Maximising ARPU
Price Elasticity

Coleago Consulting Ltd
Martin Duckworth, Director
14 March 2005

www.coleago.com

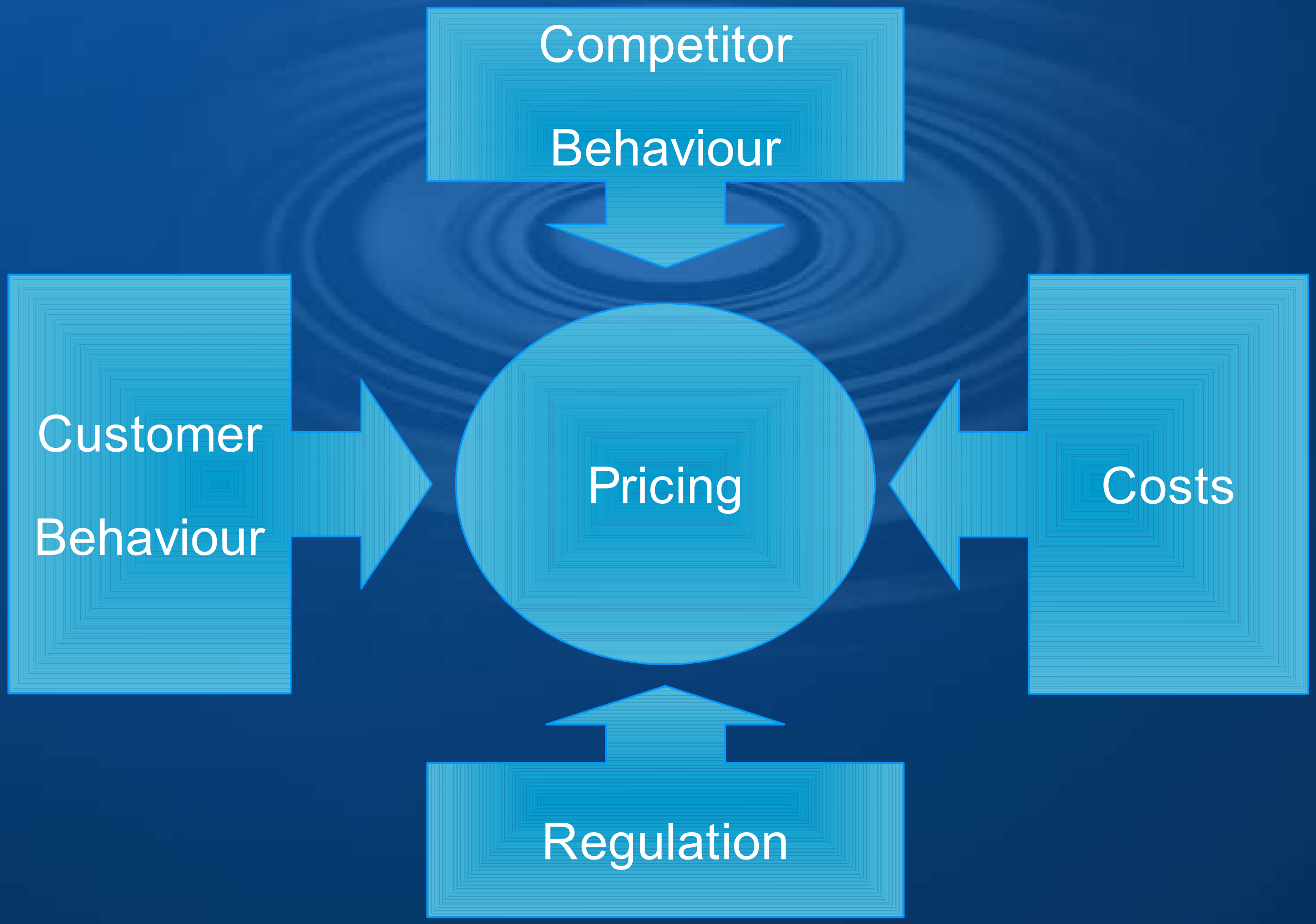
Contents

Why is elasticity important

Pricing is clearly one of the key determinants of ARPU

- Pricing feeds through directly into ARPU
- Creative pricing can stimulate demand
- Pricing is one of the key tools in any marketing strategy for customer acquisition and retention

Pricing is driven be a range of factors



Each time we change prices we need a to go through a check list

- Is the new price **profitable**
  - Is price above incremental cost?
  - Is it above incremental cost + mark up
- What will be the **competitive** response?
- What is the **revenue** (ARPU) impact of a price change?
  - What volume change can I expect?
- Is the price consistent with **regulation**?

We need a set of tools to address these questions

- Profitability → Cost Model
- Competition → Competitor analysis/ Game Theory
- Revenue Impact → Elasticity estimates
- Regulation → Compliance

What is elasticity?

