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Update on RIIO-ED1 ongoing efficiency gains

1. This report, commissioned by SP Energy Networks (SPEN), comments on Ofgem's proposal to adjust SPEN's allowed total expenditure by deducting from it Ofgem's estimates of savings to SPEN related to smart grids and smart metering, and which are in addition to the 1 per cent assumption made representing ongoing efficiency gains.

Relevance of smart grids and smart meters to SPEN's ongoing efficiency assumption

2. In its RIIO-ED1 business plan submitted to Ofgem, SP Energy Networks proposed to set ongoing efficiency gains of 1 per cent a year across all expenditure categories. In its Draft Determinations, Ofgem accepted this assumption.

3. The 1 per cent target is at the top end of the productivity measures calculated on the basis of the EU KLEMS datasets. These datasets contain information based on National Accounts and other research which allow measures of productivity growth to be calculated, by sector and over time. We prepared a report for SPEN with our findings from that analysis in June 2013; the report was included within the business plan SPEN submitted to Ofgem in July 2013.[1]

4. Ofgem also drew on the EU KLEMS data to set the ongoing efficiency assumption for the price control for gas distribution and transmission (RIIO-GD1/GT1). It decided then to set a productivity assumption for opex at 0.7 per cent, and for capex/repex at 1 per cent.[2] Ofgem has stated that that assessment also applies to the electricity distribution sector.

5. SPEN has told us that a factor contributing to its target for efficiency gains over ED1 are efficiency improvements associated with the use of smart solutions.

6. SPEN's business plan reported the savings associated with using smart solutions rather than 'conventional' solutions across a number of load-related schemes. SPEN reports these savings to be £39 million, relating to 13 different schemes.[3] SPEN told us that, in addition to this, SPEN's business plan also reflects the costs savings from

[1] Our report was submitted as part of Annex 6.m of SPEN's business plan, with the title "Historical data comparable to RIIOEDI ongoing efficiency gains".
[2] Ofgem (2012) "RIIO-T1/GD1: Real price effects and ongoing efficiency appendix", 17 December 2012, page 21.
[3] SP Energy Networks (2014) "SP Energy Network 2015-2023 Business Plan, Updated March 2014, Annex Smart grid strategy – Creating a network for the future", pages 24–25.

adopting smart solutions in other schemes, which refer to asset replacements and are not load-related. SPEN told us it estimates those additional savings to be £32 million.

7. We think it plausible that, over the course of the eight-year price control period, SPEN will uncover other opportunities, other schemes, in which it is more cost effective to adopt smart solutions rather than 'conventional' ones. Some of these opportunities will be ones that SPEN is not currently aware of. This could be because there are opportunities that have not yet arisen, or because they are ones where SPEN is not aware smart solutions can be applied.

8. The efficiency gains from applying smart solutions to such schemes over the price control period are part of the efficiency gains that the 1 per cent ongoing efficiency target is intended to capture.

9. Ofgem has proposed to make a smart grid adjustment to the total expenditure submitted by DNOs in their business plan. The adjustment reflects the savings that Ofgem considers are possible for DNOs to make during the price control period from the use of smart grids and smart meters, further to those that DNOs identify in their own business plan. It is intended to reflect Ofgem's view of the savings that the efficient use of smart grid and smart meters could achieve. The smart grid adjustment Ofgem proposes to make across all DNOs is £536 million; the adjustment is £396 million if WPD (who was fast-tracked by Ofgem in its price control assessment) is excluded. The adjustment accounts for 2.1 per cent of the total expenditure in the revised business plans DNOs, other than WPD, submitted for Ofgem's slow-track assessment.[4] In the case of SPEN the adjustment is 2.8 per cent.

10. The magnitude of the smart grid adjustment Ofgem proposes to make plan is equivalent to requiring DNOs to make an annual efficiency saving of just under 0.5 per cent in each of the eight years of the price control period.[5] Ofgem's smart grid adjustment for SPEN is equivalent to requiring it to make ongoing efficiency gains of 0.6 per cent in each year.

11. Coupled with the 1 per cent efficiency target that Ofgem has accepted for SPEN the smart grid adjustment implies a requirement for SPEN to attain a 1.6 per cent year-on-year efficiency gain, and 1.5 per cent on average for other DNOs excluding WPD.

12. A 1.5 per cent annual efficiency growth is more challenging than the average growth of value-added TFP for 80 per cent of the sectors reported in EU KLEMS for the period from 1994 to 2009, and higher than two thirds of the sectors when the average is taken over a longer period, from 1980 to 2009.

