



Rob J Hyndman

Forecasting: Principles and Practice



CASE STUDY 1: Paperware company

Problem: Want forecasts of each of hundreds of items. Series can be stationary, trended or seasonal. They currently have a large forecasting program written in-house but it doesn't seem to produce sensible forecasts. They want me to tell them what is wrong and fix it.



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- Their programmer has little experience in numerical computing.
- They employ no statisticians and want the program to produce forecasts automatically.

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Methods currently used

- A** 12 month average
- C** 6 month average
- E** straight line regression over last 12 months
- G** straight line regression over last 6 months
- H** average slope between last year's and this year's values.
(Equivalent to differencing at lag 12 and taking mean.)
- I** Same as H except over 6 months.
- K** I couldn't understand the explanation.

CASE STUDY 2: PBS



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The **Pharmaceutical Benefits Scheme** (PBS) is the Australian government drugs subsidy scheme.

- Many drugs bought from pharmacies are subsidised to allow more equitable access to modern drugs.
- The cost to government is determined by the number and types of drugs purchased. Currently nearly 1% of GDP.
- The total cost is budgeted based on forecasts of drug usage.

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POLITICS

Opp demands drug price restriction after PBS budget blow-out

The Federal Opposition has called for tighter controls on drug prices after the Pharmaceutical Benefits Scheme (PBS) budget blew out by almost \$800 million.

The money was spent on two new drugs including the controversial anti-smoking aid Zyban, which dropped in price from \$220 to \$22 after it was listed on the PBS.

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FEATURES

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Public Record**
Federal Election 2001

[For a fresh perspective on the federal election, reach into ABC Online's campaign weblog, The Poll Vault.](#)

[Audio News Online](#)

CASE STUDY 2: PBS

- In 2001: \$4.5 billion budget, under-forecasted by \$800 million.
- Thousands of products. Seasonal demand.
- Subject to covert marketing, volatile products, uncontrollable expenditure.
- Although monthly data available for 10 years, data are aggregated to annual values, and only the first three years are used in estimating the forecasts.
- All forecasts being done with the FORECAST function in MS-Excel!

Problem: How to do the forecasting better?

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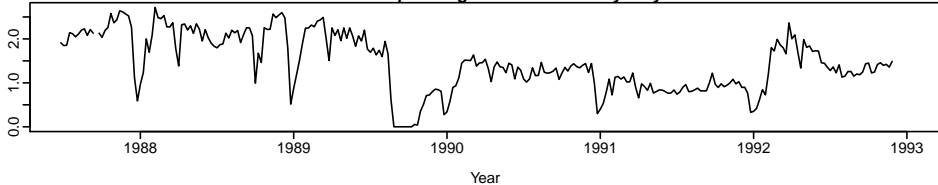
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CASE STUDY 3: Airline

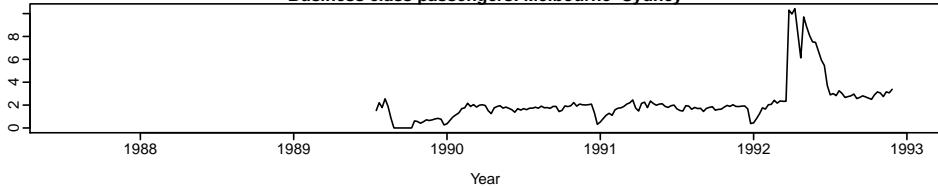


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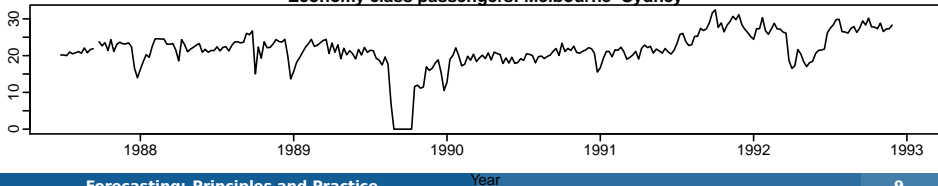
First class passengers: Melbourne–Sydney



Business class passengers: Melbourne–Sydney

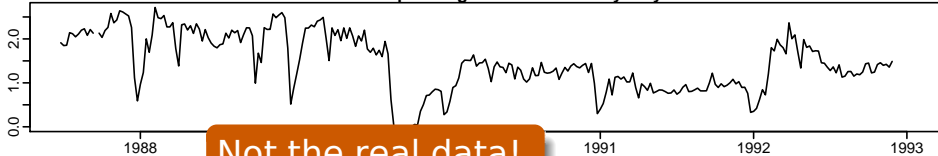


Economy class passengers: Melbourne–Sydney



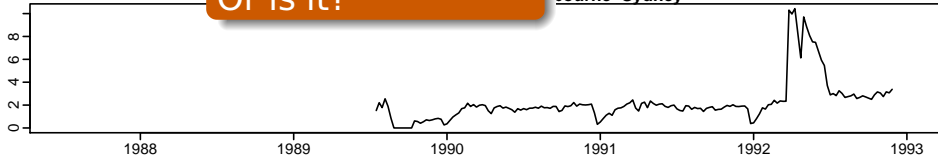
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First class passengers: Melbourne–Sydney



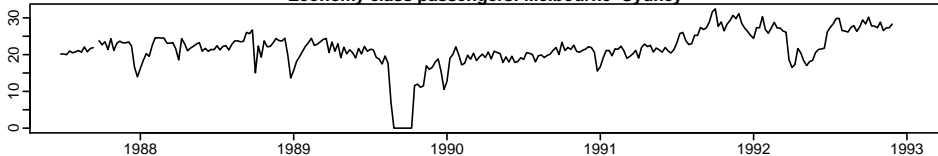
Not the real data!
Or is it?

First class passengers: Melbourne–Sydney



Year

Economy class passengers: Melbourne–Sydney



Year

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Problem: how to forecast passenger traffic on major routes.

Additional information

- They can provide a large amount of data on previous routes.
- Traffic is affected by school holidays, special events such as the Grand Prix, advertising campaigns, competition behaviour, etc.
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Resources

- Slides
- Exercises
- Textbook
- Useful links

robjhyndman.com/uwa

Useful resources

Organization:

- International Institute of Forecasters.

Blog:

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Happy forecasting

A good forecaster is not smarter than everyone else, he merely has his ignorance better organised.