Elasticity definition

- Demand price elasticity is the responsiveness to demand to a change in prices:

$$E_d = -\frac{\text{percentage change in demand}}{\text{percentage change in price}}$$

Elasticity is a model of customer behaviour

- Customers behaviour is the result of a large number of purchasing decisions
- Customers purchase when the value of the product to the consumer, for example a call, exceeds the price
- If the price changes, consumption will also change
  - A reduction in price will result in more calls with value > cost
- Elasticity is an expression of the reaction of a customers to an incremental change in price

Consumer behaviour in mobile telephony is complicated

- Customers understand the value of calls
  - A repeat purchase
- However customers awareness of the price of calls is limited
  - Customers have limited awareness of prices
  - Tariff plans hide the price of an individual call
  - Feedback on the cost is delayed
- For innovative services both the pricing and the value of the service may be unclear

For many consumers the overall bill is more important than individual prices

- Customer may see value on a individual decision basis…
  - “Is this call worth more to me than its cost?”

“Value”

Service Elasticity

- … or on an aggregate basis
  - “Is my current usage worth more to me than my monthly bill?”

“Budget”

Aggregate Elasticity

Setting prices according to elasticity can increase revenues without an overall increase in prices

- Increase prices for the most inelastic customers and services
  - Little impact on volume so that the price increase flows through to revenues
- Reduce prices for the most elastic customers and services
  - The effect of price reductions is offset by increases in volume
- "Ramsey pricing" states what the theoretically optimal pricing is

Elasticity may be in conflict with other objectives

- The most inelastic customers tend to be the most valuable (e.g. business users)
  - There is often a desire to reduce prices for customer acquisition and retention
- Inelastic customers may be less valuable (e.g. low spending residential users)
  - There may be a desire to raise prices to increase profitability
- Prices changes may provoke a competitive response
  - Price reductions can spark a price war
  - Price increases can lead to increased churn if not matched by competitors

Aside : Elasticity in regulation

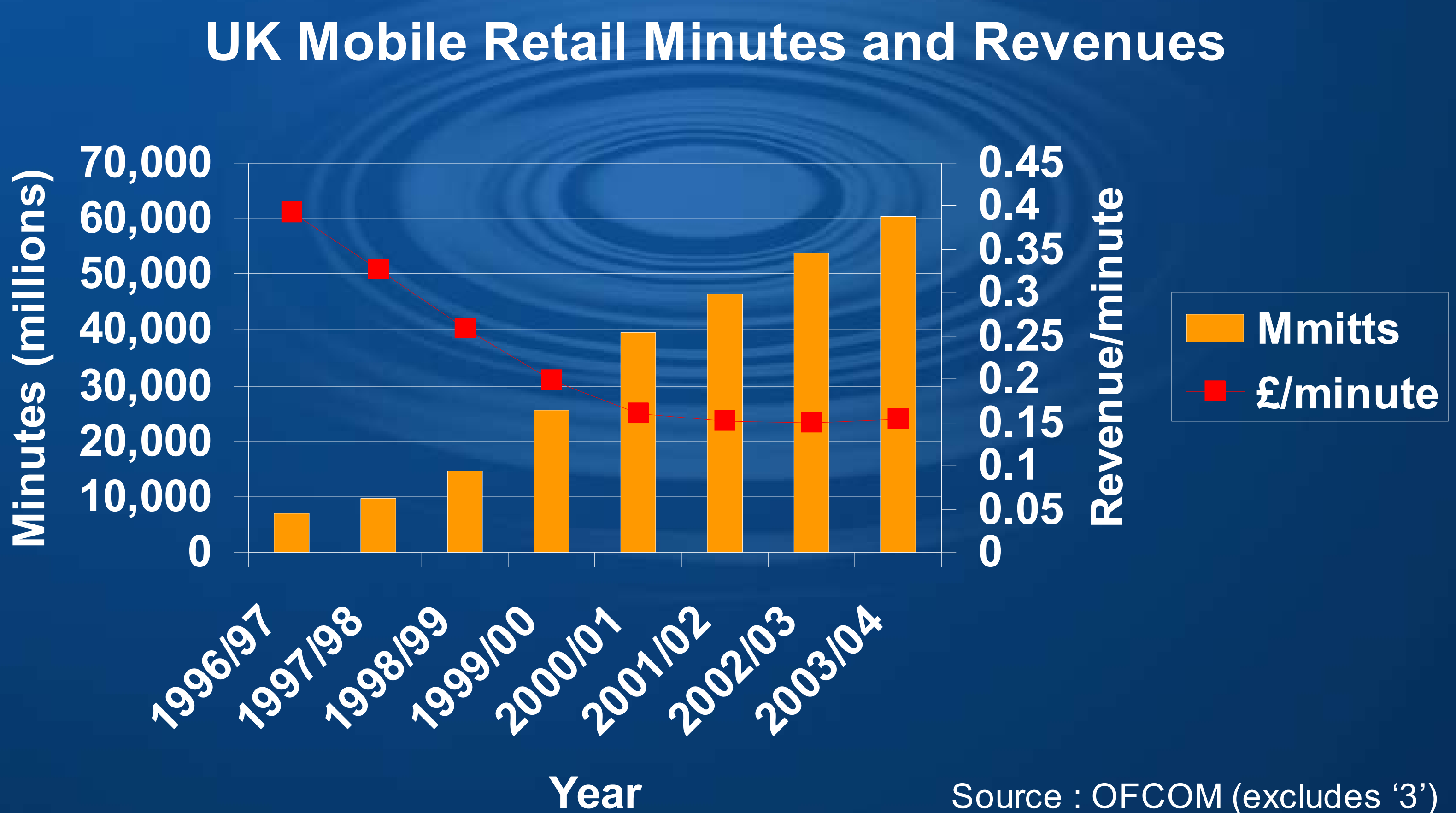
- Regulators are starting to question price discrimination
  - Different prices for services which appear to have similar costs
- A number of services are being investigated
  - Mobile call termination
  - On net calls
  - Roaming calls
- Elasticity provides an argument for price discrimination
  - Theoretically efficient “Ramsey” prices

