Session 6: Market Analysis – tools and cases

Training on Competition and Changing Market Conditions: Impact on ICT Regulation

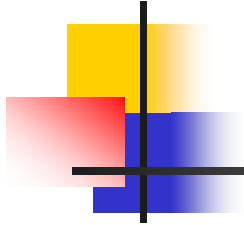Addis Ababa, 6th – 9th November, 2007

By

Dr Chris Doyle

Warwick Business School &
Consultant World Bank

Overview

- Market definition tools
- Market definition case: mobile access and call origination, Spain 2005
- Market analysis tools
- Market analysis case: mobile access and call origination, Ireland 2004
- Concluding remarks

Market Definition Tools

The SSNIP Test

- "A market is defined as a product or group of products and a geographic area in which it is produced or sold such that a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future producer or seller of those products in that area likely would impose at least a '**s**mall but **s**ignificant and **n**on-transitory' **i**ncrease in **p**rice, assuming the terms of sale of all other products are held constant. A relevant market is a group of products and a geographic area that is no bigger than necessary to satisfy this test."

From the 1982 US Horizontal Merger Guidelines

4

The SSNIP Test

- **The SSNIP Test is a thought experiment applied iteratively**

- **Start with the narrowest candidate market**

    - Is there a market for residential fixed access?

    - Look at functional characteristics of product

    - Are there similar products? E.g. non-residential fixed access (business lines)

    - Does the similar product constrain the hypothetical monopolist? If so, widen the market

Operationalizing the SSNIP Test

- Could a hypothetical monopolist increase prices by up to 10% profitably?
    - No, then widen market by including near substitutes
    - If yes, stop as market boundaries have been identified
- Why widen the market if no?
    - Other products or services on either the <u>demand</u> or the <u>supply</u> side constrain the hypothetical monopolist, in which case these must lie in the same <u>economic market</u>

Operationalizing the SSNIP Test

- It is usual to start with <u>price equal to cost</u> and to consider a price increase from this position
  - In regulated markets it is often presumed that prices are equal to cost
- If a higher price is considered, it could lead to what is known as the *cellophane fallacy*
  - After a famous antitrust case in the US involving Dupont

Beware the Cellophane Fallacy

- United States v. E.I. Du Pont De Nemours & Co (1956)
- Between 1923-47 Dupont controlled 75% of cellophane sold in U.S., which accounted for 20% of all flexible packaging products
- Government alleged Dupont had an illegal monopoly
- Court disagreed with Government on basis of market definition
- Dupont claimed cellophane was not the relevant market, since at prevailing prices there appeared to be a high cross-price elasticity of demand between cellophane and aluminium foil, wax paper and polyethylene
- A near monopoly of "the cellophane market" was a modest share of something called "the wrappings market"

Using evidence and analysis

- Company documents may reveal perceived substitutes
- National Regulatory Authority reports
- Interviews/surveys
- Switching costs – are these significant?
- Price patterns (price correlations)
- Own or cross-price elasticities
- Critical loss analysis (CLA)
  - The minimum percentage loss in volume of sales required to make a 5 or 10% price increase unprofitable

Critical loss analysis (CLA)

- Critical loss analysis (CLA) is the application of an algebraic relationship to help identify a relevant market

- Its application emerged in US anti-trust merger analysis in the early 1990s

- It has since been applied widely by anti-trust agencies around the world

CLA

1. Estimate the 'incremental margin' (i.e. the margin between price and costs assessed by using observations about price and variable costs) and calculate the 'critical loss' (CL) (i.e. the volume of sales that would make a given percentage price increase unprofitable for a hypothetical monopolist).

2. Estimate what the 'actual loss' (AL) in sales would be (using available demand data, including elasticity estimates for the 'candidate market') for a given price increase.

3. If AL exceeds CL, the market needs to be widened to include nearby substitute products.

CLA example: mobile roaming

CLA for a mark-up m=9.3%		
Price increase	CL	CLE
5%	35%	7
10%	52%	5.2
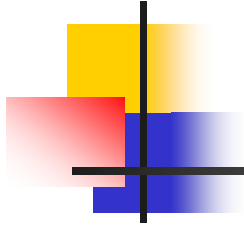
Case study Market Definition:

Mobile access and call origination

EC approach to markets

- At least two main types of relevant markets to consider:

    - Retail markets – services or facilities provided to end users
    - Wholesale markets – access to facilities provided to operators which are necessary to provide retail services

- Within these two types of markets, further market distinctions may be made depending on demand and supply side characteristics

- Retail markets should in principle be examined, for market definition purposes, in a way that is independent of the network or infrastructure being used to provide services, as well as in accordance with the principles of competition law

Recommended markets 2002

Retail

1. Access to fixed public telephone network residential
2. Access to fixed public telephone network non-residential
3. Public local and/or national telephony services fixed, residential
4. Public local international telephony services fixed, residential
5. Public local and/or national telephony services fixed, non-residential
6. Public local international telephony services fixed, non-residential
7. Minimum set of leased lines, up to and including 2Mb/sec

