The 2007 Gas Distribution Price Control Review:

Top-down Analysis of the Scope for Real Terms Cost Reductions – A Follow-up Note

Prepared for the GDNs

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www.first-economics.com

First Economics Limited

Registered office: 48 Westway Gardens, Redhill, Surrey RH1 2JB
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Executive Summary

- This short note contains further arguments and evidence on the rate of frontier shift affecting the gas distribution networks (GDNs).

- It begins by examining the foundations for Ofgem's assumption that there will be a 1.6% real terms reduction in leading GDNs' opex in the period to 2013. We find that Ofgem's bottom-up methodology is a perfectly valid way of estimating future cost trends, but that there are problems with the productivity assumptions on which the calculations are based.

- The first of these problems is an error in the advice that Ofgem has received from Reckon on 'capital-adjusted labour productivity growth'. We show that Reckon's calculations effectively assume that all historic growth in total factor productivity is attributable to reductions in the labour force alone. This is unrealistic and we do not think that Ofgem can rely upon this novel concept in its proposals.

- The second problem concerns the interpretation of the data. After correcting for Reckon's error, we essentially endorse the conclusion that Ofgem reaches in its updated proposals – i.e. that analysis of productivity trends in comparator sectors could be used to support a wide range of assumptions about future GDN productivity growth. We do not think this provides an acceptable basis for a regulator to set an efficiency target. The margin of error in Ofgem's analysis is so high that its frontier shift assumption becomes little more than a matter of guesswork.

- In these circumstances we consider that it is quite wrong for Ofgem to reject the analysis contained in our April 2007 report. We understand that the reluctance to use our frontier shift assumptions boils down to four key concerns:

    - first, a worry that the price indices in the April 2007 report might incorporate significant growth in profits over time and thereby overstate the change in underlying costs; and
    - second, a similar issue with the impact that growth in capital employed can have on costs and prices;
    - third, perceived difficulties in comparing the producer of an intermediate output with firms that sell directly to household customers; and
    - fourth, the difficulty that Reckon have reconciling the trend in First Economics indices with data on annual growth in hourly wage rates.

- The concern about profit growth is a red herring. A reduction in the economy-wide cost of capital since the late 1990s and the increasing competitiveness of the UK economy makes it difficult to believe that profits have risen more quickly than costs. Indeed, we are able to use Reckon's data on profits to show that profit margins have fallen since 1998, implying that the trend in prices slightly understates the trend in costs.

- We accept that growth in capital employed is a potential issue, albeit one that Ofgem also has to grapple with in its methodology (although not through Reckon's capital-adjusted labour productivity metric). Our way of allowing for capital growth has been to include a capital substitution effect in our calculations. Although the adjustment is somewhat arbitrary, we are convinced that it is more than sufficient to deal with the distortion and note that Ofgem largely accepted that this was the case in its initial proposals.

- The third point is not one that we understand. Although GDNs do not sell their services directly to households we can think of no reason why the trend in GDN opex cannot be

benchmarked against firms that do, provided that the nature of their cost bases is broadly similar.

- The final concern is one that Reckon themselves answer in their report. Hourly wage rates are just one determinant of unit costs – when one considers bonuses, training expenditure, R&D, utility costs, business rates, rents, redundancy and restructuring costs and a whole host of other factors, there are all manner of reasons why costs might increase more quickly than hourly wage rates. We would highlight, in particular, bonuses and redundancy/restructuring costs as two specific items of expenditure which might be expected to increase more rapidly during periods of high productivity growth but which Ofgem has not yet factored into its analysis.

- After comparing the robustness of our work with the robustness of the Ofgem/Reckon analysis, we have no hesitation in again putting forward our top-down analysis as giving the best available insights into the rate of frontier shift affecting the GDNs. We believe that we are able to deal with all of the points that Ofgem and Reckon have raised, and we know that our work consistently comes up with the same results no matter what way one looks at the cost trends. Ofgem, by contrast, has been misled by Reckon in certain areas and is forced to choose its frontier shift assumption from a very wide range of possible alternatives.

