

Regulation

(Courcoubetis&Weber: Chapter 13)



Lecture outline

- Introduction
 - Why and how to regulate?
- Price regulation
 - Rate of Return regulation
 - Price caps
- Regulation in EU
 - Regulatory framework
 - Regulatory process
- Regulation examples
 - History, case examples, future



Regulation – Why Now?

- Governments decided to liberalize telecom markets in the 1990s because of mobile networks, Internet, innovation, internationalization, and need for private capital
 - Liberalization implied privatization of government PTTs (Post, Telephone, and Telegraph administration)
- Transformation of monopolistic markets into competitive ones requires regulatory intervention
 - Real competition possible only with government support for new entrants against incumbents (PTTs)
- In 1990 only 12 countries had independent regulatory agencies, whereas in 2000 the figure was already 96 countries (ref. ITU)
- Telecom regulation has been sector-specific so far but media convergence is bringing together the telecom, broadcasting, and information services regulation



Why to Regulate?

- Foster competitive markets
 - innovation, quality, efficiency
- Promote universal access to basic telecom services
- In case of monopolies, prevent abuse
- Promote public confidence in telecommunications markets
- Protect consumer rights, including privacy rights
- Promote connectivity through interconnection arrangements
- Optimize use of scarce resources
 - radio spectrum, IDs, rights of way



How to Regulate? Principles of Effective Regulation

- 1. Introduce competition
- 2. Minimize regulatory intervention after competition is established
- 3. Harmonize with regional and global regulatory standards
- 4. Regulate by principle
- 5. Establish operational efficiencies

Source: Telecommunications Regulation Handbook



How to Make Regulatory Decisions?

- Principles of good regulatory decision-making:
 - 1. Transparency
 - 2. Objectivity
 - 3. Professionalism
 - 4. Efficiency
 - 5. Independence
- Ask for opinions \Rightarrow Make a decision \Rightarrow Monitor consequences
- The information society is a complex non-linear system
 - Such systems cannot be predicted, but they can be managed!

Status of Competition per Segment





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Why Focus on Competition?

- Competitive markets distribute resources efficiently and fairly
 - no need for a centralized controlling authority
- Competition brings benefits to society
 - Ensures that resources, products, and services are allocated to the person or persons who value them the most (allocative efficiency)
 - Forces market participants to use scarce resources as productively as possible (<u>productive efficiency</u>)
 - Encourages market participants to innovate, and to invest in new technologies at the best time (<u>dynamic</u> <u>efficiency</u>)

Source: ICT regulation toolkit, Module 2



Price regulation, general

- Regulators may not be able to produce outcomes as efficient as a well-functioning market
- However, if efficient competition is not possible, it may be necessary to regulate the prices of dominant firms
- Regulation may be required, if prices are
 - Too high overall
 - Anti-competitive, due to e.g. cross-subsidization, price-squeeze, predatory pricing
- Price regulation options include
 - Rate of return regulation
 - Incentive regulation, e.g. price caps
 - International benchmarking of prices

Source: ICT regulation toolkit, Module 5



Price regulation, objectives

- Financing objectives
 - Ensure that operators earn sufficient revenue to finance operations and investments
- Efficiency objectives
 - Allocative efficiency: prices should equal the marginal costs of producing each service
 - Productive efficiency: Services should be produced as efficiently as possible
 - Dynamic efficiency: Resources should move over time to their best uses
 >> improved productivity, new innovations
- Equity objectives
 - Fair distribution of welfare benefits, between operators and consumers and among consumers
- Other:
 - Promote competition
 - Ensure high service quality
 - Minimize regulatory costs
 - Ensure prices are competitive also internationally

Source: Telecommunications Regulation Handbook & ICT regulation toolkit, Module 2



Rate of Return regulation

- Restricts the amount of profits that the regulated firm can earn
- Two implementation steps:
 - Determine the economically appropriate revenue requirement (RR), based on incurred expenses and a "fair" return on invested capital

RR = Operating Expenses + Depreciation + Taxes + (Net Book Value * Rate of Return)

2. Set prices for individual services so that total revenue is not greater than the revenue requirement $\sum_{n=1}^{N} P * O < PP$

$$\sum_{i=1}^{N} P_i * Q_i \le RR$$

• In order to calculate prices, the regulator first needs a reasonable forecast of demand for the regulated services