Wholesale

8. Call origination, fixed
9. Call termination, fixed
10. Transit services, fixed
11. Unbundled access (inc. shared access) for broadband and voice
12. Broadband access – bitstream and equivalent
13. Terminating segments of leased lines
14. Trunk segments, leased lines
15. **Access and call origination, public mobile**
16. Voice call termination, mobile
17. National market for international roaming on mobile
18. Broadcasting transmission services

15

Access and call origination, public mobile

- **Access and Call Origination**
- **The key elements required to produce a retail service are network access, call origination and call conveyance (of varying kinds) and where necessary call termination on other networks**
  - Network access and call origination are typically supplied together by a network operator so that both services can be considered as part of the same market at a wholesale level

2002 conclusion

- The relevant wholesale market appears in general to be access and call origination on mobile networks
- The market is still subject to entry barriers, because undertakings without spectrum assignments can only enter the market on the basis of future spectrum allocations and assignment, secondary trading of spectrum or by purchasing a licensed operator
- While in principle this is not an absolute entry barrier since there are various possibilities to share spectrum including the development of national roaming or indirect access relationships, such structures have not evolved to date in this market
- However, the level of competition generally observed in this market at the retail level indicates that ex-ante regulatory intervention at a wholesale level may not be warranted

Spain's market review

- The Spanish regulator Comisión del Mercado de Telecomunicaciones (CMT) in December 2005 concluded that competition in the access and call origination market was not effectively competitive
- CMT found retail prices in Spain high and above the EU average
- CMT in Spain found high levels of profitability in the Spanish mobile market
  - The return on capital employed (ROCE) of the [then] three Spanish mobile networks in 2004 was 80% for Telefonica, 42% for Vodafone and 30% for Amena (Orange). The weighted average cost of capital for the operators are 13% for Telefonica, 14% for Vodafone and 13% for Amena
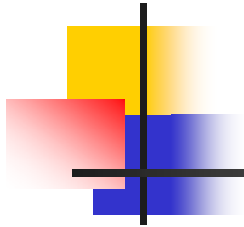
Market Analysis Tools

Identifying dominance

- Two alternative approaches to determining dominance:
- Direct measurement of dominance based on prices in relation to cost (e.g. a Lerner index type approach)
- Indirect method of measuring dominance which considers
  - Market shares
  - Entry barriers
  - Vertical characteristics of an industry
  - The power of buyers
  - Etc
- The EC's approach is rooted in the indirect method, starting as it does with an analysis of the market shares of the undertaking in question, the market shares of competitors and then considering barriers to entry
- Some countries, such as Mongolia and South Africa, specify dominance as referring to a specific market share threshold

Direct measure of dominance: Lerner Index

$$\max_{q_i} \pi_i = q_i p(q_i, \mathbf{q_{-i}}) - cq_i \quad \rightarrow \quad -\frac{\partial p}{\partial q_i}\frac{\partial Q}{\partial Q} q_i = p^* - c$$

$$-\frac{\partial p}{\partial Q}\frac{\partial Q}{\partial q_i}\frac{q_i}{p^*} = \frac{p^* - c}{p^*} \quad \text{note that} \quad \frac{\partial Q}{\partial q_i} = 1$$

$$-\frac{\partial p}{\partial Q}\frac{Q}{p^*}\frac{q_i}{Q} = \frac{p^* - c}{p^*}$$

$$\frac{m_i}{\varepsilon} = L_i, \text{ where } m_i = \frac{q_i}{Q}, \varepsilon = -\frac{\partial Q}{Q}\frac{p^*}{\partial p}, L_i = \frac{p^* - c}{p^*}.$$

Direct measures relationship to market share assessment

- L_i is the *Lerner Index* of market power of firm *I*
- *HHI* is the *Herfindahl-Hirschman Index* (usually between 0 and 10,000, or [0,1])
  - HHI=0, m=0 for all firms
  - HHI=10,000, one firm with 100% share monopoly
- Aggregate index of market power:

$$L = \sum_i m_i L_i = \sum_i m_i \left(\frac{m_i}{\varepsilon} \right) = \frac{\sum_i m_i^2}{\varepsilon} = \frac{HHI}{\varepsilon}.$$

Indirect measures of dominance

- **Examples**
  - Market share
  - Absolute size of undertaking(s)
  - Control of infrastructure not easily replicated
  - Technological advantages
  - Countervailing buying power (CBP)
  - Privileged access to capital markets
  - Economies of scale/scope
 - Vertical integration
  - Barriers to expansion
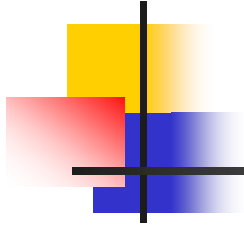
Case study Market Analysis:

