

Making the best use of management judgment in new product forecasting

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Background

New product introductions..

- Failure rate of 70-80% in retail grocery in the USA (Frozen Food Digest, 1997)
- 35% to 41% failures in one study by Choffray and Lilien, (1986).
- Huge financial costs.
- Relatively little attention paid to new product forecasting in research literature (Kahn, 2006).

The task

Forecasting demand for next n years of products that have yet to be launched.

- No sales history specific to product we want to forecast.
- Sales history for analogous products launched earlier may be available.
- May be short product life cycles & threat of early obsolescence.
- Market research data is usually available.
- Managers may be sceptical of complex models.

- In these circumstances forecasts are often based on management judgment
- Judgment can be used in:
 - direct forecasts of demand (e.g. in product's first year);
 - estimation of market potential;
 - selection of previously launched analogous products;
 - selection of method of analysis [not dealt with here].

Potential biases in management judgment



Cognitive biases

- Limits to our ability to combine multiple items of information
 - the more information we have, the worse our judgment is but the more over confident we become.
- Recent, easily recalled or striking past events tend to over influence us.

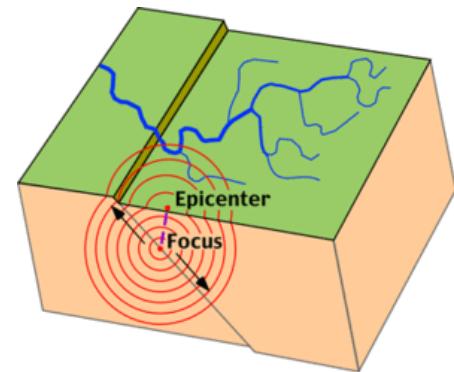
E.g. a recent product flop

- A 1993 study found people were willing to pay more for airline travel insurance covering terrorist attacks than for deaths from all possible causes



- Sales of earthquake insurance are highest after an earthquake when the risk is lowest.

They then decline as time passes (while the risk gradually increases).



Cognitive biases (continued..)

- We tend to anchor on starting values we are supplied with...



How old was Gandhi when he died?

Source: Strack & Mussweiler

One group asked was he older or younger than 9?

Then asked to estimate his age at death

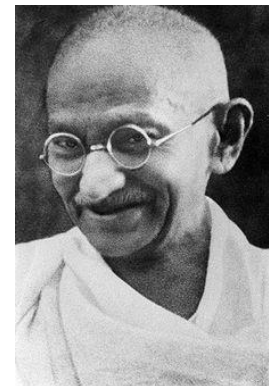
Mean answer 50

Another group asked was he older or younger than 140?

Then asked to estimate his age at death

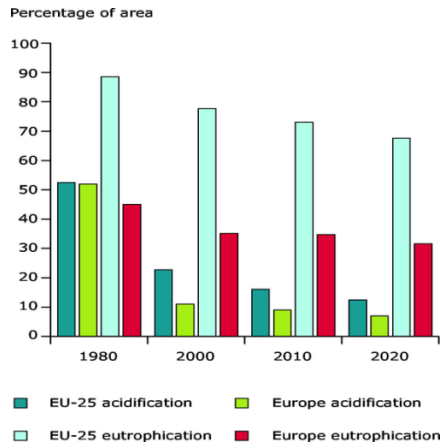
Mean answer 67

Correct answer: 78



Cognitive biases (continued..)

- We tend to ignore underlying statistical base rates in favour of highly specific information or anecdotes



versus



- This can lead to optimism bias...

“We are 90% certain this product will be profitable.

- It's been designed by an enthusiastic team.
- It's the biggest investment we've made in R & D
- Competing products are nowhere near to being launched.
- It'll be backed by a huge advertising campaign”

