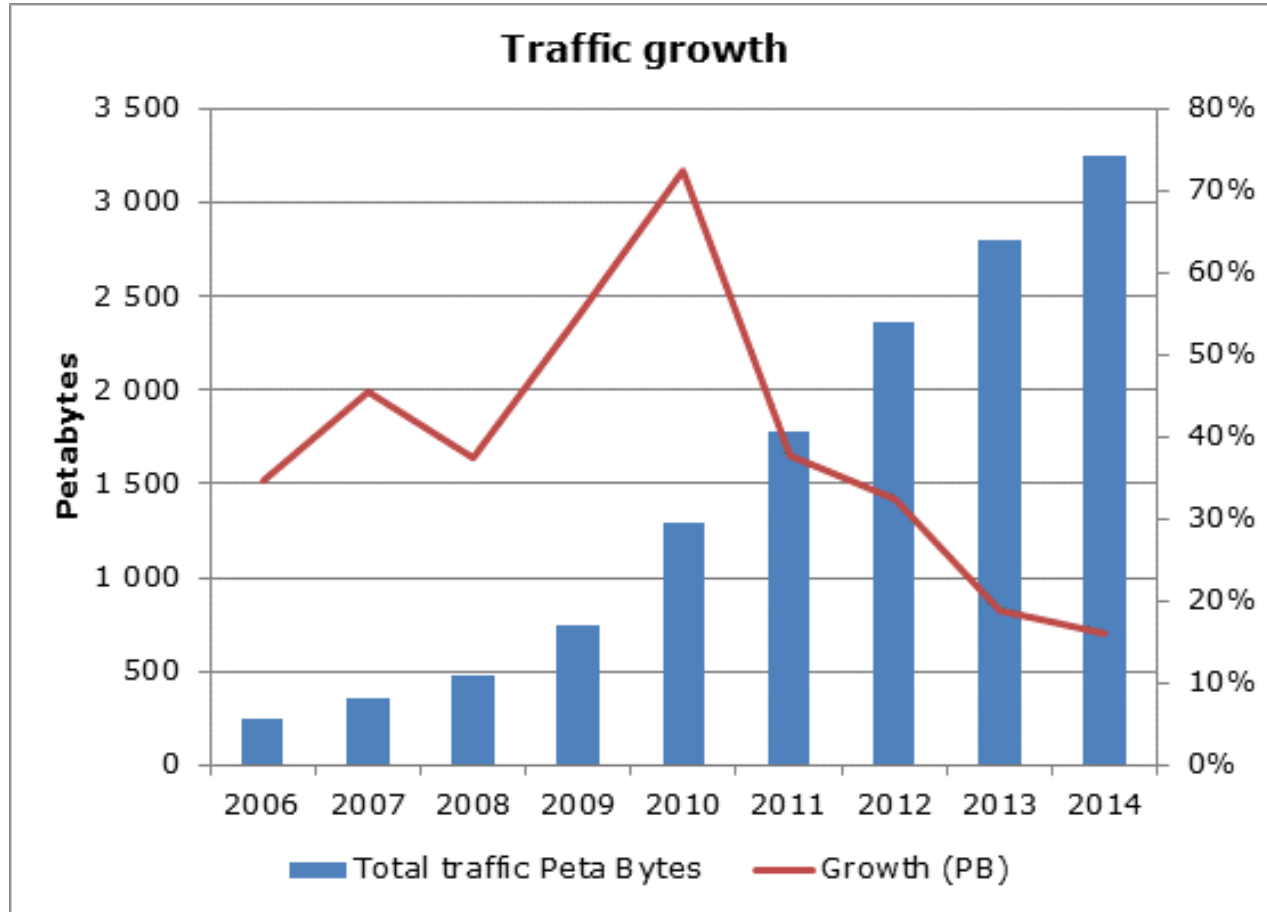


Mobile and fixed broadband growth offset decline on fixed

*Total end-customer revenues. Source: PTS

Sweden: total telecom traffic

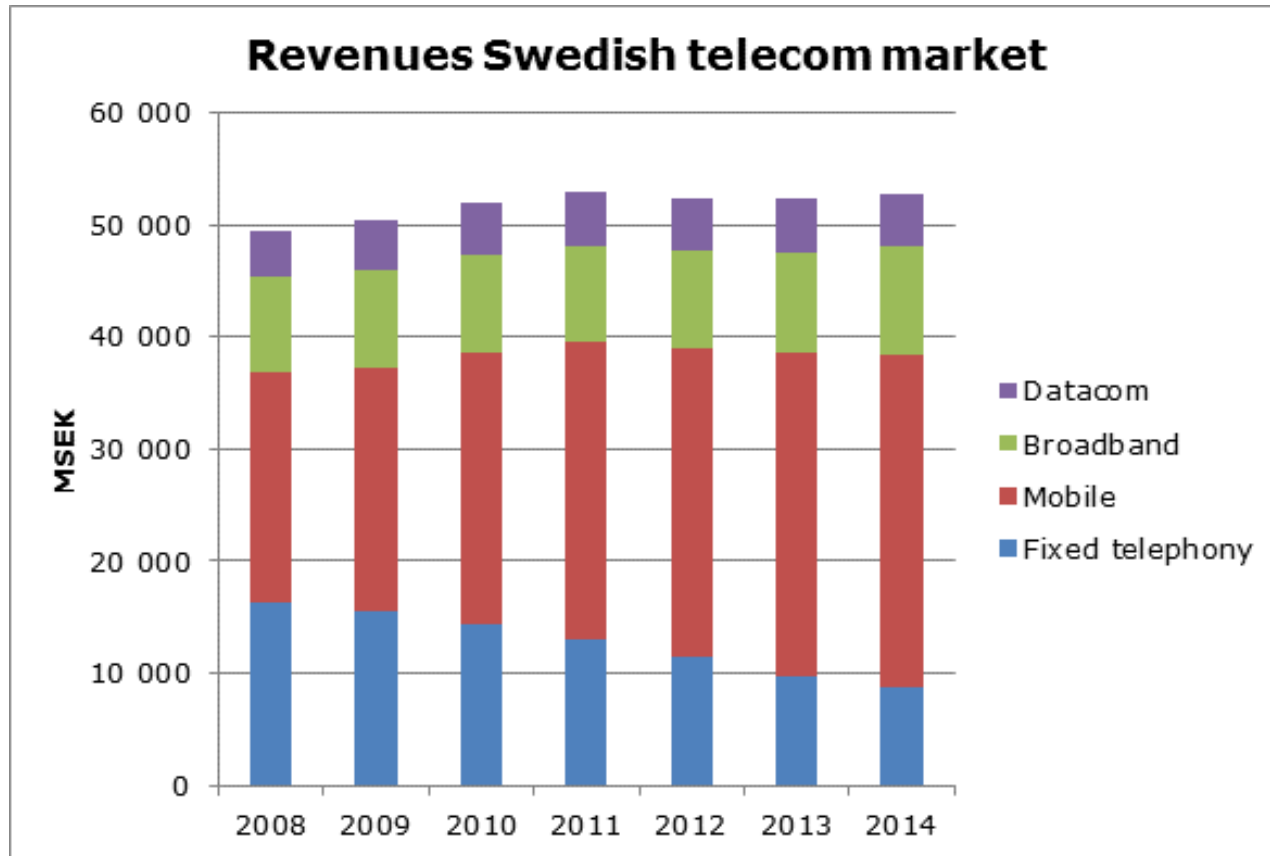
Average traffic growth
~20% per annum



Relation between traffic and revenue growth?

Source: PTS

Sweden: revenues from telecom services

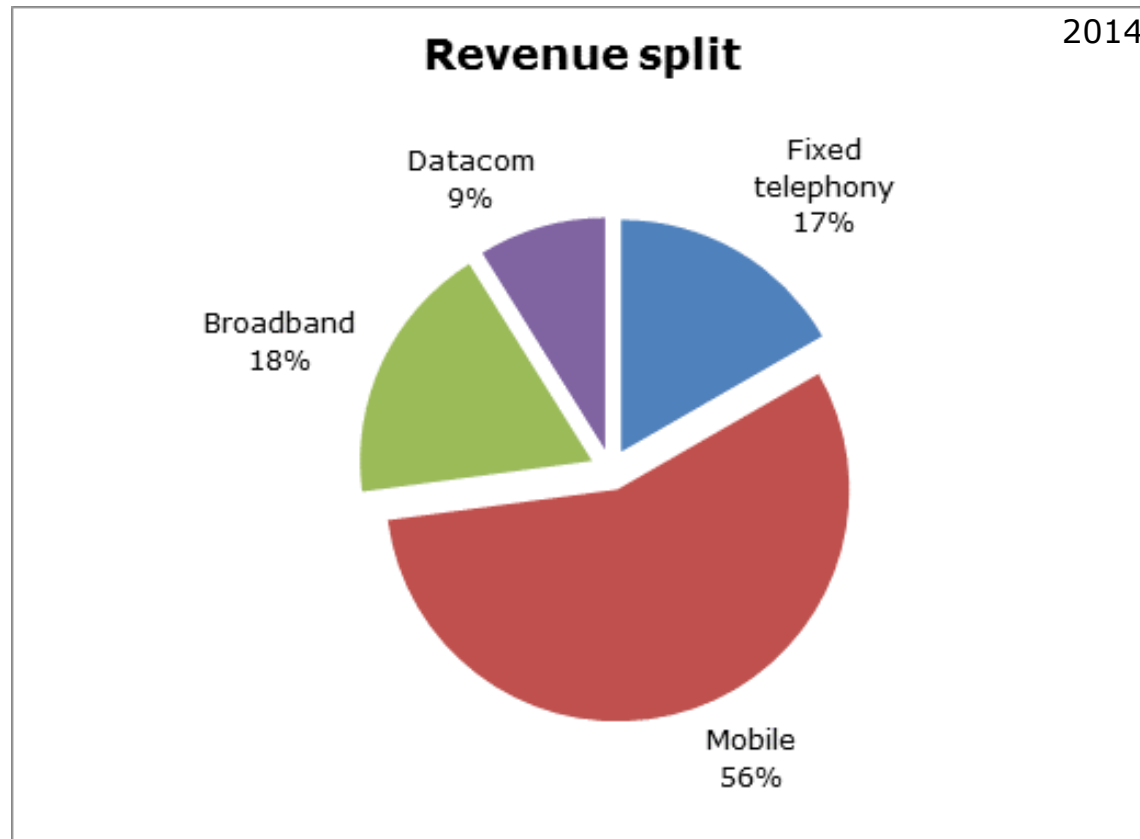


What factors influence the revenue development?