Measuring Elasticity

Measuring elasticity approaches

- Traditional “macro” approach
  - Model the relationship between demand and prices for the market as a whole over a period of time
- A “micro” approach
  - Response of individual customer segments to a given price change
- Other approaches
  - Customer surveys
  - “Cross sectional” approach to analyse differences in demand between different groups of customers who have different prices

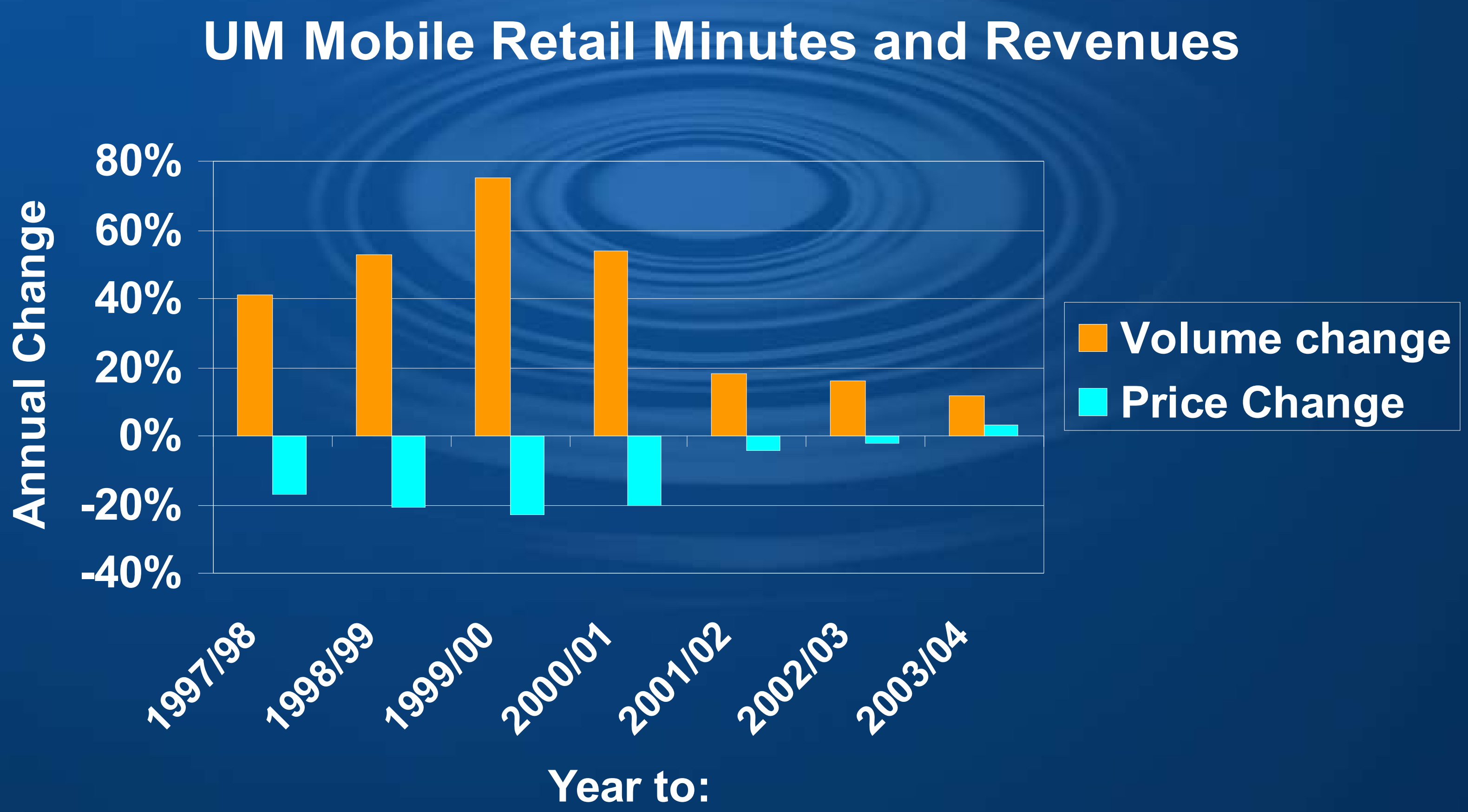
The first step is finding a consistent time series for volumes and prices...