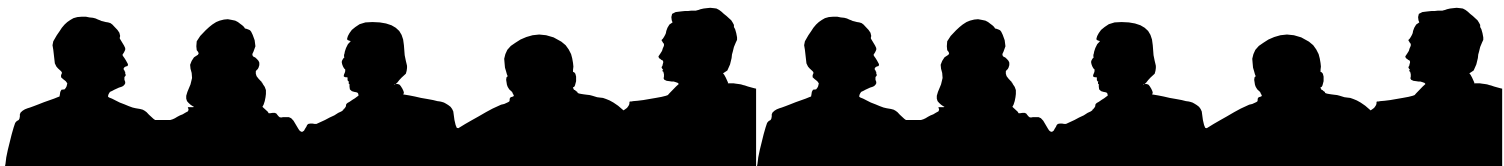
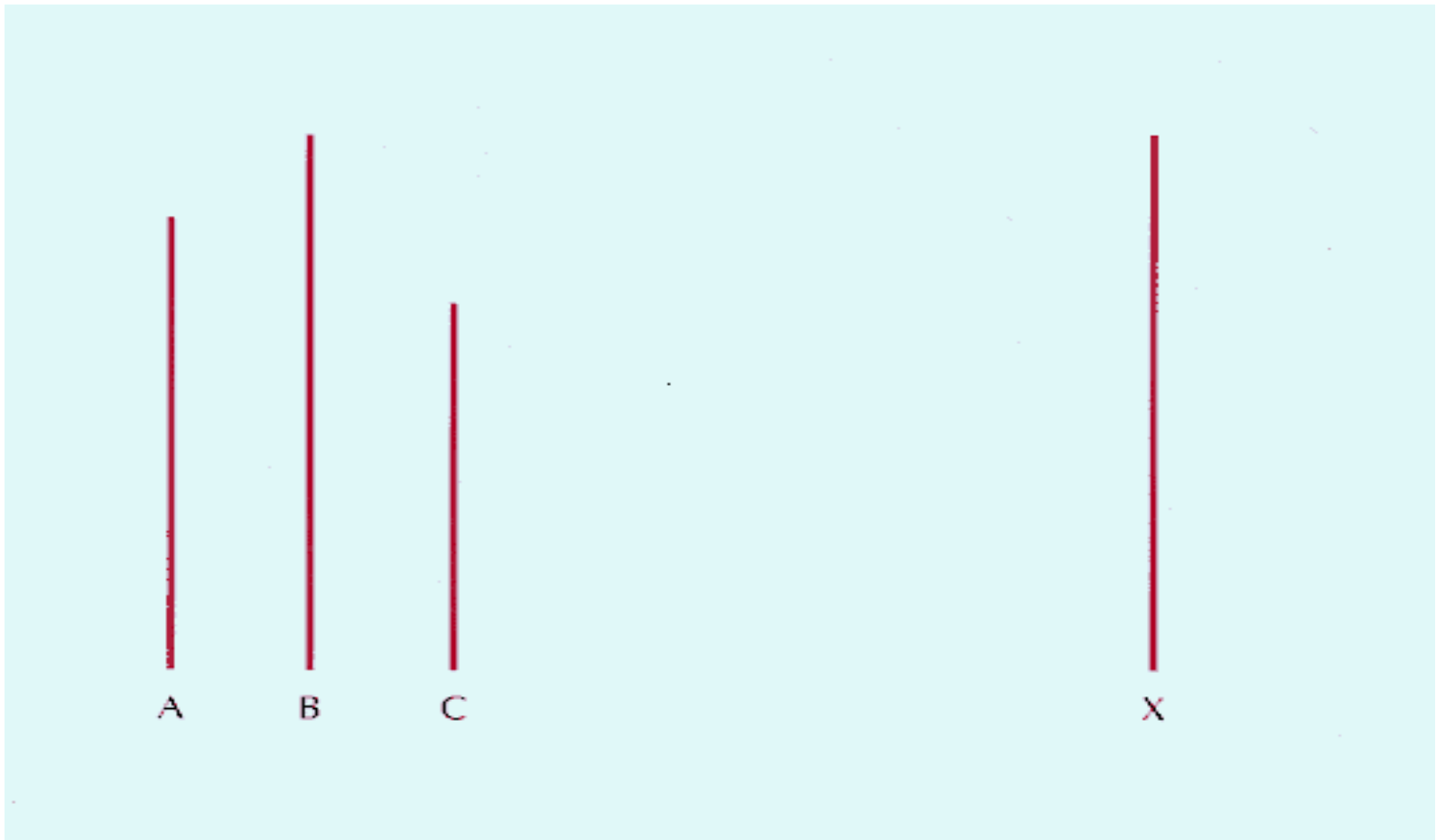
The base rate: Only 35 % of products launched in this market make a profit

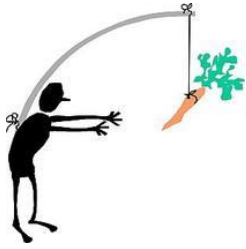


Group biases

- Risky shift: risks underestimated because of shared responsibility.
- Dominant individuals
- Conformity...

