ofgem Making a positive difference for energy consumers

RIIO-GD2 Cost Assessment Working Group

Meeting 8

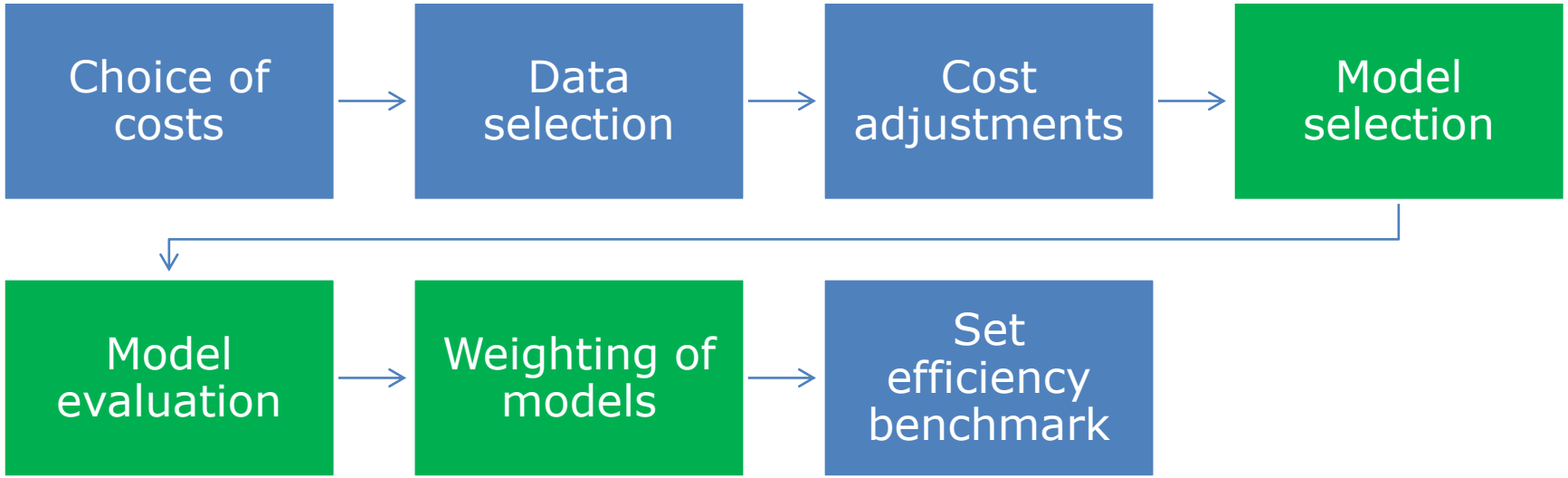
Ofgem
April 2019

BPDT Discussion

Modelling approach

Model selection, evaluation
and weighting

Approach to econometric benchmarking



Model selection

We should develop models that:

1. are consistent with engineering, operation and economic understanding of cost drivers
2. are sensibly simple (without pursuing simplicity for its own sake)
3. capture only the main cost drivers, to allow for a robust and stable estimation of the underlying relationship

We will take into account:

- Learnings from RIIO-1
- Industry feedback
- Expert advice

Model evaluation

Level of importance	Tests	
Very high	• Consistency with policy and other parts of the price control	• Jointly statistical significant (F-test) • Overall goodness of fit
High	• Consistency with a priori expectations of magnitude and signs of coefficients	• Data availability • Predictability power of the model • RESET test
Medium	• Sensitivity to: (i) removal/addition of a year (ii) changes in adjustment for regional labour costs (iii) introduction of time trend (iv) the removal of the most/least efficient company (v) introduction of quadratic or RE components	• Statistical significance of individual parameters (t-test) • Tests of pooled OLS versus random effects models – Breusch-Pagan LM test for random effects • Transparency of results/ease of interpretation • Stability of efficiency rankings and inefficiency range • Pooling test
Low	• Multicollinearity tests, linearity, homoskedasticity, normality	• Hausman test for fixed effects, comparison with current price control efficiency rankings