- We therefore believe that we have shown successfully that it would be wrong to expect the GDNs as an industry to go on reducing opex in real terms indefinitely – i.e. to out-perform the rate of productivity improvement and input price control exhibited by the firms whose goods and services appears in the basket – and we have not seen any convincing evidence from Ofgem to contradict this.

Introduction

This note gives an independent assessment of the 'frontier shift' assumptions contained in Ofgem's September 2007 gas distribution price control proposals. It is structured into two main parts:

- in section 2 we examine the foundations for Ofgem's 1.6% figure, looking at both the validity of Ofgem's overall methodology and the robustness of the Reckon LLP productivity evidence; and
- in section 3 we consider the observations that Ofgem and Reckon have made about the analysis that we produced for the GDNs earlier in the review.

The note should be read in conjunction with our April 2007 report and our earlier recommendation that Ofgem's price control determination should contain a zero or slightly positive frontier shift assumption. We do not repeat here the analysis that we have set out previously but instead focus on the new points that have been made by Ofgem and Reckon, responding to both the additional evidence that has been compiled since we wrote our report and the critique of our original work.

Right from the outset we recognise that there is no 'perfect' way for Ofgem to judge how quickly leading GDNs will reduce costs over the period 2008 to 2013. All of the different techniques and methodologies that a regulator can use to understand better the underlying cost trends affecting regulated network businesses have flaws and it is inevitable that Ofgem will need to exercise a degree of judgment and discretion when constructing its price control proposals. The purpose of this note is not pick holes in others' work, but rather to assess the reasonableness of the judgments set out in the updated proposals, focusing in particular on:

- the appropriateness of the underlying methodologies;
- the extent to which the different parties' proposals are based on robust and reliable data;
- the confidence intervals that lie around that data (i.e. the likelihood that a rational observer could form a quite different judgment after reviewing exactly the same evidence); and
- the ability to reconcile the results that the different parties have produced with other available evidence.

We return to each of these points in the concluding section of our note after we have examined the different pieces of work.

2. Ofgem's Assumptions

Our critique of Ofgem's updated proposals looks in turn at:

- the steps in the construction of Ofgem's frontier shift assumption;
- the choice of measure of productivity growth; and
- the point estimate of future productivity improvement that appears in the updated proposals document.

2.1 Methodology

Ofgem's 1.6% figure comes ultimately from the assumptions that are being made about future productivity improvement and future input price inflation, as follows:

frontier shift = rate of real input price inflation *minus* rate of productivity growth

or

-1.6% = 0.9% *minus* 2.5%

We can say without hesitation that this is a perfectly valid methodology for a regulator to adopt when estimating the rate of frontier shift affecting a regulated industry. Although Europe Economics originally recommended that Ofgem should focus instead on measuring the rates of GDN out-performance against economy-wide total factor productivity (TFP) improvement and economy-wide input price control, our April 2007 report showed that it is almost impossible to pin down the 'averages' against which out-performance is to be measured. Moving away from Europe Economics' top-down methodology to a much more bottom-up approach strikes us as an entirely appropriate response to these difficulties.

Any questions that are asked of Ofgem's frontier shift assumptions must therefore focus on whether the 0.9% and 2.5% figures in Ofgem's calculations are reasonable. Our assessment of the productivity component is set out in sections 2.2 and 2.3 below, but the analysis of input prices falls outside of our terms of reference. The one high-level comment we would make without getting into the detail is that input prices need to be defined in the widest possible sense to cover all of the potential drivers of operating costs (other than the quantity of labour employed, which is picked up by TFP growth). Unless input prices are considered in this way, there is a danger that some of the contributors to rising or falling costs will be omitted entirely from the analysis, giving a false impression of the underlying trend in GDN costs. This is an important point for the GDNs and Ofgem to consider in their work, and we return to it again later in section 3.

