



Digital Convergence Athens 2009

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Digital convergence

has two distinct meanings (1)

- First, digital convergence means producing substitute services using different technologies, taking advantage of digitization of each technology
 - Example: Voice over Internet protocol service can be provided over cable TV or other data-transmission lines, a substitute for traditional voice phone service
 - Generally, creation of new substitutes intensifies competition



Digital convergence

has two distinct meanings (2)

- Second, digital convergence means using the same device to produce complementary services, again taking advantage of digitization
 - A mobile phone can act as a video player, calendar organizer, address book, emailer, Internet browser, camera, storage device for photos, etc.
 - Creation of multi-function devices could reduce competition, as companies with a dominant position in one function/market can leverage it into other functions/markets by incorporating them in the same device, often using proprietary interfaces (iPod/iTunes)



Both types of digital convergence are consequences of digitization and of dramatic cost reductions in

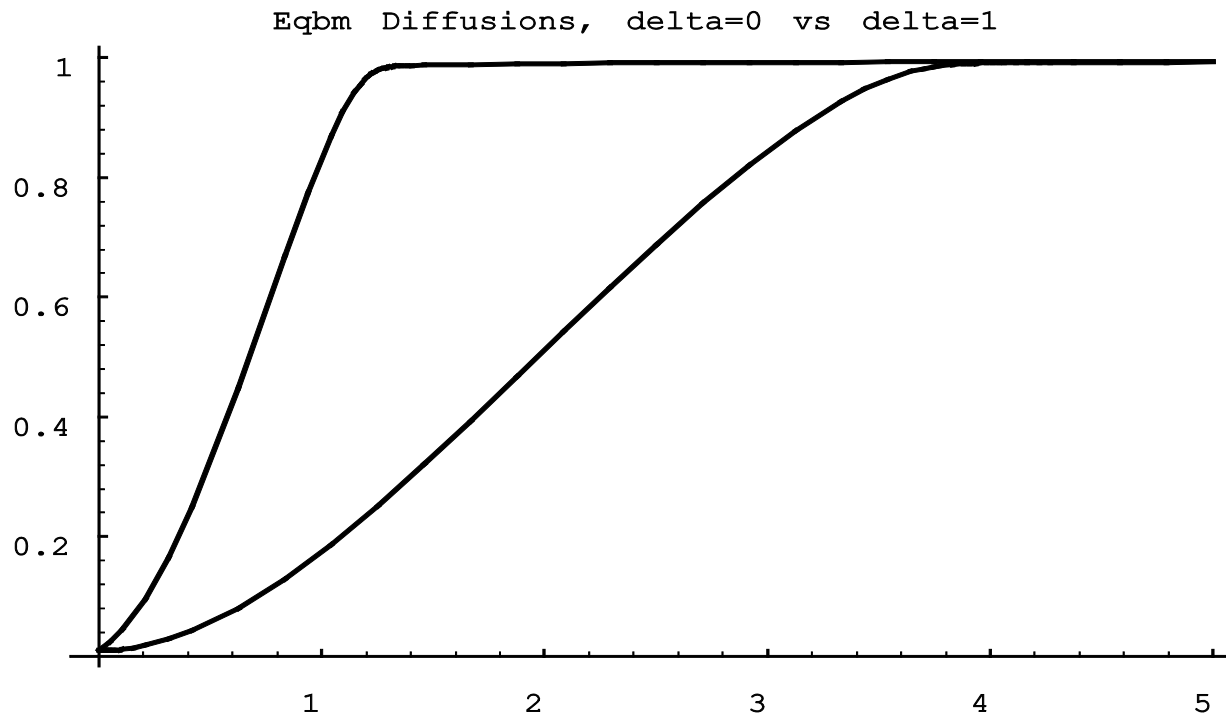
- computers / computing power / telecom switching / information processing
- data storage
- long distance transmission of information (wired and wireless)
- Significant improvements in interfaces and OSs
- Infrastructure cost reductions and better interfaces made feasible many data- and transmission-intensive services (for example the world wide web on the Internet)
- Digital convergence was helped by
 - the general transition towards programmable multifunction devices (computers)
 - the abundance of “network effects”



Importance of network effects

- Network effects exist when the value of the last unit sold or traded increases with the number of units sold or expected to be sold; arising from the existence of complementary goods
- Examples:
 - it is more valuable to subscribe to a larger rather than smaller telecommunications network
 - it is more valuable to buy Windows because its high market share ensures large number of software applications
 - Proprietary networks such as CompuServe, Prodigy, old AOL closed down in the presence of the Internet

Cumulative diffusion of innovations with and without network externalities: faster innovation adoption with network effects





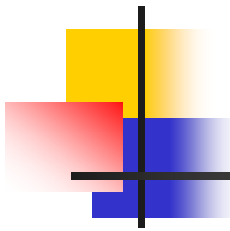
The existence of network effects implies

- that efficient prices on both sides of a network should be set lower than when network effects are not present
- **It is efficient for the Internet (and for other markets with network effects) to be publicly subsidized to stimulate growth and innovation**
- Internet growth of subscribers in Greece goes hand-in-hand with growth of *local content* in Greek and relevant applications (see Economides and Viard, “Digital Divide ...,” 2009)



Digital convergence and growth

- The Internet reduces distance and intensifies competition
 - Good for high productivity countries
 - Bad for low productivity countries
- Strong impact of Internet and telecom infrastructure
 - on international trade: Freunda and Weinhold (2004)
 - on growth: Röller and Waverman (2001), Choi and Yi (2003), others
- Vu (2007) explains growth in each country in 1999-2005 by investments in Information and Communication Technology (ICT) and non-ICT
- Finds strong correlation between ICT investment level and growth rate
- Greece had high growth rate despite low investment in ICT during this period; could have done better!