Model weighting

RIIO-GD1	• 50% top-down • 50% bottom-up
RIIO-ED1	• 25% top-down totex, 25% bottom-up totex • 50% bottom-up (disaggregated model)
Ofwat PR19	• "Triangulation" process • Non-statistical approach, equal weights applied to all models at given level of aggregation

Questions to consider

Topic	Question
Model selection	1. Do you have additional views on new cost drivers or changing particular CSVs?
Model evaluation	2. Do you have strong reasons to change the range of statistical tests used for assessing models? 3. Are there other tests we should be considering?
Model weighting	4. Do you have views on whether a statistical approach could be used to determine model weights? 5. In what situations could there be justification for applying different weights to top-down and bottom-up approaches? (other than 50/50) 6. What else could a middle-up approach look like?

Topics for further discussion

Cost adjustments (including regional cost factors)

- Responses generally unsupportive of 'symmetrical' approach
- Process for identifying downward adjustments
- High evidential bar, materiality threshold
- Sharing of cost adjustment claims
- Alternative approach to sparsity index

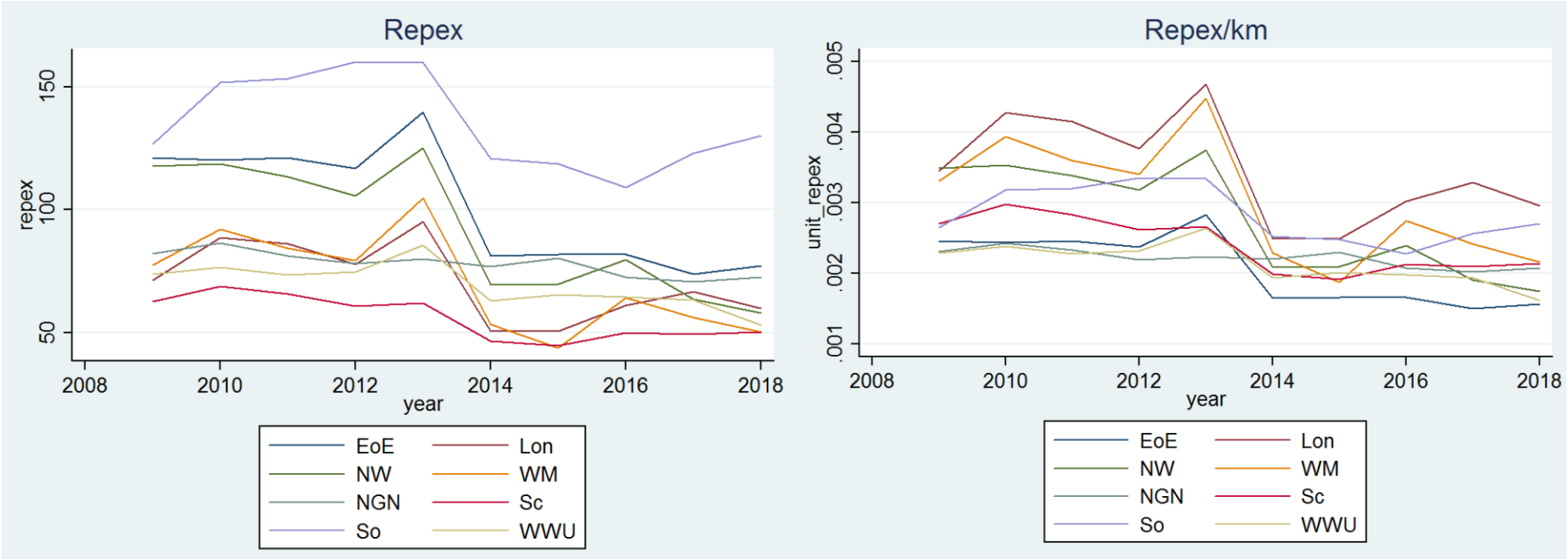
Efficiency benchmark

- ED1 v GD1 approach
- Confidence in benchmarking
- What is the case for departing from the UQ approach?