Mobile access and call origination Ireland

Case study: Mobile Access and Call Origination in Ireland

- Six weeks public consultation launched 27 January 2004 by ComReg (NRA)
- Eight responses received 9 March 2004
- Response to consultation published 9 December 2004 – responses invited on draft Decision for 20 January 2005
- Decision published 22 February 2005: O_2 and Vodafone jointly dominant and designated SMP operators
- Appeals submitted by O_2, Meteor and Vodafone March 2005
- Electronic Communications Appeal Panel hears appeals December 2005
- Decision withdrawn end December 2005

Ireland's mobile market
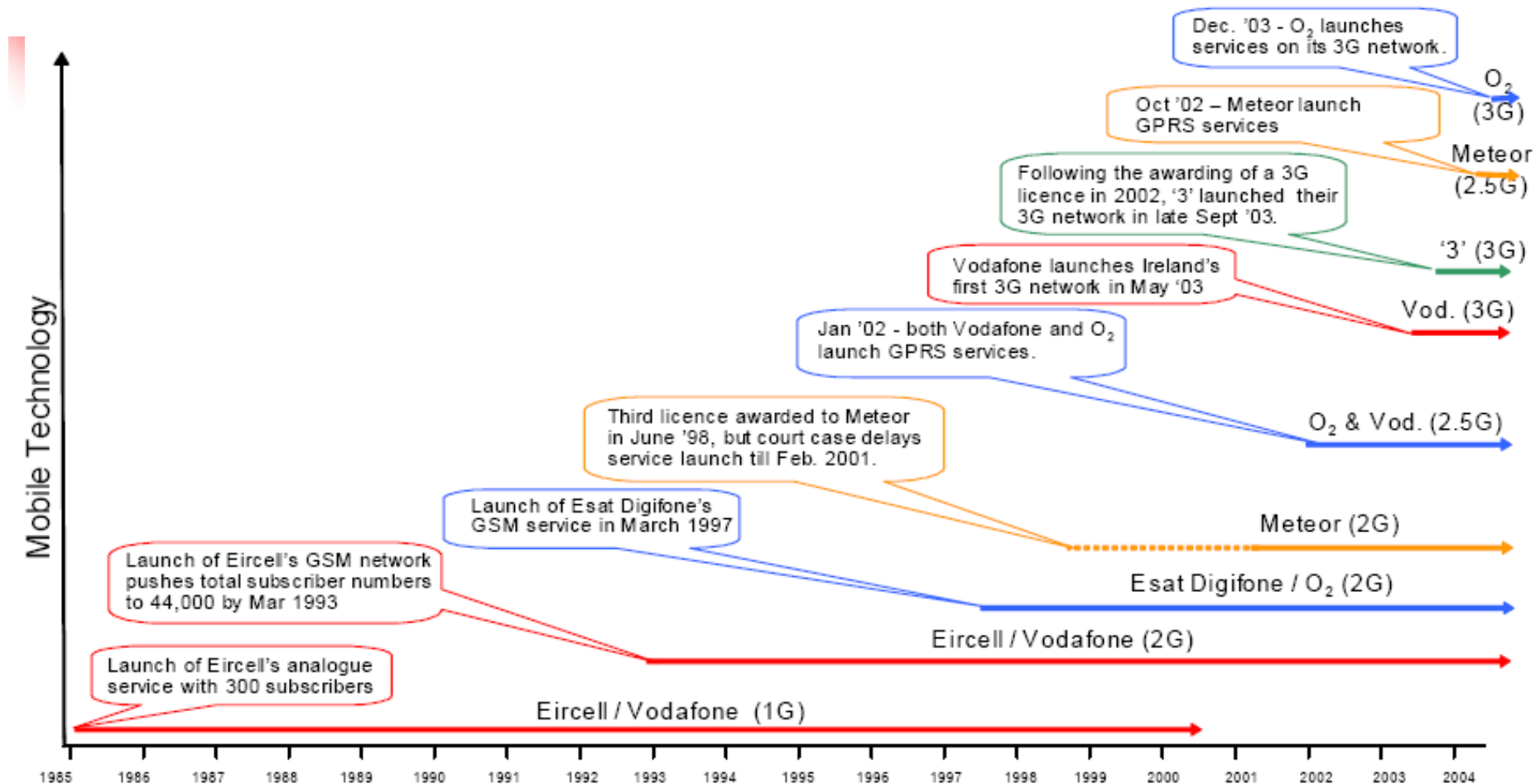
Source: ComReg "Market Analysis - Wholesale Mobile Access and Call Origination (Response to Consultation Document 04/05)" 04/118, 9 December 2004

26

Market analysis: conclusions in summary

- The absence of wholesale transactions (other than national roaming agreements) results in use of data from retail markets

- ComReg argues that retail prices are high

- ComReg concludes that no MNO is individually dominant, despite Vodafone having a share in excess of 50%