Source : OFCOM (excludes '3')

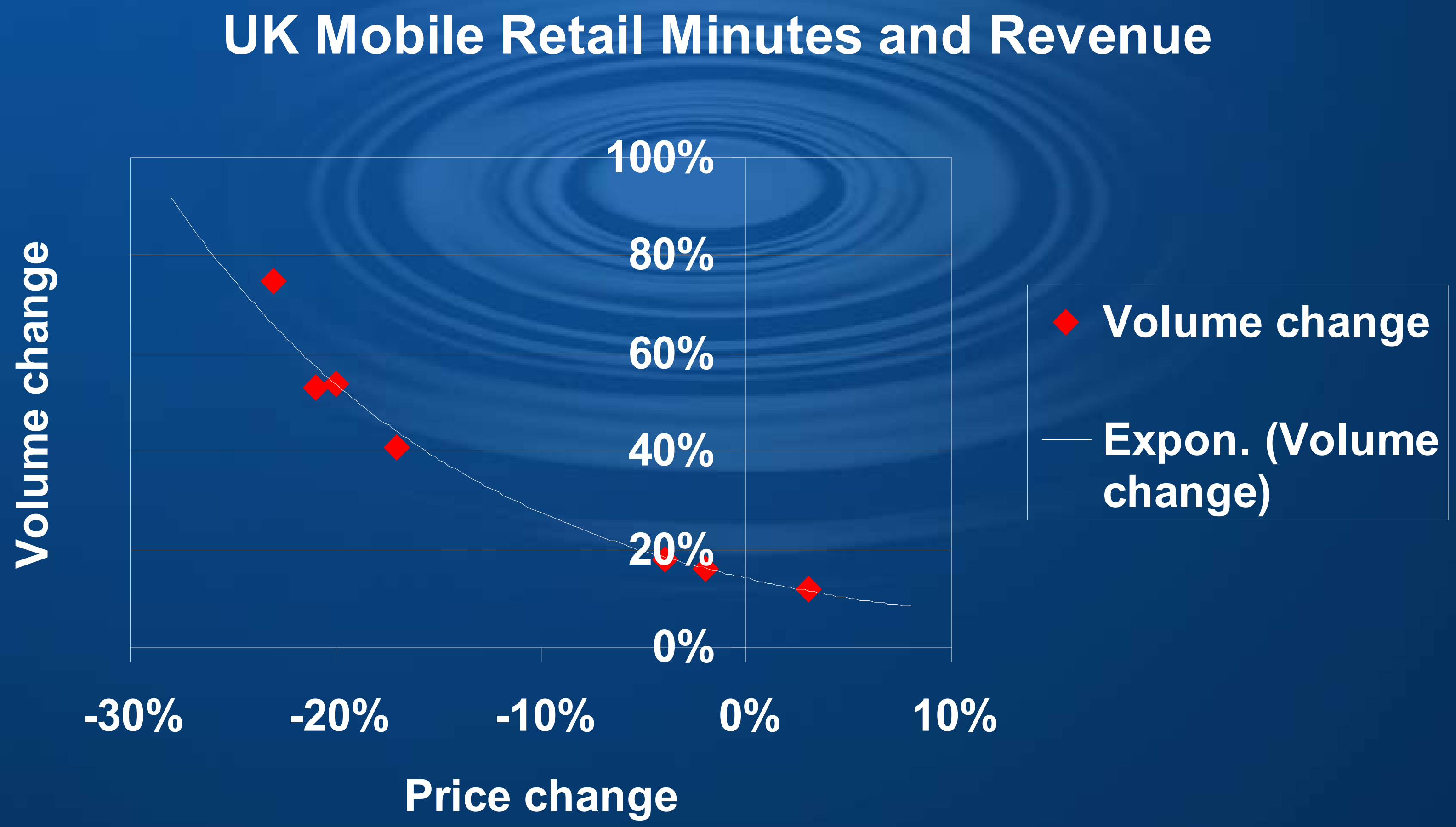
www.coleago.com

Volume changes do appear to mirror price changes...