2.2 Reckon's choice of productivity measure

The figures for productivity improvement that Ofgem reports in its updated proposals are labelled 'capital-adjusted labour productivity growth'. This is not terminology that we have ever come across before and we have not been able to identify any other published report or article that uses the term. The Reckon report states that the consultants have tried to construct a measure of productivity improvement that strips out the effect of growth in the capital stock and growth in volumes. The formula that Reckon has used is:

capital-adjusted labour productivity growth = TFP growth / share of labour

This is flawed and misleading. What Reckon has presented to Ofgem is not an estimate of what productivity growth would have been had there been zero growth in the capital stock (and volumes), but rather an estimate of what labour productivity growth would have had to

have been in order for all of the historic TFP growth to have been delivered via reductions to the labour force.

The error in Reckon's advice can be seen using simple numerical examples. Suppose, for instance, that by increasing its capital stock by 1% a firm is able to reduce its labour force by 3% and still maintain the same output. If prior to this new investment there was a 50:50 mix in capital/labour inputs, the improvement in total factor productivity would be 1% and the above formula would imply that 'capital-adjusted labour productivity growth' was 2%. However, this is very definitely not a measure of the improvement in labour productivity that would have been seen without the new investment. Instead, it is simply a counterfactual which shows what the firm would have had to in order to produce the same TFP growth by a different means.

The figures that Reckon has put forward in its report, and which Ofgem has reproduced in its updated proposals document, are not therefore a measure of the underlying labour productivity improvement in comparator industries, but rather an entirely fictitious account of what labour productivity would be if the contribution that investment makes to TFP growth is arbitrarily marked down to zero. This is of no relevance to the exercise that Ofgem is engaged in. In order to set opex efficiency assumptions, Ofgem needs to know how much productivity growth the GDNs will be able to produce during a period in which their investment programme is dominated by like-for-like replacement. Simply assuming away the contribution that investment (and economies of scale) has been making to productivity growth in other industries is no way of taking on this task

Having failed to spot this prior to the publication of the updated proposals, Ofgem has effectively included a meaningless set of figures in table A6.2 of its document. This does not have a major effect on Ofgem's conclusions for the reasons set out in section 2.3, but it is a flaw that needs to be corrected before proceeding with the bottom-up methodology.

2.3 Ofgem's choice of comparators

The judgment that Ofgem is making about the scope for future GDN productivity improvements rests on what it takes from evidence of historical productivity improvement in five other sectors of the UK economy: manufacture of chemicals, chemical products and man-made fibres; construction; financial intermediation; transport and storage; and sale/maintenance/repair of motor vehicles and retail sales of automotive fuel.

No explanation is given for the choice of these comparator sectors. The EU KLEMS data set from which the productivity figures are constructed contains information on 10 sectors, 22 sub-sectors and 5 further sub-sub-sectors of the UK economy. The question is: why refer to the chosen five comparators and not some of the other 32 benchmarks that are available to Ofgem?

Having considered the appropriateness of different comparators in the absence of such an explanation, we have two main concerns about the choices that Ofgem has made. The first relates to the choice of firms that produce chemicals, chemical products and man-made fibres as a comparator to the GDNs. This strikes us as particularly odd given that we would not expect capital-intensive firms to make a particularly good comparator for labour-dominated GDN opex. We think it is impossible to sustain an argument that a sub-sector in the EU KLEMS manufacturing series is a useful benchmark in this particular exercise.

Of more concern is the selectivity that Ofgem appears to have shown when picking from the non-manufacturing series in the data set. Of the four remaining comparators in Ofgem's proposals document, three are sub-sectors of larger sector indices: financial intermediation is part of the finance, insurance, real estate and business services sector; transport and storage is part of transport and storage and communication; and the sale/maintenance/repair of motor vehicles etc. is part of wholesale and retail trade.