- ComReg concludes that O_2 and Vodafone are jointly dominant, but Meteor and 3 are not dominant in the market

- ComReg argues that price and denial of wholesale access form part of a multidimensional focal point

Market analysis: ComReg methodology

- Market concentration (oligopoly)
- Incentive to coordinate (common interest)
- Ability to coordinate (focal point - transparency)
- Ability to detect cheating (monitoring - transparency)
- Enforceability of compliance (retaliation, sustainability)
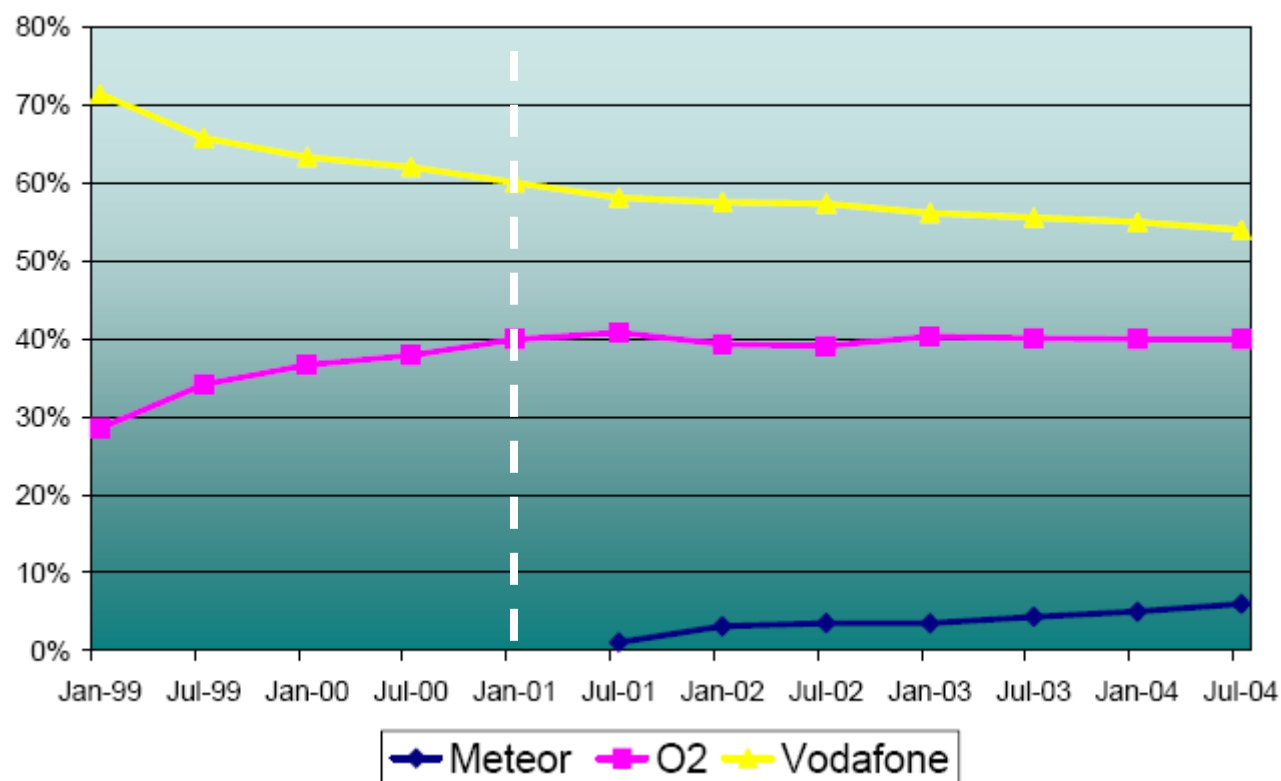- Actual and potential market constraints

Market concentration

- Subscriber and revenue share data show relatively stable shares over the review period for O_2, a slightly declining share for Vodafone, and a slightly increasing share for Meteor

