

INTERCONNECT COMMUNICATIONS
A Telcordia Technologies Company

**Telecommunications Regulatory
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Day 1- Session 2**

The Need for Regulation

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Content

- Objectives and types of regulation
 - Sector-specific and general regulation
 - *Ex ante* and *ex post* regulation
- Why regulate in
 - Economic regulation
 - Market failures
 - New and emerging markets
 - Some case studies from Hong Kong
 - Social regulation
 - Universal service/access
 - Technical regulation
 - Technical standards
 - Spectrum management





Why Regulate Telecommunications?

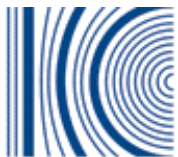
- Telecommunications is an important public utility
 - An important constituent in the Information and Communications Technology (ICT) sector
 - An important part of the economy in its own right
 - Underpins the other sectors of the economy
- Regulation is to achieve the following objectives
 - To enable users to have access to (and preferably choice of) services of the required level of quality and innovation at affordable prices
 - To enhance efficiency of market and productivity of economy
 - To protect consumer interest and public interest (universal service, privacy protection, protection from nuisance, national security, public safety, etc.)





Types of Regulation

	Sector-specific	General
<i>Ex ante</i>	<ul style="list-style-type: none">• Economic regulation• Social regulation• Security regulation• Technical regulation	<ul style="list-style-type: none">• Competition law (regulation of mergers and acquisitions (M&A's) in some jurisdictions, e.g. EU)
<i>Ex post</i>		<ul style="list-style-type: none">• Competition law (regulation of anti-competitive conduct and M&A's, e.g. Hong Kong)• Consumer protection law (e.g. prohibition of misleading and deceptive conduct)





Economic Regulation

- The promotion and maintenance of a competitive market
- Mostly sector-specific and *ex ante*
- To address market failures
 - Objectives best achieved by market forces
 - Effective competition may not emerge immediately after liberalisation
 - Regulation is a surrogate to market forces to protect consumer interest when competition is not yet effective
- To foster development of competition so that the economic regulation may be withdrawn in due course
- Level may be reduced as competition intensifies





Market Failures

- Market competition not effective to accomplish policy objectives
- Criteria adopted by European Commission for applying sector-specific *ex ante* regulation to telecommunications markets
 - Presence of high and non-transitory entry barriers, whether of structural, legal or regulatory nature
 - Structure of market does not tend towards effective competition within relevant time horizon
(Note: This involves some forward-looking assessment)
 - Competition law alone would not address the market failure concerned

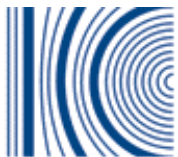
Source: EC Recommendation of 11 February 2003 on “relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC.....”





Why Market Failures Exist?

- Most telecommunications markets started from a monopoly
- “Dominance” may remain during transition to effective competition
- “Dominance” (equivalent to “Significant Market Power” in EU Regulatory Framework)
 - “Ability to act without significant competitive restraint from the competitors and customers” - Hong Kong Telecommunications Ordinance
 - “A position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by affording it to behave to an appreciable extent independently of its competitors, its customers and ultimately of consumers” – EU





- Entry barriers
 - Legal (regulatory) barriers
 - Limit on the number of licences
 - Access to “essential facilities” or bottlenecks
 - Access to “last mile” facilities
 - Access to radio spectrum
 - Access to non-replicable ducts
 - Economy of scale and scope
 - Difficulties for new entrants to reach sustainable scale of operation
 - Established position of incumbent
 - Reputation
 - Advertising
 - Information about the market
 - Relationship with customers
 - Established distribution network





- Switching cost of customers (e.g. requirement to change telephone numbers, fidelity discounts, cost of compatible customer provided equipment)
- Sunk costs
- Network effect
- Exclusionary behaviours
 - Discriminatory pricing by incumbents targeting new entrants where they are vulnerable
 - Fidelity discounts
- Countervailing buyer power (inadequacy of)
- Information asymmetries (inadequate information to consumers to make informed choice in the market)





When to Regulate?

