

***The Macpherson  
Report: Lessons for  
the private sector***

20 NOVEMBER 2019

The webinar will begin shortly...

*Business & Management*  
*60 minute webinar*



Jonathan Swan



# The Macpherson Report

## Lessons for the private sector

Jonathan Swan

# Jonathan Swan

- Director of Training, Operis ([www.operis.com](http://www.operis.com))
- Assignments for DfT, MoD, Ofgem, Ofcom, HM Treasury, NAO
- “Practical Financial Modelling: the development and audit of cash flow models” 3<sup>rd</sup> Edition, Butterworth Heinemann 2015
- “Financial Modelling” ICAEW Special Report 2007
- Chair, Joint Audit Committee, Essex Police, Fire and Crime Commissioner and Essex Police
- Chair, Audit Committee, Essex Fire & Rescue Service

# Background: West Coast Rail Link



- 1996 Virgin Trains awarded 15 year franchise
- 2011 Department for Transport undertakes franchise competition
- 2012 DfT announces award of franchise to First Group
- 2012 Governmental review cancels decision and halts all franchise competitions

# Timeline

|                 |  |   |
|-----------------|--|---|
| 24 March 2011   | prequalification:                                    | First Group<br>Virgin<br>Abellio<br>Keolis/SNCF |
| 20 January 2012 | ITT published  |   |
| May             | bids received  |   |
| June            | bids assessed  |   |
| 20 July         | Virgin informed it was not the preferred bidder      |   |
| 25 July         | DfT CAC selects First                                |   |
| 15 August       | SoS for Transport announces franchise award to First |   |
| 3 October       | SoS cancels the competition following:               |   |

*“the discovery of significant technical flaws in the way the... franchise process was conducted.”*

# The Laidlaw Report

## Inquiry into the lessons learned for the Department for Transport from the InterCity West Coast Competition

Sam Laidlaw, non-executive board member, DfT

- Initial findings report 26 October 2012 (Appendix B to final report)
- Final report 6 December 2012
- Lack of transparency
- Failure to follow own guidelines
- Technical modelling flaws

# Financial and economic modelling

EY engaged to undertake financial modelling analysis:

- GDP Resilience Model (500 stochastic scenarios)
- Ready Reckoner
- Subordinated Loan Facility model
- Elasticity (GDP to revenue)
- Other
  - GDP indices
  - Liquidity ratios



## 5.17 I therefore make the following findings:

- 5.17.1 The GDP Resilience Model used by the DfT to calibrate the Ready Reckoner was inaccurately interpreted as being in nominal rather than real terms;
- 5.17.2 There were further inconsistencies in the use of elasticity factors, which further understated the level of SLF. These flaws meant that bidders were provided with inconsistent and confusing information that prevented them from determining the level of SLF required and the optimal capital structure for their bids;
- 5.17.3 These flaws and inconsistencies resulted in SLF levels that substantially understated the level of SLF required to comply with the DfT's target default rate; and
- 5.17.4 The quality assurance of the GDP Resilience Model was inadequate, particularly considering the importance of the model and its inputs/outputs to the ICWC franchise process.

# The Macpherson Report

The Review of quality assurance of Government analytical models: final report (March 2013)

- Nicholas Macpherson, Permanent Secretary to the Treasury
- Report commissioned by Cabinet Secretary and Head of the Civil Service in October 2012

*“The recent experience with the Intercity West Coast franchise competition underlines the importance of good quality assurance.”*

1. Analysis of current approach to quality assurance using information received from departments
2. Identification of a set of best practice principles for model quality assurance across public and private sectors
3. Recommendations for government

# Recommendations

1. All business critical models... should have appropriate quality assurance of their inputs, methodology and outputs in the context of the risk their use represents. If unavoidable time constraints prevent this happening then this should be explicitly acknowledged and reported.
2. All business critical models... should be managed within a framework that ensures appropriately specialist staff are responsible for developing and using the models as well as quality assurance.

# Recommendations

3. There should be a single Senior Responsible Owner for each model (“Model SRO”) through its lifecycle, and clarity from the outset on how QA is to be managed. Key submissions using results from the model should summarise the QA that has been undertaken, including the level of expert scrutiny and challenge. They should also confirm that the Model SRO is content that the QA process is compliant and appropriate, that model risks, limitations and major assumptions are understood by users of the model, and the use of the model outputs is appropriate.

