

The Actuarial Profession
making financial sense of the future

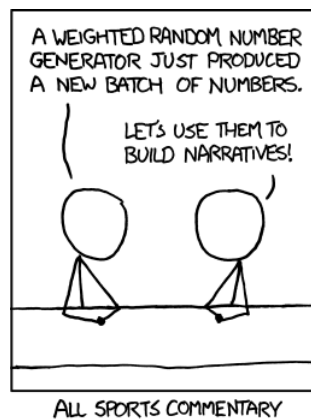
Life Conference and Exhibition 2011
Peter Murphy, Lloyds Banking Group

Ex post justification The dangers of plausible explanations

21 November 2011

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Ex post justification



Insurance Company ABC plc

- ABC plc is a domestic UK insurer writing a full range of life insurance contracts

£m	31/12/2010	31/12/2011
Available Capital	1,000	1,050
Required Capital	500	600
Working Capital	500	450

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Ideal Solution

- Every element of the model can be checked.
 - All cashflow models are completely understood
 - Loss function fitting is perfect
 - Changes to distribution of risk factors and their impacts are well understood
- All data going into the model is thoroughly validated

We can prove results of the model are correct

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David Hume

“the knowledge.. of a relation is not, in any instance, attained by reasoning a priori; but arises entirely from experience, when we find that any particular objects are constantly conjoined with each other”

“No object ever discovers by the qualities which appear to the senses, wither the causes which produced it, or the effects which will arise from it; nor can our reason, un assisted by experience ever draw any inference concerning real existence and matter of fact.... Causes and effects are discoverable not by reason but by experience”

Source: Enquiry concerning human understanding

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Introduction to Induction

For most of the history of science the prevailing theory of science was it is possible to justify a theory by “induction”



Possible explanations

1. Equity markets have improved, but increases in equity volatility have made the basis for calculating required capital more severe.
2. Profitable new business has improved the base position and increased capital requirements.
3. Some complex capital raising has fiddled with the balance sheet

£m	31/12/2010	31/12/2011
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Karl Popper

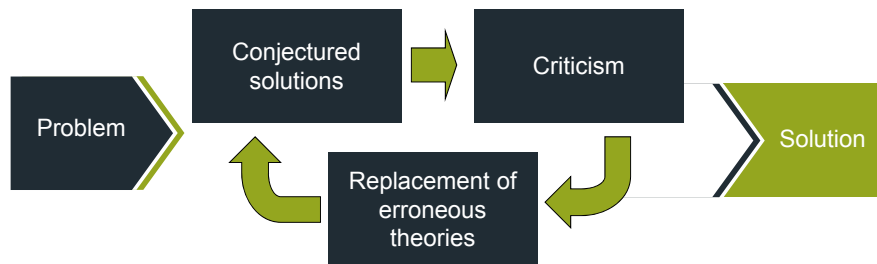
“Popper is known for his attempt to repudiate the classical observationalist / inductivist form of scientific method in favour of empirical falsification. He is also known for his opposition to the classical justificationist account of knowledge which he replaced with critical rationalism, “the first non justificational philosophy of criticism in the history of philosophy”.

Source: Wikipedia

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Problem solving



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ABC plc – Some more info

- FTSE 100 @ 31/12/2010 = 5899.94
- FTSE 100 @ 31/12/2011 = 5900.00

- Here is the info split out

£m	31/12/2010	31/12/2011		
		In-force	New Business	Total
Available Capital	1,000	900	150	1,050
Required Capital	500	500	100	600
Working Capital	500	350	50	400

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Application to internal model validation

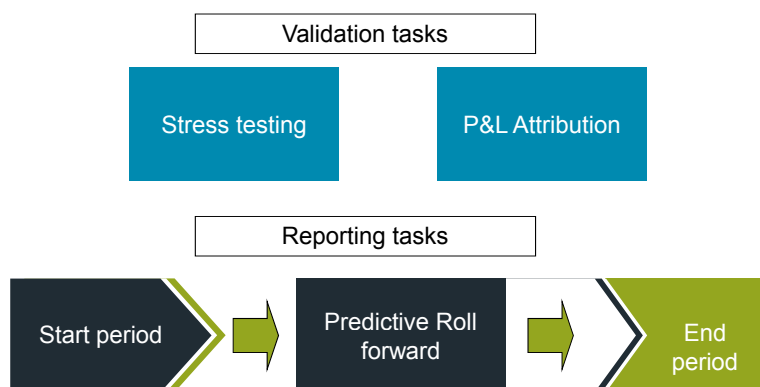
“Validation is a set of tools and processes used by the undertaking to gain confidence over the results, design, workings and other processes within the internal model. These tools and processes used for validation will be quantitative as well as qualitative. In fact, having in place only quantitative systems for validation with no scope for qualitative interpretation of the results from these systems will pose serious risk to the undertaking, as it is highly unlikely that the undertaking will be able to design quantitative processes that will be able to explain sufficiently all the results and processes of the model.”

Source: EIOPA

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Validation within a reporting cycle



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Methods of validation – Analysis of change

Problem	▶	Validation of the change in results from period to period
Conjectured Solutions	▶	Solutions chosen to explain the changes based on: <ul style="list-style-type: none"> • Changes in risk factors • Understanding of the business • Results of previous stress testing work
Criticism	▶	Detailed tests carried out to test the explanations generated, including: <ul style="list-style-type: none"> • P&L attribution • Simplified models
Solution	▶	Clear explanations which have passed a thorough set of tests. The ongoing process will attempt to improve the explanations and produce better tests

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Methods of validation – Initial model build

Problem	▶	Validation of results
Conjectured Solutions	▶	Solutions chosen to explain the changes based on: <ul style="list-style-type: none"> • Risk factors behaviour • Understanding of the business • Results of earlier models and methodologies
Criticism	▶	Detailed tests carried out to test the explanations generated, including: <ul style="list-style-type: none"> • Step by step introduction of changes • Simplified models
Solution	▶	Clear explanations which have passed a thorough set of tests. The ongoing process will attempt to improve the explanations and produce better tests

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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 presenter.

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