

General Insurance Pricing Seminar
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Seasonality and issues of the season

Agenda

Issues of the season

- New claim trends
- Legislative changes
- Equality Bill
- Economic recession and new government

Seasonality

- Fitting round the circle

New claim trends

- Number of claims
 - Theft has decreased due to increases in vehicle security
 - Accidental damage frequency generally reducing
 - Frequency of bodily injury claims increasing
 - Fraud rates expected to increase in recession

New claim trends

- Average claim size up
 - Average payout for bodily injury increasing – number of claimants up per claim
 - Increase in repair costs
 - complexity of modern car design eg electronics
 - valuable items eg satellite navigation tools
 - Increase in no-win, no-fee personal injury law firms → increasingly litigious
 - Credit hire - increased provision of replacement vehicles
 - Catastrophe losses eg storms and floods related to climate change

New claims environment has led to a 50% increase in bodily injury costs over 2 years



Legislative changes

- **Ministry of Justice Reforms to Road Traffic Act** (30 April 2010)
 - Fixed stages and costs with set deadlines for personal injury claims between £1,000 - £10,000
 - Cease to make success fees recoverable from unsuccessful opponents
 - Jackson Review: Ban referral fees?
 - Legal Services Act 2007: ABS=>Claims management Co's?
- **New vehicles now taxed according to emissions**
 - Incentive for people to drive more efficient cars
- **Equality Act 2010**

History lesson: EU Gender Directive

- Implemented 13 December 2004
- Access to and supply of goods and services
- Applied to insurance contracts from 21/12/07
- Difference evident in assessment of risk
- Reliance on published data
- Proportionality of premiums (or benefits)
- Recognition of current differences across EU

History lesson: EU Gender Directive – UK implementation

- Response to consultation published in November '07
- UK law updated
- Data published:
 - Aggregate data allowed
 - Female Risk / Male Risk reported to "secure consistency" and so that "publications are intelligible"
 - By age band, not exceeding 5 years, 80+ one band
 - Updated regularly, at least every 3(2) years

History lesson: EU Gender Directive – UK implementation

- Proportionate:
 - "some tolerance around the degree"
 - "should be symmetrical above or below a data point"
 - "fair and reasonable"
 - "close relationship between the underlying data and the assessment of risks"
 - "unlikely to be expressed as a clear linear relationship between a data table and the premiums"
 - "aggregate tables may represent an industry average"

Current situation: EU Gender Directive – Where are we now?

- Retain for risk pricing
- Retain for marketing
- Impact on optimised premiums?
 - What is male-female relativity?
- Other EU countries have implemented in different ways

Future impact: EU Gender directive

- Hard to see how motor prices would be challenged
- Existing pressure groups focus on equal rights for women, who usually receive lower premiums
- Added bureaucracy marginal cost, unlikely to impact significantly on premiums or profitability

Insurance industry seems to have escaped relatively unscathed from this directive

Future impact: UK Equality Bill

- Covers wide range of discrimination in all areas including **age** in **financial services**
- Age will be allowed in insurance, subject to limitations similar to Gender Directive
- Passed in “wash-up” at end of last parliament
- Implementation in 2012
 - Solvency II
 - Olympics

UK Equality Bill

- Published data on industry-wide or individual basis
- Premiums not proportional to risk (allowance for fixed costs)
- Discounting to gain/retain business allowed
- Age bands permitted
 - Recognise that this benefits older customers
 - Cost/benefit of individual ages for travel not clear
- Universal coverage not required
 - Age limits should be very clear
 - Companies to refer customers to suitable provider(s)
 - Recognise no shortage of insurance, just hard to find

UK Equality Bill

- Portfolio management
- May limit price optimisation
 - Currently still scope to optimise over things other than age
 - Indirect discrimination may be an issue (age of licence)
- Additional reporting requirements will increase costs
 - Higher premiums will follow
 - Some companies may withdraw from market?
- EU Directive is also in the pipeline
 - UK actively engaged in EU discussion on this, is happy to lead the way
- What next?
 - Occupation, area ...

