State-of-the-Art
Mobile Internet connectivity

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Mobile Internet connectivity and its Impact on e-commerce

- Introduction
- Trends for mobile broadband
  - Usage
  - Technology
  - Applications
- The impact of roaming
  - Impact on consumers
  - The effects of the 2012 Roaming Regulation
  - Switzerland as a comparative case study

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Introduction

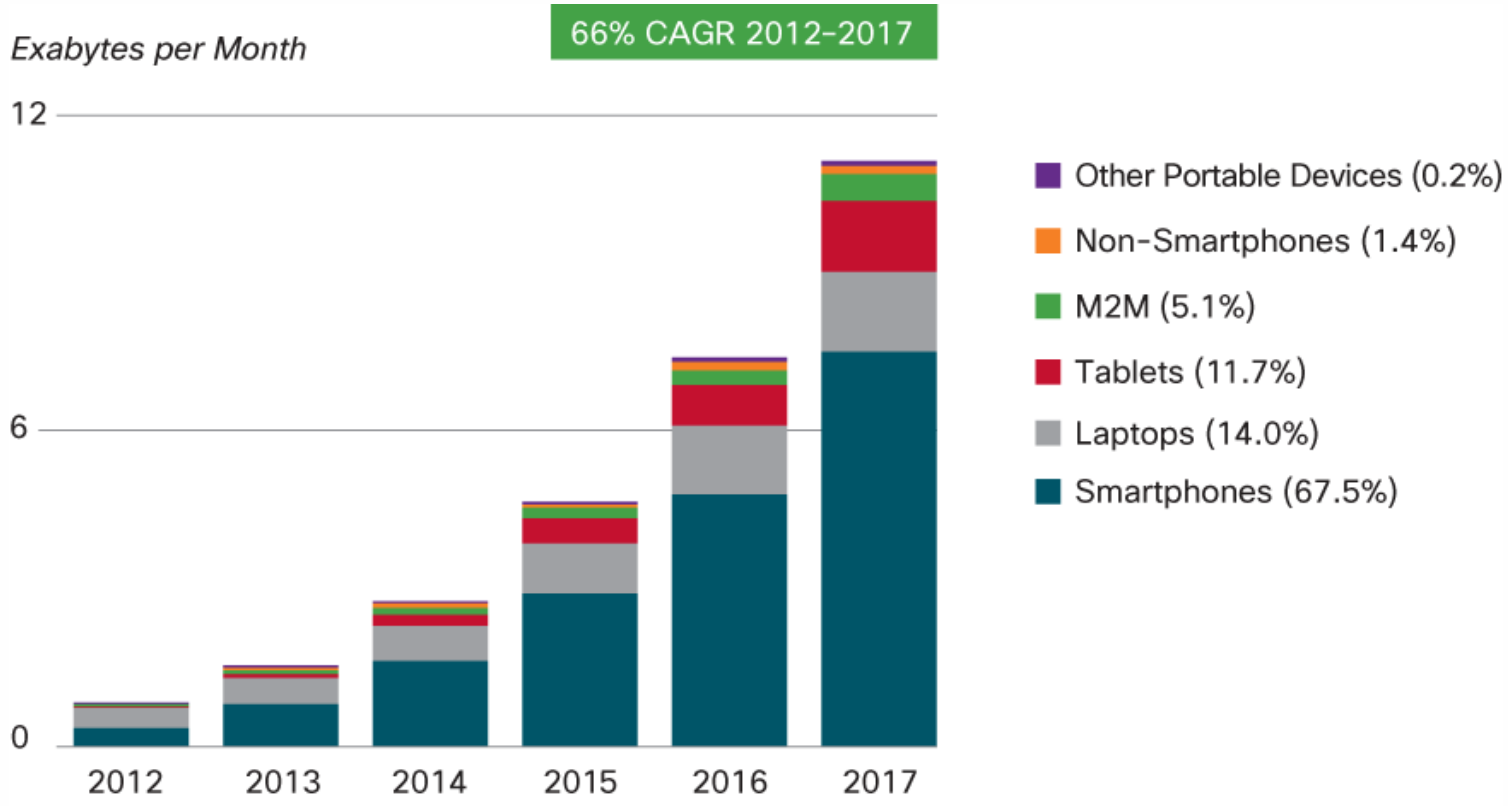
- How is the evolution of wireless Internet data (especially LTE and Wi-Fi off-load) changing the ways in consumers use the Internet?
- What are the implications of these changes?
- Do current arrangements as regards mobile data roaming impact consumer benefits that would otherwise flow from increased use of mobile data, and thus inhibit the desirable evolution of mobile data?

