



The Actuarial Profession
making financial sense of the future

GIRO Conference and Exhibition 2012
Juggling uncertainty the actuary's part to play

20th September 2012

© 2012 The Actuarial Profession • www.actuaries.org.uk



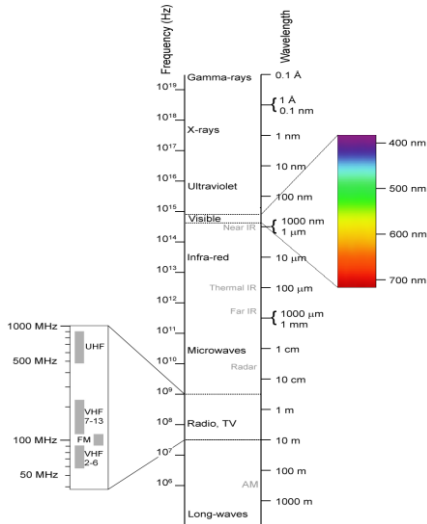
The Actuarial Profession
making financial sense of the future

GIRO Conference and Exhibition 2012

Will science brake the Pricing Cycle?
Phil Ellis & Graham Fulcher

© 2011 The Actuarial Profession • www.actuaries.org.uk

There is a spectrum of belief



© 2011 The Actuarial Profession • www.actuarial.org.uk

Source: universetoday.com

We are all somewhere between:

Total Believer

- New science will save us
- Cycles will be a thing of the past

Total Sceptic

- Nothing has changed at all
- Cycles will be here for ages yet

2

Heard it all before ... Dozens of false dawns already ...

Insurance industry history

- Regular pronouncements about “beating the cycle”
- Over very many years
- Experience consistently proved otherwise
 - *To date at least*
- Are we REALLY better than our fathers (and mothers)?



© 2011 The Actuarial Profession • www.actuarial.org.uk

Source: Wikimedia Commons

3

Sciences and Cycles – It can be done

When it works

- Limited science to date
- Predictable and objective
- External factors minimised



The challenges

- Science has been around for years
- Competition and competitors cheating
- Crashes & weather



© 2011 The Actuarial Profession • www.actuaries.org.uk

Source: Wikimedia Commons

4

There are many other examples ...



You may not recognise this man
Some clues ... he's not ...

- Roger Taylor
- Mark Cox
- Buster Mottram
- Jeremy Bates, John Lloyd,
- Andrew Castle, Chris Wilkinson,
- Tim Henman, Greg Rusedski, ...

© 2011 The Actuarial Profession • www.actuaries.org.uk

Source: Wikimedia Commons

5

“76 years of hurt ...”



© 2011 The Actuarial Profession • www.actuaries.org.uk

Source: Wikimedia Commons

6

Major Global Cause: Capacity constraints



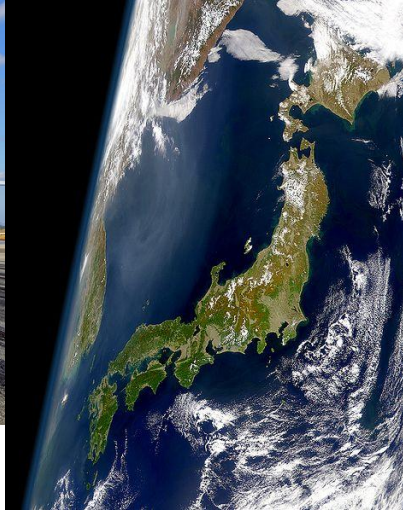
Cycle turns historically always driven by capital impairment

- Capital higher and companies greater diversified
- Perception of impairment a driver
- Less severe upturns
- More mini-cycles

© 2011 The Actuarial Profession • www.actuaries.org.uk

7

Cycles not always a problem? Under-price & Payback can work



- Arguably makes sense
 - eg Airlines & Japanese property

© 2011 The Actuarial Profession • www.actuaries.org.uk

Source: airbus.com, Wikimedia Commons

8

Cause Reducing(?): Uncertainty of costs



Driving through the rear view mirror

- Naïve rate making
- Institutional lags (accounting, regulatory, rate filing)
- Estimation errors

© 2011 The Actuarial Profession • www.actuaries.org.uk

Source: Wikimedia Commons

9

But even a clear model may not help a lot ... *Une reprise from Phil's 2010 GIRO talk*

The Drake equation

- $N = N^* \times f_p \times n_e \times f_l \times f_i \times f_c \times L/T_g$
 - Billions of stars, but rare life
- Model first proposed in 1961, not seriously improved since
- Drake's original result was 10
- Current "plausible" estimates include 2.1, 6.5×10^{-5} , 2×10^4
 - Source Wikipedia
- Actuaries must price, capitalise for and reserve "binary events"
 - even with a "sound model", usefulness may be limited!

*Note Wikipedia now (14 Sept 12) says original estimates were 10^3 to 10^8
and shows "possible estimates" as 8×10^{-20} and 2×10^8*

Science hasn't helped personal lines much?!

Consider UK motor insurance

- Sophisticated modelling
 - Multi-factor GLMs
 - Pricing elasticities
 - etc, etc
- Early-adopter advantage
- Now science is essential
 - except perhaps the most comfortable niches



Arguably: Cycle persists, margins just thinner for everyone

Cause Persisting: Competitive factors

Greater ease of price discovery and switching

Aggregate effect of winners curse on profit
 $\xi(N) * \beta * \sigma(X) * \text{sqrt} [1 - p(X)] / N$

Independent of

- Volatility of claims
- Correlation between claims and estimates

Depends on

- Volatility of estimates
- Correlation between estimates of competitors
- Susceptible to rogue/uninformed competition

Some science can be dangerous (or just wrong)

- Capital Allocation for Pricing
 - *Perennial Ellis hobby horse*
- I doubt the sense
- And it can be badly applied
- A likely failure in hindsight (!)

Ref: Bernhard Bergman papers



I'm not that convinced by string theory either ...

Cause Reducing: Market structure

Ease of uninformed entry

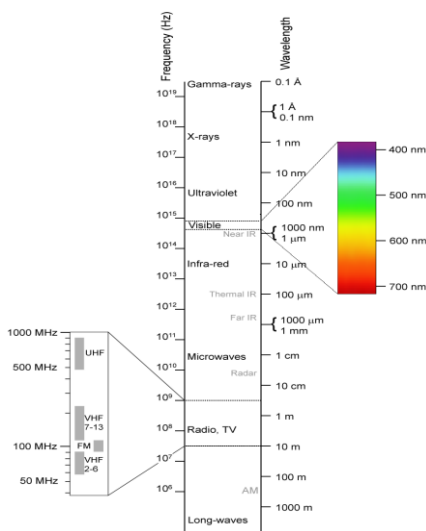
- ORSA
- Cost of the scientists
- Franchise board

Difficulty of rational exit

- Sidecars
- Hedge funds



There is a spectrum of belief



Total Believer or Total Sceptic?

- *Graham & Phil's view:*
- Science won't **break** the cycle
 - It's here to stay
- But might well **brake** it
 - Not as severe
 - Classes more dislocated
 - Fewer, more extreme causes
- *What do you think?!*

Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

The views expressed in this presentation are those of the presenters.