www.coleago.com

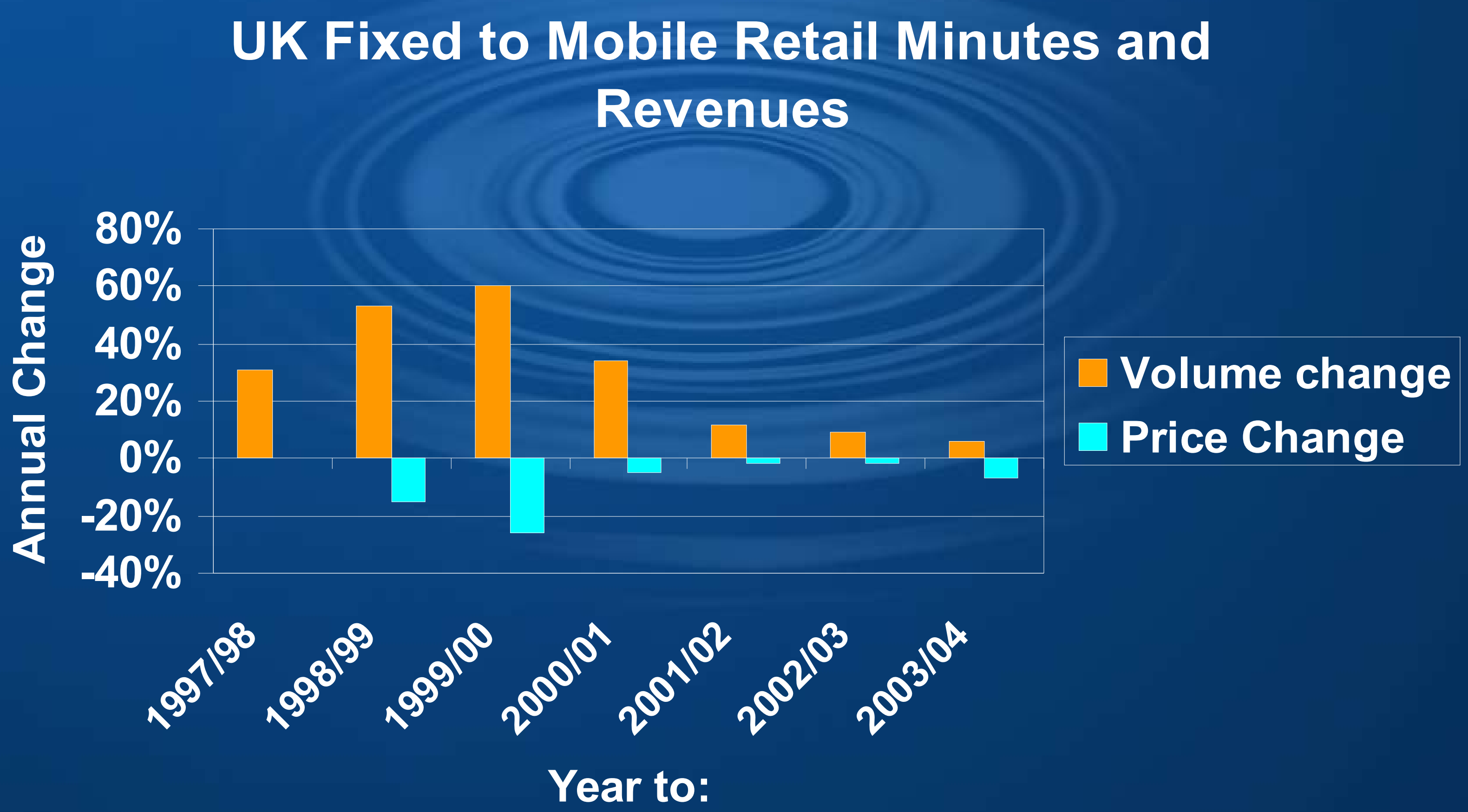
... And there appears to be a clear correlation between changes in price and change in demand



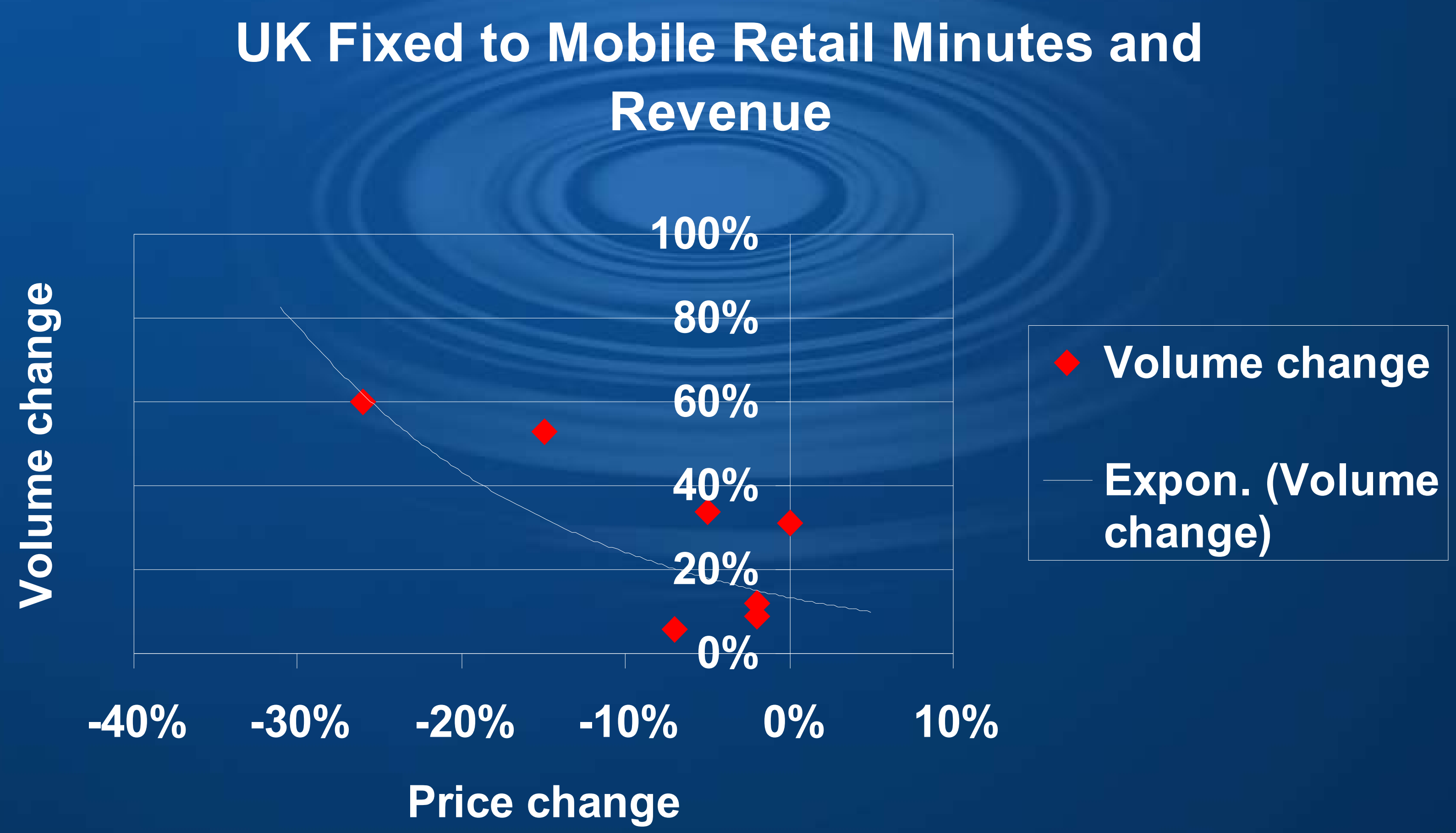
However the traditional “macro” approach is of limited value