Updating Synthetic Unit Costs

Repex, Mains Reinforcement and Connections

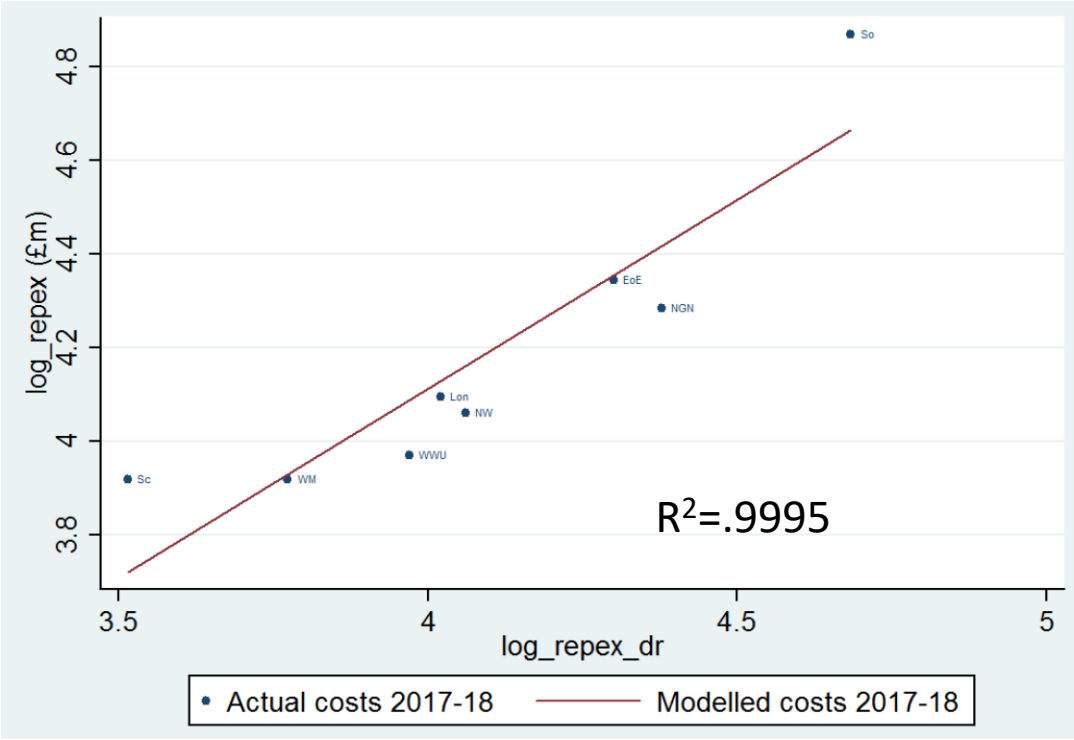
Repex over time



Note. Network length data from RRPs

- GDPCR1: Total mains c/f (tab 3.14 Mains&Governors, cell M14)
- RIIO-GD1: Total in-service mains c/f (tab 6.2 Network Assets, cell Q23)

Repex Regression – RIIO-GD1 actuals



gdn	normalised actual costs	modelled costs	ranking
EoE	77.03	77.73	6
Lon	59.93	62.01	4
NGN	72.43	82.74	1
NW	57.92	64.08	3
Sc	50.30	41.25	7
So	130.15	105.93	8
WM	50.30	50.81	5
WWU	52.97	59.55	2

Note. £m, 2009-10 prices.

- Regression on 5 years of actual data
- Synthetic unit costs as in RIIO-GD1

Remarks

- Sc and So repex include capitalised replacement
- Is So an outlier?

Synthetic unit costs – preliminary work

Unit Costs

- Data from RRPs (2013-14 to 2017-18)
- Unit costs for each GDN and each year

GDN's weighted average

- For each year, unit costs multiplied by the share of total laid
- Then, sum of the components to obtain a weighted average for the GDN over the 5 years

Updated synthetic cost

- A weighted average of the GDNs' weighted averages
- Same synthetic unit costs for all GDNs

Remarks:

- Does the approach reflect what was done in RIIO-GD1?
- This analysis does not account for regional factors
- WIP: some synthetic unit costs not updated yet