- Shares for revenues and overall subscribers do not exhibit volatility

- Share of market held by O_2 and Vodafone exceeded 90%

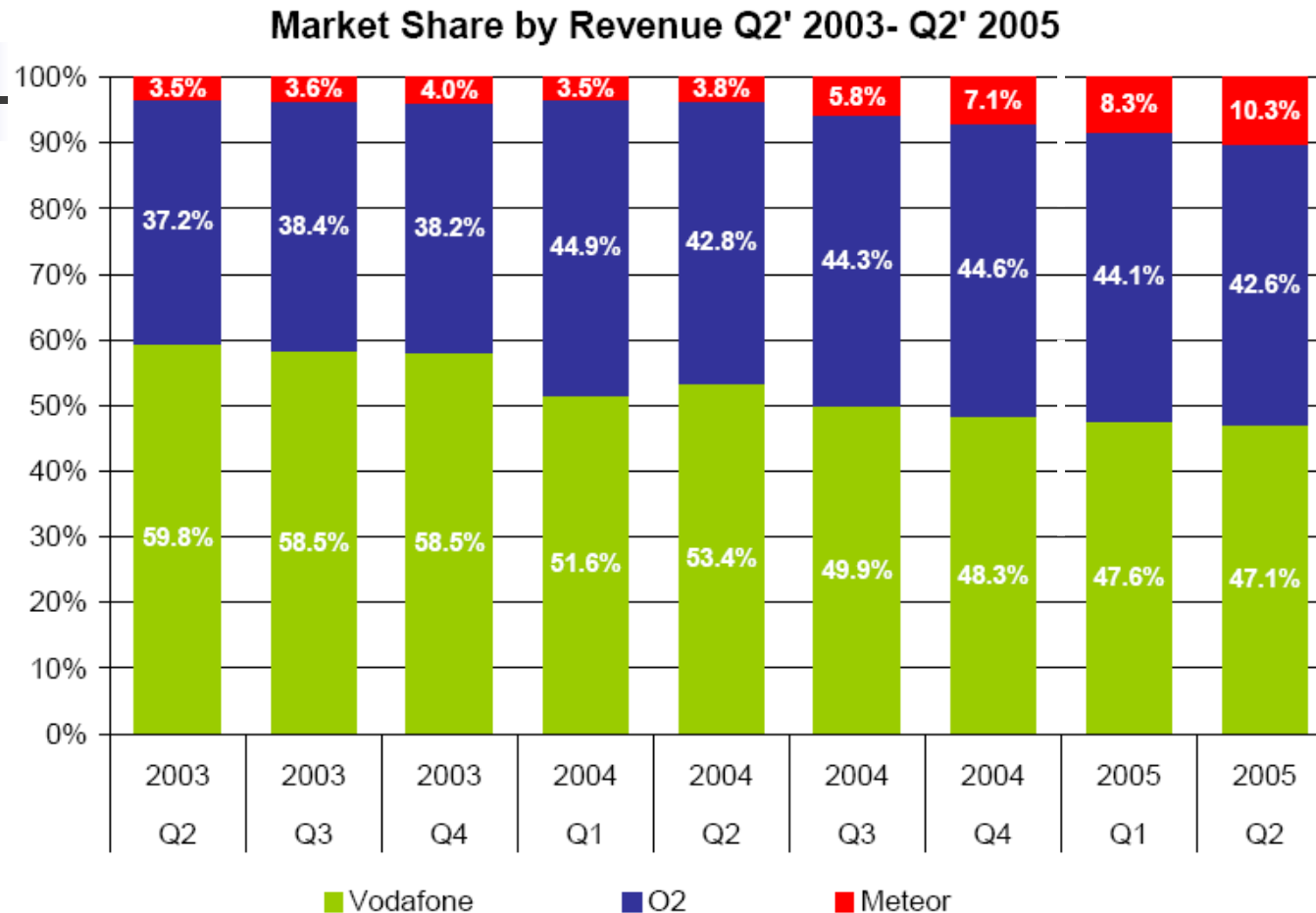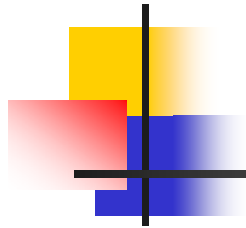- ComReg argued that the high share held by O_2 and Vodafone would persist over the period of the review

Market concentration: subscribers shares

Market Share - Total Number of Subscribers

30

Market concentration: revenue

Market Share by Revenue Q2' 2003- Q2' 2005

	2003 Q2	2003 Q3	2003 Q4	2004 Q1	2004 Q2	2004 Q3	2004 Q4	2005 Q1	2005 Q2
Meteor	3.5%	3.6%	4.0%	3.5%	3.8%	5.8%	7.1%	8.3%	10.3%
O2	37.2%	38.4%	38.2%	44.9%	42.8%	44.3%	44.6%	44.1%	42.6%
Vodafone	59.8%	58.5%	58.5%	51.6%	53.4%	49.9%	48.3%	47.6%	47.1%

Legend: Vodafone, O2, Meteor

Source: ComReg "Quarterly Key Data Report September 2005" 05/73, 20 September 2005

Price as a focal point? Transparency?

