MONASH University

MONASH BUSINESS SCHOOL

ETC3550/ETC5550 Applied forecasting

Revision

Assignment 1

Stock price forecasting (Q1 and Q5)

- Hard to beat naive forecast
- Random walk model says forecast variance = $h\sigma^2$.

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Maximum temperature at Melbourne airport (Q2)

- Weather is relatively stationary over similar time of year and recent years.
- So take mean and var of max temp in April over last 10 years.

Assignment 1

Difference in points in AFL match (Q3)

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- Could look at distribution of for-against points for last few years across all games for each team. Assume distributions independent.

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Seasonally adjusted estimate of total employment (Q4)

- Probably locally trended.
- Perhaps use drift method based on average monthly change in last 2 years.

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 fix it.

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.

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!

CASE STUDY 3: Car fleet company

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Problem: how to forecast resale value of vehicles? How should this affect leasing and sales policies?

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Additional information

- They can provide a large amount of data on previous vehicles and their eventual resale values.
- The resale values are currently estimated by a group of specialists. They see me as a threat and do not cooperate.

CASE STUDY 4: Airline

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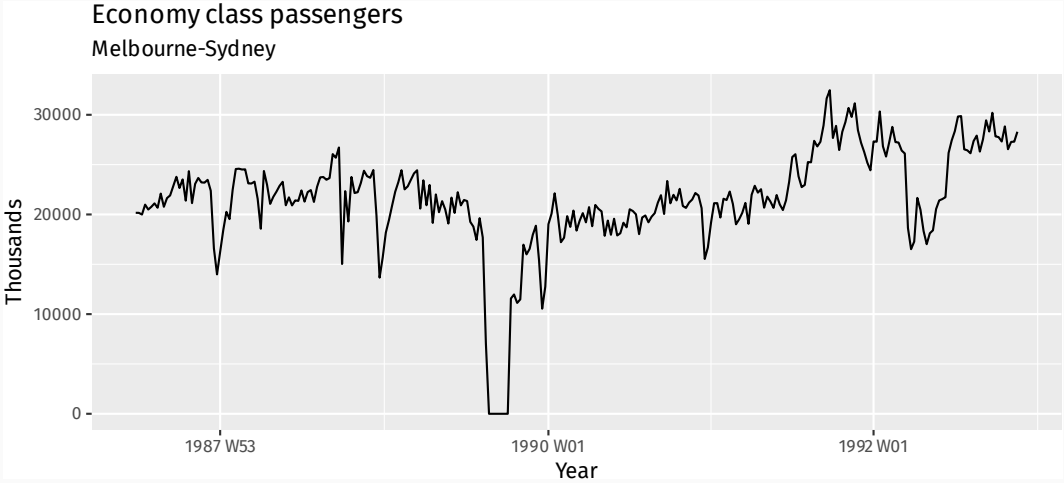

CASE STUDY 4: Airline

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.

Exam: 5.00pm (AEST) 16 June

Five Sections, all to be attempted.

- **A** Short answers/explanations. Write about 1/4 page on four topics (out of six possible topics). Nuanced answers required.

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- **C, D, E** Benchmarks, ETS models, ARIMA models, Dynamic regression models, forecast evaluation.

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- Interpretation of R output, but no coding.
- Closed book with ETS formula sheet
- Allowed: a calculator, 1 A4 double-sided sheet of notes, 5 blank working sheets

Preparing for the exam

- Exams from 2021–2024 on website.
- Solutions available from 2 June.
- Exercises. Make sure you have done them all (especially the last two topics).
- Identify your weak points and practice them.
- Write your own summary of the material.
- Practice explaining the material to a class-mate.

Help available

- See us during the consultation times (for details refer to the website).
- Discuss on the forum.

Useful resources for forecasters

Organization:

- International Institute of Forecasters.

Annual Conference:

- International Symposium on Forecasting
  - Beijing, China, June 29–July 2, 2025

Journals:

- International Journal of Forecasting
- Foresight (the practitioner's journal)

Links to all of the above at **forecasters.org**

IIF Best Student Award

- forecasters.org/programs/research-awards/students/
- US$100
- A certificate of achievement from the IIF
- One year free membership of the Institute with all attendant benefits. Subscriptions to:
  - the *International Journal of Forecasting*
  - the practitioner journal: *Foresight*
  - The Oracle newsletter

Discounts on conference and workshop fees, and links to a worldwide community of forecasters in many disciplines.

Happy forecasting

Good forecasters are not smarter than everyone else, they merely have their ignorance better organised.

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Please fill in your SETU