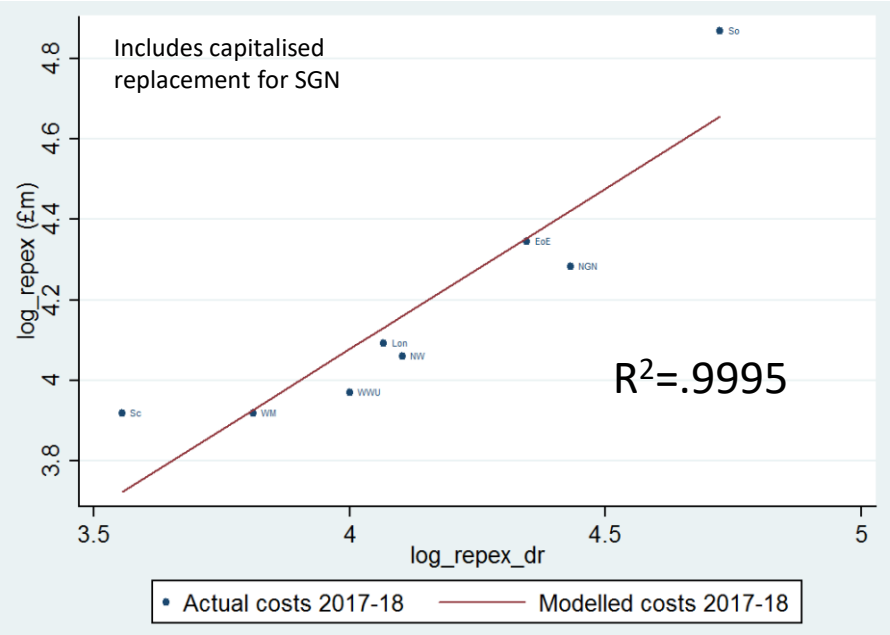
Synthetic unit costs – preliminary work

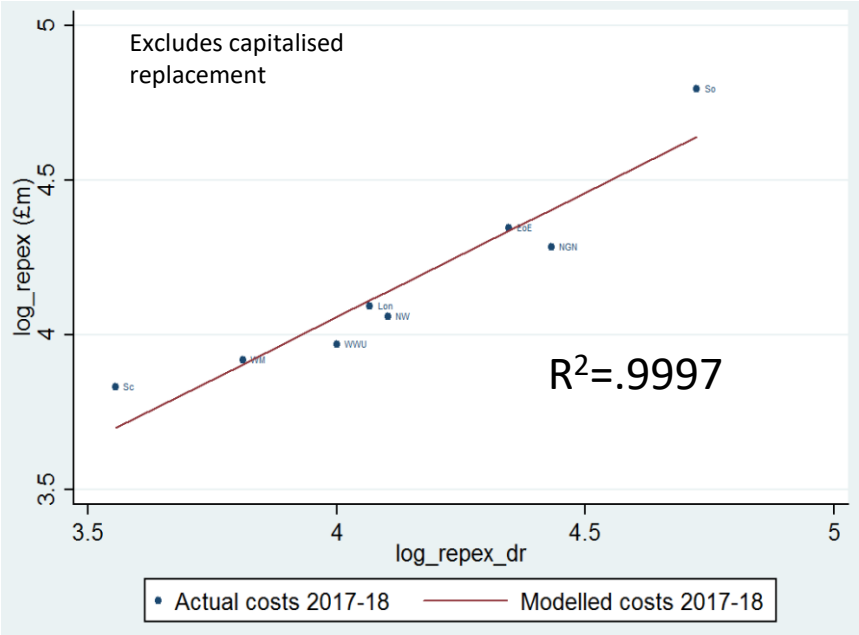
Mains - laid size	Synthetic (£/m)	Updated Synthetic (£/m)
<=75mm	79.81	79.63
>75mm to 125mm	88.75	99.00
>125mm to 180mm	147.73	151.11
>180mm to 250mm	250.95	280.77
>250mm to 355mm	338.44	338.55
>355mm to 500mm	502.37	421.03

Services	Synthetic (£/m)	Updated Synthetic (£/m)
Domestic - relay	536.86	572.65
Domestic - test and transfer	194.82	367.38
Non-domestic	1904.00	1370.24

Note. 2009-10 prices.