Network neutrality (“NN”) on the Internet has contributed to Internet adoption and innovation

- Network neutrality: same treatment of information packets irrespective of service they perform
- NN guarantees a level playing field in competition on the Internet, including dissemination of news
- NN is a significant contributor to innovation and growth Economides (2007, 2008), Economides and Tag (2007, 2009)
- It is crucial that net neutrality is preserved despite attempts by AT&T, Verizon, and Cable TV companies to abolish it, and also be extended to cellular Internet access
- US Pres. Barack Obama defended NN and made it part of his campaign pledges and the US stimulus package

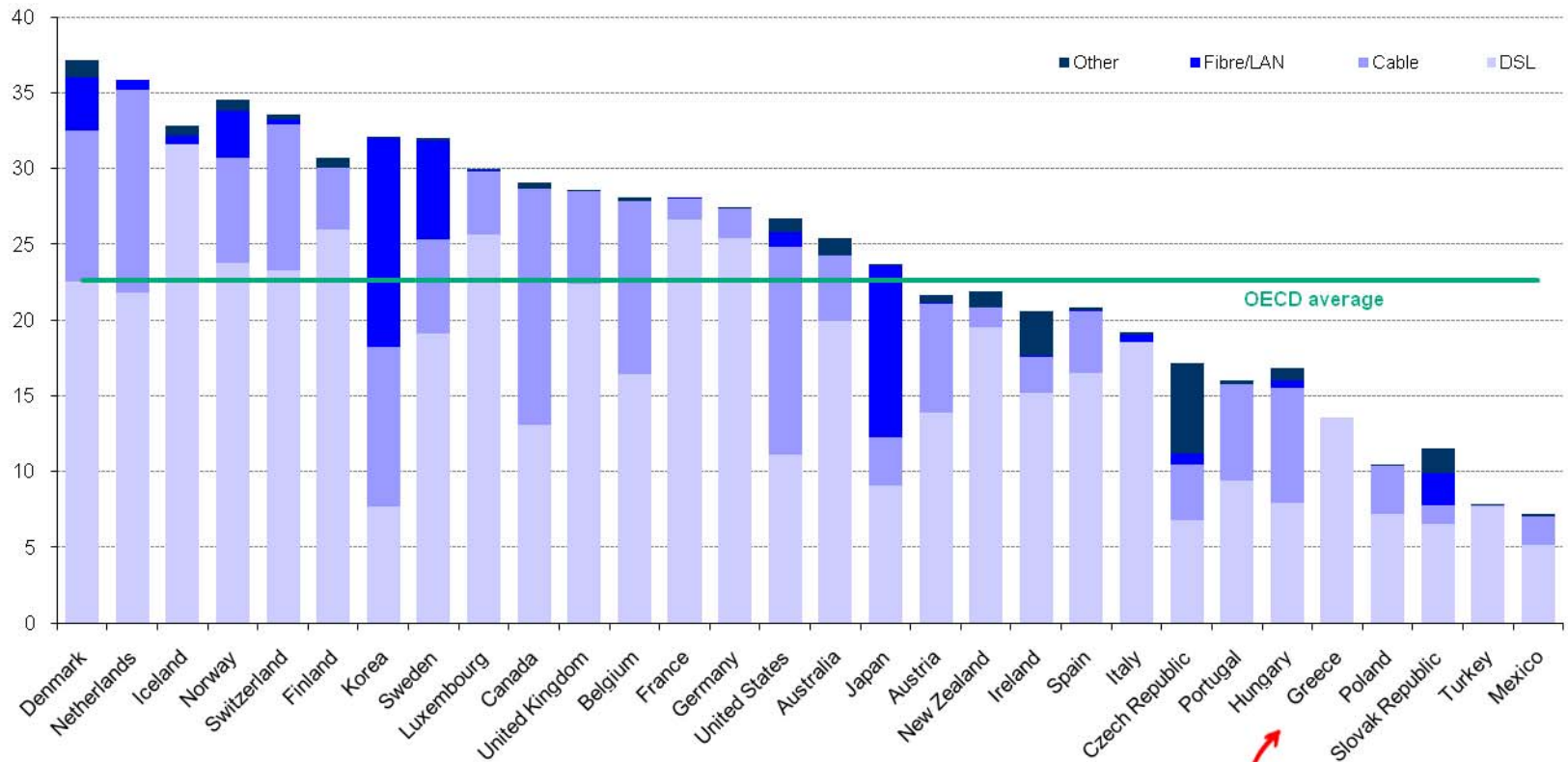


In US, telecommunications

- consumers have not reaped the full benefits of cost reductions and competition because of an antiquated regulatory framework that, ironically, was supposed to protect consumers from monopolistic abuses
- US 15th in Internet penetration (in Dec. 2008)!
- Greece started on Internet broadband with long delay because of abuse of monopoly power of OTE
 - has improved considerably in the last 4 years
 - now is 26th in OECD, has a long way to go
 - behind comparable EU countries: Ireland and Portugal
 - way behind other small EU countries Denmark and Netherlands

Lagging in Broadband

OECD Broadband subscribers per 100 inhabitants, by technology, December 2008



Source: OECD



Bottom line: What should be done for Internet growth in Greece?

- Need a strong and independent regulator who will
 - ensure low prices for Internet access
 - promote infrastructure entry
 - adhere to unbundling requirements to promote service competition
 - ensure net neutrality
- Promote complementary products
 - Subsidize PCs (programs giving away laptops to Univ. and high school students)
 - Promote content in Greek
- Facilitate Internet access, for example providing free access in urban / town / village squares