We can think of no logical reason why the sub-sectors rather than the sectors are better comparators for the GDNs. Indeed, as a matter of principle, we think it is better to widen the sample wherever possible so as to improve the robustness of the data set. In these specific cases, extending the data set allows us to introduce firms that are engaged in the renting of equipment, IT and R&D to the basket of comparators – additions that we see as useful benchmarks given the activities that the GDNs carry out.

Table 1 incorporates the above amendments.

Table 1: TFP growth in comparator industries, 1973 to 2004

Sector	%
Construction	1.4
Finance, insurance, real estate and business services	(0.8)
Transport and storage and communication	2.2
Wholesale and retail trade	0.5

Note: for the reasons set out in section 2.2, the table shows annual growth in TFP rather than the capital-adjusted labour productivity metric.

We find it extremely difficult to draw any meaningful conclusions from this evidence. The data simply indicates that different industries exhibit different rates of productivity improvement, with some seeing faster TFP growth than others. This is not an especially surprising finding. But it says nothing about the rate of productivity improvement that Ofgem might expect of the GDNs over the next five years.

At one level, we can agree with the point that Ofgem makes in its updated proposals about the evidence not being inconsistent with an assumption that the GDNs will improve productivity by 1.4% per annum. However, the evidence is also not inconsistent with annual productivity improvements of, say, 0.8% a year (the average of the figures in table 1) or any figure between roughly 0.5% and 1.5%.

This is probably the best way of characterising the evidence that Ofgem is relying upon: it is not inconsistent with its proposals, but nor is it really capable to supporting Ofgem's position. The question then is whether other ways of looking at the rate of frontier shift give more robust results.

3. Ofgem's Use of First Economics' Work

Our reading of the statements contained in the updated proposals document and Reckon's accompanying report is that Ofgem's reluctance to use First Economics' frontier shift assumptions boils down to four key concerns:

- first, a worry that the two price indices we put forward in our April 2007 report might incorporate significant growth in profits over time and thereby overstate the change in underlying costs; and
- second, a similar issue with the impact that growth in capital employed can have on costs and prices;
- third, perceived difficulties in comparing the producer of an intermediate output with firms that sell directly to household customers; and
- fourth, the difficulty that Reckon has reconciling the trend in our indices with data on annual growth in hourly wage rates.

Although Reckon identified other possible issues, such as the appropriateness of some of our comparators, we note that these were not considered sufficient, in themselves, to invalidate our conclusions (indeed, in the case of the choice of comparators, the consultants explicitly note that there are sufficient cross checks in our analysis to deal with any concerns that our results are sensitive to outliers).

Our response to the four main points is set out below.

3.1 Profit growth

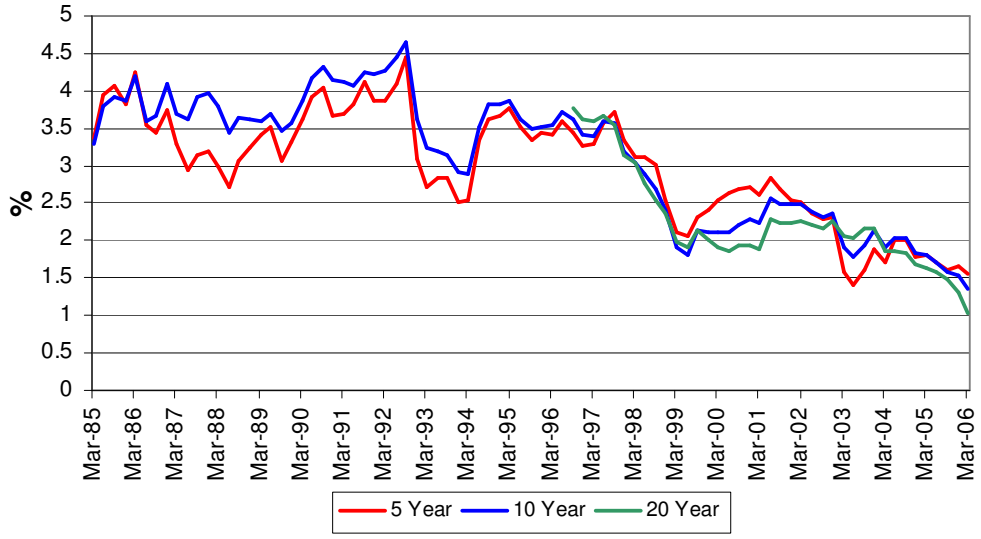
Since our indices measure changes in price from one year to the next, it is self evident that they capture both changes in costs and changes in firms' profits. Before concluding that this invalidates our methodology, it is important to note that the inclusion of profits *per se* is not a problem; it is only if profits have been increasing more quickly than costs that there is an issue. Put in a different way, if profit margins grew between 1998 and 2006, our top-down and bottom-up indices would overstate the underlying trend in costs and overestimate the rate of frontier shift affecting the GDNs; if, however, margins were steady or fell over that period, our indices understate the trend in costs and underestimate the rate of frontier shift.