Repex regression – RIIO-GD1 actuals, updated synthetic costs





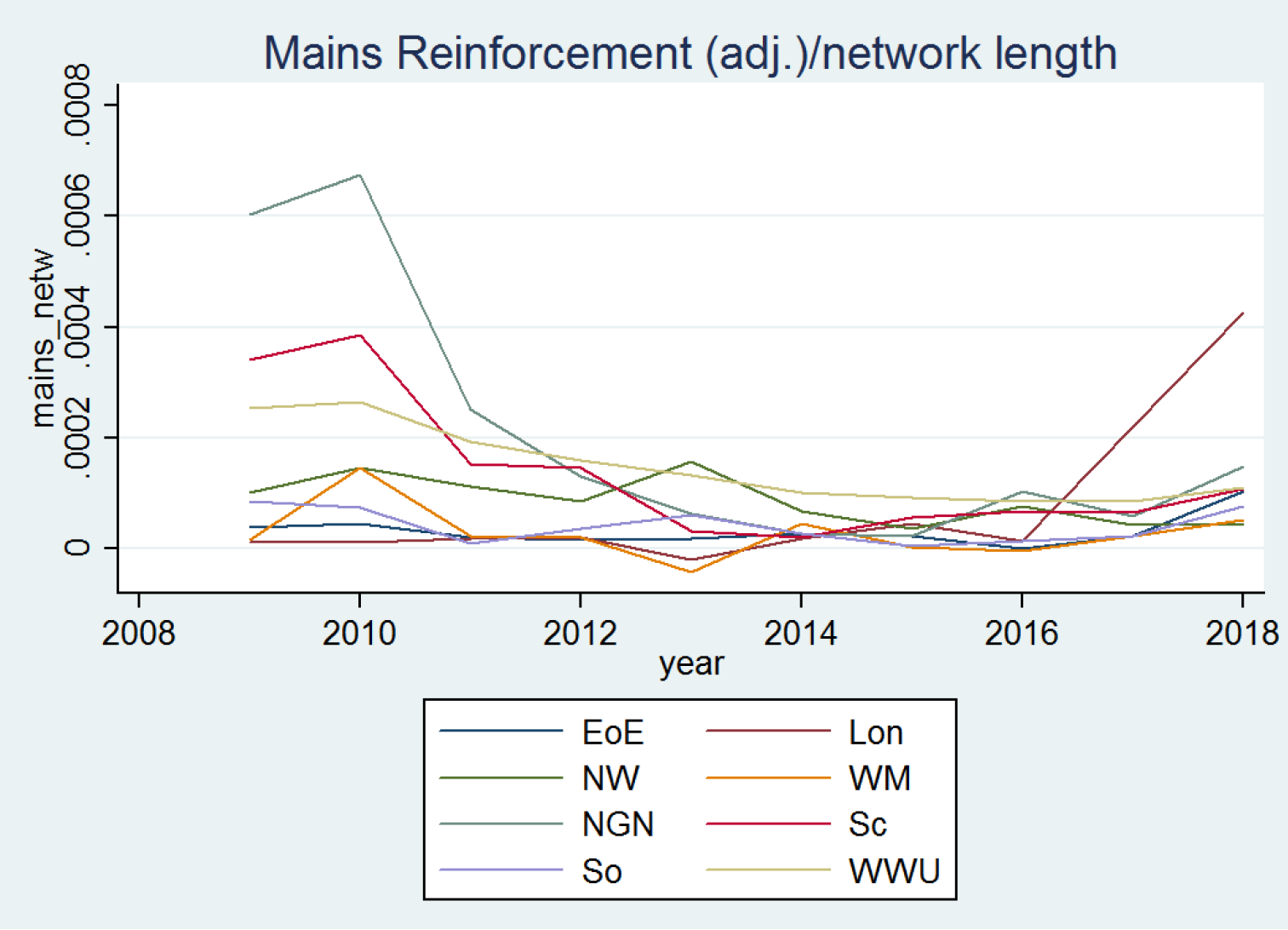
	With Cap. Rep. for SGN			Without Cap. Rep.	
gdn	normalised actual costs	modelled costs	ranking	normalised actual costs	modelled costs
EoE	77.03	77.82	5	77.03	76.36
Lon	59.93	62.26	4	59.93	61.00
NGN	72.43	83.28	1	72.43	81.76
NW	57.92	64.09	3	57.92	62.80
Sc	50.30	41.41	7	46.13	40.45
So	130.15	105.20	8	120.80	103.45
WM	50.30	50.78	6	50.30	49.67
WWU	52.97	59.06	2	52.97	57.84

Note. £m, 2009-10 prices.