Revenues = total end customer revenues

Source: PTS

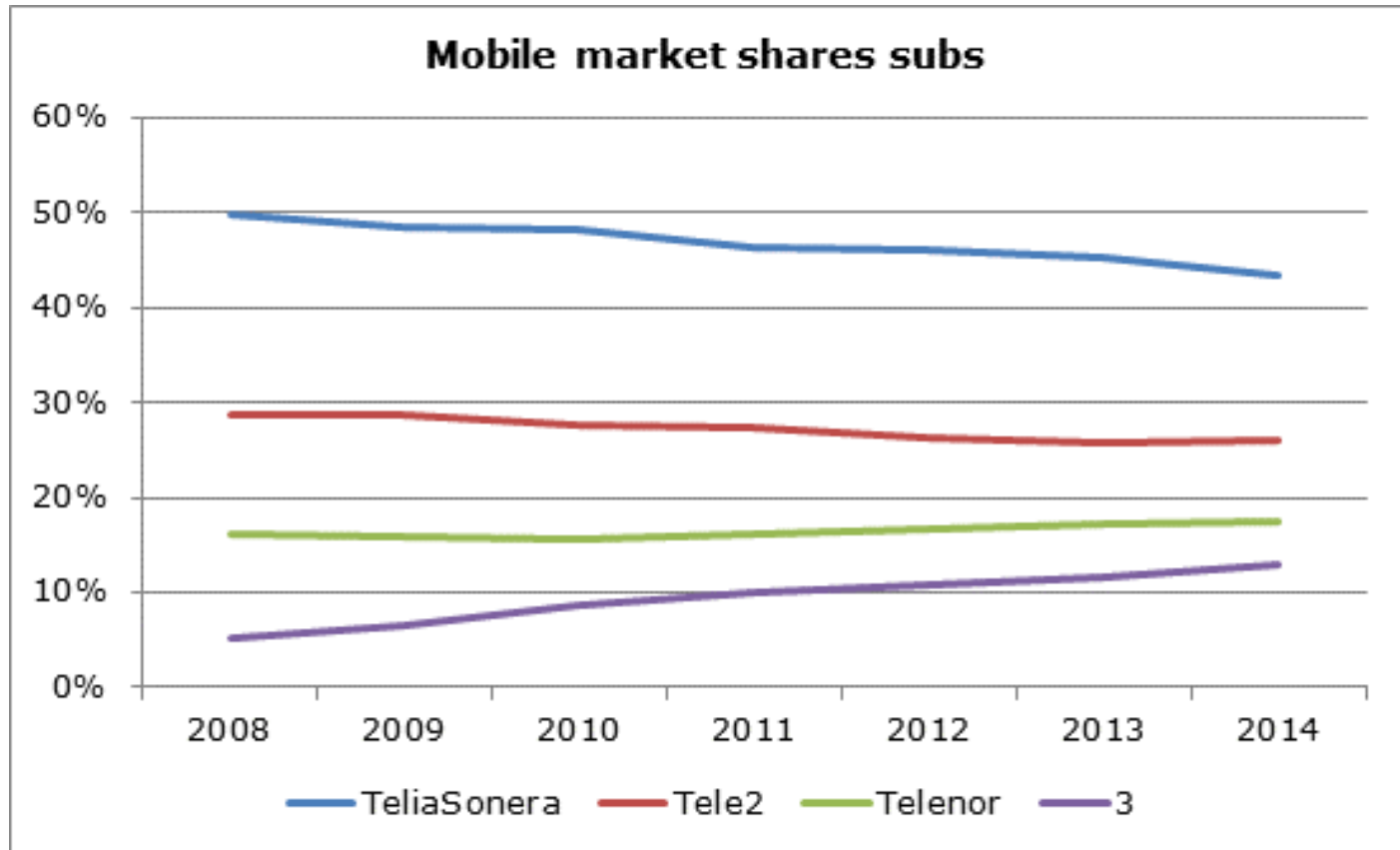
Sweden: Revenue split telecom services



What does the split tells us about the market?

Source: PTS

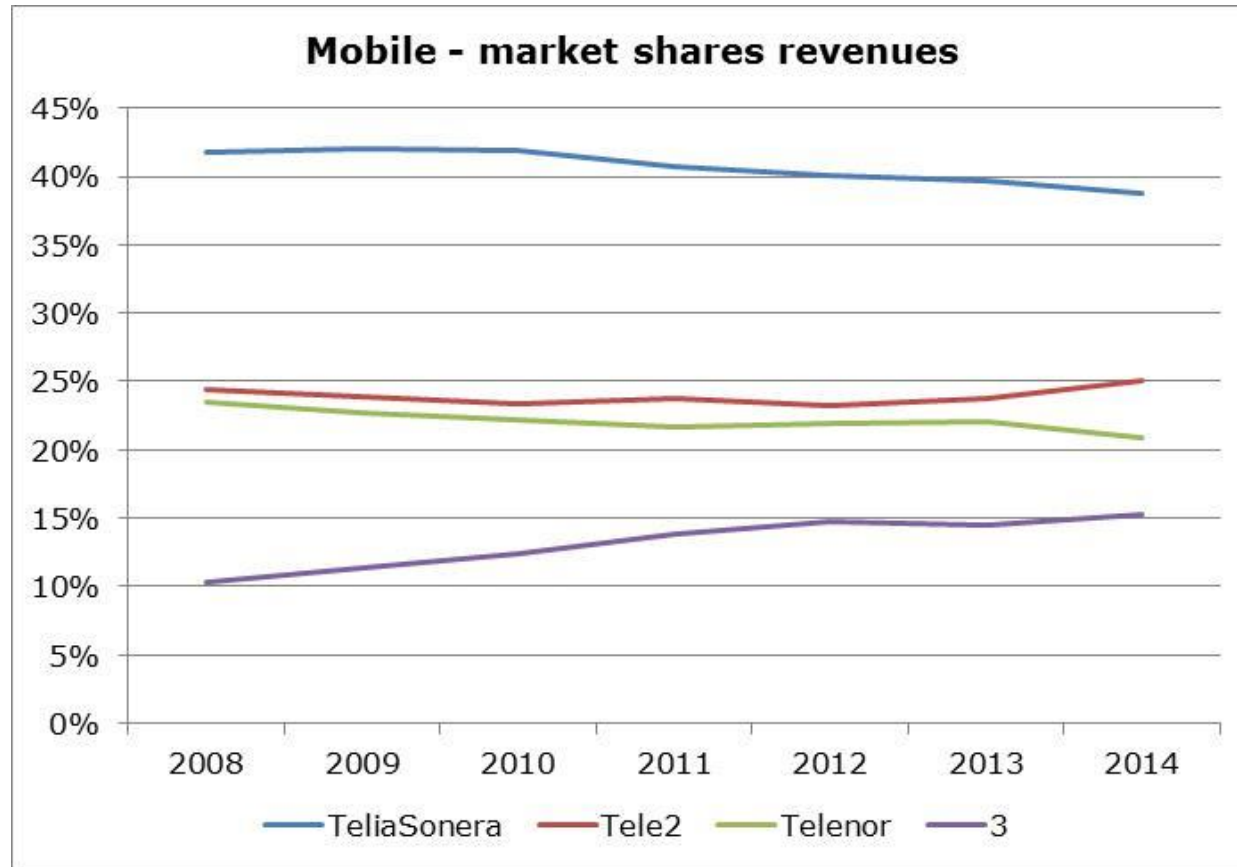
Market shares (subs) Swedish mobile



Source: PTS

TeliaSonera dominates, 3 is gaining shares, Tele2 declining

Market shares (revenues) Swedish mobile



Source: PTS

What conclusions could be drawn from the deviation: market shares on subscribers vs revenues?

Actors – different roles and functions



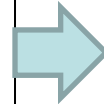
- Network Operators
- Mobile Virtual Network Operators (MVNO)
- Tower companies
- Distributors
- Equipment manufactures
- Handset suppliers
- Application providers
- Online companies
- OTT
- Other...



Core competence



- Distributors
- Equipment suppliers
- Terminal suppliers
- Network operators
- MVNOs
- Applications
- Payments



- Financial
- Innovation
- Management
- Operational
- Sales and marketing
- Services
- Software
- Technical
- Other

What competences are critical?

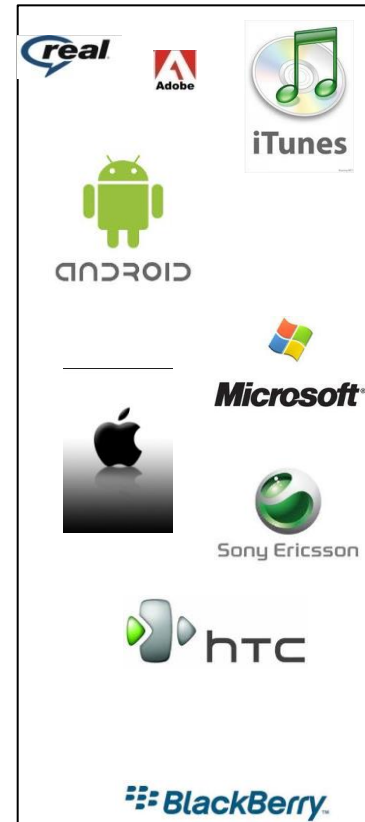
Competition from on-line companies

Connectivity

Enabling technology/
services

User interface

Online Services



What impact have Apple's, Google's and Facebook's expansion on operators?