- Many tariffs, often complex
- Some tariffs offered on a bespoke basis (corporate accounts) – though account for a small proportion of revenue
- Most tariffs visible – though complicated
- Tariff packages are often compared by using customer profiles
- ComReg undertook tariff comparisons using the 'Monthly Minimum Bill (MMB)' for a number of customer profiles
- At least one operator in Ireland assesses competitors' positions by applying MMB analysis

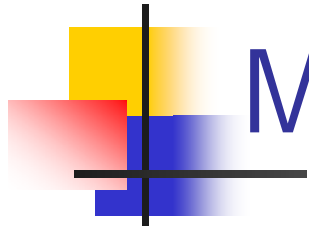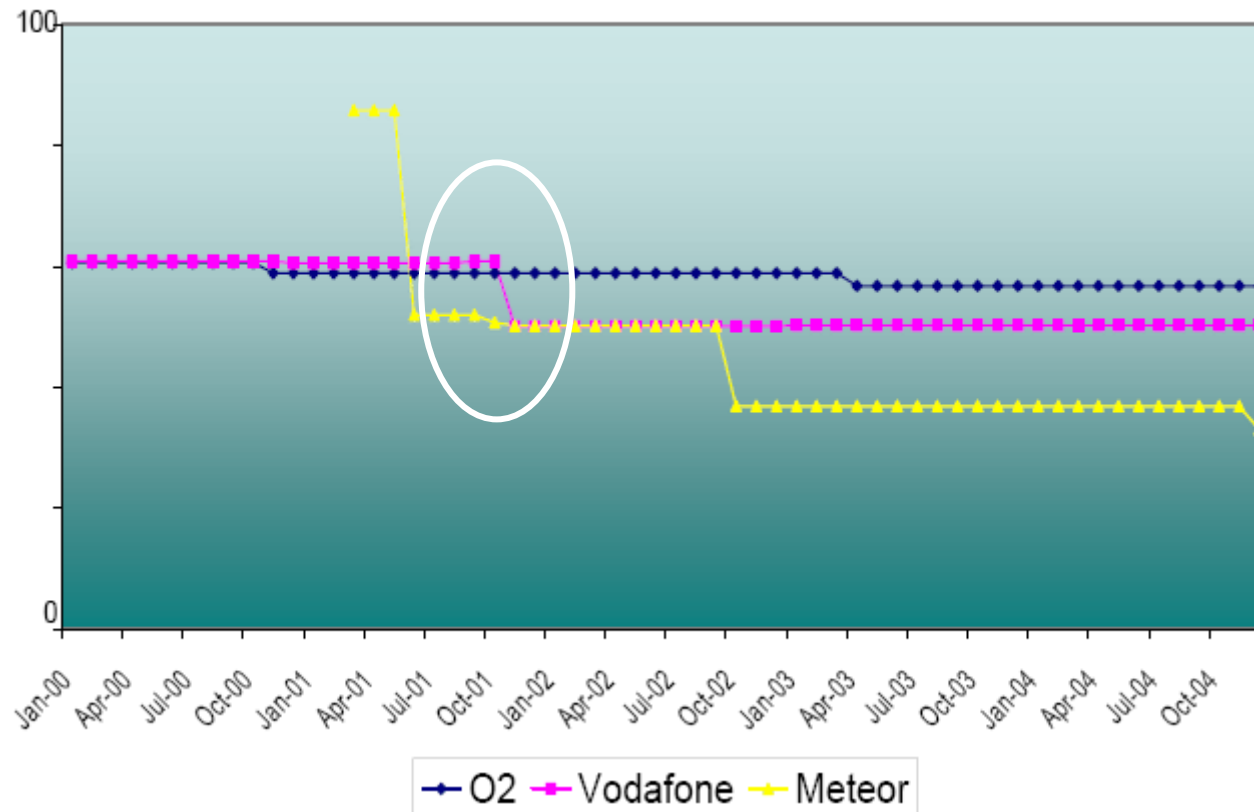# MMB analysis: Low user, even

