OFGEM
UPDATE OF INPUT PRICE INFLATION FORECASTS FOR DPCR5

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Final Report

ORIGINAL

Submitted by:

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CEPA

CONTENTS

DISCLAIMER

EXECUTIVE SUMMARY

In April 2009 CEPA provided Ofgem with a number of scenarios for input prices for a number of activities by Distribution Network Operators (DNOs). Given the uncertainty regarding the macroeconomic climate in the UK and elsewhere, and given that Ofgem was still developing its proposals for DPCR5, we provided three scenarios based on different future macroeconomic outcomes. Since April, however, the outlook for the UK economy has changed significantly with a greater clarity over the future emerging. The time that has passed has also allowed the DNOs and their consultants to comment on our projections and on the approach that we adopted. In the run-up to its Final Proposals, Ofgem has asked us to review our projections and to consider the comments made by the DNOs and their consultants. In this report we present the outcome of this exercise.

Given that the macroeconomic picture has stabilised somewhat and there is greater consensus regarding the likely future path of the UK economy, and given that Ofgem will shortly be issuing its Final Proposals for the DNOs' price controls, we have moved from a scenario based approach to developing single central forecasts for key input variables, whilst recognising that there remains significant uncertainty over future macroeconomic outturns. As such, we have sought to develop a set of forecasts that represent our best view of the likely level of Real Price Effects (RPEs) for DPCR5. We have based these on a view of the economy that is consistent with the median forecasts in the August 2009 issue of HM Treasury's 'Forecasts for the UK Economy' publication. These see the recovery from the recession as slow and gradual, and expect a convergence to growth and inflation trend rates that correspond to the long-term historical averages (which are lower than the pre-crisis trends).

Overall we have sought to weigh up the available evidence and the views expressed by the DNOs to reach a reasonable overall view of the RPEs. As discussed further below, our conclusions for individual parts of the overall RPE are in some cases higher and others lower than the forecasts provided by the DNOs and their consultants.

Retail Price Index (RPI) forecasts

Our forecast for RPI inflation is derived from the median forecast in the August issue of 'Forecasts for the UK Economy'. This provides us with RPI forecasts to 2013, after which we assume a trend growth rate of 2.7% per annum in the RPI, which is the RPI inflation rate that corresponds to CPI inflation of 2% (i.e. in line with the Bank of England's target).

General Labour RPE forecasts

DNOs argued that our General Labour RPE projections for 2009/10 from April were too low and that they did not take account of the wage rigidities inherent in the contracts DNOs have entered into. We were not provided with actual wage settlement figures by the DNOs prior to our April report, but even if Ofgem was able to gather such data, setting the RPEs only according to actual figures is potentially inconsistent with the principles of incentive based regulation and could provide perverse incentives to DNOs. Our approach has been that RPEs should be set with a view of the wage growth that a notionally efficient DNO could be expected to incur.

In our update, we have continued to rely on the ONS' Average Earnings Index (AEI) for the private sector, which is inclusive of bonus payments. We consider this to be the most representative available index of the wages private companies, such as the DNOs, would be paying for non-specialised labour. Our forecasts for the first two years are based on the median forecast of the AEI found in the August edition on 'Forecasts for the UK Economy' and for the remainder of the forecast period we assume a gradual return to the historical trend growth rate of 1.3% (in real terms).

The RPE for General Labour was negative in 2008/09, which was a function of the unusual economic conditions that prevailed during that year. While it can be argued that a negative RPE is one of the risks attached to RPI-X regulation, we think that the behaviour of the indices is unlikely to be representative of the reality of labour costs faced by DNOs during that year. Many contracts are likely to be agreed on a multi-year basis and possibly indexed to RPI, which points to likely wage rigidities, especially towards the down side. As such, we think that a prudent approach would be to apply a zero RPE for general labour in 2008/09, although we recognise that reasonable arguments can be made for adopting the actual RPE that we developed.