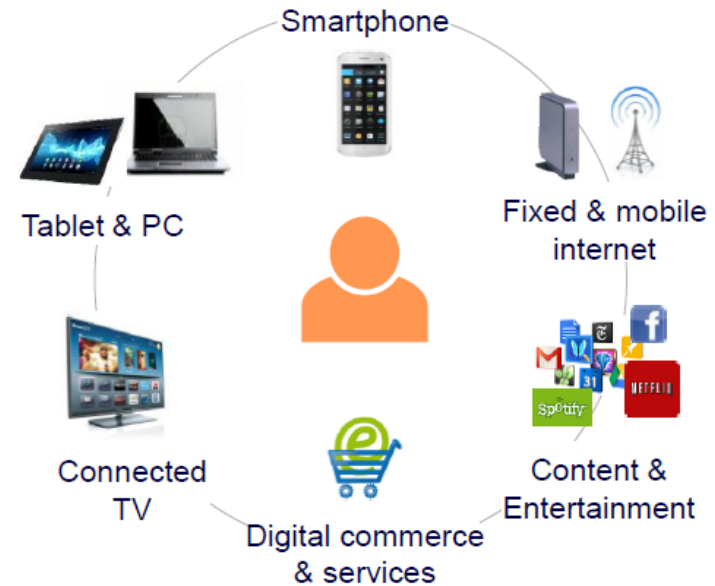


Old world telco

Feature phone



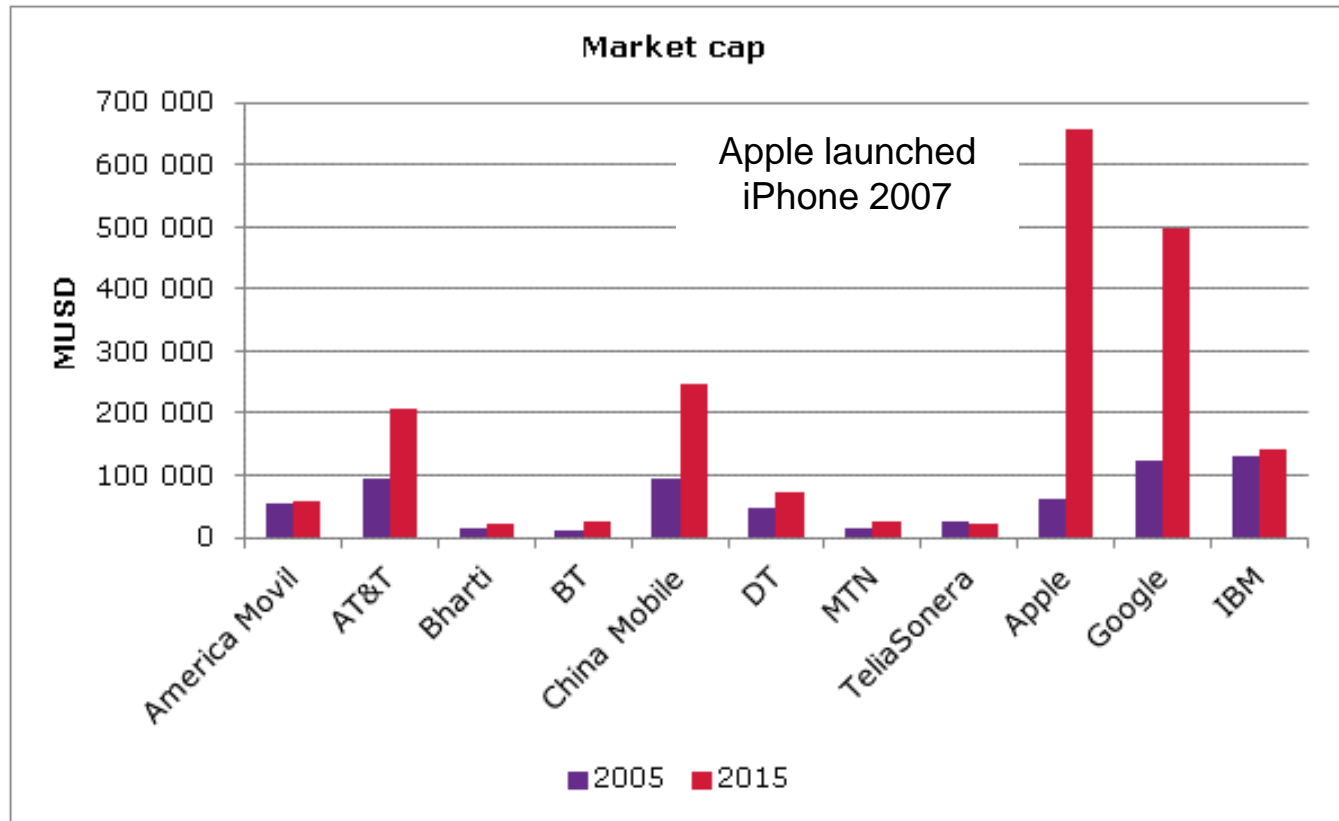
New world: Digital lifestyle company



- Increased stickiness
- Higher share of wallet
- Millicom has the payment mechanism

Source: Millicom

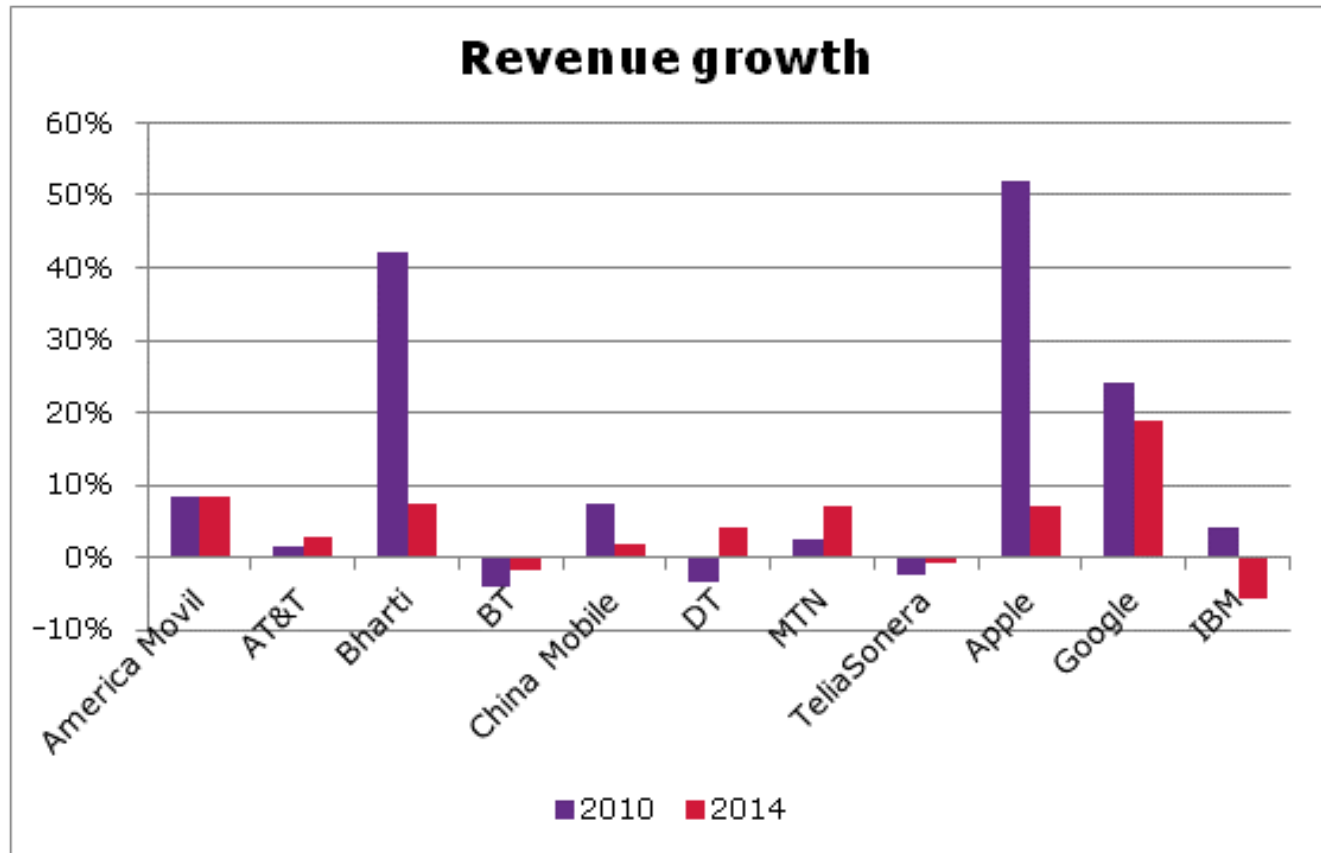
Growing or dropping in value



What factors determine the market capitalization of a company?
Why has Apple's value increased while TeliaSonera has declined?