- Correlation does not imply causality
  - Price may not be the key determinant of changes in demand
  - Price changes may be the result of an increase in demand and hence reduction in costs
- As neither pricing nor customers are homogeneous, results cannot necessarily be applied to an individual segment
  - There is a significant amount of price discrimination
  - Elasticity is likely to vary between customer segments
- Historic relationships may no longer be relevant

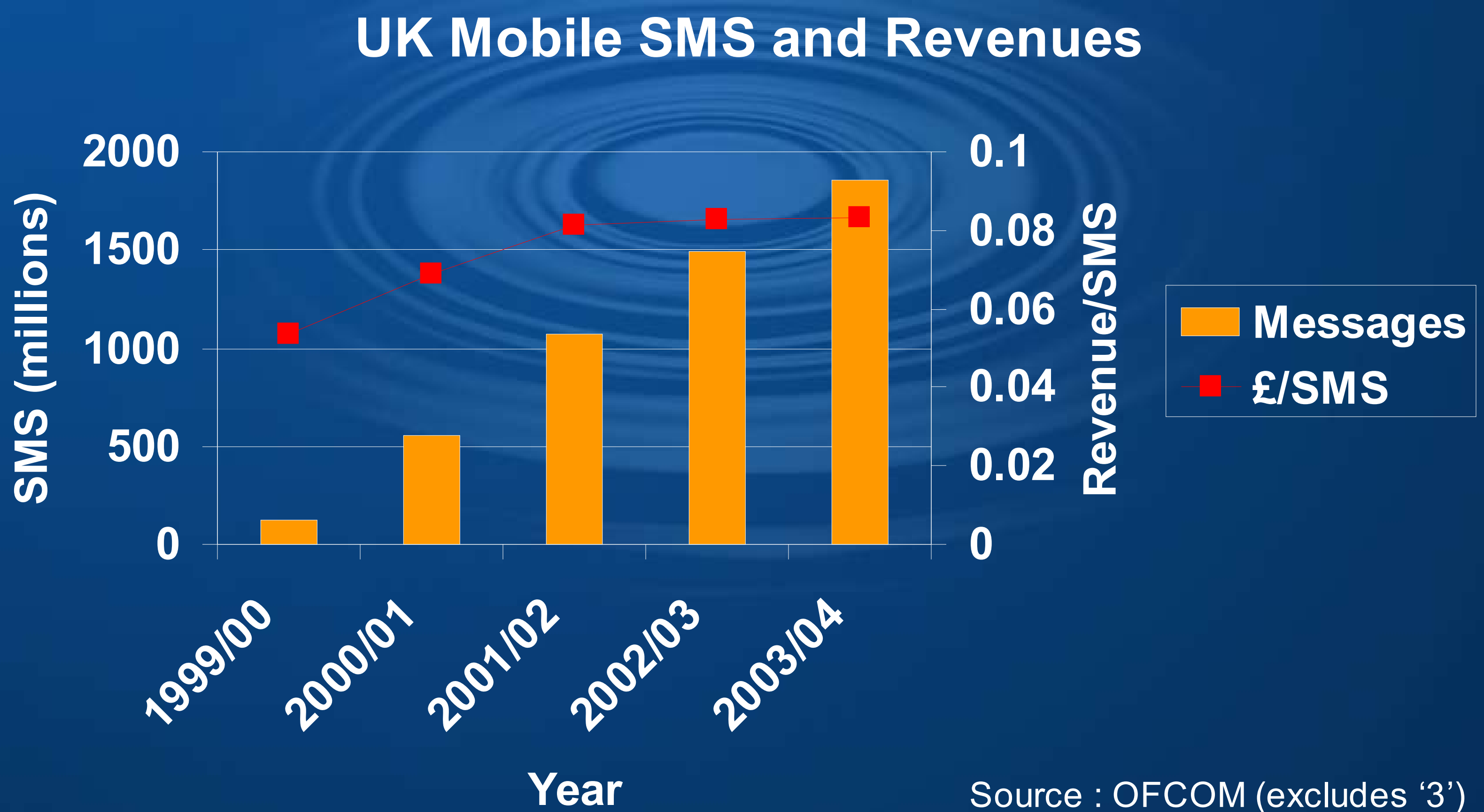
Similarly for fixed to mobile calls volume changes do appear to mirror price changes...