13. Even if the smart grid adjustment proposed by Ofgem represents 'catch-up' rather than a contribution to the 'frontier shift', comparing the implied 1.5 per cent efficiency requirement with the findings from the EU KLEMS is reasonable as the productivity growth measures estimated from EU KLEMS data include an element of frontier shift and average 'catch up' within each of the sectors. The EU KLEMS data

[4] Ofgem (2014), "RIIO-ED1: Draft determinations for the slow-track electricity distribution companies Business plan expenditure assessment", 14 July 2014, Table 2.5.

[5] We have assumed that the efficiency saving would start to apply from 2015/2016.

for the UK are aggregates over sectors, which, at any one time, will comprise efficient and less efficient companies. Thus, productivity gains estimated from that data include an element of average catch-up.

SPEN's ongoing efficiency assumption in the light of historical productivity data

14. We replicate below some of the figures included in our June 2013 report, summarising our analysis of the EU KLEMS dataset.

Figure 1 Comparison of average value added total factor productivity growth rates by different averaging periods

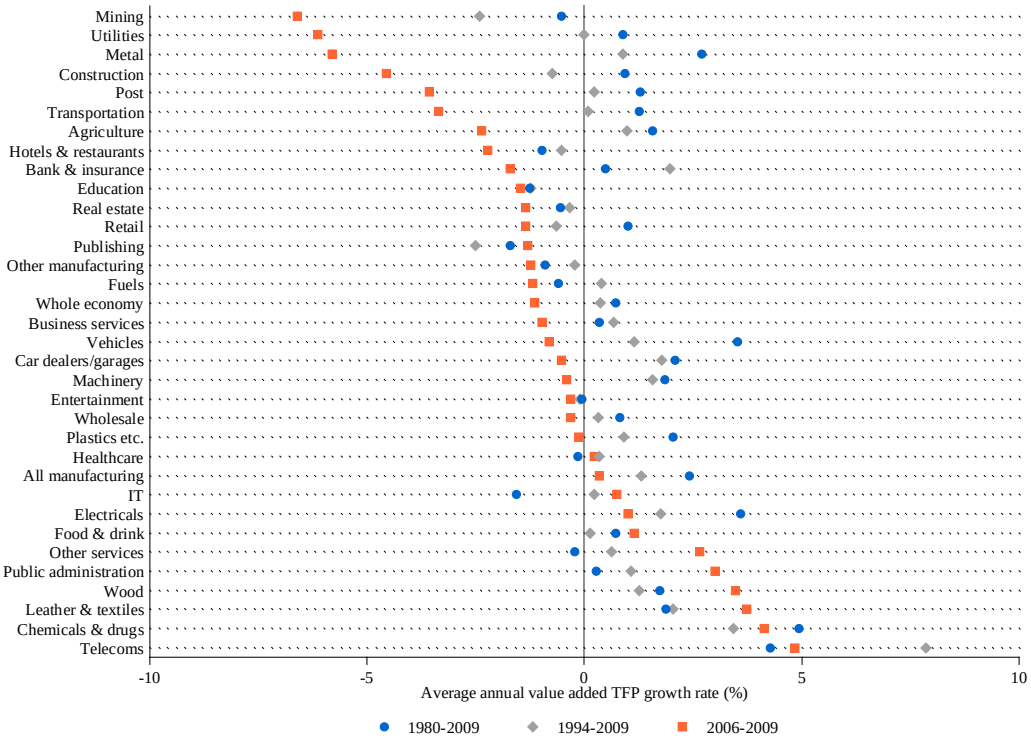
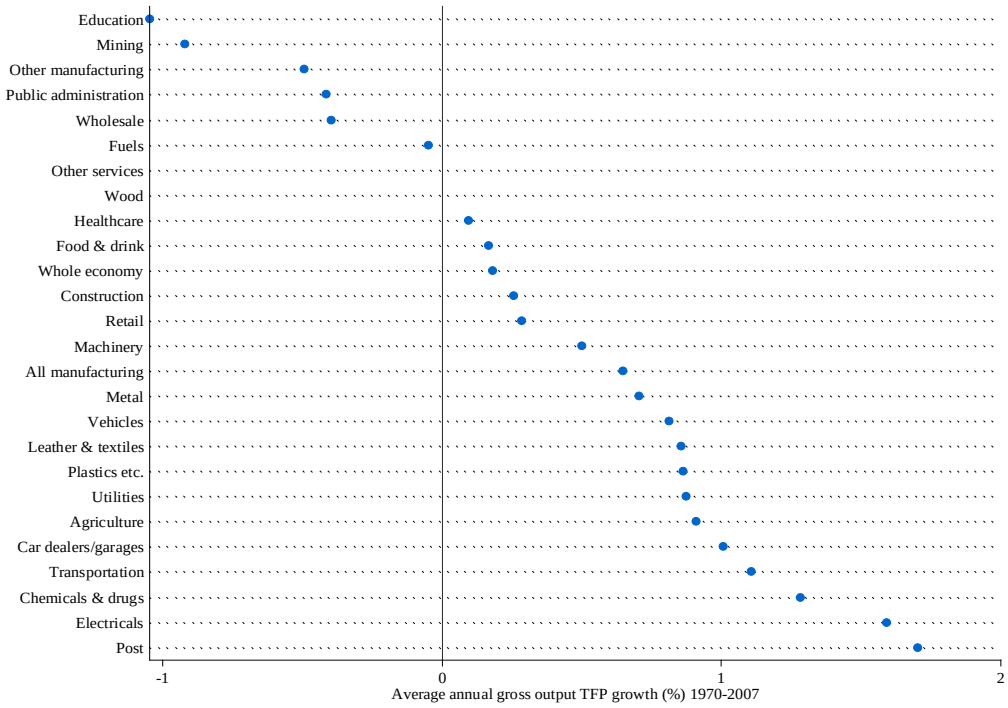