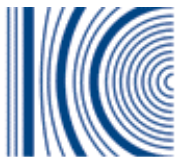
- Define public policy objectives
- Examine counterfactual of no regulation
 - Can public policy objectives be achieved by the market?
- Examine benefit and cost of regulation
 - Does benefit of regulation (achieving the policy objectives) exceed cost of regulation (e.g. dampening investment incentive, regulatory failure, e.g. applying regulation when regulation is not warranted)?
- If benefit of regulation outweighs cost of regulation, apply the minimum and proportionate regulation





When is *Ex Ante* Regulation Needed?

- *Ex post* competition law to prevent lessening of competition while *ex ante* regulation is to enhance the level competition
- *Ex post* regulation – in the event of breach, damage to market is already done before enforcement
- *Ex ante* regulation – regulatory error may apply regulation where it is not warranted (Type I error as opposed to Type II error where regulation is not applied when it is warranted)
- Need to balance the risks
- Risks may be different at different stages of market development





EU Regulatory Framework

- EU's Regulatory Framework for Electronic Communications Networks and Services lays down the principles for applying sector-specific *ex ante* regulation
- When substantial market power (SMP) exists, appropriate *ex ante* regulation is to be applied on the undertaking with the SMP
- Where no substantial market power exists, i.e. the market is effectively competitive, no *ex ante* regulation may be applied on any undertakings

Source: EC Directive 2002/21/EC on "a common regulatory framework for electronic communications networks and services"

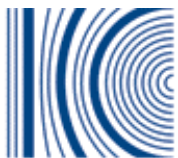




Ofcom's Regulatory Principles

- Bias against intervention, but with a willingness to intervene firmly, promptly and effectively when required
- Intervention to be evidence-based, proportionate, consistent, accountable and transparent
- The least intrusive regulatory mechanisms to achieve policy objectives

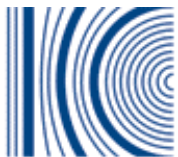
*Source: "About Ofcom" section in Ofcom's website
<http://www.ofcom.org.uk>*





Canada's Telecom Policy Review

- Telecommunications Policy Review Panel Report
March 2006
- Market and technologies have changed sufficiently to warrant fundamental change to regulation
- In the future, reliance should be made on market forces to the maximum extent
- Reversing current presumption for regulation unless CRTC issues forbearance – replacing with presumption of no regulation unless necessary to protect end-users or maintain competition



*Source: Canada's Telecommunications Policy Review Panel
website at <http://www.telecomreview.ca>*



Criteria for Regulation in Australia

- Criteria for “Declaration” of Services under Trade Practices Act by ACCC
- Promote the long-term interests of end-users of carriage services or of services provided by means of carriage services
 - Promoting competition in markets for carriage services and services supplied by means of carriage services
 - Achieving any-to-any connectivity
 - Encouraging the economically efficient use of, and economically efficient investment in, the infrastructure

Source: “Declaration of Telecommunications Services” section in ACCC website at <http://www.accc.gov.au>





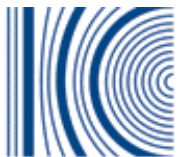
Asymmetric Tariff Regulation

- To prevent excessive pricing before market forces become effective restraints
- To prevent anti-competitive pricing before entrants can establish foothold in market
- Case study in Hong Kong
 - Local fixed network market liberalised from July 1995
 - Price cap for commercial lines withdrawn by July 1998
 - Price cap for residential lines withdrawn by end-2001
 - Initially tariffs (ceilings and discounts) of incumbent were subject to *ex ante* approval by regulator while tariffs (ceilings only) of new entrants were subject to publication only
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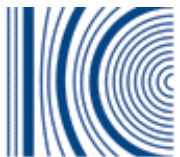
- Case study in Hong Kong (cont'd)
 - Incumbent and four new entrants active in local telephone services market at retail level
 - Competition intense in market – prices and market share of incumbent continued to fall
 - By October 2004, new entrants collectively have obtained 30% of market and their customer access networks covered 60% of households
 - *Ex ante* approval restricted flexibility of incumbent to respond to market
 - *Ex ante* approval of incumbent's tariffs was withdrawn from January 2005
 - No presumption of “dominance” or “non-dominance” of incumbent operator
 - Now regulation is based on *ex post* enforcement of competition provisions in Telecommunications Ordinance