Source: Bloomberg

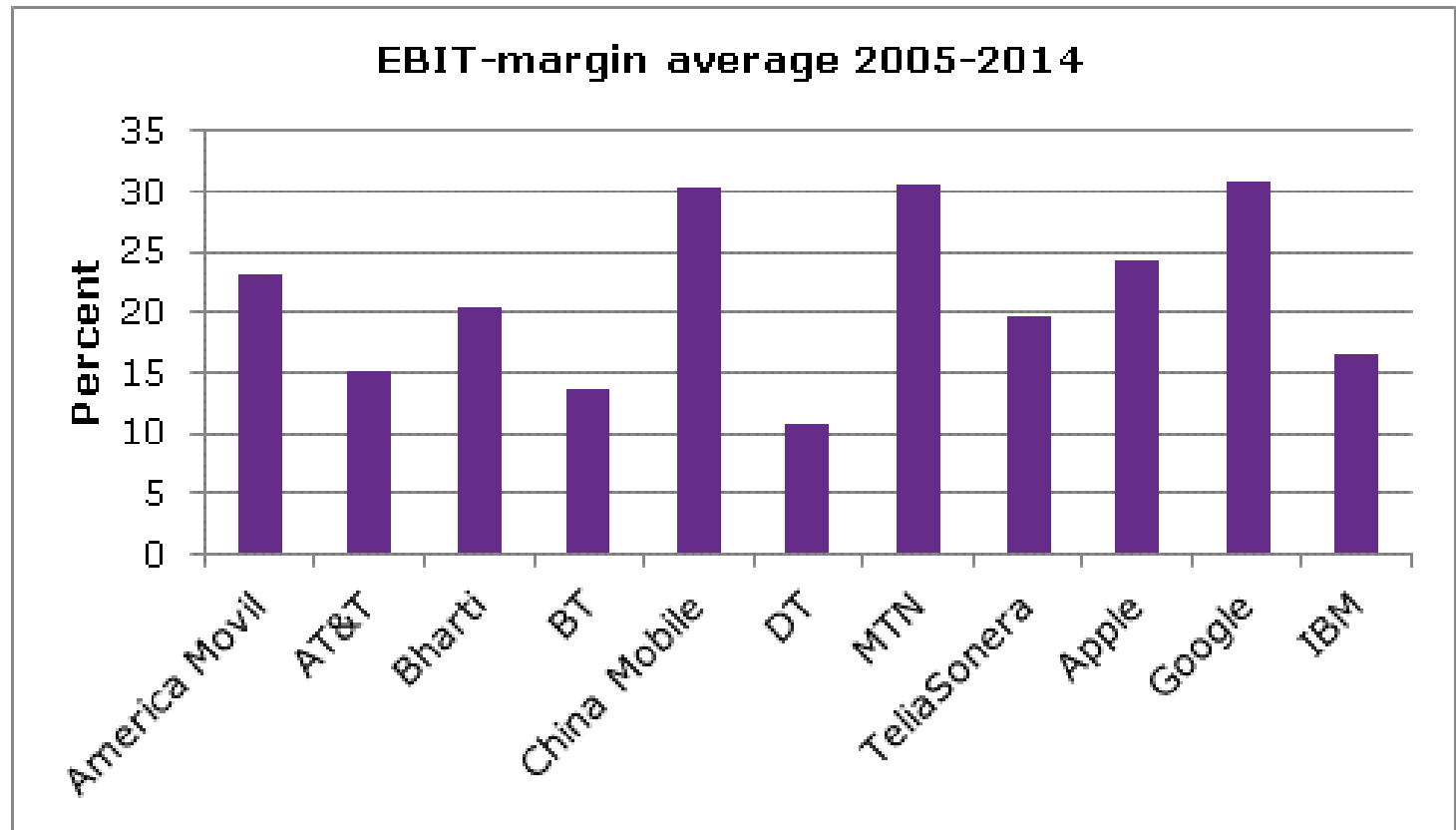
Google outperform



Source: Bloomberg

What can explain the differences between the companies?

...and high margin



What explains TeliaSonera's high margin?

Source: Bloomberg

Focus on access and/or services



- Should operators focus on services and apps or only access?
- How to capitalize on the App economy?
- Different business models
- Many new competitors with established brands: operators market share will be small
- OTT, apps, digital services, IPTV....

Operators loosing ground on services and apps

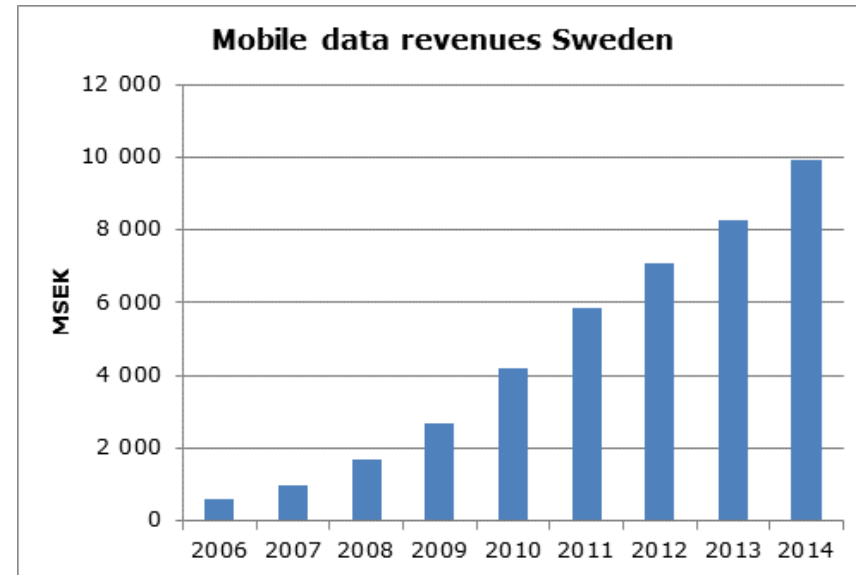


- Consumers have embraced smartphones and it is driving contracts and data packages
- The emergence of a an App economy
- The transition to all IP network pave the way for over the top (OTT)

Support from mobile data



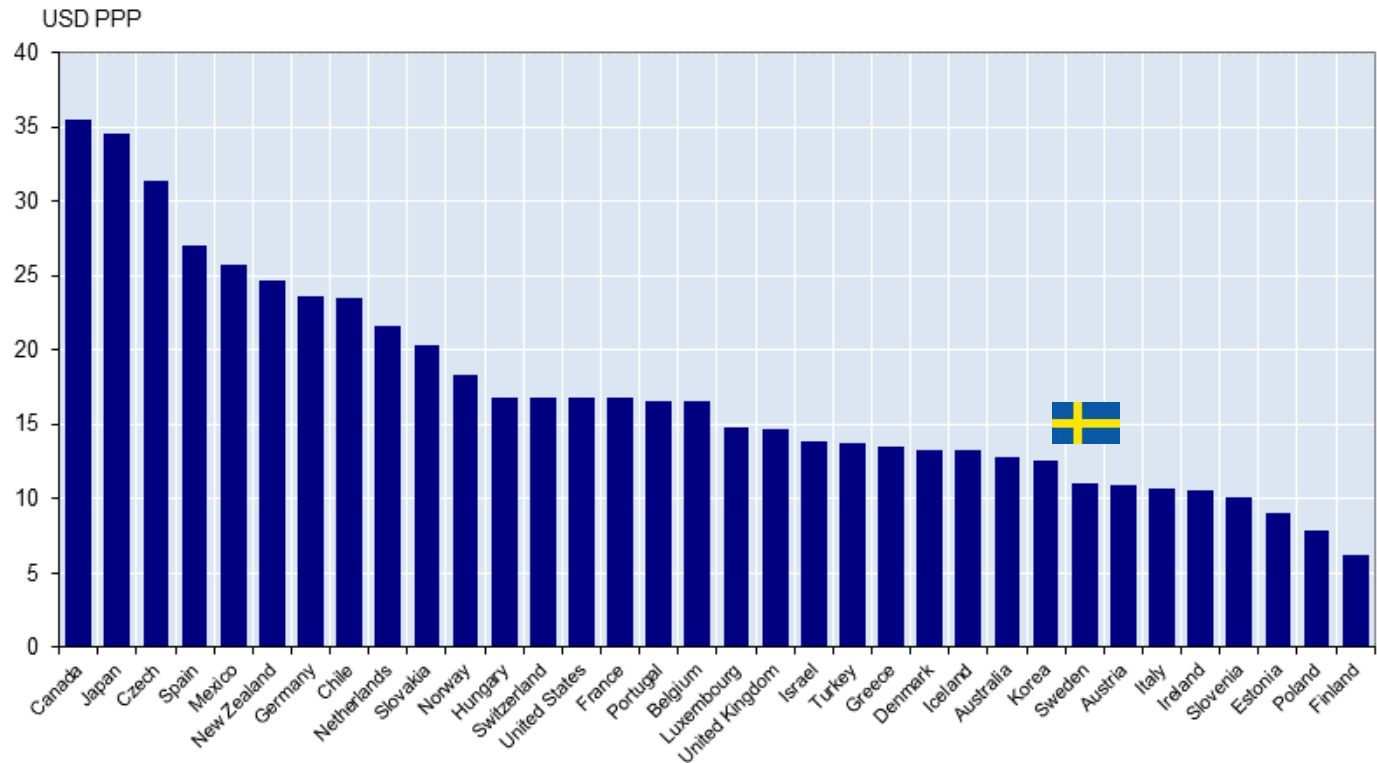
- Mobile data drives growth
- Most users have smartphones and subscribe to data packages
- Rapid growth of mobile data traffic +35% while revenues increased 20% 2014, illustrating that operators have difficulties to monetize on mobile data



Source: PTS

International comparison on prices

Laptop mobile broadband basket, 2 GB, September 2014, USD PPP

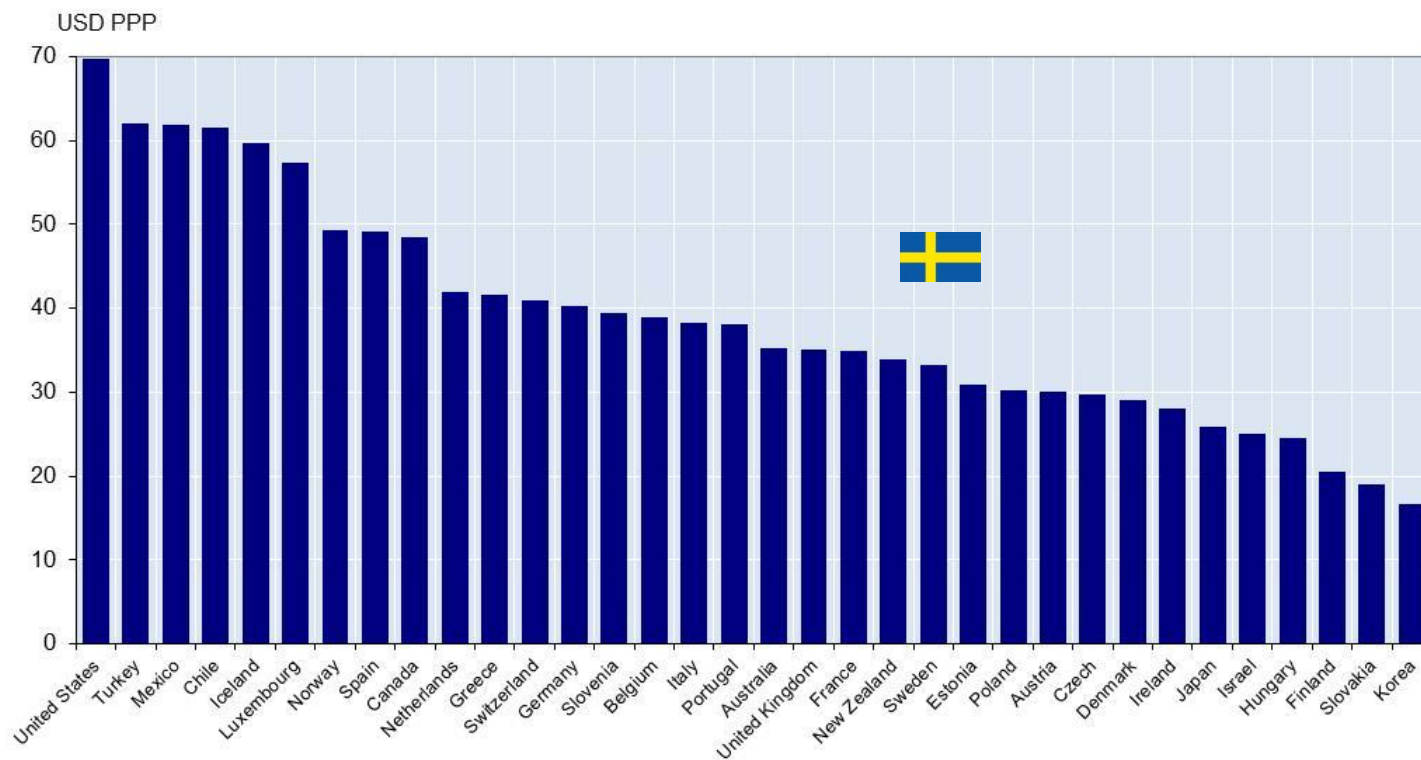


Identify loopholes in comparison of prices

Source: OECD Digital Economy Outlook 2015

Comparison on prices for fixed broadband

Fixed broadband basket, high use, >25/30 Mbit/s, USD PPP



What explains the price difference between Sweden and the US?