Introduction

- The growth of mobile data offers important opportunities to Europeans:
  - As a means of providing consumers with ubiquitous IP-based access to data and applications anytime, anywhere, whether moving or stationary.
  - As a means of achieving ubiquitous broadband coverage, even to remote or hard-to-reach areas, and thus achieving the objectives of the Digital Agenda for Europe in a technologically neutral way.
  - As an alternative to fixed high speed broadband access, even in areas of moderate density, subject to constraints of capacity and demand.

Trends in usage

- Smartphone and tablet use is growing.



Figures in legend refer to traffic share in 2017.

Source: Cisco VNI Mobile Forecast, 2013

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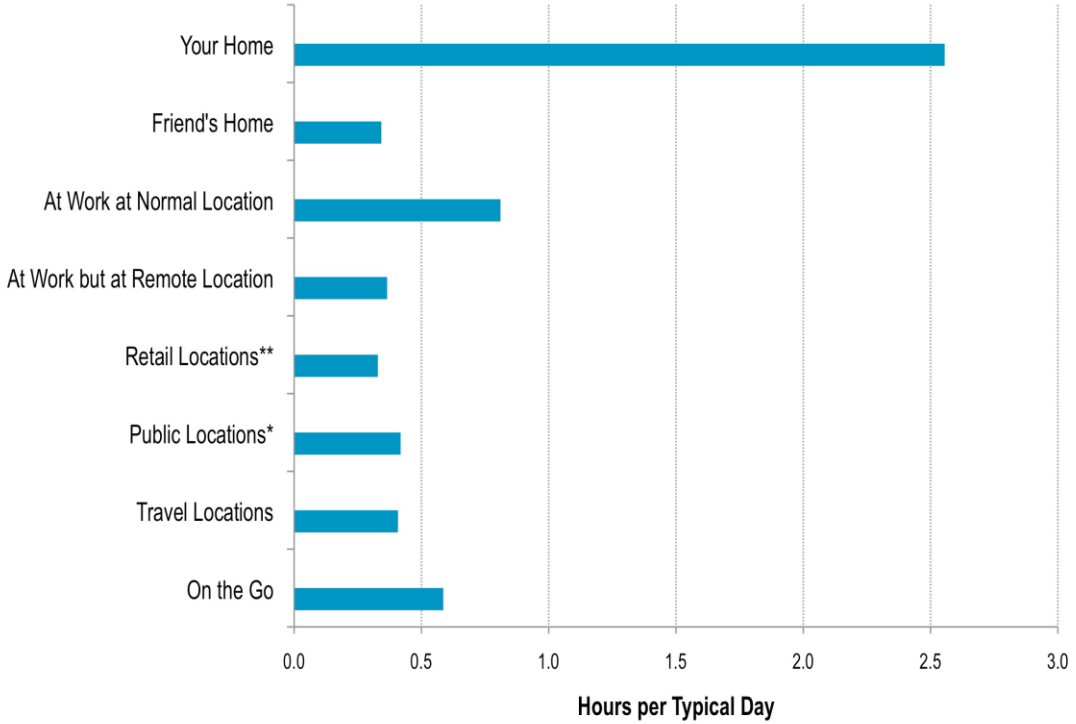
Trends in usage

- Not all use of mobile devices is mobile.