Unbundling of Local Loops

- To promote competition before customer access networks of new entrants are rolled out
- To provide the “ladder of investment” (new entrants may gradually migrate from access-based competition to facilities-based competition)
- Case study in Hong Kong
 - “Type II interconnection” (equivalent to unbundling of local loops) introduced in 1995
 - Available to copper-based local loops only (not available to optical fibres in local loops)
 - 11% local loops unbundled for new entrants
 - Economics of self-built networks facilitated by population/building density in Hong Kong
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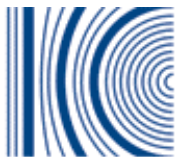
- Case Study in Hong Kong (cont'd)
 - By October 2004, customer access networks of new entrants covered 60% of households
 - Type II interconnection accelerated competition and choice during initial years of liberalisation but could potentially dampen incentive to roll out customer access networks – need to balance short-term and long-term benefits to consumers
 - In 2004, decision was taken to phase out mandatory Type II interconnection at telephone exchanges progressively
 - Arrangement to be phased out 3 years from buildings connected by alternative customer access network
 - Full withdrawal by end-June 2008 except where local loops are “essential facilities”
 - Type II interconnection at building level maintained





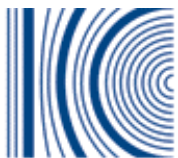
Interconnection

- To achieve “any-to-any” connectivity
- As interconnection is seen to benefit the new entrants more, incumbent may have little incentive to interconnect with new entrants during initial period after liberalisation or may impose excessive prices for interconnection
- Termination of calls may be a monopoly service
- Transaction costs for negotiating interconnection agreements among multiple operators in liberalised market could be high if there were no regulatory intervention
- Lack of certainties in interconnection would raise entry barriers and investment risks





- Need for continued regulation to be reviewed as market develops
 - Sizes of customer bases have expanded
 - Need for interconnection is mutual among operators
 - Countervailing buyer power may mitigate any market power
- Case study in Hong Kong
 - In recent years, no need for regulatory intervention for interconnection exists between fixed networks where symmetric arrangement applies
 - Continued need for regulation for interconnection exists between fixed and mobile networks where asymmetric arrangement applies
 - Regulatory review in progress - intend to withdraw regulation where it is no longer warranted
 - When applying regulation, aim to apply the minimum regulation that is expected to introduce the least distortion to the market





Regulation to be Reviewed Regularly

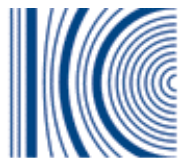
- Regulation should evolve with market and technological developments
- Major trends
 - Broadband and wireless technologies
 - Multiple customer access networks
 - Convergence through “everything” over IP
- Regulatory reviews by many regulators
 - IP-based services
 - Next Generation Networks (NGN)





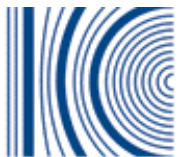
Regulation of IP-based Services

- Technology-neutrality – “like services should be regulated in a like manner” – this would tend to mean that telephone services on IP network should be regulated as those on circuit-switched networks
- Not to hinder deployment of technologies – certain regulation designed for circuit-switched phone services may not be applicable to IP telephony
- Case study in Hong Kong
 - Technology neutral approach
 - Two classes to prevent unnecessary regulation hindering technology deployment
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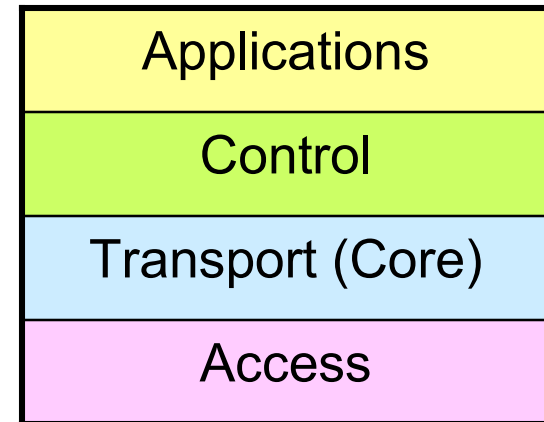
- Case study in Hong Kong (cont'd)
 - Class 1 service – intended to be substitutes for conventional telephone services. All licence conditions for conventional telephone services will continue to apply.
 - Class 2 service – not intended to be substitutes for conventional telephone services. Some conditions for conventional telephone services not to apply
 - Need to protect consumers on
 - Ability to call emergency services and provide updated location information
 - Provision of backup power for “lifeline” services (services to which devices are attached for summoning assistance by the aged, infirm or disabled during emergencies)
 - Provision of adequate information to customers on service limitations (e.g. power supply backup, non-availability of certain capabilities)