There is no definitive way of showing which of these alternative scenarios is the more accurate description of what actually happened. However, we can think about the factors that might cause profits to change as a percentage of revenues over a period of eight years. Two key drivers will be:

- the underlying cost of capital for UK firms; and
- the extent to which the firms in our two indices have been able to generate supernormal profits.

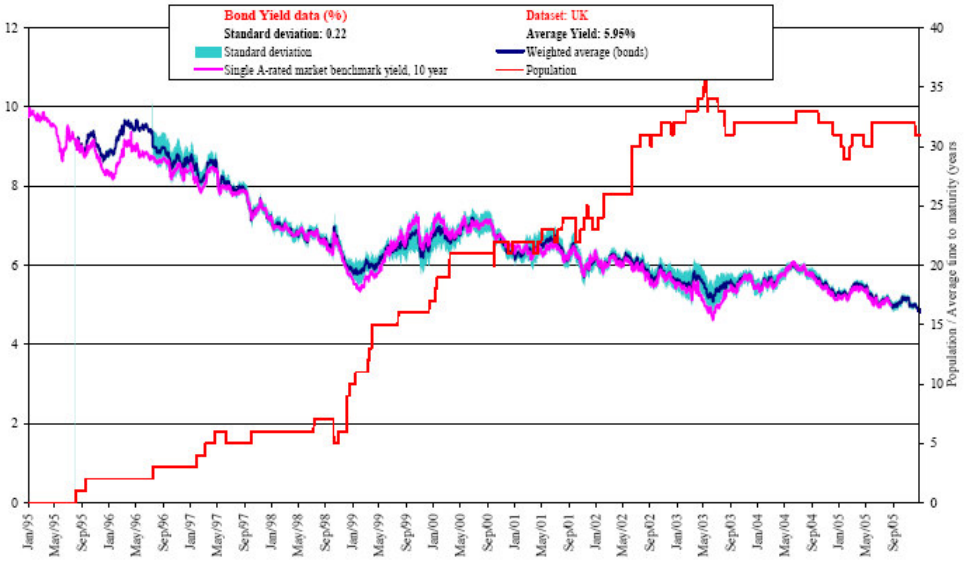
A priori we would expect the first of these factors to point towards a reduction in profit margins. Between 1998 and 2006 the risk-free rate fell from above 3% to below 2%, triggering a marked reduction in corporate borrowing costs (as depicted in figures 1 and 2, below). This tends to suggest that the normal level of profit for a typical UK firm ought to have fallen in the period under examination, implying, all other things being equal, that our two indices most probably understate the rate of change in underlying costs.

Figure 1: Yields on UK government index-linked debt



Source: First Economics' calculations.

Figure 2: Yields paid by A-rated UK companies



Source: taken from Ofgem's initial transmission price control proposals.