N=varies

Q33. In a typical day, for how long do you use your mobile devices in each of the following locations?

* *Public – e.g., stadiums, parks, schools*
** *Retail – e.g., stores, restaurants*

Source: Cisco IBSG (2012)

Trends in usage

- The rate of mobile traffic growth appears to be slowing due to a number of interrelated factors:
  - Increasing prevalence of capped and tiered plans.
  - A slight reduction in the number of mobile-connected laptops in Europe in 2012.
  - Unexpectedly great traffic off-load due to Wi-Fi.

Source: Cisco VNI Mobile (2012)

Trends in usage

- Traffic off-load, largely due to Wi-Fi in the home, is far greater than many had predicted as recently as a year ago.

Source: Mobidia / Informa (2013)

Trends in usage

Rank	Cellular	Wi-Fi	Roaming
1	Browsing	Browsing	Browsing
2	Facebook app	YouTube	Facebook app
3	Tethering	Video and audio streaming	Google Maps
4	YouTube	Downloads	E-mail
5	Downloads	iPlayer	Tethering

- Application usage is also different when the traffic is off-loaded than when it travels over the cellular network.

Source: Mobidia / Informa (2012)

Trends in Technology

- Typical realistically achievable mobile speeds are less than theoretical limits, but still impressive.
- Gains come from use greater spectral efficiency through use of multiple antennae (MIMO), and from more spectrum.

Mobile technology generation	Range of typically achievable maximum downstream bandwidth (Mbit/s)
HSPA	2-5
HSPA+	5-25
LTE	10-100

Source: TNO estimates

Trends in Technology

- Price/performance enhancements lead to
  - lower cost for MNOs, and
  - better and more cost-effective mobile data for consumers.
- Mobile off-load enables greater and more flexible use of nominally mobile devices.
- Consumer devices are becoming smarter, more user-friendly, and more capable.
- Collectively, mobile data is becoming ever more promising over time.

Trends in Applications

- Applications that historically were used only from fixed networks now become practical for users while travelling:
  - private off-load via Wi-Fi and femtocells;
  - public off-load solutions (e.g. FON);
  - Increased speed;
  - lower unit prices for data;
  - better handsets, tablets, and netbooks.
- Small screen versus large screen.
- New location-aware applications.

Trends in Applications

- Some services are especially important when travelling:
  - Navigation applications, such as maps with pointers to local facilities and services.
  - Schedule information for public transport.
  - Online check-in services, boarding passes.
  - On-line translation tools.
  - Customer support services for various types of electronic equipment.
  - Internet banking.
  - E-government services.

The 2012 Roaming Regulation

- Drives a substantial reduction in the retail price for roaming data, to € 0,20 per MB in 2014.
- However, the price may still be high enough to limit use.