Price cap regulation

- Controls the prices charged by a firm, rather than the profits
 - provides incentives for improved efficiency
- Regulator determines an annual price cap formula and its duration
- Regulation with fixed weights:
 - $\{p: \sum_{i} p_{i} q_{i}(p^{0}) \leq \sum_{i} p_{i}^{0} q_{i}(p^{0})\}$, where
 - p^0 is reference price vector, p is new price vector, q is quantity
 - Difficult to choose p^0 and to estimate the demand $q_i(p^0)$
- Regulation with dynamic price-caps:
 - E.g. tariff-basket regulation: $\{p^t : \sum_i p_i^t q_i^{t-1} \le \sum_i p_i^{t-1} q_i^{t-1}\}$
- Regulation with Price Cap Index (PCI, ~RPI = Retail Price Index):
 - $PCI_{t} = PCI_{t-1} * [1 + CPI X \pm Z]$, where
 - PCI_t = Price Cap Index (for a basket of services), CPI = Consumer Price Index (i.e. inflation), X = adjustment for expected efficiency gains, Z = adjustment for exogenous costs, t is time
- BUT, simple static price caps are more useful markets of rapid technology innovation, e.g. mobile industry

Source: Courcoubetis & Weber 2003 & ICT regulation toolkit, Module 5



EU - Regulatory Framework Adopted 24 July 2003

- Framework directive
 - Establishes the common regulatory framework
 - Defines the tasks of National Regulatory Agencies (NRA)
 - Sets procedures for Significant Market Power (SMP) definition
 - Accounting separation requirement (network/services)
- Access directive
 - Interconnection and access rights and obligations
 - Cost recovery and price control
 - Accounting separation, use of specific cost accounting systems
- Universal service directive
 - Defines minimum set of basic services to all citizens
 - Basic telephone service, leased lines





- Important role of NRAs in choosing the appropriate remedy
- Remedy should be effective => solve the lack of competition



EU – Regulatory Process (2/3)

- 1. EU defines the *Relevant Markets*
- 2. NRAs analyze the *Relevant Markets* on national level
- 3. Actions
 - A) If the national market is not efficiently competitive
 - NRA identifies SMP operators
 - NRA imposes regulatory obligations
 - B) If it is competitive
 - No new obligation can be set
 - And the existing obligations have to be removed



EU – Regulatory Process (3/3)

Definition of Relevant Markets

- Commission has defined 7 retail and 11 wholesale markets
- Retail markets (7)
 - Access to PSTN at fixed location (residential/non-residential)
 - Publicly available local/national PSTN calls (residential/non-residential)
 - Publicly available international PSTN calls (residential/non-residential)
 - Minimum set of leased lines up to 2Mb/s
- Wholesale markets (11)
 - Call origination/termination in an individual PSTN
 - Transit services in the fixed PSTN
 - Wholesale unbundled access to metallic loops for voice and broadband
 - Wholesale broadband access ("bitstream" access)
 - Wholesale terminating and trunk segments of leased lines
 - Access and call origination in public mobile networks
 - Voice call termination in public mobile networks
 - Wholesale national market for international roaming on public mobile
 - Broadcasting transmission services, to deliver broadcast content to endusers



Regulation Comparison US vs. EU

- EU pursues technology- and service-neutral regulation, while the US still leans on detailed silos. EU deals with convergence explicitly.
- EU has centralized responsibility for law creation and decentralized for law enforcement. The US does not separate these responsibilities
- US defines specific regulatory outcomes, while EU defines the process for reaching outcomes
- In the EU, people trust governments more than corporations. In the US, it is vice versa. FCC lacks the authority to get confidential information and may lack the ability to protect that information

Source: S.Marcus, 2003



Example Case Finland: History (1/2)

- 1987 Regulation was made independent (separate from PTT)
- 1990 Data and GSM networks were opened for competition
- 1997 Telecom Market Act (note: government starts privatization of PTT)
 - Bundling of handsets and subscriptions prohibited
 - Operators must separate network and service operator businesses
- 1999 Network operators obligated to sell C&B to service operators
- 1999 UMTS licences allocated
- 2000 UMTS operators entitled to national roaming with GSM operators
- 2001 Subscribers to select their local telephone operator
- 2002 Communications Market Act I
 - Single unit (Ficora) responsible for telecom, broadcasting and Internet
 - Broadcasting licences separated to programming and network
 - Cable TV operators *must carry* the public digital YLE broadcasting
 - Regulator (Ficora) gets the responsibility of information security (CERT-FI, Computer Emergency Response Team - Finland)