Group biases: Asch's experiments



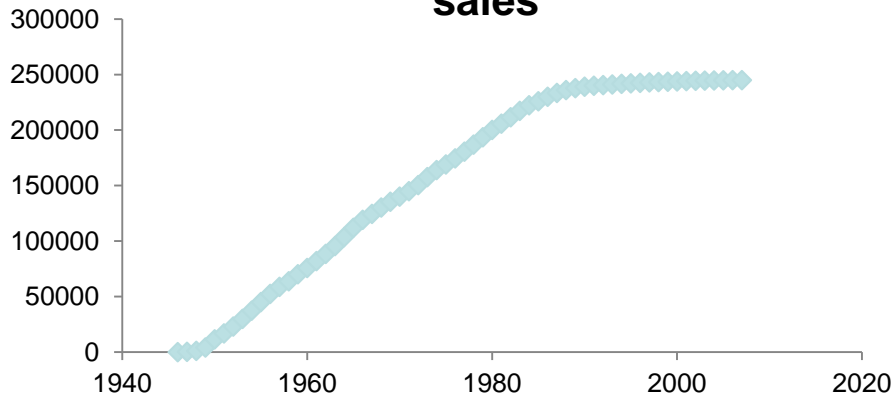


Political and Motivational biases

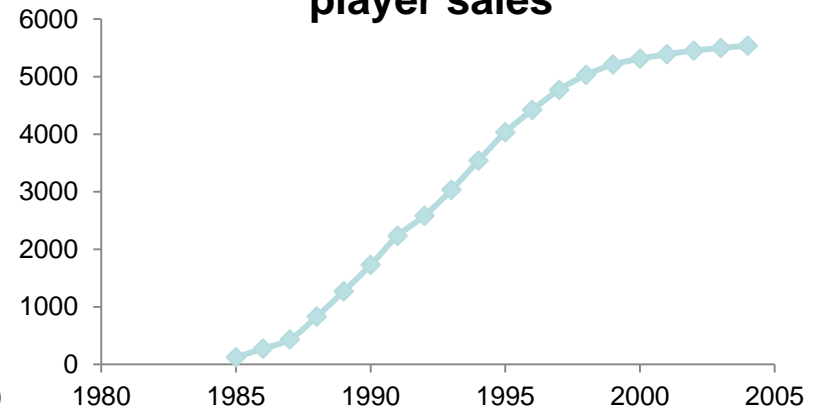
- Advocacy bias: Managers may consciously over estimate the prospects for their product when there's competition for resources
- Wishful thinking: Desirability bias

Selecting analogous products launched in the past

Cumulative US monochrome TV sales



Cumulative US video cassette player sales



But how good are we at choosing analogies?

Selecting analogous products launched in the past

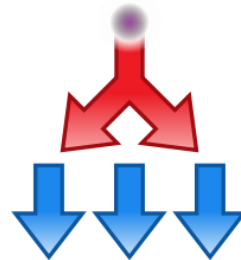
- Survivor bias -only products that survived will have long histories.
- Selection based on few attributes or superficial similarity.
- Selection based on recency or ease of recall.
- Adoption patterns are changing. E.g. 'word of mouth' is becoming more prominent probably because of the internet so sales patterns of past products may be a poor guide.

Solutions?



Overcoming information overload

- Decomposition -break the estimation problem into small parts



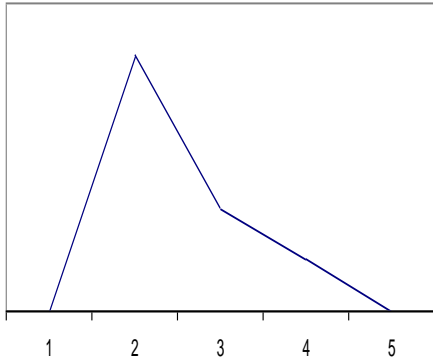
- E.g. Forecasting market potential in 2014 for a hay-fever tablet (Product G) in the USA...

