

# **Some final comments**

**Rob J Hyndman**

# 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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## Additional information

- Program written in COBOL making numerical calculations limited. It is not possible to do any optimisation.
- Their programmer has little experience in numerical computing.
- They employ no statisticians and want the program to produce forecasts automatically.

# CASE STUDY 1: Paperware company

## 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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## 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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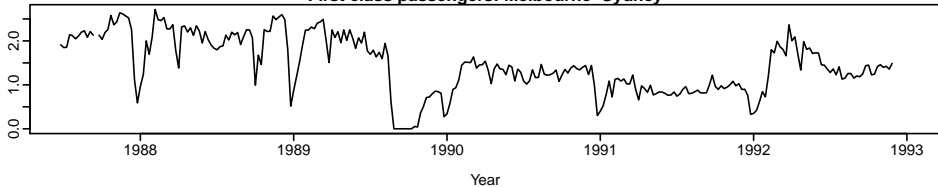
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# CASE STUDY 3: Airline

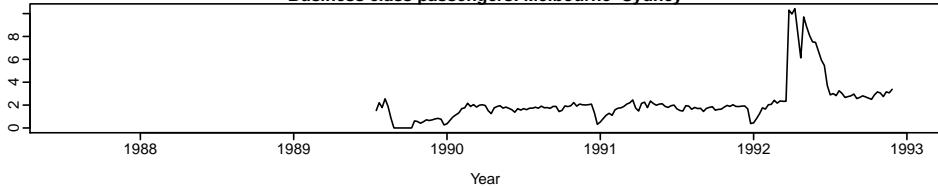


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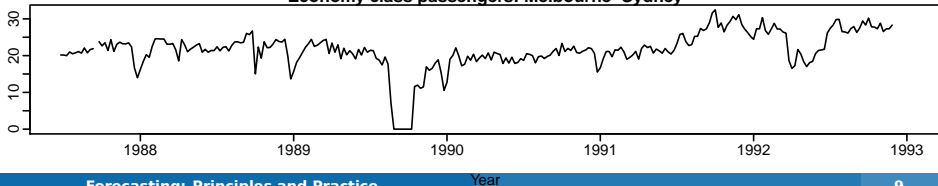
**First class passengers: Melbourne–Sydney**



**Business class passengers: Melbourne–Sydney**

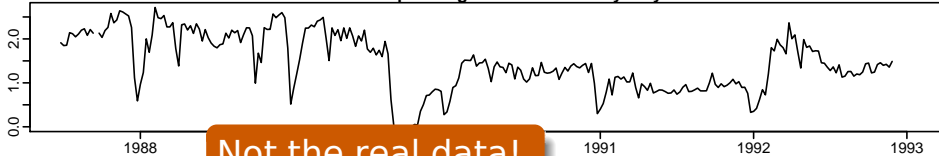


**Economy class passengers: Melbourne–Sydney**



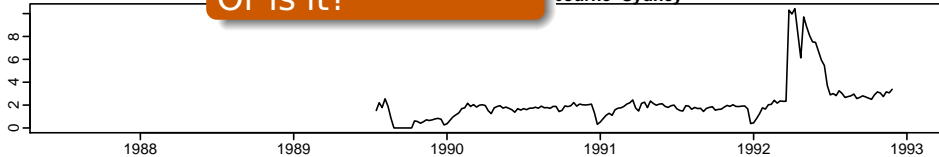
# CASE STUDY 3: Airline

**First class passengers: Melbourne–Sydney**



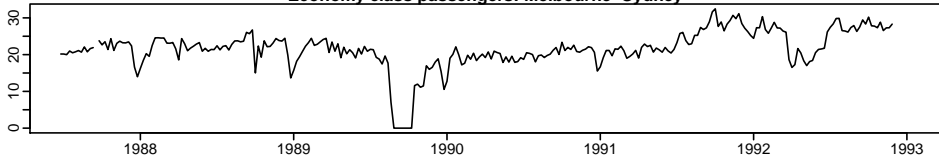
Not the real data!  
Or is it?

**First class passengers: Melbourne–Sydney**



Year

**Economy class passengers: Melbourne–Sydney**



Year

# CASE STUDY 3: Airline

**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.
- They have a highly capable team of people who are able to do most of the computing.

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# Resources

- Slides
- Exercises
- Textbook
- Useful links

[robjhyndman.com/eindhoven](http://robjhyndman.com/eindhoven)



# Useful resources

## Organization:

- International Institute of Forecasters.

## Blog:

- [robjhyndman.com/hyndsight](http://robjhyndman.com/hyndsight)

## Conferences:

- International Symposium on Forecasting.  
June 2017, Cairns, Australia.

## Journals:

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## FORESIGHT

Spring 2013

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**ALTERNATIVE WORLDS**"

# Questions?

Ask on

- [stackoverflow.com](https://stackoverflow.com) (for R questions)
- [crossvalidated.com](https://crossvalidated.com) (for statistics questions)

# Happy forecasting

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