Low User Even
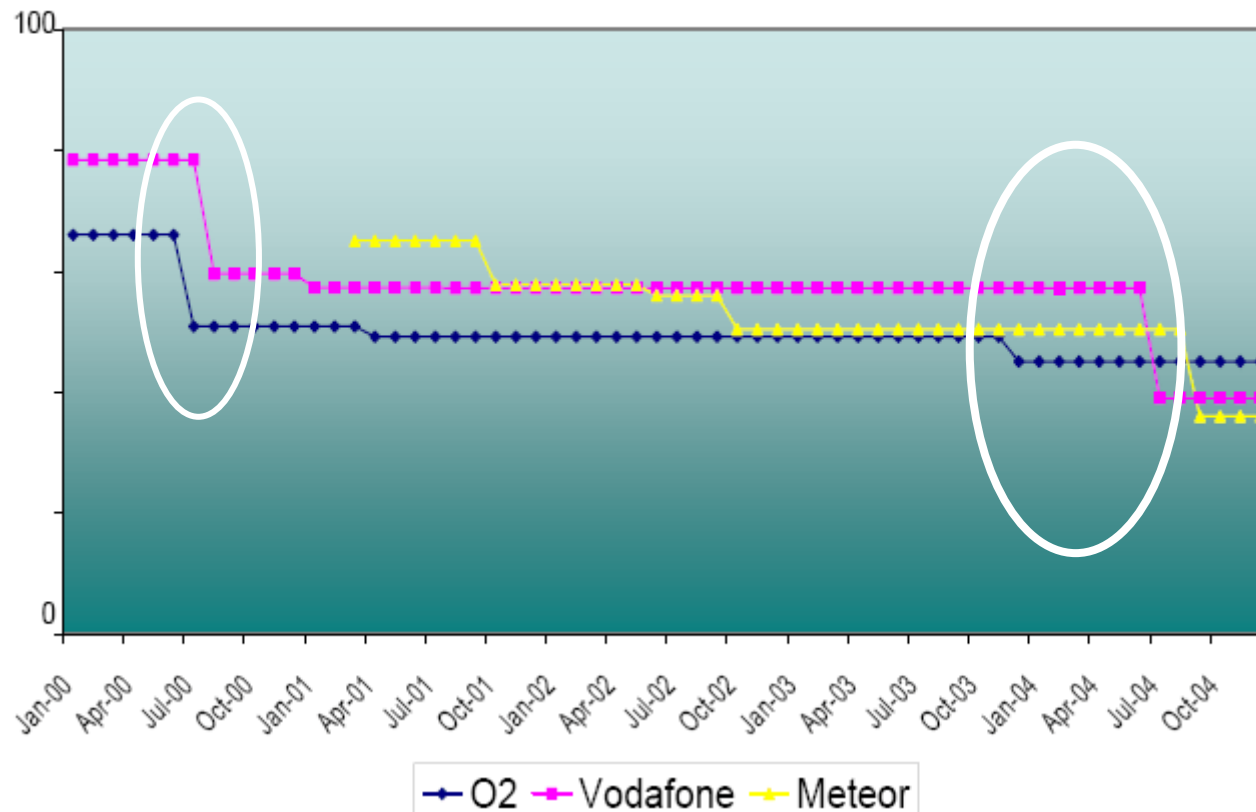
Source: ComReg "Market Analysis - Wholesale Mobile Access and Call Origination
(Response to Consultation Document 04/05)" 04/118a, 9 December 2004

MMB analysis: Medium user, even

Medium User Even
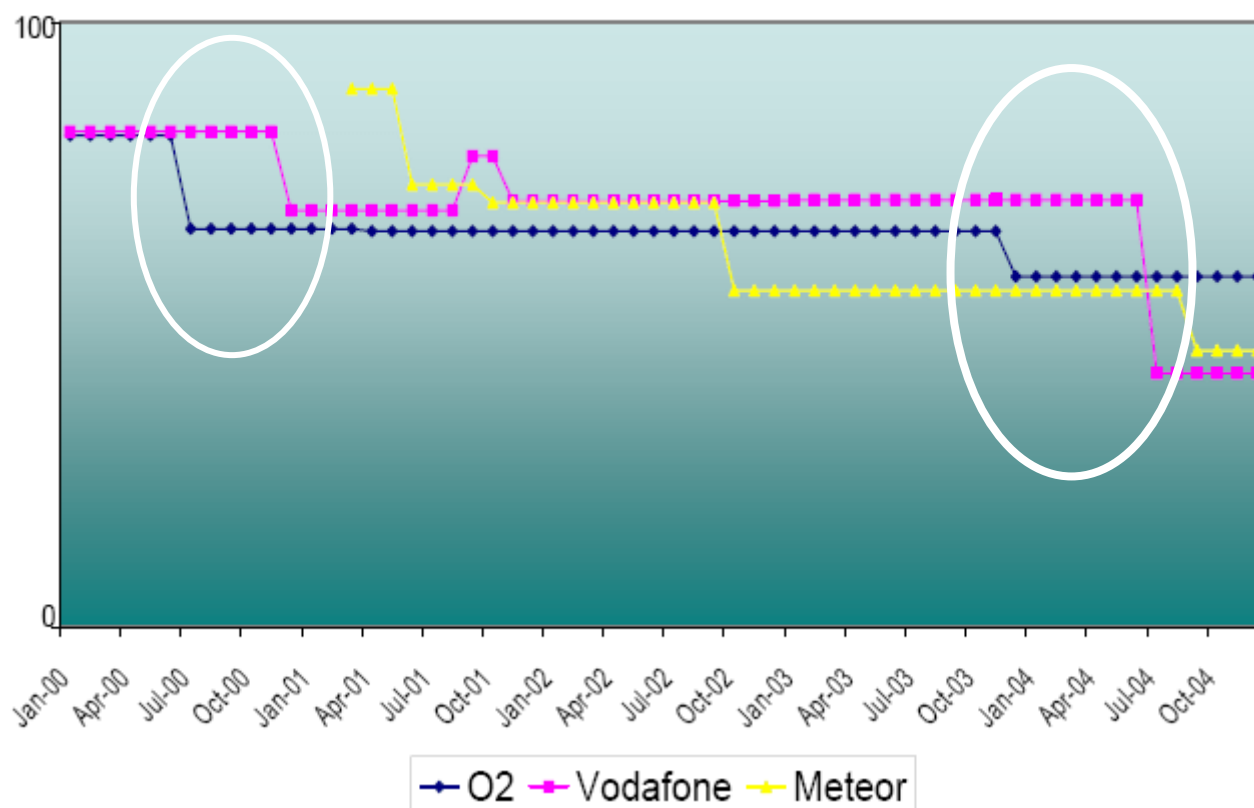
Source: ComReg "Market Analysis - Wholesale Mobile Access and Call Origination
(Response to Consultation Document 04/05)" 04/118a, 9 December 2004