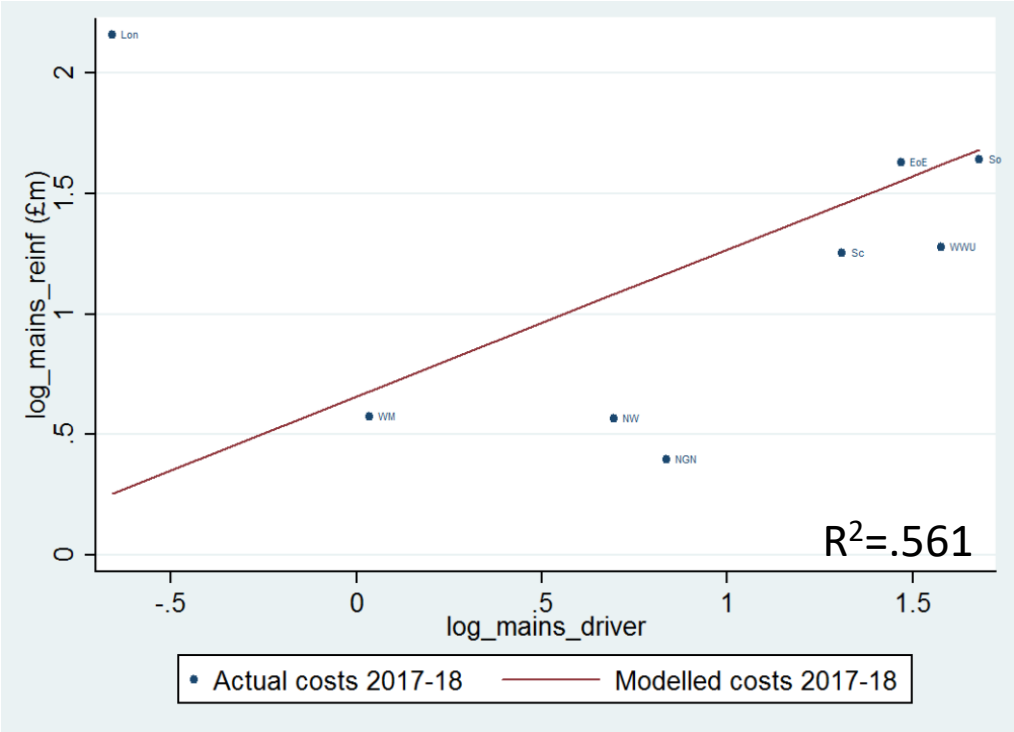
Questions

- What the very high R^2 is telling us?
- What could be an alternative driver?
- How to explain the high variation of synthetic unit costs for services?