- Forecast of market potential for product G for 2014 for sales through allergists
 - = Forecast of prevalent cases in US [71,733,000 Data Monitor]
 - x % aged 20 to 64
 - x % diagnosed
 - x % with specific grass allergy
 - x % visiting allergist
 - x [% mild cases x % oral medication x % prescribe G
 +% mod. cases x % oral medication x % prescribe G
 +% sevr. cases x % oral medication x % prescribe G]
- + ditto for forecast of sales through ENT specialists
- + ditto for forecasts of sales through Primary Care Physicians (PCPs)

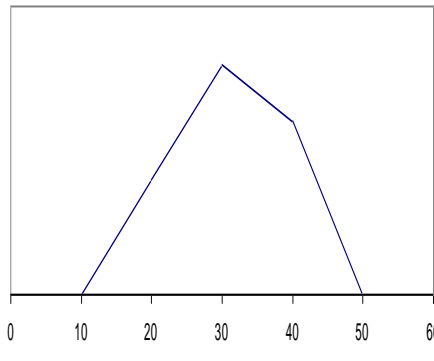
Advantages of decomposition

- Judgmental forecasting task can be made easier.
- Survey data and secondary data can be mixed with judgmental estimates.
- Provides an audit trail –and a documented defensible rationale for a forecast.
- Can be used for ‘What If?’ analyses.

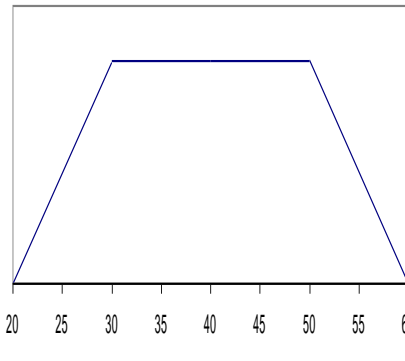
Using decomposition to produce probability forecasts...