Figure 2 Average gross output total factor productivity growth by sector 1970–2007



15. Headline value-added total factor productivity estimates from the latest EU KLEMS dataset:

	Share of economy 2009	Ongoing efficiency 2006–2009	Ongoing efficiency 1994–2009	Ongoing efficiency 1980–2009	Ongoing efficiency 1980–2007
Agriculture	0.6%	-2.4%	1.0%	1.5%	1.8%
Bank & insurance	10.1%	-1.7%	1.9%	0.5%	0.8%
Business services	11.8%	-1.0%	0.7%	0.3%	0.7%
Car dealers/garages	1.7%	-0.5%	1.7%	2.0%	2.5%
Chemicals & drugs	1.7%	4.0%	3.3%	4.7%	4.7%
Construction	7.0%	-4.8%	-0.7%	0.9%	1.5%
Education	6.8%	-1.6%	-1.3%	-1.3%	-1.2%
Electricals	1.0%	1.0%	1.7%	3.5%	3.6%
Entertainment	1.5%	-0.3%	-0.1%	-0.1%	0.1%
Food & drink	1.8%	1.1%	0.1%	0.7%	0.6%
Fuels	0.1%	-1.5%	0.3%	-0.6%	-1.0%
Healthcare	7.9%	0.2%	0.3%	-0.2%	-0.1%
Hotels & restaurants	2.8%	-2.3%	-0.5%	-1.0%	-0.8%
IT	2.6%	0.7%	0.1%	-1.8%	-1.8%
Leather & textiles	0.3%	3.6%	2.0%	1.8%	1.8%
Machinery	0.7%	-0.5%	1.5%	1.8%	1.9%
Metal	1.3%	-6.2%	0.9%	2.6%	3.5%
Mining	2.1%	-7.1%	-2.5%	-0.5%	0.0%
Other manufacturing	0.7%	-1.3%	-0.2%	-0.9%	-0.6%
Other services	1.4%	2.6%	0.6%	-0.2%	-0.6%
Plastics etc.	0.7%	-0.1%	0.9%	2.0%	2.3%
Post	0.7%	-4.1%	-1.3%	0.2%	0.7%
Public administration	5.4%	2.9%	1.1%	0.3%	0.0%

	Share of economy 2009	Ongoing efficiency 2006–2009	Ongoing efficiency 1994–2009	Ongoing efficiency 1980–2009	Ongoing efficiency 1980–2007
Publishing	1.7%	-1.3%	-2.6%	-1.8%	-1.6%
Real estate	7.2%	-1.4%	-0.3%	-0.5%	-0.5%
Retail	5.4%	-1.4%	-0.7%	1.0%	1.2%
Telecoms	1.9%	4.6%	7.3%	4.1%	4.2%
Transportation	4.2%	-3.5%	0.1%	1.2%	1.8%
Utilities	2.9%	-6.5%	0.0%	0.9%	1.6%
Vehicles	0.8%	-1.3%	1.0%	3.3%	3.8%
Wholesale	3.9%	-0.3%	0.3%	0.8%	1.1%
Wood	0.9%	3.4%	1.3%	1.7%	1.5%
Whole economy	100.0%	-1.2%	0.4%	0.7%	0.9%

SPEN's ongoing efficiency assumption in the light of Ofgem's views in RIIO-ED1 and RIIO-GD1

16. In its RIIO-RD1 Draft Determinations for slow-track companies, Ofgem said that, for RIIO-GD1 and RIIO-T1 it had drawn on productivity data from the EU KLEMS database to develop an ongoing efficiency assumption, and that it considered this approach to also apply to the electricity distribution sector, both in its fast-track and in its slow-track assessment of DNOs. In line with this, Ofgem did not publish updated analysis of EU KLEMS data for RIIO-ED1.