Example Case Finland: History (2/2)

- 2003 Communications Market Act II
 - Deployment of the EU Communications Market Act (as basic laws)
 - Broadcast operators equal to telecom operators (due to convergence)
 - Digital content services still remain out of scope
 - Mobile number portability made obligatory
- 2003 Rules for allocation of national domain names (.fi)
- 2003 VoIP calls to PSTN subject to PSTN regulation
- 2003 Mobile number portability
- 2004 Mobile Network Operators defined as SMPs \Rightarrow *cost-oriented pricing* and cost reporting enforced on all interconnection traffic
- 2004 Child protection against harmful TV broadcasting
- 2004 Fixed telephony number portability
- 2006 Bundling of mobile handsets and subscriptions



Example Case Europe: Roaming fees

- Retail prices of roaming calls are significantly higher than those of domestic mobile calls
 - Roaming generates ~10% of operators revenues
 - Cannot be explained by differences in cost levels
 - Not decreasing sufficiently by market mechanisms
 - Difficult to control by national regulators
- Proposed solution: Price caps
 - EU to set a maximum limit on the wholesale and retail prices
 - Proposed retail price caps:
 - 0.60 euros for calls made abroad
 - 0.29 euros for calls received abroad
- Decision made in the summer 2007



Example

Case Finland: Mobile termination fees

- FICORA, February 2007: "The reduction in termination charges will
 - ...promote competition in the industry...
 - ...allow for a reduction in retail prices applicable to calls made from fixed-line networks to mobile networks...
 - ...reduce the distortion of prices between termination charges and the retail prices of mobile services..."



Source: FICORA, operators



Example Case Finland: Handset bundling

- Historically, bundling of mobile handsets and subscriptions has been forbidden by law
- Bundling of 3G handsets and subscriptions allowed from April 2006
 - Max. 2-year contracts, SIM locks allowed
 - Clear communication about pricing and terms required
- Why was it allowed?
 - Low 3G penetration
 - Finland lagging behind in usage of advanced services
 - Operators wanted it
- After 3 years, the situation will be assessed again
 - Allow bundling of all handsets, not just 3G?
 - Forbid handset bundling again?



Example

Impacts of handset bundling on mobile data usage: Scope of framework





Impacts of Handset Bundling on Mobile Data Usage: Example Framework





Example

Case Finland: Handset Bundling April 2006 – Before and after law change

April 2006	Before (Jan 06)	After (Jan 07)
Handset bundling	Not allowed	Allowed - Targeted
Competition	Heavily on price	Services and 3G- packages
Mobile handset base	0,05% 3G	10% 3G
Marketing of mobile data	No	Still No
Usage of mobile data	X MB	(3-4)*X MB
Customer churn	>15%	<15%
Switching cost	Low	Higher

Sources: COIN, Mobile Operators, Ficora, Numpac





Case Finland: Handset Bundling - Conclusions

- Targeted handset bundling can have a positive impact on the adoption of mobile data
- However, benefits of handset bundling are sensitive to:
 - bundling rules defined by regulator
 - other market related issues
- Anti-competitive impacts can be reduced by:
 - shortening the maximum contract period
 - imposing mixed bundling



Example

Case Finland: Speculation on Future

- Wholesale price cap for broadband Internet access / mobile termination ?
- Penalty for generation of spam traffic ?
- Longer memory for authorized monitoring of person-to-person traffic ?
- ENUM interoperability for VoIP between GSM and Internet ?
- Portability of operator-independent domain names (.fi) ?
- National roaming for WLAN hotspots ?
- Peer-to-peer connectivity between mobile handsets ?
- Role of mobile virtual network operators (MVNOs): enabling an MVNO to use several MNOs in parallel ?
- Open SIM-cards to facilitate parallel mobile value chains (more ids in one SIM-card) ?
- Role of independent content operators: enabling flexible delivery of digital content through all channels ?



References

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