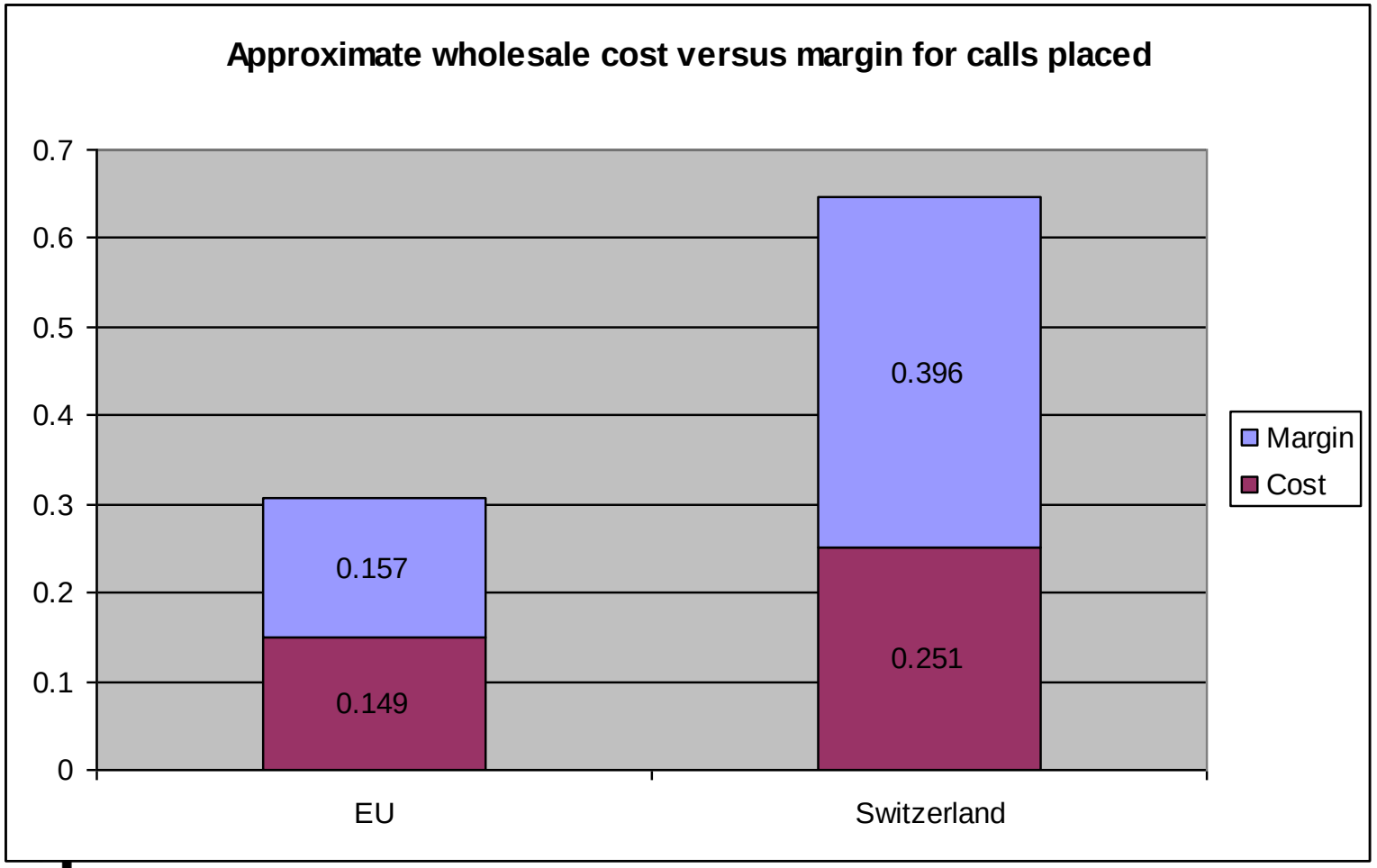
	Current	1 July 2012	1 July 2013	1 July 2014
Retail price cap per MB (excluding VAT)	None	€ 0,70	€ 0,45	€ 0,20
Wholesale price cap per MB	€ 0,50	€ 0,25	€ 0,15	€ 0,05

Case Study: Switzerland

- Switzerland is neither an EU nor an EEA participant, even though it has numerous bilateral agreements with the EU.
- It nonetheless voluntarily participates in the BEREC data collection.
- Switzerland is thus in a unique position:
  - It is not under the Roaming Regulation.
  - Excellent data is nonetheless available.
- How do states not under the Regulation differ from those subject to it?