# Recommendations

4. The Accounting Officer's governance statement within the annual report should include confirmation that an appropriate QA framework is in place and is used for all business critical models. As part of this process, and to provide effective risk management, the Accounting Officer may wish to confirm that there is an up-to-date list of business critical models and that this is publicly available.
5. All departments... should have in place, by the end of June 2013, a plan for how they will create the right environment for QA, including how they will address issues of culture, capacity and capability, and control.

# Government analytical models

- Policy simulation
- Forecasting
- Financial evaluation
- Procurement and commercial
- Planning
- Science-based
- Allocation

# Government analytical models

Met Office: 3 x Cray XC40 supercomputers

- 14 trillion arithmetic operations per second
- 2 petabytes of memory
- 24 petabytes of storage
- 460,000 compute cores (laptop has 4)

Atmospheric model has 1 million lines of code



# ‘Business Critical’

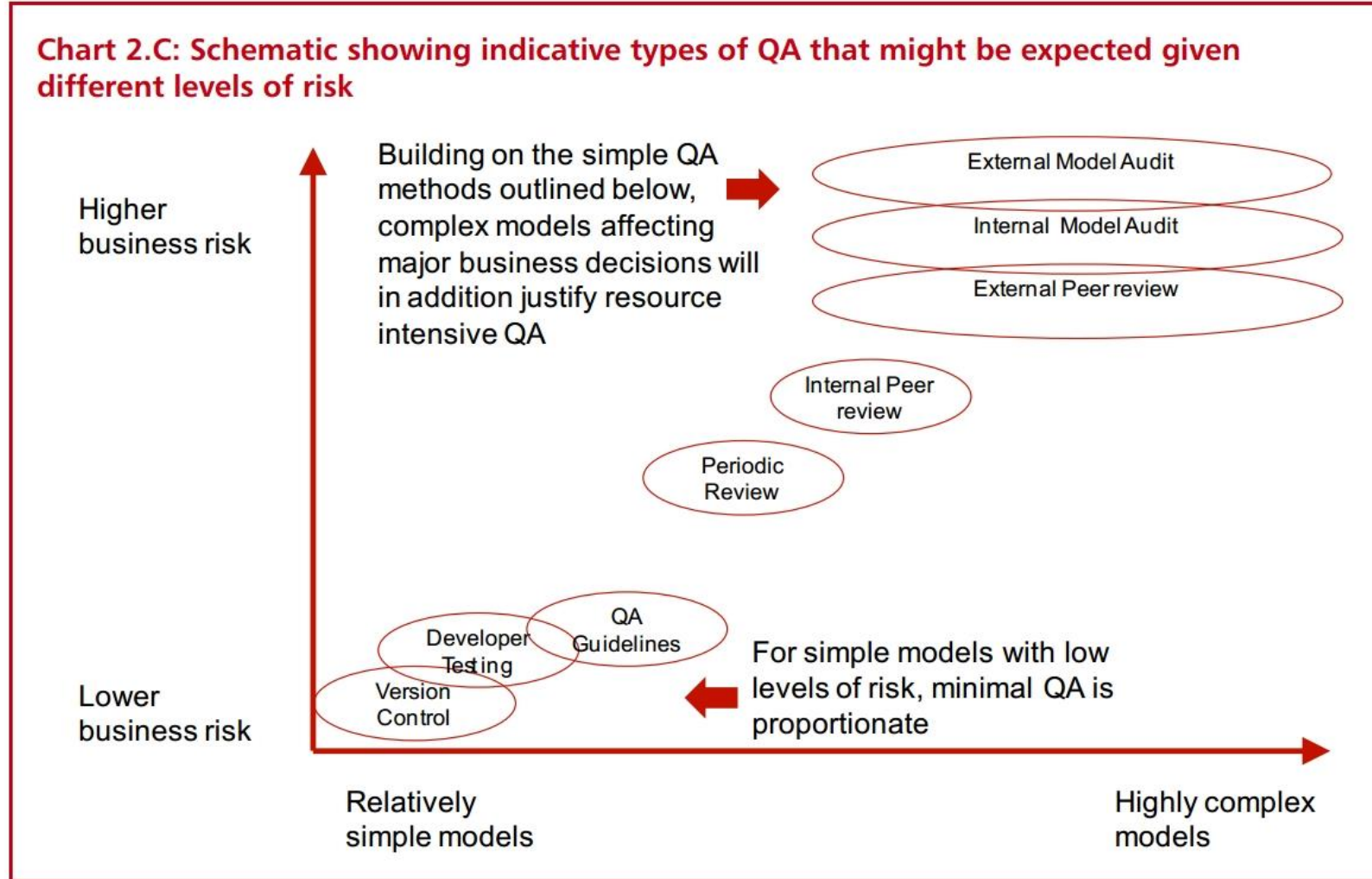
- The extent to which the model drives key financial and funding decisions
- The extent to which it is essential to the achievement of their business plan
- The extent to which error could lead to serious financial, legal or reputational damage