Source: OECD Digital Economy Outlook 2015

Concluding

- The operator landscape is changing
- Increased competition from OTT
- The diffusion of smartphones is having a fundamental impact on the industry





From monopoly to oligopoly, de-regulation, liberalizing

From monopoly to liberalization



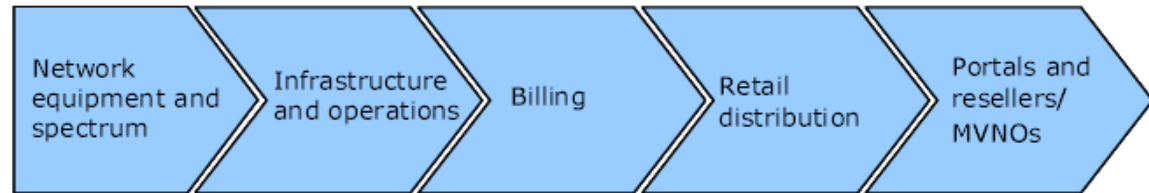
Monopoly

- Control
- Monopoly on telecom services and the relevant competence
- Micro electronics
- Undeveloped market

Liberalization

- BT paved the way (network vs financial position)
- New operators, competition, mobile expansion
- EU framework
- Internationalization
- Capital market

Value chain – mobile operators



Vodafone	<ul style="list-style-type: none"> • 99% population coverage • 1,800hMz 	<ul style="list-style-type: none"> • In-house 	<ul style="list-style-type: none"> • Own billing system 	<ul style="list-style-type: none"> • Own branded and other retail chains • Distribution 	<ul style="list-style-type: none"> • Own portal • Centrica
Orange	<ul style="list-style-type: none"> • 99% population coverage • 1,800hMz 	<ul style="list-style-type: none"> • In-house 	<ul style="list-style-type: none"> • Own billing system 	<ul style="list-style-type: none"> • Own branded retail chains • Other retailers • Distributors 	<ul style="list-style-type: none"> • Own portal

FIGURE 3 The traditional industry value chain view of the mobile network operator: Vodafone and Orange.

Source: Joe Peppard, Anna Rylander, From Value Chain to value Network, European Management Journal, Vol. 24, Issue 2, 2006.

Vertical integration vs disintegration?

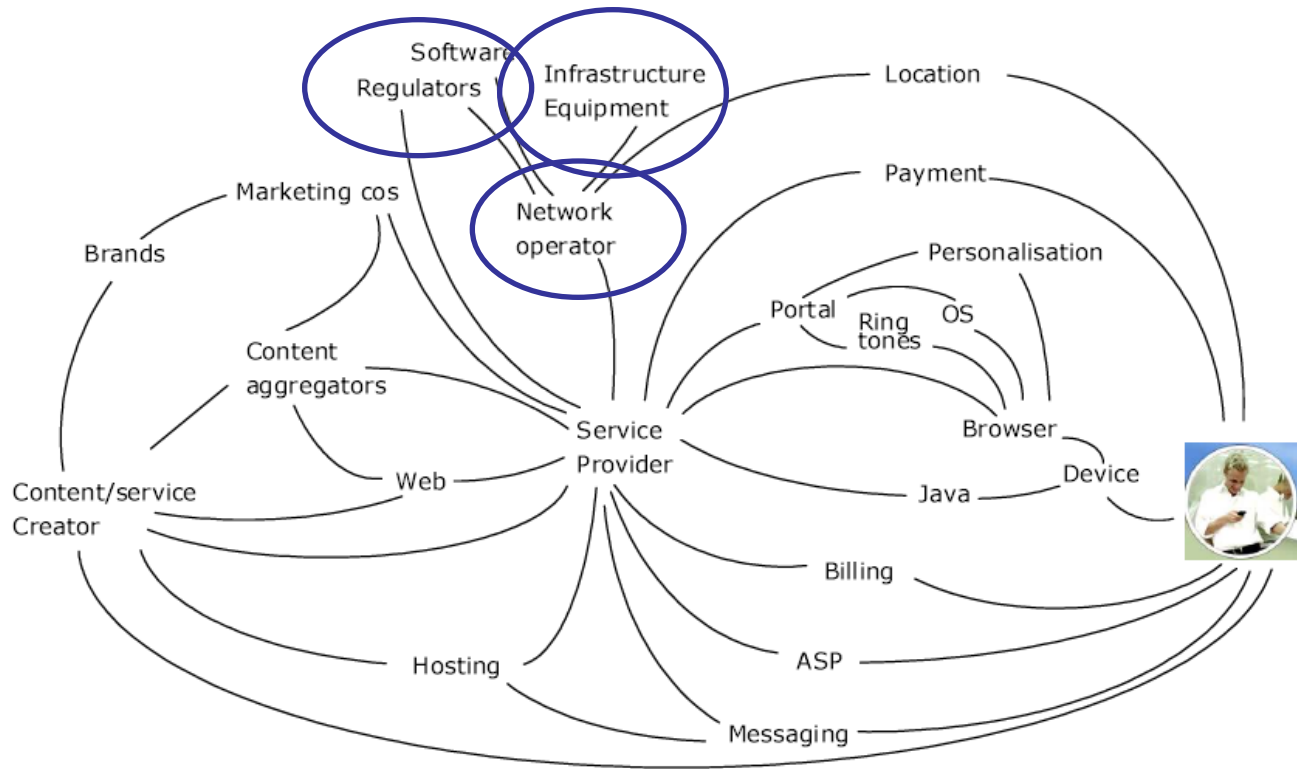


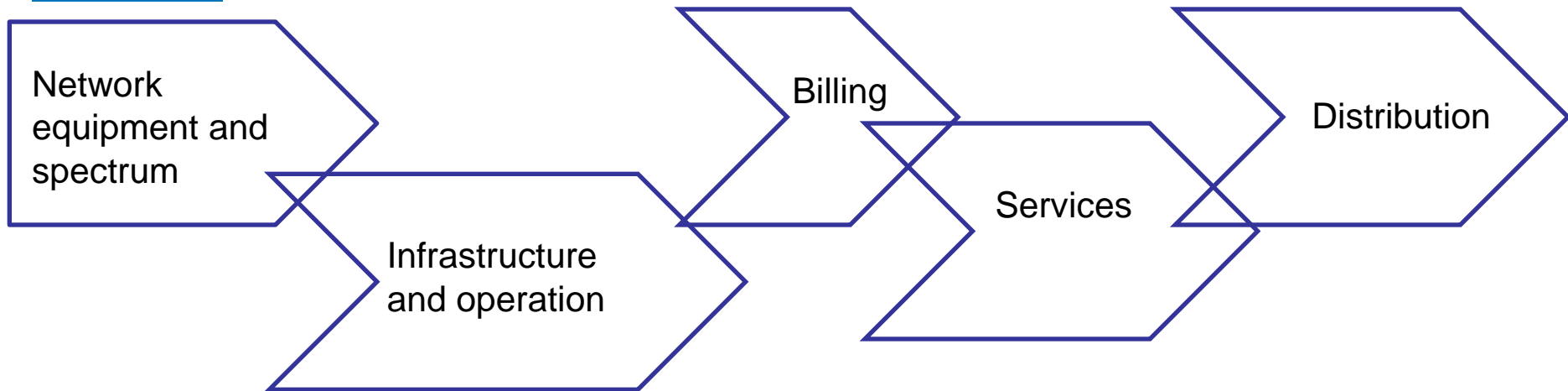
FIGURE 4 Partial network value map for mobile content.

Who are driving the current development? Explore vital links...