Economic recession and the new government's policy

- Squeeze in public spending likely to increase unemployment
- High inflation will lead to higher interest rates (timing uncertain)
- Tax rises likely
 - IPT doubling?
 - VAT to 20%?
 - Direct taxation?
- Current low investment returns

Economic recession and the new government's policy

- Likely to result in:
 - More fraud
 - Increased claims cost (via inflation)
 - Increased claim cost (structured settlements more attractive)
- Premiums will need to rise:
 - By how much?
 - Motor premiums increased 18.7% during 2009 for comprehensive cover (Axco 2010)
 - When?

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Where do we find seasonality?

- Anything where weather or daylight has an effect:
 - Driving (harder)
 - Escape of water (colder)
- Anything where absence has an effect
 - Driving (more)
 - Theft (emptier)

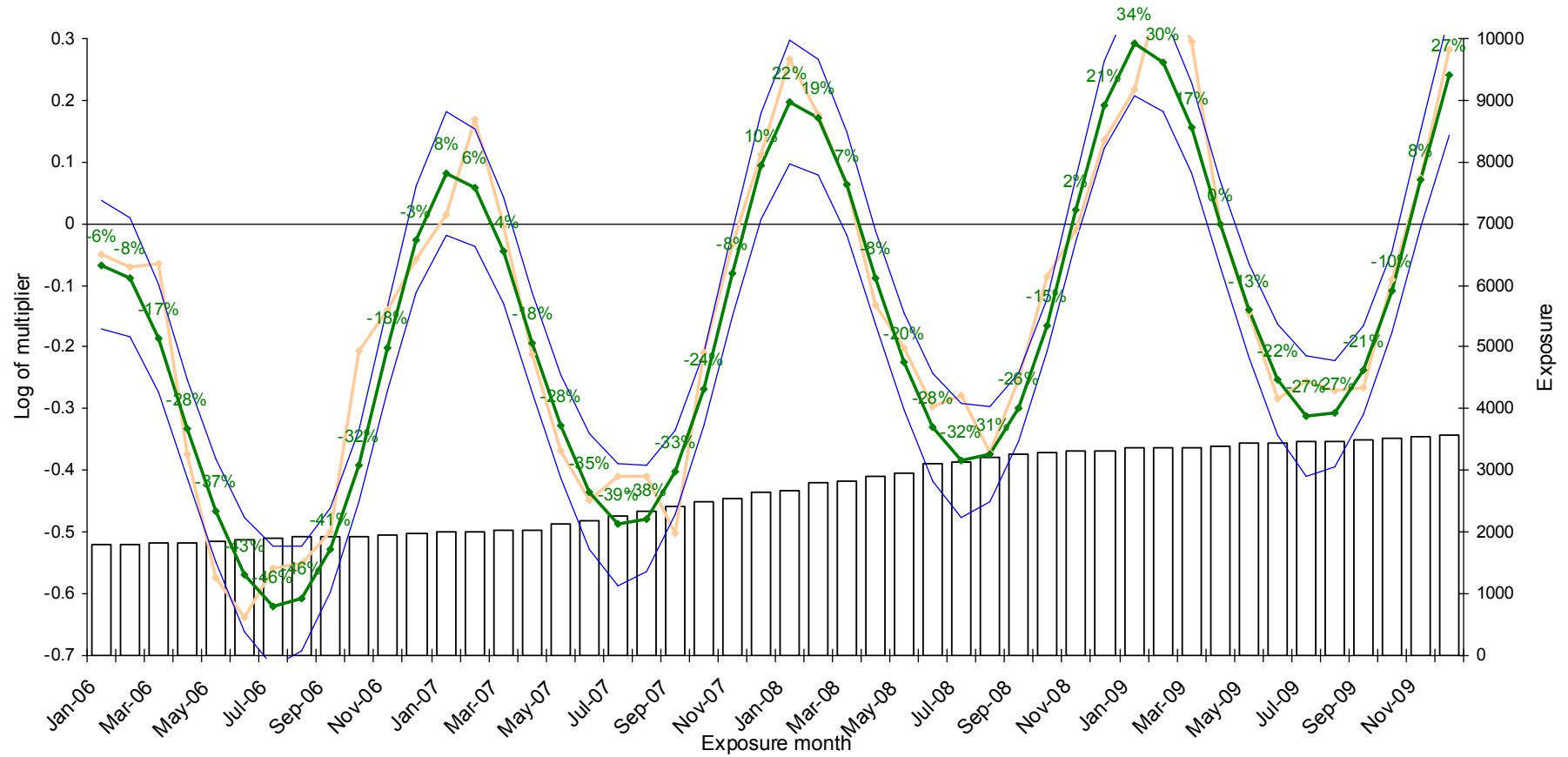
Why model seasonality?