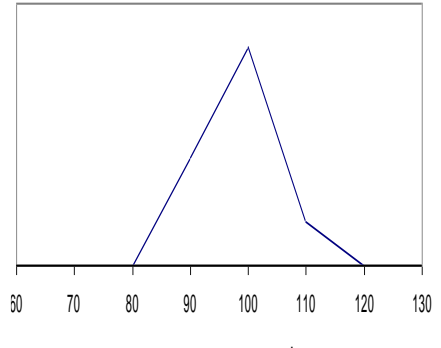
Size of market \$m



Market share %



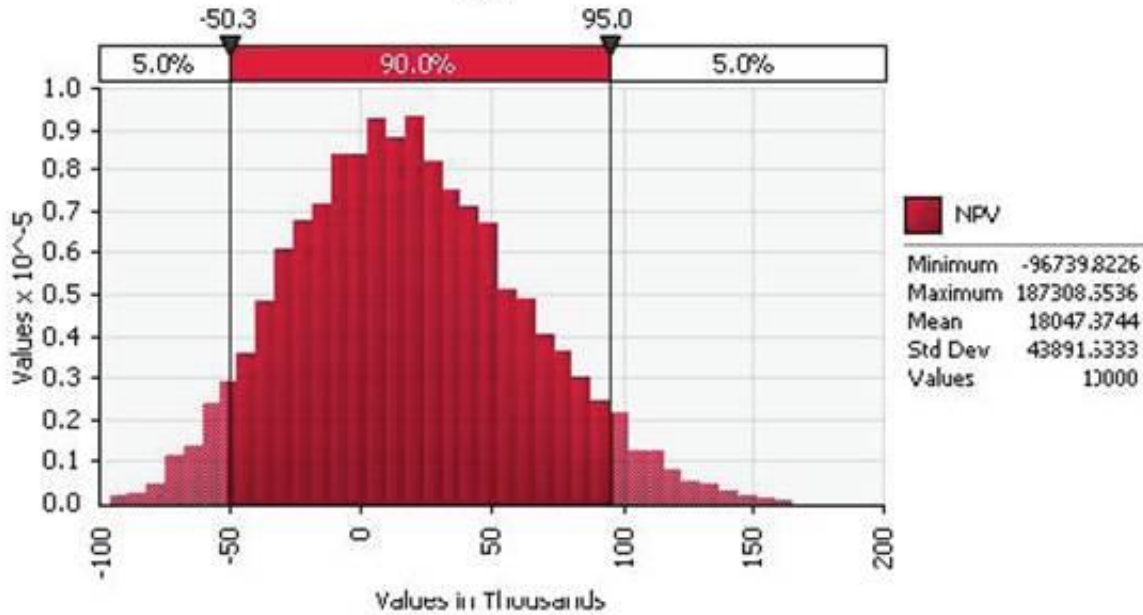
Production costs \$m



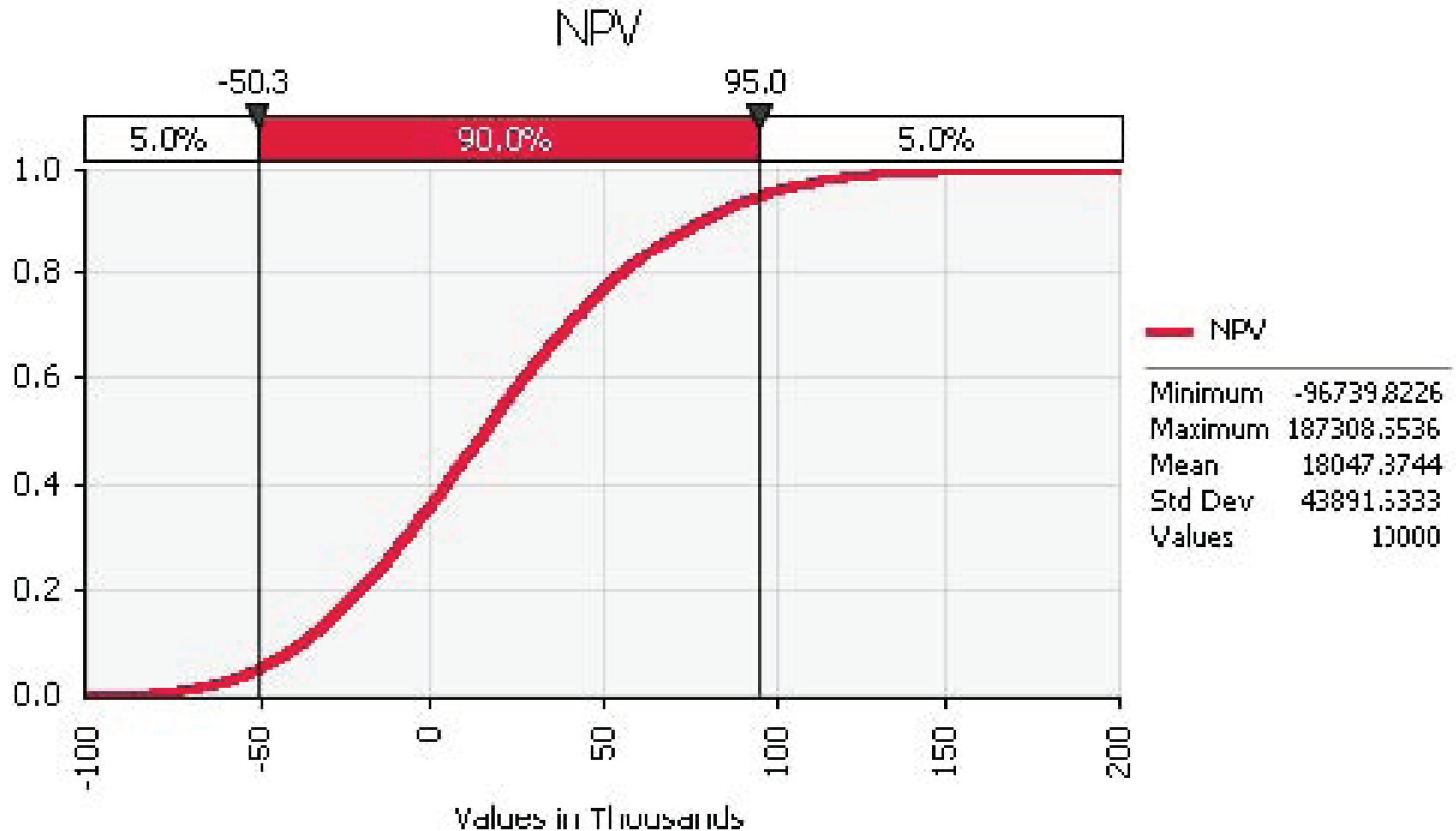
Distribution costs \$m

Thousands of scenarios simulated

NPV

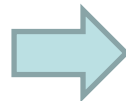


Cumulative probability distribution



Mitigating optimism bias: Reference class forecasting

Identify a set of similar products (the reference class):



Market Share	% of Products
0 to under 20%	45
20 to under 40%	25
40 to under 60%	20
60 to under 80%	10

Suggests that chances of market share of 40% or more are only 30%

But how do you identify similar products?

- Thomas (1987) suggest scoring candidate products..

<u>Environment</u>	<u>New product</u>	<u>Candidate product 1</u>	<u>Candidate product 2</u>	<u>....</u>	<u>Candidate product n</u>
Economic					
Technological					
...					
<u>Market structure</u>					
Market potential					
Sales history					
No. of competitors					
..					
Buyer behaviour					
Buying situation					
Decision process					
..					
<u>Marketing strategy</u>					
Product					
Price					
...					
<u>Characteristics of innovation</u>					
Compatability					
Complexity					
...					

You could give different weights to the criteria

Trade offs in selecting analogous products

Casting net too wide might mean including relatively dissimilar products.

Vs

But casting net too narrowly and you risk being over influenced by a few freak sales histories

Analogies that are old may have very different sales patterns.

Vs

But analogous products launched very recently may have too short a sales history to be informative

Overcoming group biases

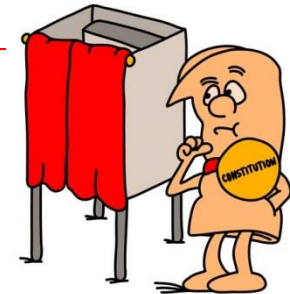
- The Delphi method
- Designed to avoid biases of face-to-face discussion



Phases of Delphi

1. Panellists provide estimates individually and privately