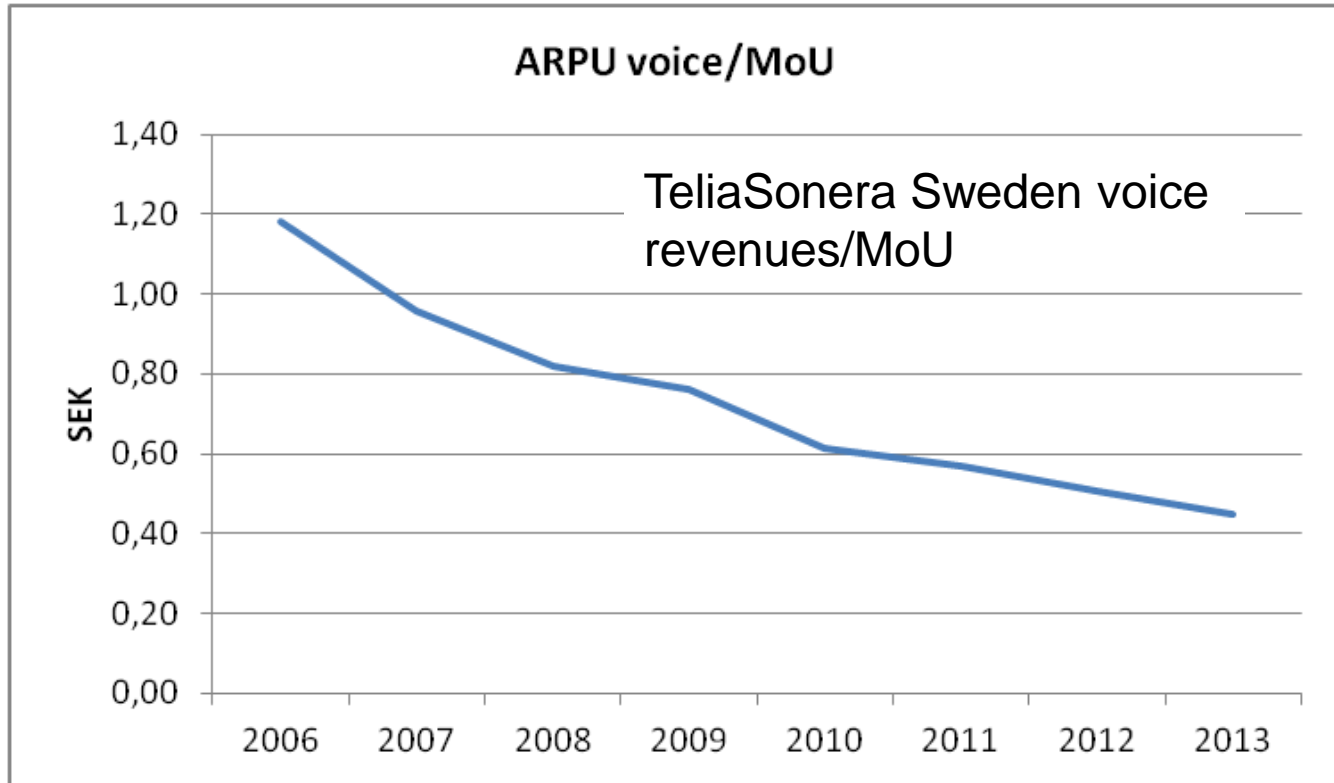
Source: Joe Peppard, Anna Rylander, From Value Chain to value Network, European Management Journal, Vol. 24, Issue 2, 2006.

A gradual disintegration

- The majority of network operators are still vertically integrated,
- But lower growth are driving operators to disconnect (phase out, outsource) various parts of their operations to reduce cost
- Network sharing drive more specialization

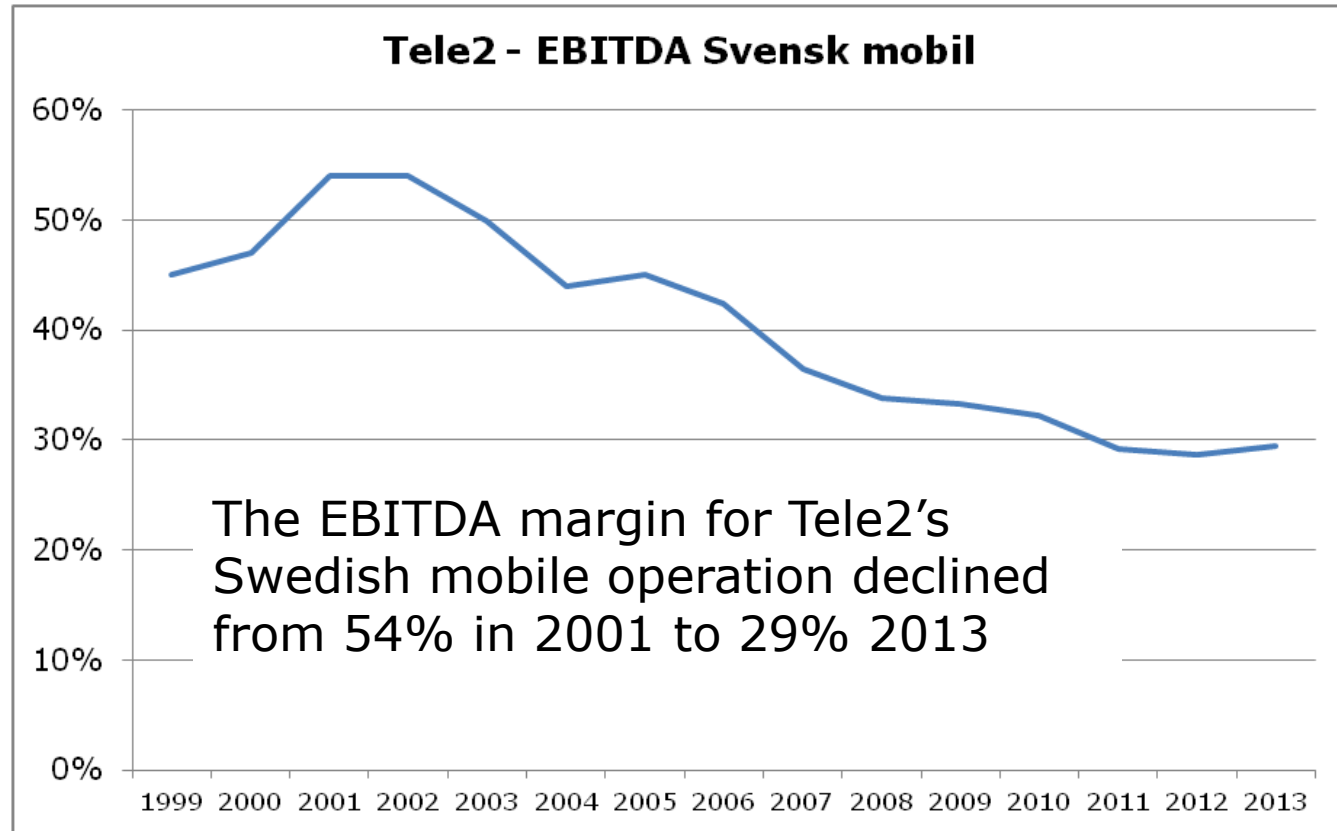


Competition pushing down prices



Revenues per minute has declined $\sim 12\%$ per year since 1995

...and pressed down Tele2's profit margin



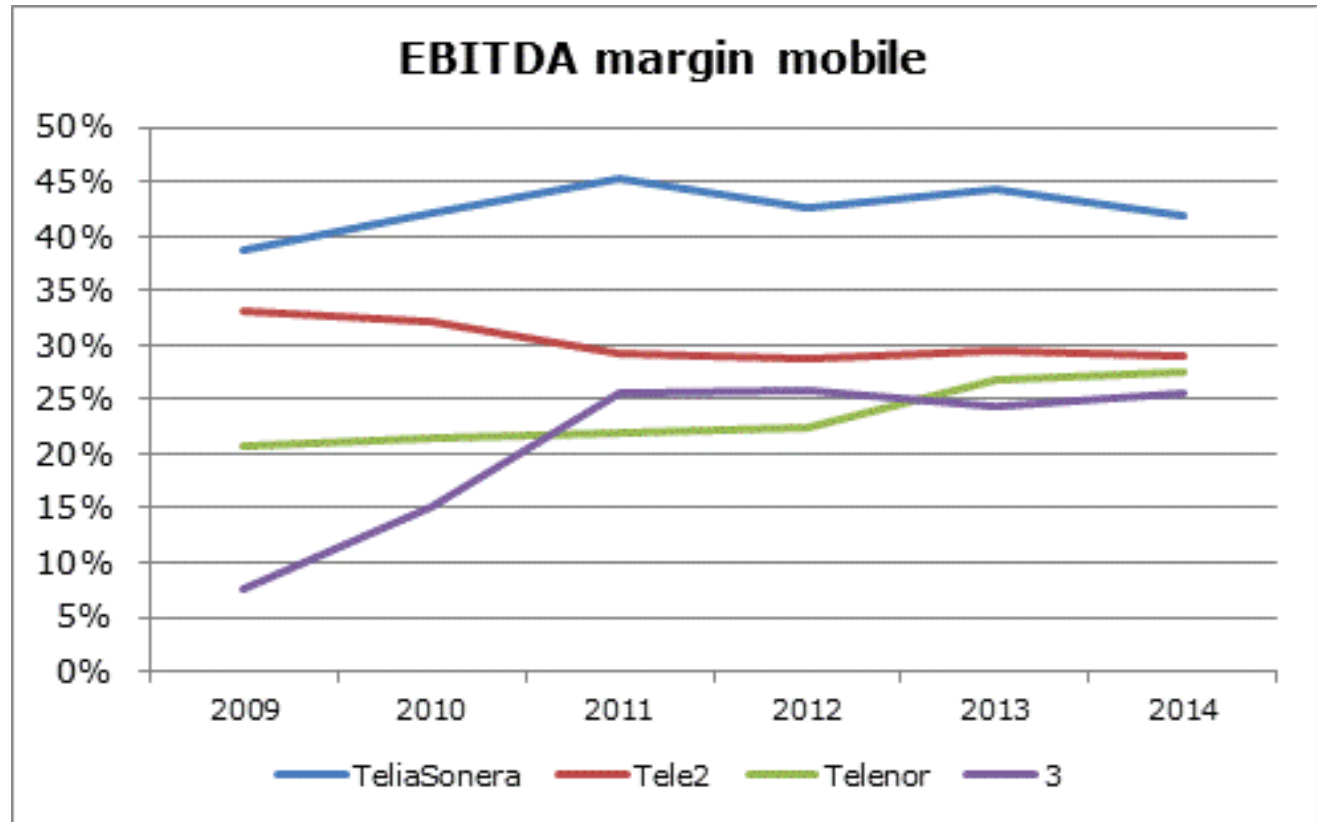
EBITDA= Earnings before interest, taxes, depreciations and amortizations

What factors explain lower profit margin?