17. Ofgem's December 2012 final proposals for gas distribution and for gas and electricity transmission sets out the analysis it carried out of EU KLEMS and the conclusions it drew for setting its ongoing efficiency assumption. Ofgem said:[6]

> 3.3. Specifically, as at IP, we draw the following conclusions from the comparator sector data set out in Table 2.1 below:
>
> A one per cent improvement in opex efficiency based on partial factor productivity measures (ie labour, and labour and intermediate inputs) for the industry averages (which range from 2.8 to 0.5 per cent p.a.). Our assumption of one per cent is also in line with network company assumptions.
>
> A 0.7 per cent improvement in capex and repex efficiency which is at the top-end of the estimates for total factor productivity (TFP) for construction, our principal comparator, but below the average TFP for other industries.

[6] Ofgem (2012) "RIIO-T1/GD1: Real price effects and ongoing efficiency appendix", 17 December 2012.

18. Table 2.1 in that Ofgem document shows averages over the period 1970 to 2007 of the estimates, based on EU KLEMS datasets, of measures of annual growth in productivity for a number of sectors.

19. A notable feature of the data in Ofgem's table 2.1 is that the gross-output measures are generally lower than the value-added measures. For construction, the highest gross-output measure is 0.4 per cent and the highest value-added measure is 0.7 per cent. For averages across all sectors, the highest value-added figure is 1.5 per cent, and the highest measure based on gross output is 0.8 per cent. In its initial proposals, Ofgem had reviewed the arguments in support of using gross output or value added measures as the basis for the ongoing efficiency assumptions, and states that it draws on both measures in coming to its decision.[7]

Risks in comparing ongoing efficiency indices on historical productivity data

20. We identified in our June 2013 report a set of risks that arise when comparing measures of historical productivity gains with the ongoing efficiency indices submitted as part of RIIO-ED1 business plans. Those risks have not gone away, and should be borne in mind when drawing on historical productivity data. We set out below the risks we identified then and which we think still hold true.[8]

21. Some of the potential biases that we have identified would tend to lead to measures of productivity gains for UK economic sectors which are greater than plausibly achievable ongoing efficiency gains for activities of electricity distribution network operators. These include:

    (a) Data for UK economic sectors are aggregates over sectors, which, at any one time, will comprise efficient and less efficient companies. Thus, reported productivity gains in UK economic sectors include an element of average catch-up, whereas there is no such catch-up element in the ongoing efficiency indices.

    (b) Ongoing efficiency indices apply to all costs, including purchased-in services, materials and energy and the relevant outputs are network investments and network operation services which are akin to gross output. Thus, the relevant comparator measures of productivity are gross output measures, which are systematically lower than value-added measures. Much of the available data for UK economic sector is on a value-added basis; in particular the latest EU KLEMS data are only available on a value-added basis.

    (c) Research shows that sharp falls in reported productivity in 2008–2009 might not be fully explained by ordinary spare capacity or labour hoarding features in a recession. Given that an intrinsic loss of efficiency is unlikely (new technologies or working practices do not get de-invented), it is possible that the explanation of this productivity puzzle rests in part on the sudden unwinding of accumulated

[7] Ofgem (2001) "RIIO-T1/GD1: Initial proposals – Real price effects and ongoing efficiency appendix", 27 July 2012, pages 19–22.

[8] Further to these, we note the debate on the impact of the recession on the trend of TFP growth in the economy a whole going forward. See, for example European Commission (2014) "European Economic Forecast Winter 2014, European Economy 2|2014", pages 31–34;" Office for Budget Responsibility (2011) "Economics and fiscal outlook", November 2011; Institute for Fiscal Studies (2014), "The IFS Green Budget".

defects in the data, perhaps in difficult areas such as the measurement of output quality, labour quality or services from capital. If this is the explanation, then the productivity gains in UK economic sector up to 2007 have in all likelihood been overstated.

22. Against these, there are features that might cause some measures of productivity gains for UK economic sectors to be understated, and which explain instances of negative productivity gains in the data which would probably not apply to ongoing efficiency gains for notionally efficient activities of electricity distribution network operators. These include:

(a) Spare capacity due to falls in demand or other market fluctuations could explain temporary bleeps (although they do not appear to explain the full magnitude of the recent falls in reported productivity). Whilst sharp and unexpected falls in demand for capital expenditure activities of electricity distribution network operators are, in principle, possible, we think that it is unlikely to be appropriate to take such effects into account in the context of a business plan for a period where electricity distribution network operators are expected to invest in smart grids and other projects related to low-carbon objectives.

(b) The macro-economic data shows continued growth in capital employed in the face of falling demand in many sectors, particularly in recent years, which leads to measured falls in productivity. It is possible that the investment is being undertaken in new products or services (for which there is no demand yet), so that timing mismatch between capital and outputs might be distorting productivity data. Such a mismatch is less likely to occur in respect of the six areas of activity to which ongoing efficiency indices would apply (since the outputs for these six areas of activity are well defined and might not permit much product innovation).