Specialised Labour RPE forecasts

DNOs have argued for a positive premium for specialised wage growth relative to general wage growth. They have argued that, given the large increase in capex planned for DPCR5, demand for specialised labour in the infrastructure sector would not be materially affected by the economic crisis. However, whilst, there may be some arguments in favour of a premium, it is difficult to demonstrate given the lack of specific data. We have looked at a range of indices and information to consider the evidence for a premium, but as set out in the main report these indices present conflicting evidence.

Whilst we are sceptical that a premium would be present in the medium to long term, given the aforementioned conflicting nature of evidence reviewed, we cannot be completely confident that no premium would be present in the short term. Indeed, there are challenges in reaching a firm conclusion as to what an appropriate level of any premium might be; however, the same evidence leaves us unconvinced that the premium is as large as the DNOs have suggested.

Before reaching a conclusion, ideally we would have liked to gather more evidence from organisations with experience of the specialised labour market on a day to day basis, such as recruitment agencies, but this has proven difficult to do in the timescales available. In coming to a view on an appropriate premium, having looked at the indices discussed above, and recognising the considerable difficulties in making an estimate, we are suggesting a premium of 0.7 percentage points. However, this should be seen as a point within a potential range for a reasonable premium which could start at zero, but which would be unlikely to extend to the level proposed by the DNOs. Given the available evidence that might be drawn in reaching a view on this issue, Ofgem will need to consider whether the premium proposed is appropriate.

RPE forecasts for Other Inputs

In forecasting the RPEs for general materials, specialised materials, and equipment and plant, we continue to use the same indices we used in April. We also continue to rely on the correlation-based approach to forecasting that we adopted in April. While we acknowledge the drawbacks of this approach, the lack of historical cost data for the DNOs means that we are forced to adopt a

second-best alternative. Correlation-based forecasting has the advantage of being transparent and objective – two qualities that we consider important given the degree of uncertainty associated with the future costs of the items we are attempting to forecast.

Results

Table S1 summarises our RPE forecasts. For the period 2010/11-2014/15, we note that, relative to our "central / most likely" scenario in April (Scenario 1), the current forecasts result in higher RPEs for both categories of labour and lower RPEs for materials and equipment. The changes are driven by the fact that our nominal forecasts for materials and equipment fall by more than the decline in our RPI forecast, while the opposite is true for the two labour categories.

Table S1: Average forecasts by input price category

Category	CEPA October (%)	CEPA April, Scenario 1 (%)
Average RPE forecasts for 2010/11-2014/15		
General labour	1.5	1.1
Specialised labour	2.2	1.1
General materials	0.6	1.3
Specialised materials	0.3	0.9
Equipment & plant	-2.3	-1.9
Average RPE forecasts for 2008/09-2014/15		
General labour	1.2	1.5
Specialised labour	1.9	1.5
General materials	1.1	1.5
Specialised materials	0.9	1.8
Equipment & plant	-1.8	-2.0

Source: CEPA analysis

1. INTRODUCTION

In April 2009 CEPA provided Ofgem with a number of scenarios for input prices for a number of activities by Distribution Network Operators (DNOs). Given the uncertainty regarding the macroeconomic climate in the UK and elsewhere, and given that Ofgem was still developing its proposals for DPCR5, we provided three scenarios based on different future macroeconomic outcomes. These were provided along with projections for the Retail Prices Index (RPI) inflation in order to derive estimates of Real Price Effects (RPEs), for which Ofgem makes an allowance when setting the price controls for DNOs. Ofgem used these to inform its Initial Proposals.[1]

Since April, however, the outlook for the UK economy has changed significantly with a greater clarity over the future emerging. The time that has passed has also allowed the DNOs and their consultants to comment on our projections and on the approach that we adopted. In the run-up to its Final Proposals, Ofgem has asked us to review our projections and to consider the comments made by the DNOs and their consultants. In this report we present the outcome of this exercise. It is important to note, however, that we have not been asked by Ofgem to respond to comments from DNOs or their consultants about how Ofgem used our work to generate the RPE estimates used in Initial Proposals.