... Although the correlation is far less clear



For SMS there is little evidence of elasticity

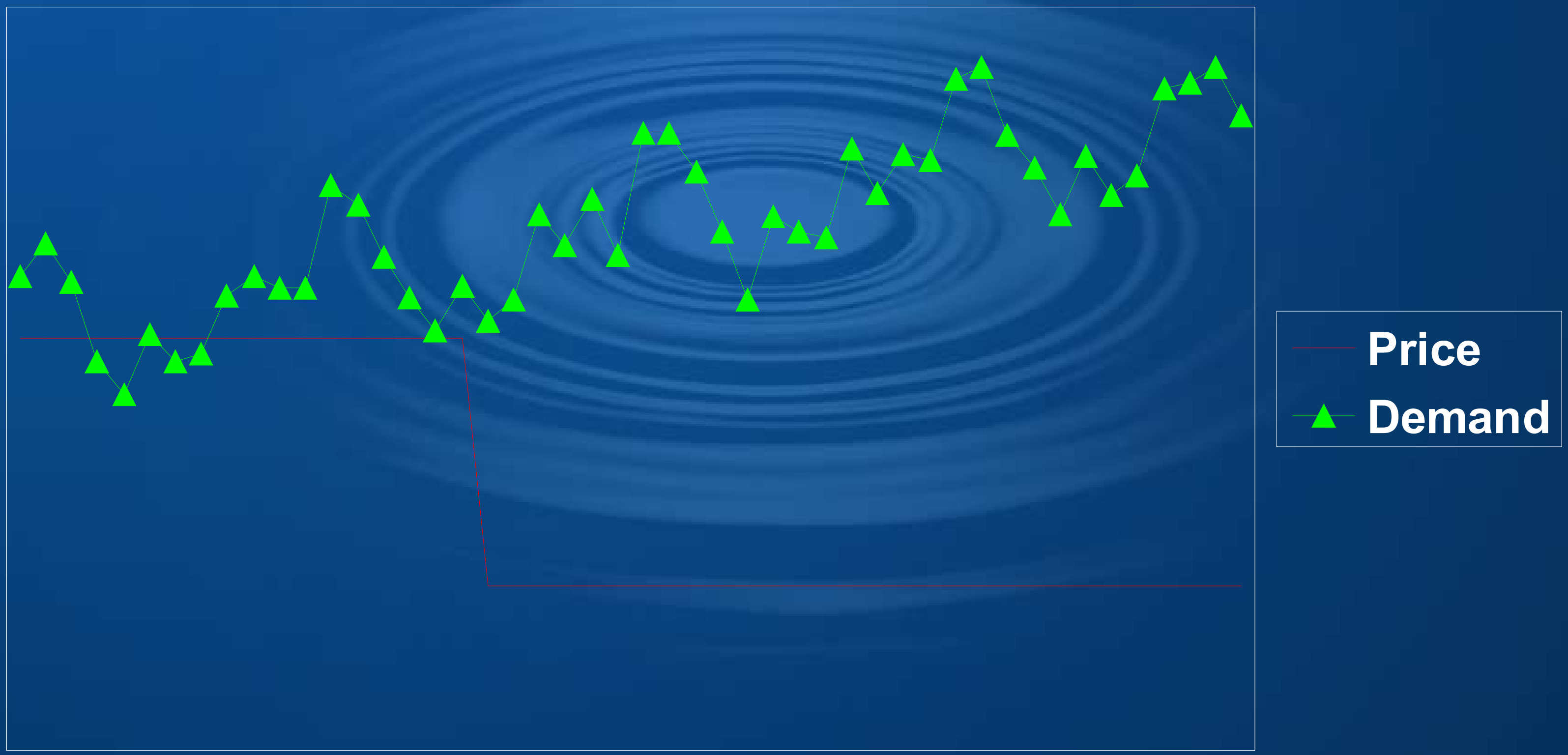


Source : OFCOM (excludes '3')