Example: Ofgem – Business Critical Models are defined by the following criteria:

1. The extent to which error in the model can lead to serious financial legal or reputation damage for Ofgem.
2. The extent to which the model is essential for achieving the Ofgem business plan.
3. The financial impact of the model is >£1 million p.a.



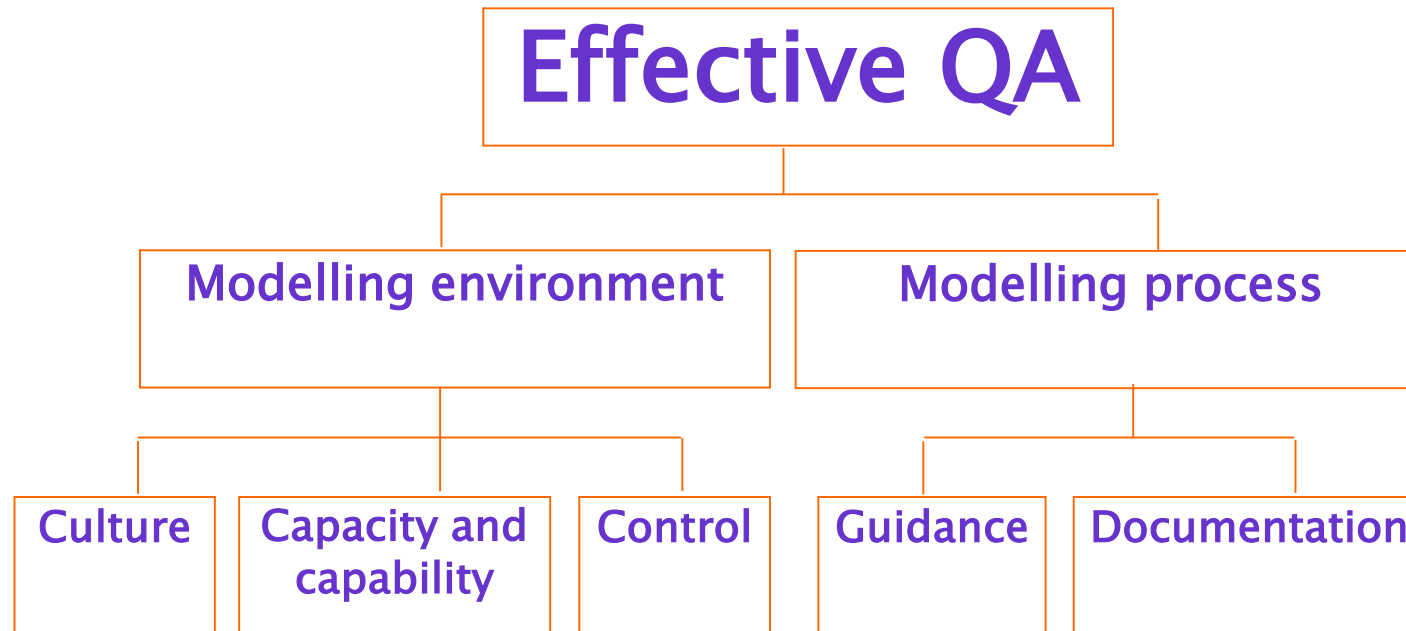
# Types of quality assurance



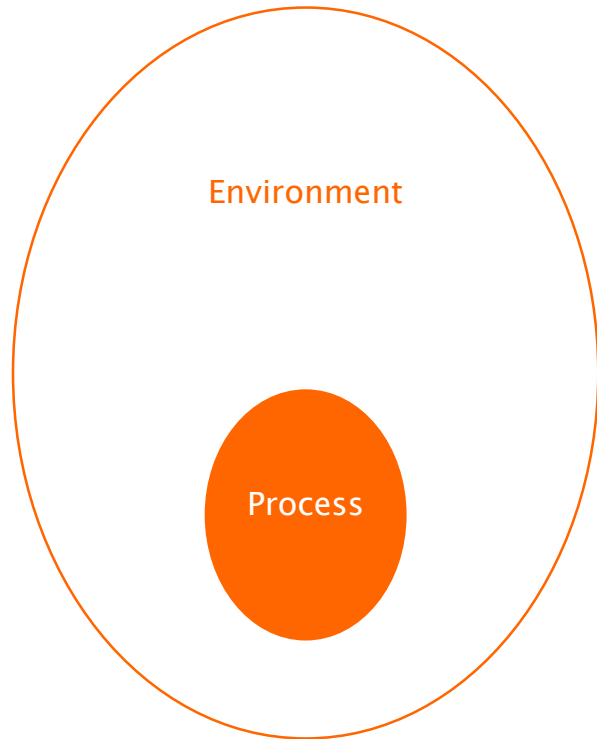
# Types of quality assurance

|                              |   |
|------------------------------|---|
| Developer testing            | Use of a range of developer tools including parallel build and analytical review or sense check;  |
| Internal peer review         | Obtaining a critical evaluation from a third party independent of the development of the model, but from within the same organisation;                        |
| External peer review         | Formal or informal engagement of a third party to conduct critical evaluation, from outside the organisation in which the model is being developed;           |
| Use of version control       | Use of unique identifier for different versions of a model;   |
| Internal model audit         | Formal audit of a model within the organisation, perhaps involving use of internal audit functions;   |
| QA guidelines and checklists | Model development refers to department's guidance or other documented QA processes (eg third party publications);   |
| External model audit         | Formal engagement of external professionals to conduct a critical evaluation of the model, perhaps involving audit professionals;                             |
| Governance                   | At least one of planning, design and/or sign off of model for use is referred to a more senior person. There is a clear line of accountability for the model; |
| Transparency                 | Model is placed in the wider domain for scrutiny, and/or results are published;   |