- Accurate pricing of less than annual business
- Understand effect of changes in volume
 - Improved modelling of accident year loss ratios
- Early warning of systematic changes

Seasonality plus trend

Seasonality investigation

Investigating seasonality - Month spline, year spline

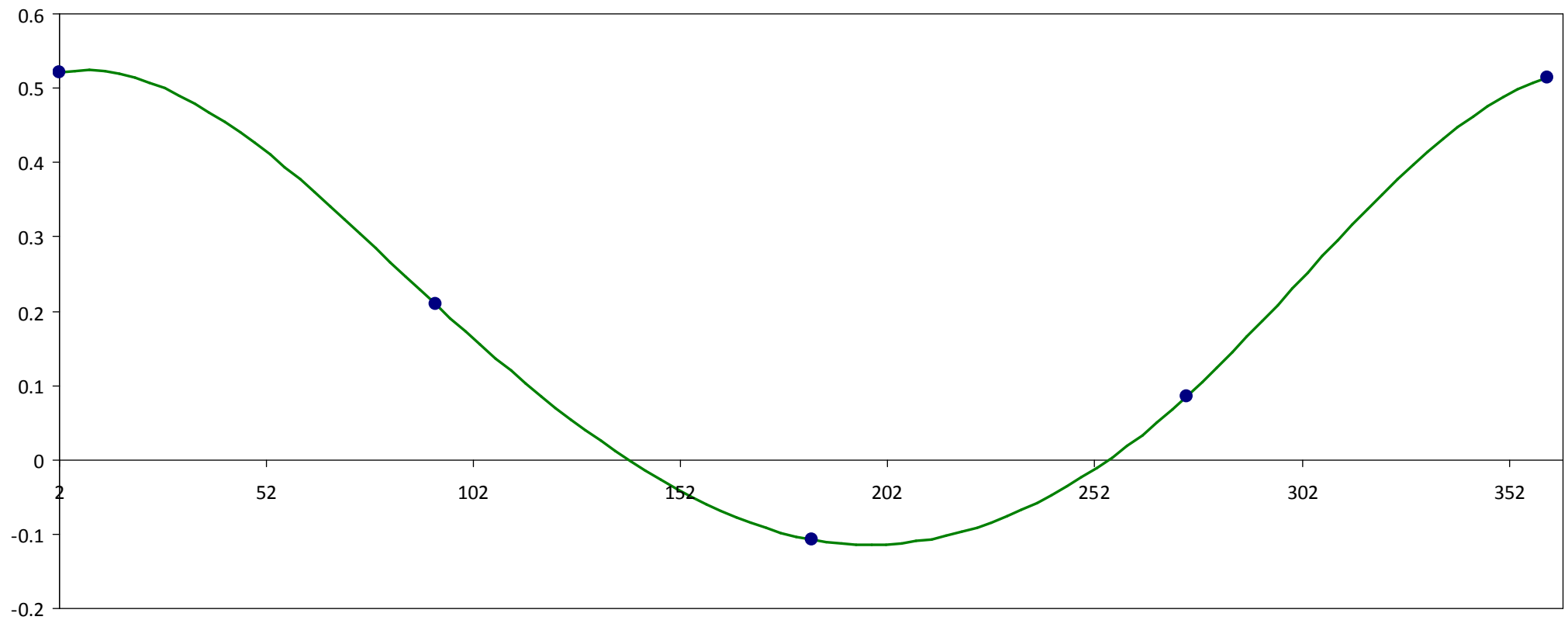