Micro approach

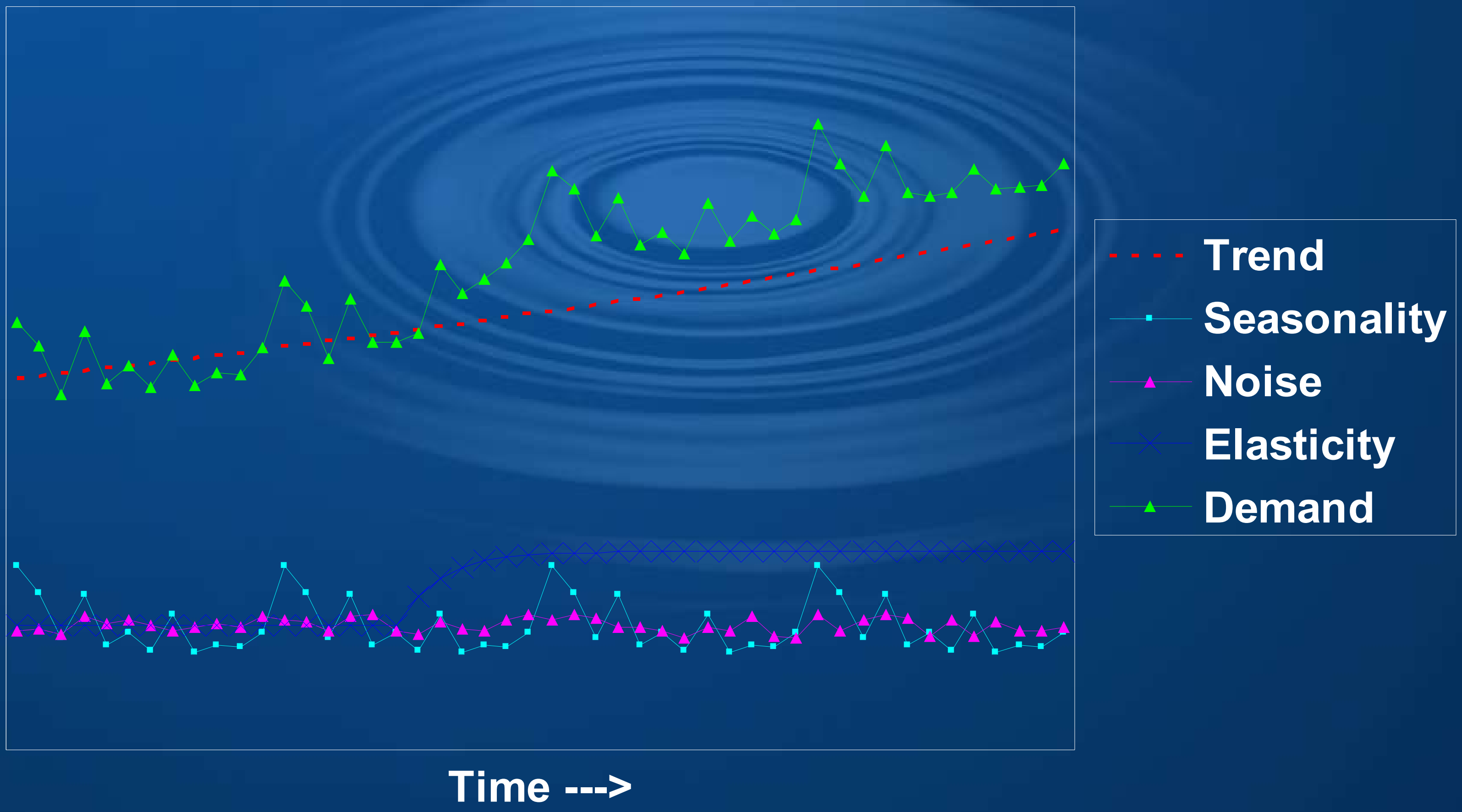
- Identify relevant price changes
  - May be temporary promotions or permanent changes
- Extract information on usage for data warehouse for a period covering the price change
- Time series analysis to remove the impact of seasonality, any underlying trend and to filter out noise

The results of price changes may be masked by other sources of volatility



Time ---->

Time Series Analysis must be used to "decompose" demand in order to extract the elasticity effect



“micro” approach

- The micro approach provides targeted and timely elasticity estimates
  - We can use segmentation consistent with the marketing strategy

- We need to identify appropriate price changes

- Also need a long enough time series to enable us to extract the effect of the price change from other sources of volatility

Summary and Conclusions

Summary : How do we use elasticity?

- Efficiently price to maximise ARPU and profitability
  - Reduce prices for elastic services to stimulate demand
  - Increase prices for the most “inelastic” services to increase revenues
- Effectively compete
  - Understand the revenue impact of competitive price cutting
- Financial forecasting
- Justify prices to regulator
  - Argue that price discrimination is “efficient”

Summary : How can we measure elasticity?

- Traditional approach based on the whole market may provide a first estimate
  - Results may be too general for targeted pricing actions

- The increasing availability of detailed data allows us to carry out more relevant analysis
  - For individual segments
  - For individual price changes

Conclusions

- Elasticity estimates are an important part of the marketing toolkit
- Adjusting prices to reflect elasticity can boost ARPUs
- While estimating elasticity is difficult, it is worthwhile

www.coleago.com

Martin Duckworth, Director
martin.duckworth@coleago.com
+34 679 472760