| Periodic review              | Model is reviewed at intervals to ensure it remains fit for the intended purpose, if used on an ongoing basis   |

# Key elements of quality assurance



# Quality assurance vs quality control



## Quality assurance – *environment*

“...understanding the space in which modelling takes place – the alignment of business concerns and business strategy with the use of models by people at the senior level for decision making...”

## Quality control – *process*

“...is more than simply ensuring adherence to a set of rules, and is far more about creating an appropriate system that ensures that models are being tested and reviewed...”

# People

Roles around the development process

- Senior responsible officer
- [Compliance officer]

Roles within the development process

- Model developers
- Model users
- Model customers

# Protocols and standards

## Public sector

Treasury Green Book (Appraisal and evaluation in central government)

Treasury Aqua Book (Guidance on producing quality analysis for government)

HMRC checklist

MoD JSP 507

DfT WebTAG

Ofgem Model Checklist

BEIS QA Template

## Private sector

Operis

ICAEW financial modelling guide

FAST

BPM

BP EEM

SMART

# Examples

- ODPM Housing PFI Financial Model
- Ofgem RIIO price control model

# Conclusions

- Focus on quality assurance – the modelling environment
- Appoint the model SRO
- Appoint the compliance officer
- Select a methodology – and use it, *with appropriate quality controls*
- Train the non-modellers about models (*not* how to model)



# Questions



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*Practical Excel tips*  
2 December

## **Free 20 minute webinars – 12.30pm**

*Learning for your future*  
22 January

*Secrets of a successful CV*  
12 February

## **Free evening events – 6.00pm**

*Resilience and fortitude*  
26 November

# *Business & Management*

## **THANK YOU FOR ATTENDING**

Contact the Business & Management Faculty

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