Regulation of Next Generation Networks

- Layered architecture
- Open interface between layers
- Intelligence resides in network edges, separating services provision from facilities operation
- Need to examine if “bottleneck” exists in each layer before deciding to regulate
- Multiple access networks connected to transport (core) network
- No entry barriers for transport networks
- Therefore bottleneck unlikely to exist on access and transport layers





- New sources of market power – potential “bottlenecks” on control and application layers to be examined
- “Open access” or “walled garden” – which is the better approach to promote competition in services, applications and content?
- Market or regulation – which is the better approach to achieve “open access”?
- Need to maintain facilities investment incentives
- Market may drive facilities operators to offer differentiated transmission services for which service providers would be willing to pay – therefore regulator should monitor market development before deciding to regulate





Ofcom's NGN Regulatory Philosophy

- Focussing of regulation on areas where there are durable competitive bottlenecks
- Enabling competition at the deepest level feasible (implying facilities-based competition where feasible is preferred to services-based competition)
- Gradual withdrawal of regulation everywhere else

Source: Ofcom's statements on "Strategic Review of Telecommunications" 2003 - 05





EC on New and Emerging Markets

- New and emerging markets, in which market power may be found to exist because of “first mover” advantages, should not in principle be subject to *ex ante* regulation
- Recognition of
 - lack of information to assess market boundary and potential market failures
 - “First mover” advantages may be necessary to enhance dynamic efficiency as opposed to promoting static efficiency only

Source: EC Recommendation of 11 February 2003 on “relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC.....”





Social and Security Regulation

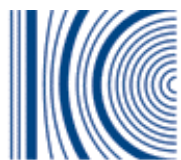
- To achieve some desirable public policy objectives which the market alone fails to achieve
 - Universal service/access
 - Minimum quality for basic services
 - Calls to emergency service
 - Backup power supply
 - Protection against nuisance (e.g. SPAM)
 - Protection against misleading/deceptive market conduct
 - Protection against unfair contract terms
 - Protection against frauds
 - Public interest protection
 - Privacy
 - National security
 - Law enforcement (e.g. lawful interception of communications)
 - Public safety





Universal Service/Access

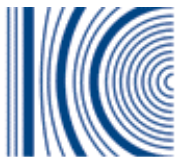
- Public policy objectives
 - To ensure that access to basic services is available to all at high-cost areas at affordable prices
 - To ensure that disadvantaged (low-income users, users with disabilities) have access to basic services
- Cross-subsidization or Universal Service Fund is necessary to achieve average-pricing
- Market alone unlikely to achieve the policy objectives
- But universal service regulation could also distort market and investment
- Therefore market-based approach may be better
 - Not restricting to a particular technology
 - Tendering for least-cost universal service provider
 - De-averaged pricing (?)





Technical Regulation

- To achieve some desirable public policy objectives which the market alone fails to achieve
- Technical standards
 - Preferably market-driven
 - Regulatory intervention may be justified
 - To ensure compatibility and interoperability between telecommunications systems
 - To avoid interference and safety hazards
 - To reduce market power (by adoption of “open standards”)
- Scarce resources need to be allocated fairly in order to promote fair competition
 - Radio spectrum
 - Telecommunications numbers
 - Space underneath public roads for ducts





Spectrum Management

- Traditionally managed by “command and control”
- Reliance on market alone is not feasible
 - Scarce and valuable public resources
 - Need to avoid radio interference
 - Need to comply with international obligations to avoid interference
 - Public interest – national security, essential services, safety
- Regulators may not have all information for “command and control”, therefore it may be better to use market mechanisms
 - Auctioning – value/initial user decided by market
 - Trading – user decided by market
 - Liberalisation – use decided by market





INTERCONNECT COMMUNICATIONS
A Telcordia Technologies Company

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