Given that the macroeconomic picture has stabilised somewhat and there is greater consensus regarding the likely future path of the UK economy, and given that Ofgem will shortly be issuing its Final Proposals for the DNOs' price controls, we have moved from a scenario based approach to developing single central forecasts for key input variables, whilst recognising that there remains significant uncertainty over future macroeconomic outturns. As such, we have sought to develop a set of forecasts that represent our best view of the likely level of Real Price Effects (RPEs) for DPCR5. We have based these on a view of the economy that is consistent with the median forecasts in the August 2009 issue of HM Treasury's 'Forecasts for the UK Economy' publication. These see the recovery from the recession as slow and gradual, and expect a convergence to growth and inflation trend rates that correspond to the long-term historical averages (which are lower than the pre-crisis trends).

Given the focus of the comments from the DNOs in response to our April projections was on the assumptions used for Labour RPEs, we have focused particularly on considering the evidence on this issue, to ensure that our current forecasts are as robust as reasonably possible. In doing so, we have sought to weigh up the available evidence and the views expressed by the DNOs, to reach what we believe to be is a reasonable overall view of the RPEs.

1.1. Structure of the report

The rest of the report is structured as follows:

- Section 2 reviews the context for our analysis both in terms of recent economic developments and the comments made by the DNOs;

[1] Ofgem (2009) 'Electricity Distribution Price control Review initial proposals', accessed at: http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=254&refer=Networks/ElecDist/PriceCntrls/DPCR5.

- Section 3 presents our forecasts for RPI inflation and RPEs, as well as providing our analysis with regard to key points made by the DNOs; and
- Section 4 summarises our forecasts and concludes.

Additional information is included in Annexes A to E.

2. CONTEXT AND APPROACH

2.1. Introduction

In this section we discuss the context to our updated forecasts in terms of the DPCR5 process and the macroeconomic climate. We also discuss the main comments that have been made regarding our April projections by the DNOs and their consultants.

2.2. Approach to forecasting in April report

In our April report to Ofgem we adopted a scenario-based approach in order to account for the great degree of uncertainty that prevailed at the time regarding the prospects for the UK economy in both the short and medium term. We developed three scenarios of future macroeconomic conditions around which we then produced a number of projections. The scenarios were titled: "Optimistic Case", "Prolonged Crisis" and "Deflation Trap", and broadly corresponded to V, U and L-shaped recessions. The scenarios were developed from reviewing the experience in previous recessions, both in the UK and internationally. In very simplified terms, the three scenarios might be described as follows:

- **Scenario 1, Optimistic Case** – In this scenario, a sharp fall in GDP during 2008/09 is followed by a swift recovery and a peak in growth during 2011/12. The economy settles around its trend growth rate of the boom years 1998-2007 (2.8% per annum) and economic activity is high throughout DPCR5.
- **Scenario 2, Prolonged Crisis** – In this scenario the UK economy contracts from 2008/09 to 2010/11. The recovery in 2011/12 is sharp, but the economy settles into a lower trend growth rate (2.2% per annum) due primarily to increased regulation of financial services and a sharp decline in public expenditure necessary to restore balance to the public finances.
- **Scenario 3, Deflation Trap** – In this case GDP contracts for three successive years and the rate of recovery is much slower than in either of the two alternative scenarios. As the UK economy struggles to adjust to a new economic environment in which financial services are no longer its main source of value-added creation, it settles to a trend growth rate that is half the rate observed during the boom years (that is, 1.4% per annum).