....but still healthy EBITDA margins for mobile



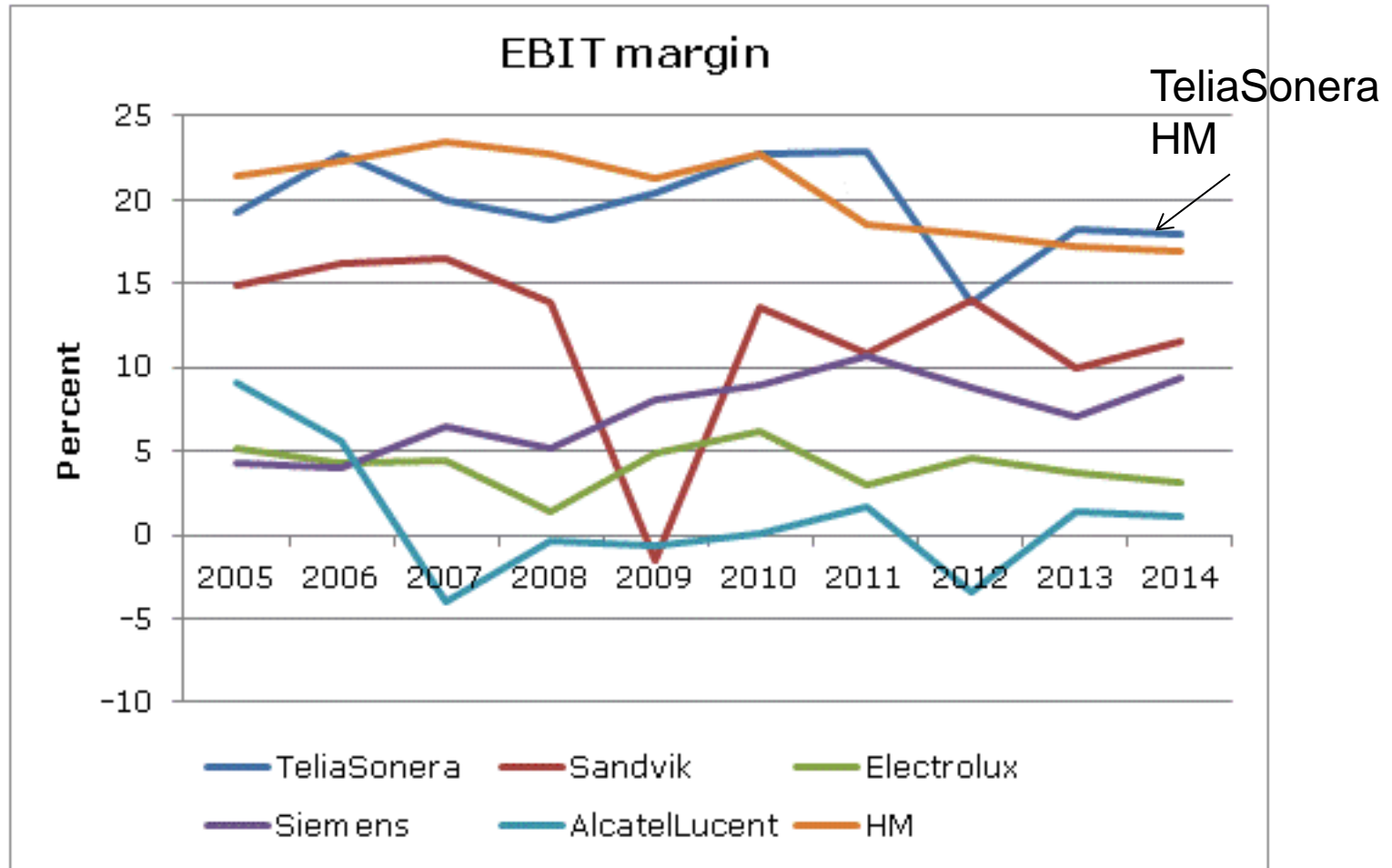
EBITDA
(Earnings before
interest taxation,
depreciation, and
amortization)



What should TeliaSonera's competitors do in order to improve profitability?

Source: Operator reports

...and good profitability compared to other industries



Source: Bloomberg

Becoming a utility industry?



- Telecom => utility
- Mobile broadband has changed the traffic mix and partly also revenues
- Lower growth => pressure on costs
- Searching for new revenue streams
- Infrastructure based competition demands massive capital investments "sunk cost"
- Spectrum auctions is favoring large operators
- Driving consolidation

What characterize a mature industry? What measures could be done in order to offset this development?

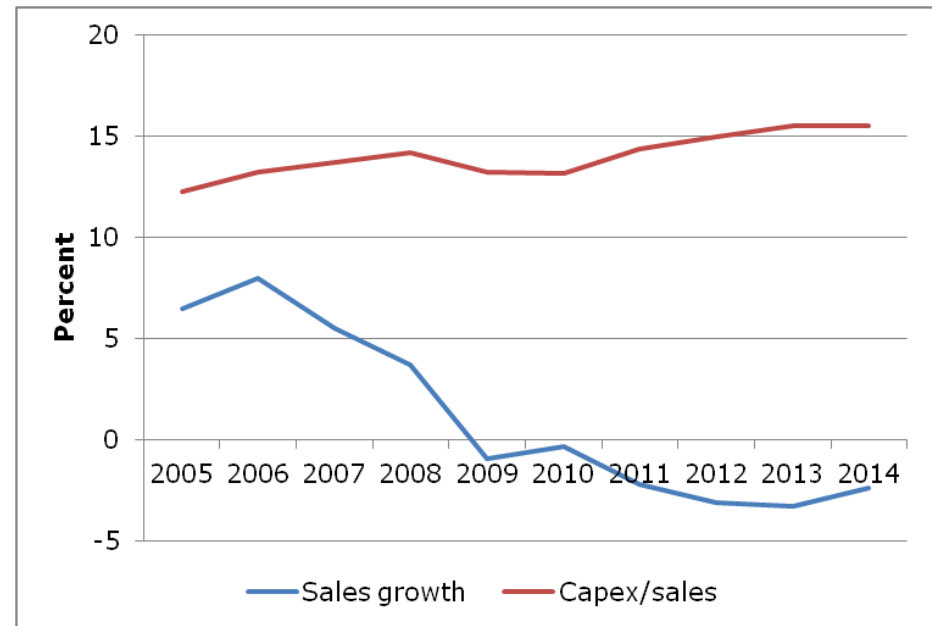
With lower growth

- Lower revenue growth
- Profitable growth requires lower Opex
- Improved cash flow requires reduction of Capex



Interplay between operational expenditures (Opex) and capital expenditures (Capex)?

European operators: Sales growth and capex/sales



Source: Bloomberg

When the market is shrinking



- **Consolidation**, financially strong operators take over smaller operators, or smaller operators merge
- **Lower competition** with no growth and consolidation, declining margins drives cost cutting and efficiency programs
- **Consumer value lower** with fewer choices and higher prices, but offset from cost cutting and competition from new actors such as online companies
- **Operators** have to be enablers and provide a smart pipe in order to create growth

How to cope with the data growth?



- Traffic is growing strongly, but flat revenues
- Increased load on networks
- Production costs has to be trimmed

Growing demand for our services and changing customer behavior...

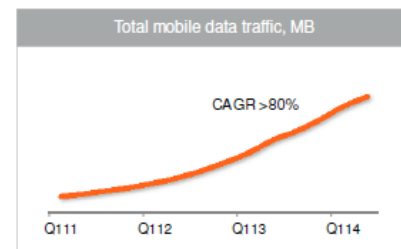
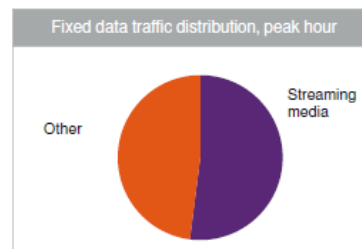
Customers demanding bandwidth & quality...



...with more usage, anytime anywhere...



...and simplicity for customers



Source: Teliasonera CMD 2014 presentation

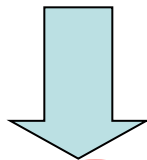
The data challenge

5 min clip



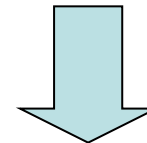
=

115 000



1 SEK

Revenues



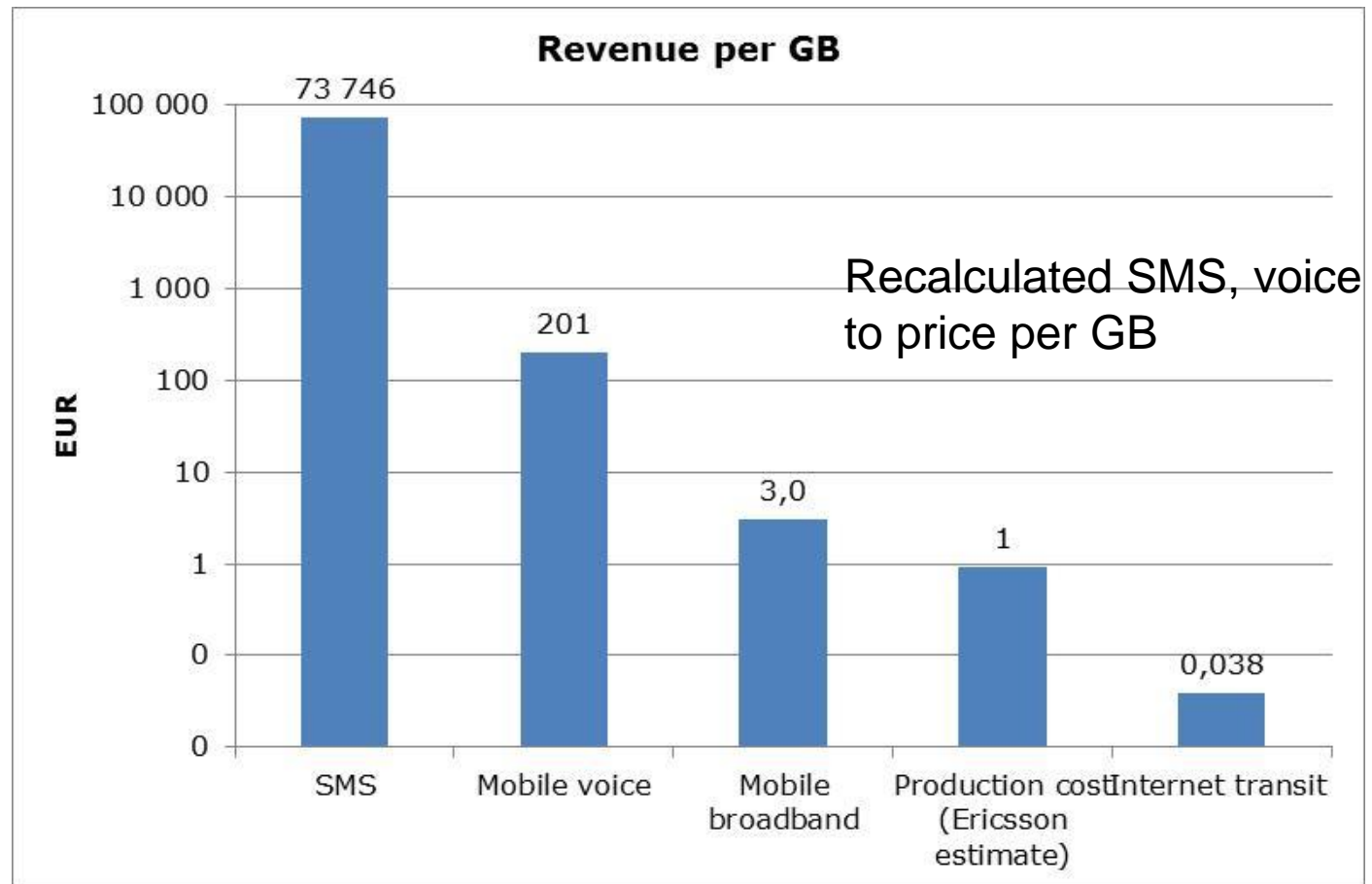
23 000 SEK

Similar amount
of data

Assumption: YouTube 0.5 Mbit/s and with 5 min clip, $60 * 0.5/8 * 5 = 19$ MB. Price ca 0,05 SEK per MB. SMS 160 bytes = 6250 SMS per MB. Price 0,20 SEK per SMS. SMS is very profitable with EBITDA margin of 90%. If you assume 15% of revenues is SMS and a group EBITDA marginal of 35% should a drop of SMS lead to a drop of margin to ca 25%