MMB analysis: High user, even

Post Paid: High User Even

Source: ComReg "Market Analysis - Wholesale Mobile Access and Call Origination
(Response to Consultation Document 04/05)" 04/118a, 9 December 2004

Are MMB trends consistent with tacit collusion?

- For high users little tariff variation and apparent parallel pricing – suggestive of tacit collusion
- There are price reductions made by O2 and Vodafone, notably in low and medium customer profiles
  - In close proximity in early 2000 (both anticipating the entry of Meteor and foresee a lower equilibrium price?)
  - End 2003 O2 lowers price in tariffs that are optimal for low and medium users, Vodafone reacts in May/June 2004 – retaliation?
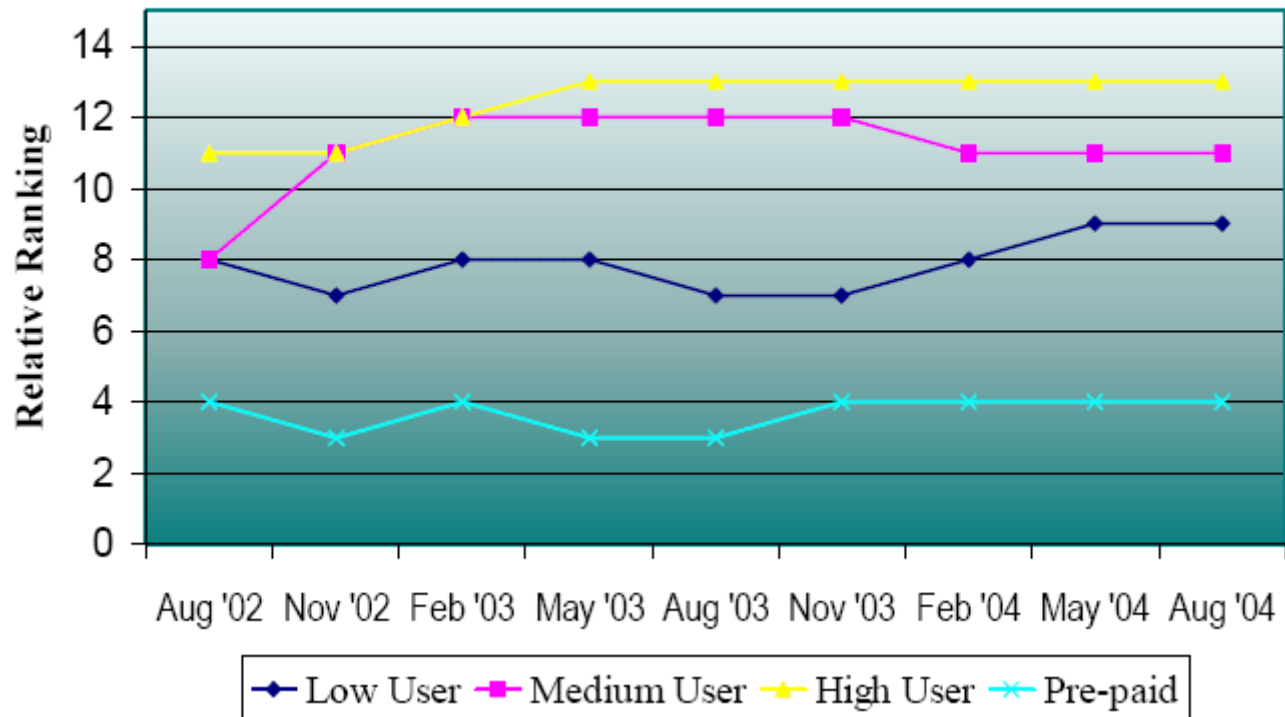
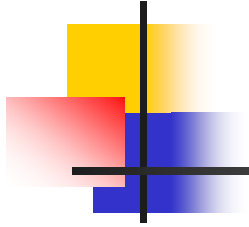# Are prices in Ireland high?

- ComReg made comparisons of mobile retail tariffs with other EU member states and concluded that prices in Ireland are relatively high
  - Notably for medium and high user customer profiles

Benchmark prices: EU15

Irelands Position in the Various Mobile Baskets Relative to EU15: Aug. '02 - Aug '04

Source: ComReg "Market Analysis - Wholesale Mobile Access and Call Origination (Response to Consultation Document 04/05)" 04/118a, 9 December 2004

End Session 6