Exposure Oneway relativities 95 % confidence interval Unsmoothed estimate

Seasonality plus trend

Seasonality investigation

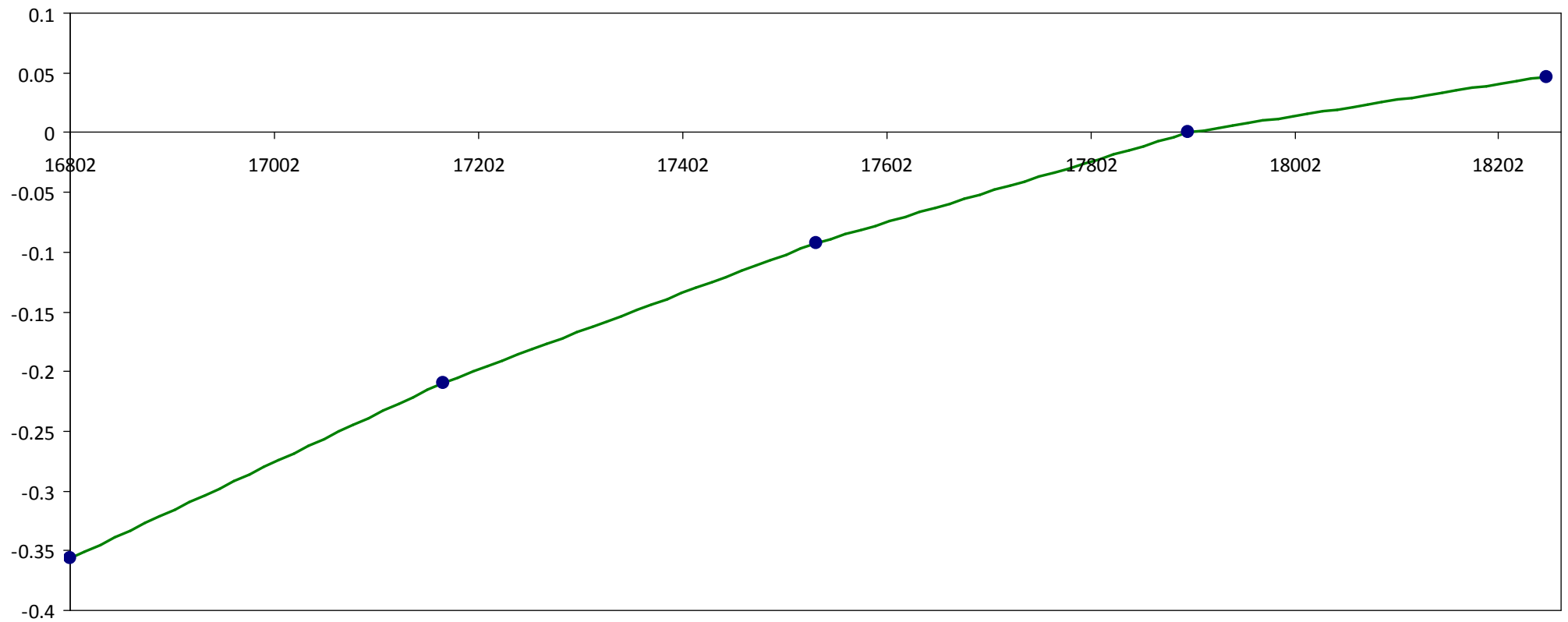
Spline seasonality



Seasonality plus trend

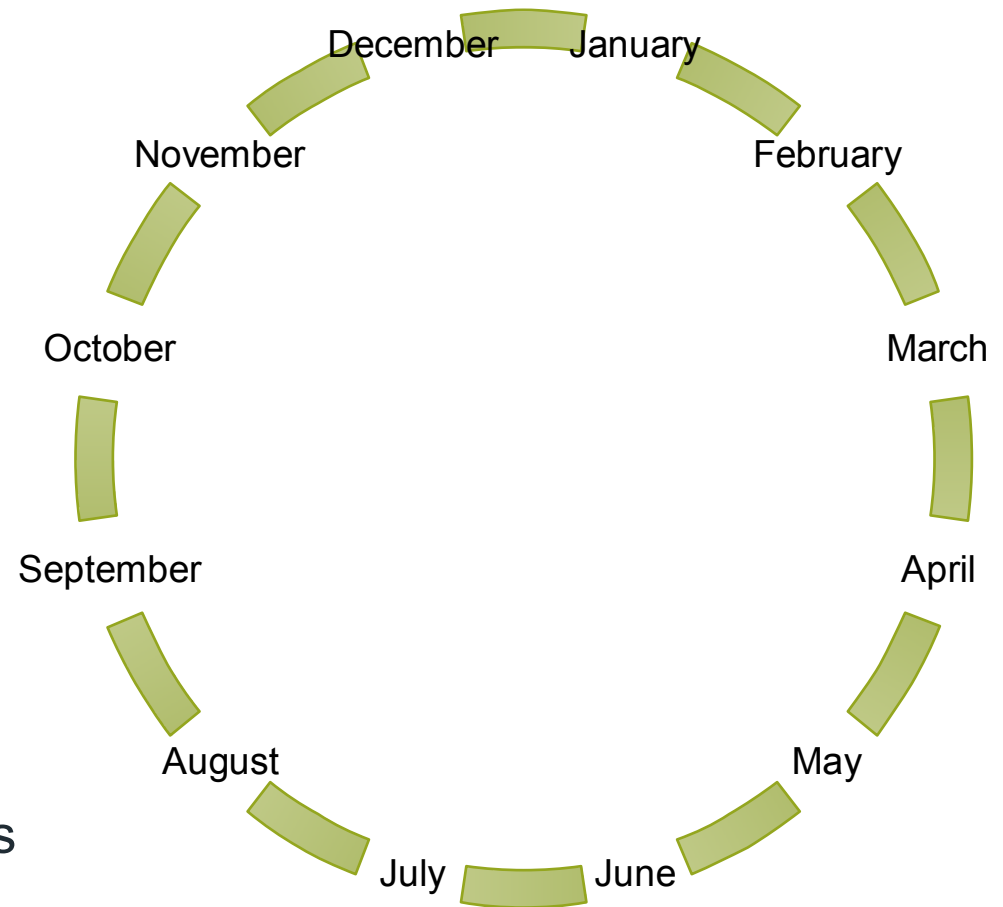
Seasonality investigation

Trend effect



Fitting round the circle

- Inflation and trend effects can be dealt with as a “force of interest” approach:
 - $(1+i)^t = \exp(t \cdot \ln(1+i))$
 - Just a GLM with (continuous) time as a variate
 - Linear spline allows variation between years
- Seasonal effects require more sophisticated handling to avoid unnatural step changes
 - Circular splines can achieve this