Voice as an application



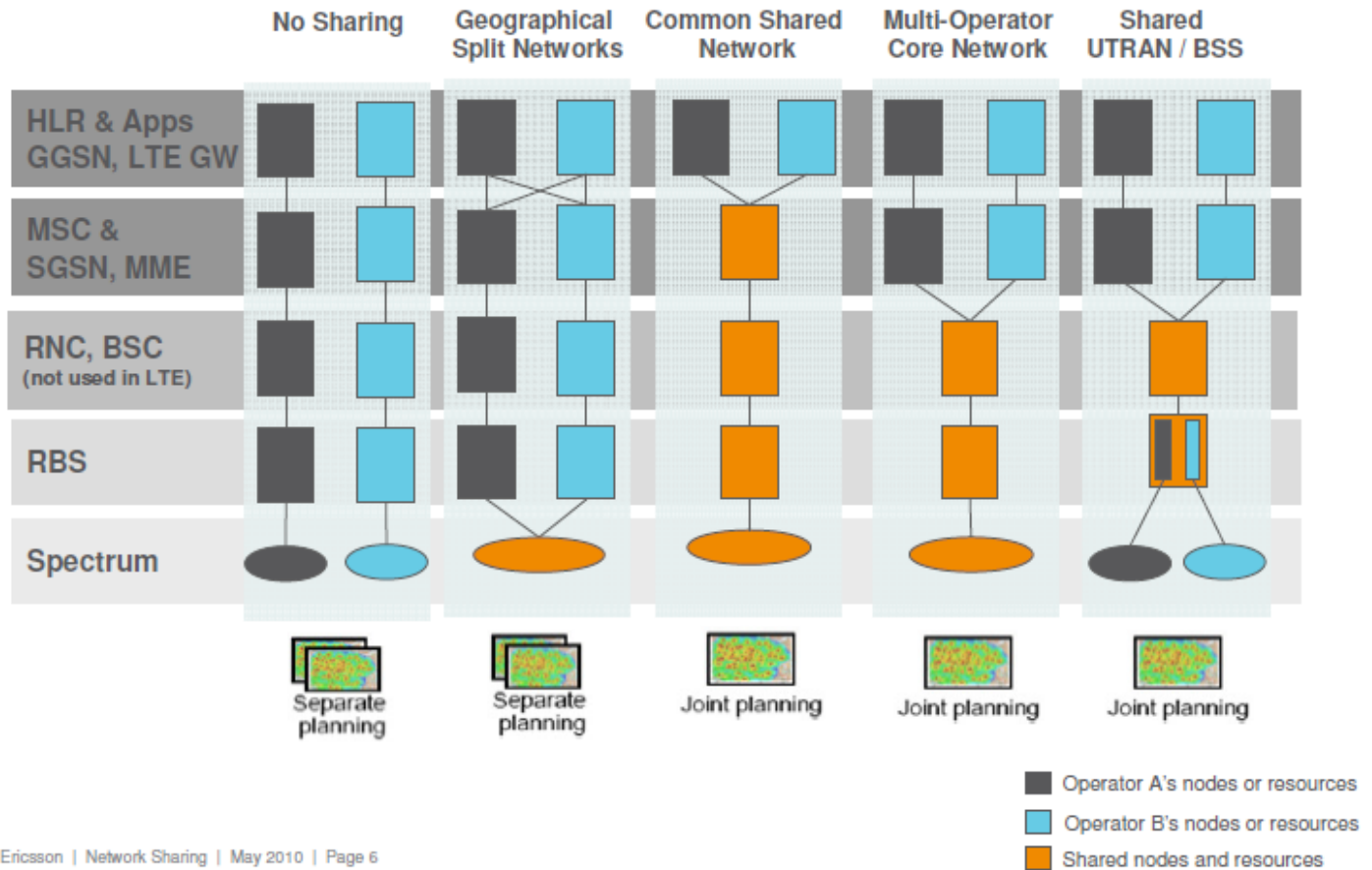
Basis: SMS 160 bytes, 6554 SMS per MB, average price per SMS SEK 0.13

Voice: 47 kbps including overhead

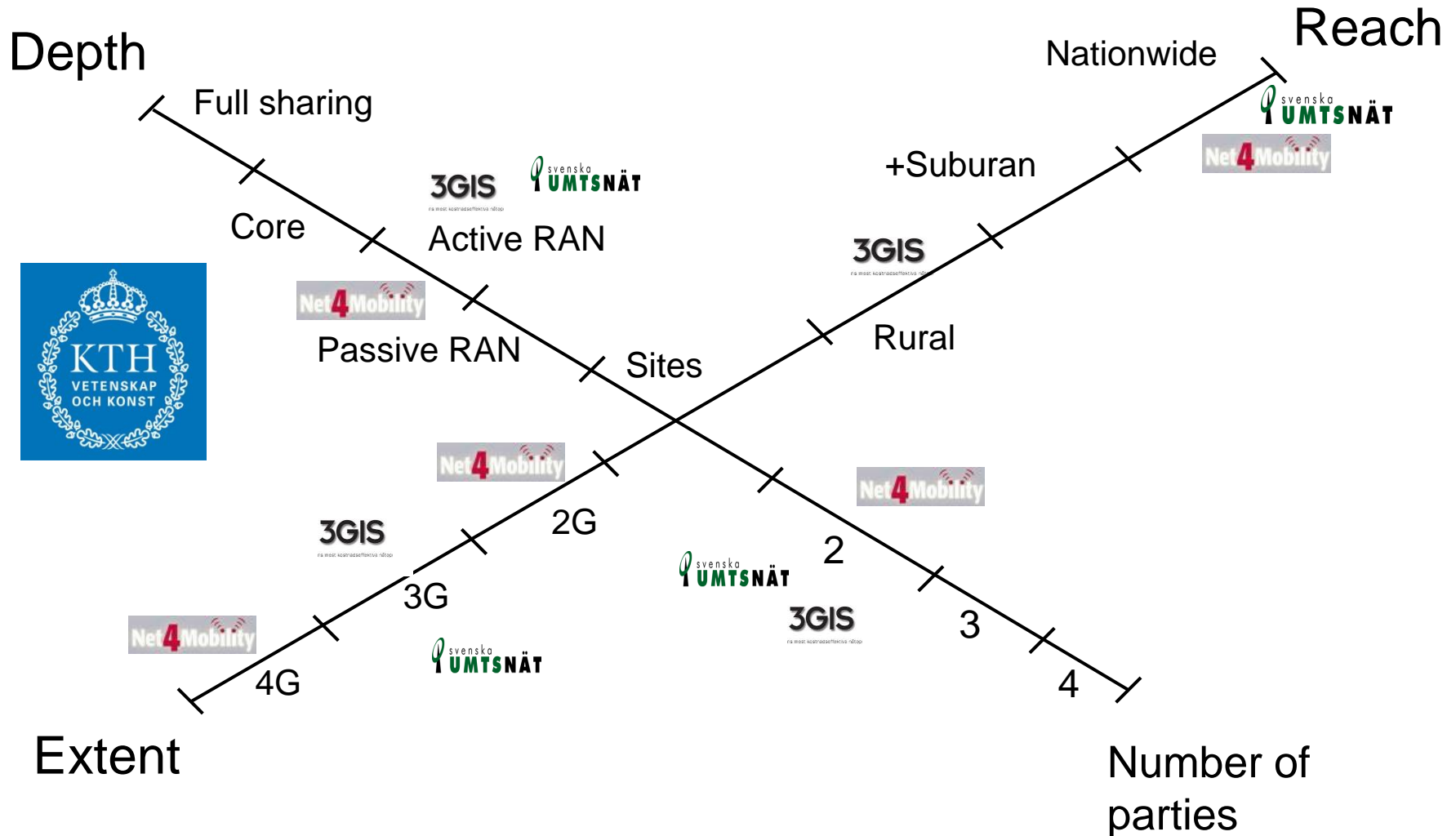
Internet transit, 125 VoIP per MB, price per VoIP SEK 0.0000028,

Source: OECD Internet traffic exchange, Svensk telemarknad

Network sharing on the agenda



Network sharing – 4 dimensions



Source: T. Frisanco et.al , Infrastructure Sharing and Shared Operations for Network Operators, IEEE, ICC 2008

Pros and cons with mobile network sharing

+

- Lower capex
- Lower opex
- Maintained position on the market with its brand
- Support from a better network than what it could afford to build on their own



-

- Cumbersome to reach consensus on all decisions and form a common view
- Lose independence over network strategy
- Hidden cost, impossible to foresee everything that has to be part of a network agreement

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Revenues	The amount of money that a company actually receives during a specific period

Conclusions



- Telecom is maturing, searching for a new revenue streams
- Strong volume growth with continuously lower prices
- Focus on lower costs, looking for new ways to rationalize