We compared our scenarios to analysts' views at the time and found that Scenarios 1 and 2 were within the range of forecasts expected by most analysts, while Scenario 3 was decidedly more pessimistic. We, therefore, suggested the following with regard to how Ofgem might use our forecasts:

- Scenario 1 – 50%. This scenario fitted most closely to the consensus view for the performance of the UK economy over the medium-term.
- Scenario 2 – 35%. This scenario was seen as a real possibility by many economists.
- Scenario 3 – 15%. This scenario was seen as a possibility, but a less likely one than Scenarios 1 and 2.

In this report, we compare updated current forecasts to those of Scenario 1 in April, since this allows us to highlight how the changing consensus outlook for the economy has affected our estimates.

To forecast input price inflation we would ideally have liked to have considered the relationships between indices for which we can collect historical data and the historical path of such costs for DNOs. This was not possible because of the limited historical information available regarding the path of the latter. Therefore, we considered the correlation coefficient between potentially relevant indices and RPI. While considering the indices which held the strongest correlation coefficients with RPI, we overlaid this with a degree of qualitative judgement using wider evidence in order to select the indices which we felt most closely represented the activities of DNOs. Our forecasts from April are summarised in Table 2.1.

Table 2.1: Summary of average forecasts for 2010/11-2014/15

	Scenario 1 (%)	**Scenario 2 (%)**	**Scenario 3 (%)**
Average forecasts for 2010/11-2014/15			
RPI	3.0	3.3	-0.2
General labour (RPE)	1.1	0.9	2.3
Specialised labour (RPE)	1.1	0.4	1.3
General materials (RPE)	1.3	1.2	1.8
Specialised materials (RPE)	0.9	0.6	3.6
Equipment and plant (RPE)	-1.9	-1.9	-2.2
Average forecasts for 2008/09-2014/15			
RPI	1.8	2.0	-0.5
General labour (RPE)	1.5	1.4	2.4
Specialised labour (RPE)	1.5	0.9	1.4
General materials (RPE)	1.5	1.5	1.9
Specialised materials (RPE)	1.8	1.7	3.9
Equipment and plant (RPE)	-2.0	-2.0	-2.3

Source: CEPA

2.3. DNO responses

In considering the responses of the DNOs, we would first like to clarify a misunderstanding about our approach in the April report that appears to be present in their comments. Our projections for input prices were calculated in nominal terms, from which our RPI projections were deducted in order to provide the RPE numbers. It was these RPE forecasts that were presented in the report, in line with Ofgem's requirements. We did not, however, make forecasts of RPEs directly, as the DNOs and First Economics suggested.

DNO comments, in response to Ofgem's Methodology and Initial Results paper (May 2009)[2] and Initial Proposals (August 2009)[3] have centred on our wage growth projections. Specifically, the DNOs, drawing on analysis provided by First Economics,[4] have argued two key points:

- that our wage growth forecasts were too low and not representative of the costs actually incurred by companies in the electricity distribution sector; and
- that we should have allowed a positive premium for specialised / contractor labour.

We provide a more detailed discussion of these comments in Sections 3.2 and 3.3 below, where we carry out analysis to derive wage growth forecasts for general labour and specialised labour, respectively.

One of the DNOs also criticised our scenario-based approach, arguing that it required arbitrary assumptions and would become out of date just as quickly as point-estimates.[5] It is notable, however, our forecast in this report is within the range of those derived in April, whereas First Economics has revised its forecasts on three separate occasions. In Annex B we review First Economics' forecasts, while specific arguments made by the DNOs and First Economics with regard to wage growth are examined as part of Sections 3.2 and 3.3.

2.4. Recent economic developments

While the UK remains in recession, the economic situation in the run-up to the publication of Ofgem's Final Proposals is notably different to the one that prevailed when we were preparing our April scenario projections. More specifically, when we were working on our April numbers, there was a great deal of uncertainty regarding the financial crisis – analysts were divided on how deep the recession would be, when the trough would be reached and what the recovery would look like. We sought to capture this high degree of uncertainty with the scenario-based approach rather than adopting single point estimates.