For the second of the two factors highlighted above to offset this understatement one has to believe that UK firms were more likely to generate supernormal returns as the period unfolded. It seems to us most unlikely that this would have been the case. Between 1998 and 2006 the UK government introduced two major reforms of competition law (the Competition Act 1998 and the Enterprise Act 2002) and placed competitiveness at the heart of its economic policies. Ofgem would have to argue that the UK economy became less competitive despite these measures in order to justify a decision to reject our indices because they incorporate profit growth as well as changes in costs.

Although there is no way of demonstrating unequivocally that this did not happen, we note that Reckon's chosen measure of profitability supports the assumption that profit margins

fell, rather than rose, between 1998 and 2006. Table 2 reproduces Reckon's calculation of profit margins in 2003 against the same metric five years earlier from the same data source. The table shows that profit margins fell at the level of the economy as a whole and in all seven of the industries that Reckon included in table 2 of their report.

Table 2: Reckon's profit margin measure, 1998 to 2003

Sector	1998	2003	Change
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	25%	24%	(1%)
Post and telecommunications	23%	19%	(3%)
Other service activities	31%	30%	(1%)
Sale, maintenance and repair of motor vehicles and motorcycles; retail sales services of automotive fuel	16%	14%	(2%)
Publishing, printing and reproduction of recorded media	14%	12%	(2%)
Recreational, cultural and sporting activities	21%	18%	(3%)
Hotels and restaurants	16%	14%	(2%)
Whole economy	18%	17%	(1%)

Taking all of this evidence together, we do not think that Ofgem has any real basis for arguing that our work can be overlooked because it measures changes in profit margins as well as changes in costs. If anything, changes in the cost of capital, a qualitative assessment of the competitiveness of the UK economy and Reckon's profit calculation all suggest that our indices understate the underlying trend in costs affecting a UK-based, labour-intensive business – not the other way around.

3.2 Capital employed

Concerns about the impact of changes in capital employed on our price indices are expressed slightly differently in Ofgem's consultation document and Reckon's accompanying report, but we assume that they amount to the same thing: namely a worry that growth in the capital stock had led us to overstate the cost trends that are likely to affect the GDNs' opex.

We agree that we would ideally want to separate completely the effect of changes in the capital stock from other cost drivers when analysing the trends in companies' cost bases. However, the discussion in section 2.2 of this note illustrates that this is not nearly as straightforward as it sounds. Once it has corrected for the errors in Reckon's analysis, we think that it is inevitable that Ofgem will have to refer to trends in total factor productivity (i.e. a measure of productivity growth that captures the effects of both changes in the labour force and changes in the capital stock) when reaching its final determination. It is not therefore really appropriate to criticise or reject our work on the basis that we have had to grapple with the same sorts of issues.

Our way of dealing with the effects of changes in capital employed was to include a capital substitution effect in our April 2007 calculations. Reckon criticises this aspect of our analysis for being arbitrary and poorly justified, which we accept. By way of an explanation, we would point out that our report suggested that others look into this issue in more detail, paying particular attention to the extent to which the GDNs' investment programmes for the forthcoming control period would lead directly to opex reductions. In advance of this work, we do not think it is unreasonable for us to have assumed that the Europe Economics capital substitution adjustment was overstated; indeed, Ofgem reached the same conclusion in its initial proposals.

Our capital substitution effect is nonetheless a very rough approximation and we accept that it introduces a degree of error to our results. Overall, however, we think it is more likely that we have overstated rather than understated the effect – the GDNs have been explicit about this when they have given us feedback on our work and the line of argument that Reckon sets out in paragraph 2.10 of its report seems to support this point of view.

3.3 Intermediate and final outputs

The third of the four implied criticisms of our April 2007 work centres on the fact that we have analysed the cost drivers affecting goods and services sold to households when the GDNs sell their services not to end consumers but to other firms. There were two main reasons for this approach:

- the fact that price limits are indexed in line with RPI, automatically forcing the GDNs to match the productivity growth and input price control exhibited by firms whose goods and services are bought by a representative UK household; and
- more generally, the availability, credibility and transparency of the RPI data set, which we hoped would allow us to avoid any debate about the robustness of our underlying data.