Seasonality

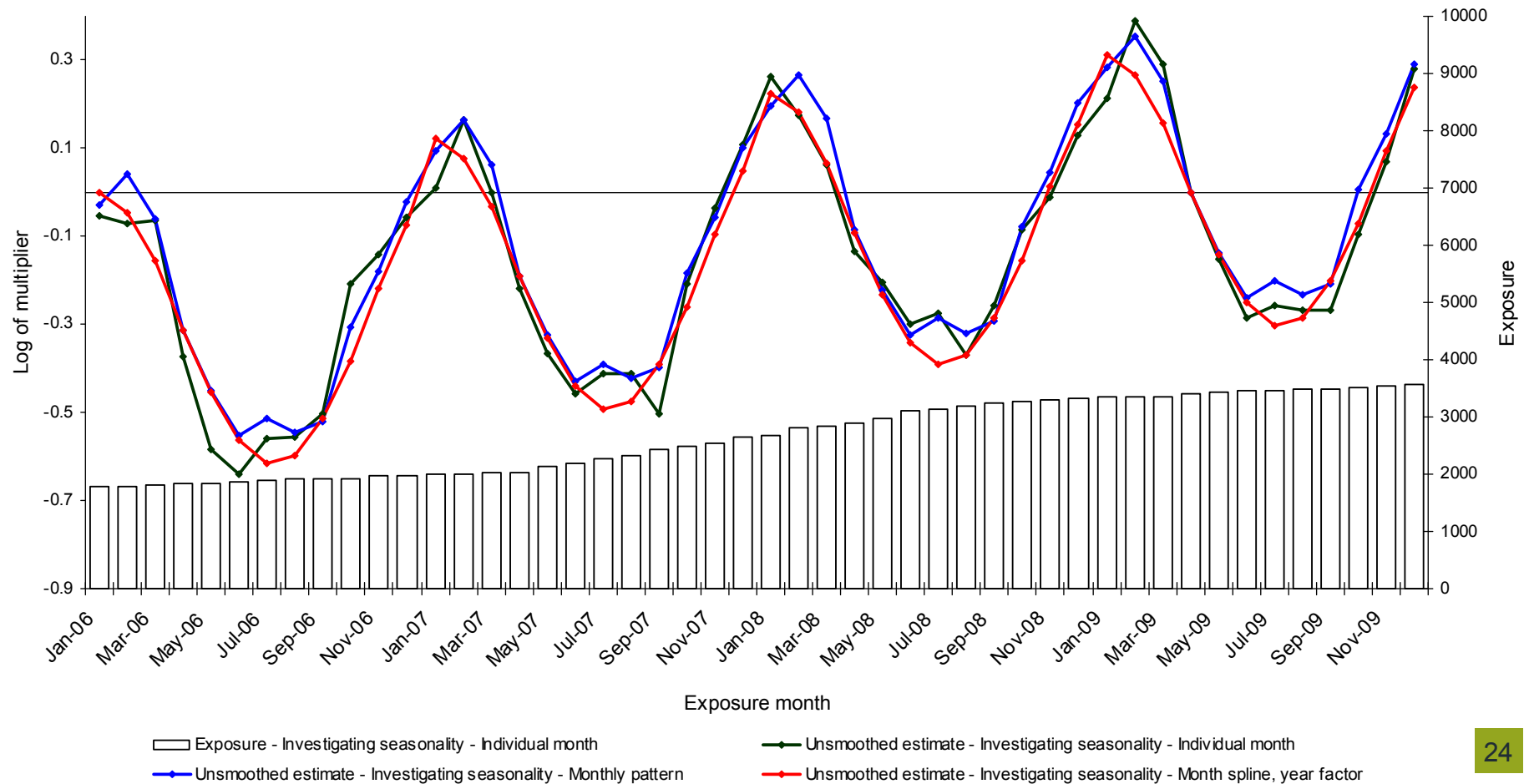
Practical issues

- Take care with definition of variates
 - Model will struggle with 2010.08 versus 2010.50
 - Splines can help here
- Knot position still important
- Year and seasonality confusion from “arbitrary” trend changes
- Where does the noise go?
 - Consider using two annual effects
- Balance complexity and number of parameters

Seasonality plus trend

Seasonality investigation

Seasonality: Factor or Spline?



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And, of course ...

- Will England win the World Cup?



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