Price versus wholesale cost: calls placed

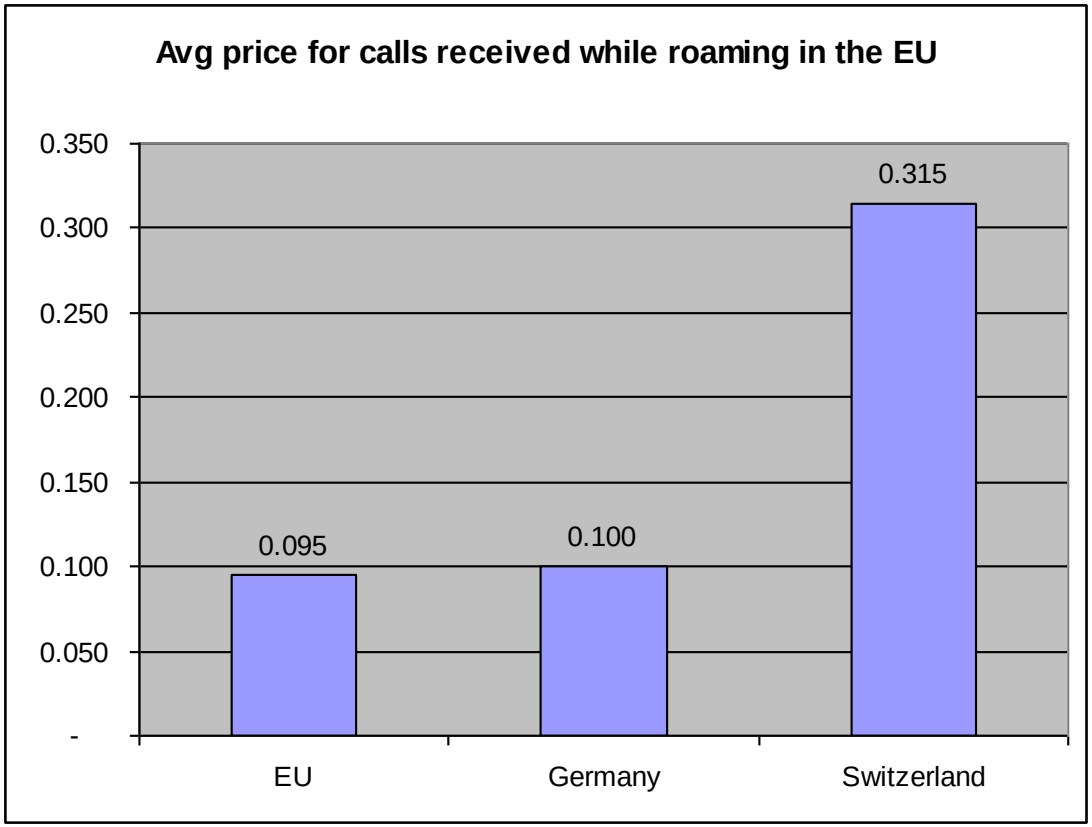
Wholesale costs (WIK est.) do not explain the high retail price.



Data Source: BEREC benchmark data report, January 2013

Retail price: calls received

In 2Q2012, Swiss roamers in the EU paid 232% more than European roamers in the EU.



Data Source: BEREC benchmark data report, January 2013

The 2012 Roaming Regulation

- Two structural solutions put forward by BEREC.
- Single IMSI
  - Opens up competition to MVNO-like organisations.
  - May improve retail competition.
  - No apparent gain for wholesale competition.
  - Unlikely to be a “game changer”.
- Local Break-Out (LBO)
  - Addresses data, but not voice or SMS (except perhaps through OTT services).
  - Prices might approach domestic prices in the visited country (“roam like a native”).
  - Are multi-country solutions likely to appear?
  - What relationship to provision of public off-load?

Concluding remarks

- When a European is travelling, his or her need for data is likely to be *more*, not *less*, than when at home.
- How unfortunate if these very applications were prohibitively expensive!
- There will be real socio-economic costs to Europe if these applications, for practical purposes, stop at national borders.
  - Potential scale economies would continue to be lost;
  - consumer welfare would be directly impacted as a result;
  - and to some degree European competitiveness would be negatively impacted.