–ideally with anonymous written supporting arguments.
2. Results of polling are tallied and statistics fed back together with anonymous written discussion
3. Re-polling takes place
4. Process is repeated until consensus emerges. Median estimate is then used as forecast

Some points on Delphi



- Can be used for large, geographically dispersed groups
- No pressures from dominant individuals
- Anonymity allows change of mind without loss of face

Prediction markets

- Assets are created whose final cash value (often this is £1) is tied to a particular event (e.g., total first year sales will be between £1m and £2m).
- These are bought and exchanged.
- The current market prices can then be interpreted as predictions of the probability of the event or the expected value of the parameter.

E.g. a price of £0.7 = a probability of 0.7 that sales will be between £1m and £2m.

Companies using prediction markets

Hewlett-Packard GE Healthcare

Intel

Microsoft

Inpharmation

Pfizer

Johnson & Johnson

Eli Lilly

Implementing Prediction Markets

- Needs special software and a person acting as market maker.
- Number of traders need not be large, but they must be active.
- Incentives must be real and potentially payable within the near future.

Advantages of prediction markets

- They provide incentives for accurate forecasts.
- They mitigate bias -optimists' views are balanced by pessimists'.
- They release untapped knowledge
 - knowledge within firms that is never formally observed.
- They can reduce time spent in meetings.
- They are dynamically updated
 - it's in people's interests to incorporate new information into updated forecasts.

Disadvantages relative to Delphi

- People may find it hard to translate their expectations into market prices - Delphi is easier for them.
- In Delphi reasons for judgments can be circulated – others may learn from these.