Mains Reinforcement over time



Mains Reinforcement – RIIO-GD1 actuals, updated synthetic unit costs



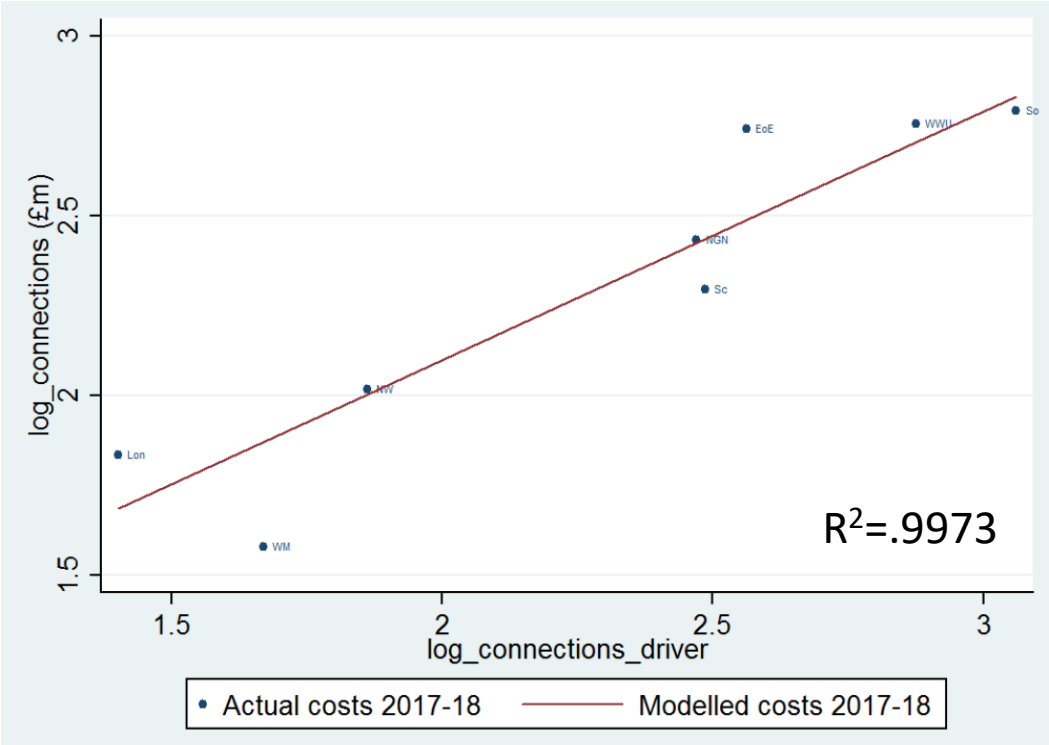
gdn	normalised actual costs	modelled costs	ranking
EoE	5.10	4.73	7
Lon	8.66	1.29	8
NGN	1.49	3.21	1
NW	1.76	2.95	2
Sc	3.50	4.29	4
So	5.16	5.38	6
WM	1.78	1.97	5
WWU	3.58	5.05	3

Note. £m, 2009-10 prices.

Remarks

- Updated synthetic unit costs are very different from the ones used in RIIO-GD1
  - <=180 mm: 138 £/m vs. 224 £/m
  - >180 mm: 254 £/m vs. 530 £/m
- Poor model performance
- Data issues to be solved?

Connections – RIIO-GD1 actuals, inclusion of Fuel Poor Connections



gdn	normalised actual costs	modelled costs	ranking
EoE	15.52	12.03	8
Lon	6.25	5.40	7
NGN	11.39	11.29	4
NW	7.51	7.41	5
Sc	9.92	11.41	2
So	16.31	16.98	3
WM	4.85	6.50	1
WWU	15.71	14.94	6

Note. £m, 2009-10 prices.

Remarks

- Synthetic unit costs updated at a higher level
  - mains: .09 £m/km vs. .85-.140 £m/km
  - services: .0012 £m/unit vs. .0005-0015 £m/unit
- Need to work on more detailed synthetic unit costs – suggested approach?

Summary

Summer consultation paper

- Our current thinking on cost assessment for RIIO-2
- Scoping, developing and testing cost assessment methodologies
- Particular focus on:
  - Econometric modelling techniques
  - Regional factors
  - Real price effects
  - Business support costs
- We will consider consultant findings and analysis

Future CAWGs

	Possible topics	Presentations
CAWG 9 **May 2019**	• Regional factors • Modelling – discussions/presentations following on from CAWG 7 and 8 modelling topics	• TBC • TBC – **Does anyone have any suggestions for specific regression topics/questions that we can revisit in more detail in May?**

- CAWG 9, Thursday 9th May, London
- Meeting time to be confirmed depending on length of agenda
- **Early June CAWG?**

Summary

Any other business

Action items

ofgem Making a positive difference for energy consumers

Our core purpose is to ensure that all consumers can get good value and service from the energy market. In support of this we favour market solutions where practical, incentive regulation for monopolies and an approach that seeks to enable innovation and beneficial change whilst protecting consumers.

We will ensure that Ofgem will operate as an efficient organisation, driven by skilled and empowered staff, that will act quickly, predictably and effectively in the consumer interest, based on independent and transparent insight into consumers' experiences and the operation of energy systems and markets.

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