We do not dispute that the GDNs are different from the firms in our data set in supplying an exclusively intermediate output. However, we are not entirely sure why this is relevant or how it could be construed as a reason for rejecting our conclusions. All of our comparators are ultimately responsible for combining a set of inputs into some sort of output and all will experience ongoing productivity growth and changes in input prices. The fact that the GDNs sell to other firms whereas our comparators sometimes (but not always) sell to households does not in any way detract from the relevance of the information that we have extracted about the underlying cost trends affecting these businesses.

If the concern was expressed in terms of unease about the inclusion of specific components in our two price indices, we would be happy to consider again whether to exclude or include individual comparators. We have always recognised that there is no exact comparator to the GDNs, but we also believe that a shuffling of the comparators does not change significantly the results of our work. As it is, though, Reckon's point is not a reasonable criticism of our work.

3.4 Implied negative productivity growth

The final criticism of our work is the one that we take most seriously. Reckon's view is that the trend in our top-down and bottom-up indices stands in excess of the growth in input prices, implying that productivity has been declining rather than improving over time in our comparator indices. We certainly would not be comfortable with a conclusion that suggests the GDNs will not improve productivity during the next control period. But we do not believe that our results lead to this conclusion.

Reckon themselves start in paragraph 2.61 of their report to give an explanation for the apparent gap between Ofgem's estimates of hourly wages and the trend in our indices. As the consultants note, input prices (defined in the widest possible sense) might rise more quickly than hourly wages when one starts to take account of NI insurance contributions, pensions and insurance. Reckon might have also included in this list bonuses, training expenditure, R&D, utility costs, business rates, rents, redundancy and restructuring costs and a whole host of other factors.

The existence of these other costs does not lead to the conclusion that Reckon reaches in paragraph 2.62 of their report – i.e. that if these factors are sufficient to explain the apparent reduction in productivity in our comparators then our challenge to Ofgem's method of analysis fails. In fact, the conclusion to be drawn is the exact opposite of this. That is to say

that our work cannot be rejected on the basis of an overly simplistic comparison between the trend in final prices and one of many contributors to unit costs.

Where we can agree with Reckon is when the consultants say that our work is a challenge to Ofgem's input price assumptions. In this regard, we would draw Ofgem's attention to two specific omissions from its analysis to date. The first is bonuses. Many companies in the UK economy have incentive schemes in which the benefits of productivity improvement are shared between employees and shareholders. In order to be internally consistent, we would expect Ofgem to recognise that the achievement of substantial productivity savings (2.5% per annum in frontier shift alone) requires firms to pay higher bonuses when cost reduction targets are achieved and workers become more productive.

The second omission is redundancy and restructuring costs. Given the types of business that the GDNs run, a significant proportion of any productivity savings that a firm makes will have to come through a reduction in the labour force. These manpower reductions are not costless; rather we would expect the GDNs to have to pay sizeable redundancy payments. Again, as a matter of internal consistency, we would expect these costs to be recognised somewhere within Ofgem's price controls and we note that there is regulatory precedent for this in the CAA's most recent review of NATS.[1]

[a] The CAA's November 2004 price control proposals when referring to redundancy costs state explicitly that 'it would be inappropriate for users to enjoy the long-term savings that [NATS] produces without also compensating the company for the one-off costs that it incurs during the transition' (paragraph 7.41, p.61)

4. Conclusions

As we made clear at the start of this note, our objective in reviewing Ofgem's updated proposals has not been to snipe at the new evidence that has been compiled since the publication of the initial proposals. Instead, we recognise that there are weaknesses in all of the analytical techniques that are used during the periodic review process and that a regulator has to step back and ask itself which of several different pieces of ultimately imperfect evidence provides the most reliable insights into cost trends. In our opinion, this is best done by working through the following considerations:

- the appropriateness of the underlying methodologies;
- the extent to which the different parties' proposals are based on robust and reliable data;
- the confidence interval that lies around that data (i.e. the likelihood that a rational observer could form a quite different judgment after reviewing exactly the same evidence); and
- the ability to reconcile the results that the different parties have produced with other available evidence.