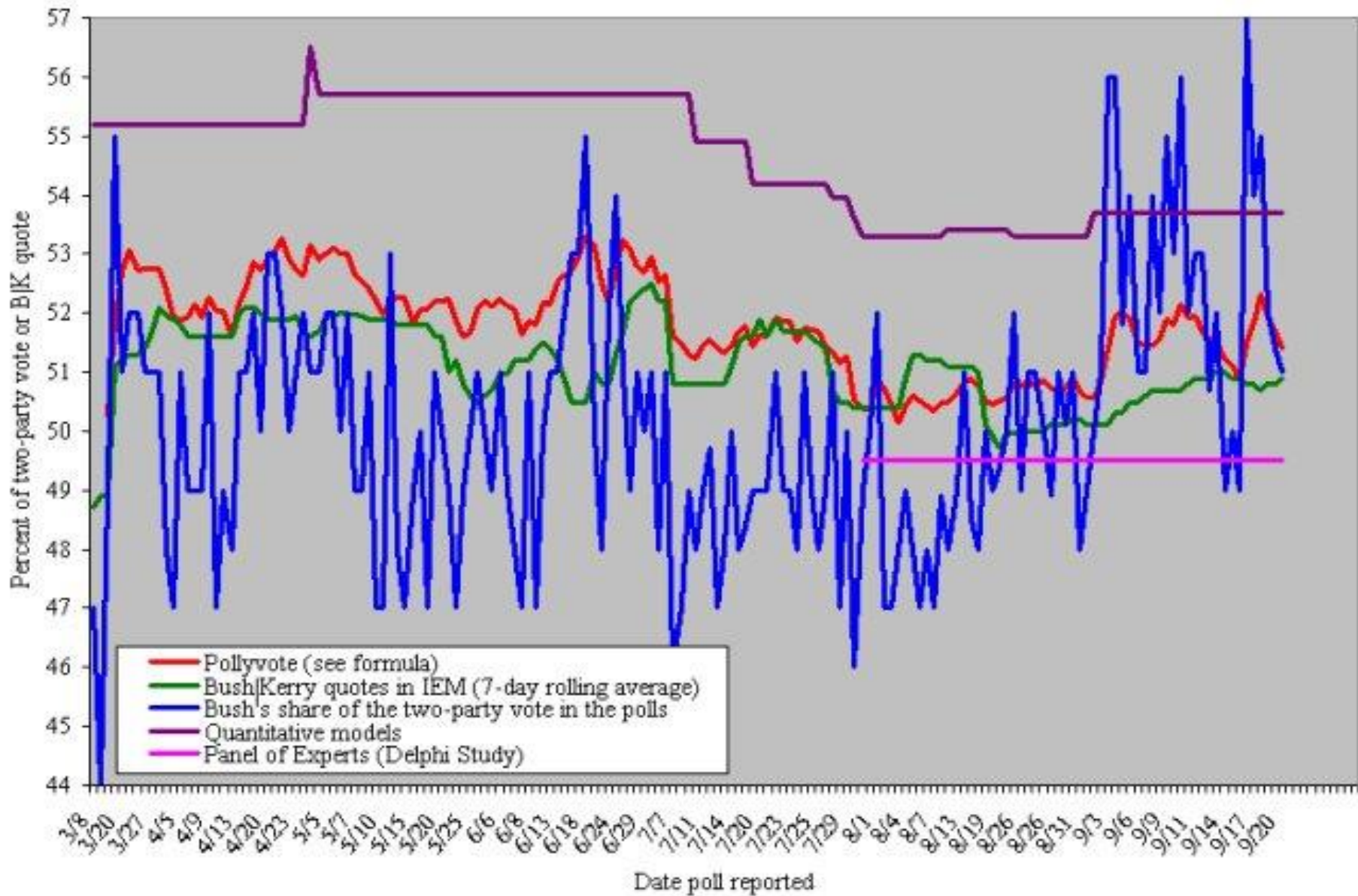
Disadvantages relative to Delphi (contd/)

- Prediction markets are vulnerable to attacks designed to manipulate results...
- Delphi avoids cascades:
 - an excessive price movement when people think an initial small price movement was due to new information and react to this.

Combination of judgment and model

- Simple means of judgmental and model forecasts often improve accuracy

E.g. Model forecast = 500 units
Judgmental forecast = 700 units
Combined forecast = 600 units



Source: www.forecastingprinciples.com

Conclusions

- Management judgment can play an important role in new product forecasting alongside statistical methods.
- However, it can suffer from cognitive, motivational & political biases.
- Structuring the judgmental forecasting process through methods like decomposition or Delphi can help to overcome these biases.