On the first of these points, we see little difference in the Ofgem and First Economics methodologies. Although they come at the same issue from very different directions, both are theoretically capable of revealing useful information about annual changes in GDN costs. In both cases, the main challenge is choosing comparators whose cost drivers match as closely as possible the main influences on GDN opex.

The data set from which these comparators are drawn are the EU KLEMS work and a bottom-up assessment of input prices in the case of Ofgem's methodology, and the RPI data set in the case of our work. We would suggest that the RPI data set is marginally the more robust and reliable data set, principally because the EU KLEMS data has not been subject to the same validation that the ONS's calculations have undergone (we note in particular that Reckon were unable to reconcile the EU KLEMS data to the NIESR data that Ofgem used in its 2004 electricity DNO review). However, this is only a minor point.

A more substantive difference between the two methodologies is the margin of error in the calculations. As we noted in section 2.3, Ofgem's productivity evidence does not translate easily to a point estimate of the frontier shift affecting the GDNs. A reasonable person could quite easily view the same data and conclude that it supports a frontier shift assumption that is up to 1% lower than the figure in Ofgem's updated proposals. By contrast, our April 2007 report came at the analysis of cost trends from two completely different directions and found broadly the same results. Indeed, we are fairly certain that anyone who tries to replicate our work with a different set of comparators is going to reach the same conclusions.

This makes it important to step back and ask which of the two contrasting conclusions is intuitively the more sensible. Ofgem, in particular, lacks a solid foundation for its point estimate, so the key question is whether it makes sense to be forecasting that the GDNs will go on reducing opex in real terms indefinitely. For our work, the challenge is the other way around – does it seem sensible to be arguing that the opex frontier in mature network industries shifts in such a way that companies see a flat cost trend or even small real terms increase in costs year on year?

There are different ways of answering these questions. One useful point of reference is the performance of other mature network businesses during the last five years. Our April 2007 work showed that opex in several industries had been drifting upwards in recent years and that out-performance had started to give way to under-performance. Ofgem has access to more up-to-date information than us and will be able to assess whether this is a continuing trend.

Another way to look at the problem is to go back to the question that we posed at the start of our April 2007 report: is it credible to think that the GDNs will out-perform the rate of productivity improvement and input price control exhibited by the firms whose goods and services are in the RPI basket? The way that the goods sector of the economy is holding down costs, and hence the headline rate of RPI-measured inflation, makes it difficult to believe that this is the case.

Finally, one can look to see where in the UK economy there is evidence that companies have been able to reduce opex in real terms year on year. Our work (using the RPI data set) indicated that the only part of the service sector in which this appears to be achievable is the telecoms sector. Everywhere else service-sector firms are experiencing real terms cost increases from one year to the next.

All of the above factors lead us to conclude that Ofgem's frontier shift assumption is not well supported and not likely to describe very accurately the underlying trend in GDN costs. As Ofgem prepares its final proposals, we recommend, as a minimum, that it considers two amendments that would give a more intuitively sensible set of opex allowances to the GDNs:

- a reduction in the 1.4% productivity assumption to a lower number that is equally well supported by the figures in table 1 of this note; and
- separate allowance for redundancy and restructuring costs, recognising (like the CAA in its review of NATS) that productivity savings cannot be achieved costlessly and that it would be inappropriate for customers to benefit from lower future costs without paying upfront for the one-off costs incurred during the transition to a lower recurring cost base.

More generally, however, we would suggest that Ofgem looks again at the top-down analysis in our April 2007 paper and uses it at least as a cross-check on its conclusions. Although we recognise that our work is not without flaws, we continue to believe that it represents the most robust and reliable way for a regulator to estimate the underlying trend in a regulated industry's costs.

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