Despite the latest estimate from the Office of National Statistics (ONS) showing that the UK economy is currently in its longest recession since records began, something akin to an emerging consensus has been reached in recent months with regard to the economic outlook. Analysts seem to agree that "the worst is behind us" and that the trough of the recession was reached during the first half of 2009. Expectations are for slow and gradual growth in Gross Domestic Product (GDP) and a gradual recovery across the economy, including the labour market, housing market, credit growth and the Sterling exchange rate.

The greater clarity with regard to the future of the UK economy is reflected in the Bank of England's projections. The Bank's projections for GDP growth and for changes in the

[2] Ofgem's paper and the responses to the consultation process can be accessed at: http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=207&refer=Networks/ElecDist/PriceCntrls/DPCR5.

[3] Ofgem's Initial Proposals document and the responses to it can be accessed at: http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=254&refer=Networks/ElecDist/PriceCntrls/DPCR5.

[4] We were provided with two documents written by First Economics: 'Frontier shift: May 2009 update – prepared for Western Power Distribution' (dated 27 May 2009) and 'Forecasting wage inflation – a note prepared by First Economics for the electricity DNOs' (dated 14 September 2009). In addition, we were also provided with submission by CE Electric on the pay deals agreed by DNOs.

[5] This criticism is also hypocritical since it was the very same DNO that commissioned Oxera to provide scenario-based forecasts in two of the reports that we reviewed in April.

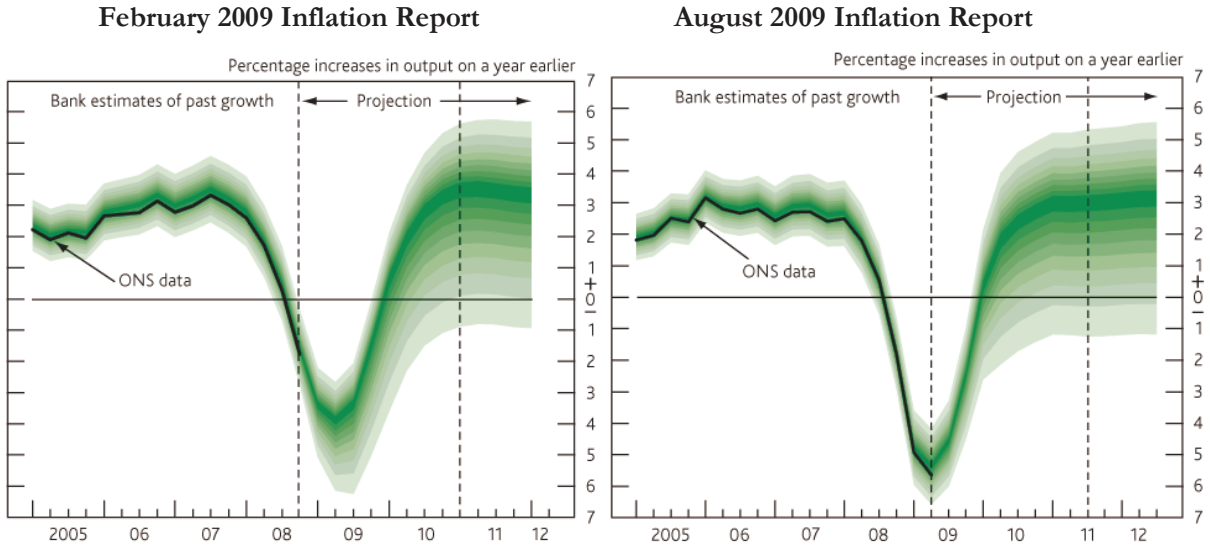
Consumer Price Index (CPI) are presented in Figures 2.1 and 2.2, respectively. In February the Bank noted that:

> *"The prospects for economic growth remain unusually uncertain, reflecting the exceptional economic and financial factors affecting the outlook. The risks around the central projection are judged to be weighted heavily to the downside."*[6]

In contrast, by August the Bank of England had asserted that:

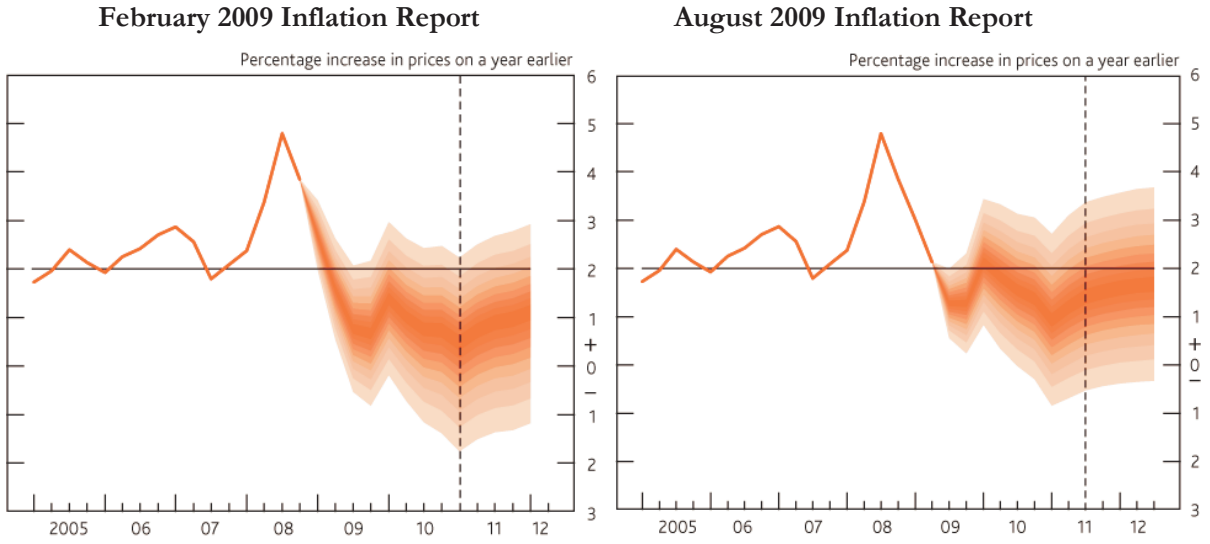
> *"The pace of contraction moderated and business surveys suggested that the trough in output was near. The prospects for domestic economic activity are underpinned by the considerable stimulus from the easing in monetary and fiscal policy and the past depreciation of sterling."*[7]

Figure 2.1: Bank of England GDP projections



Source: Bank of England

Figure 2.2: Bank of England CPI projections



Source: Bank of England

[6] Bank of England, Inflation Report, February 2009, p. 7.
[7] Bank of England, Inflation Report, August 2009, p. 5.

2.5. Current approach

While we maintain the view that the scenario-based approach used in our April report is the most robust way of dealing with the uncertainty inherent in macroeconomic forecasting and provided a useful framework for responses from the DNOs, we note that as Ofgem nears its Final Proposals it is required to come up with point estimates of RPEs. Given this requirement, Ofgem's terms of reference (reproduced in Annex A) have asked us to develop our forecasts based on a single set of projections for input prices.

Moreover, in order to avoid any criticism that we might be putting forward own interpretations as to future developments (as we did to some extent in the scenario based approach) we have based our current forecasts, as far as possible, on a view of the economy that is consistent with the median forecasts in the August 2009 issue of HM Treasury's 'Forecasts for the UK Economy' publication.[8] That said, whilst our April projections were derived through independent analysis, we checked them against the prevailing analyst views to ensure that they were in line with what other economists, albeit ones of varying views, were projecting. For avoidance of doubt, our revised forecasts in this report rely explicitly on the prevailing analyst opinion.

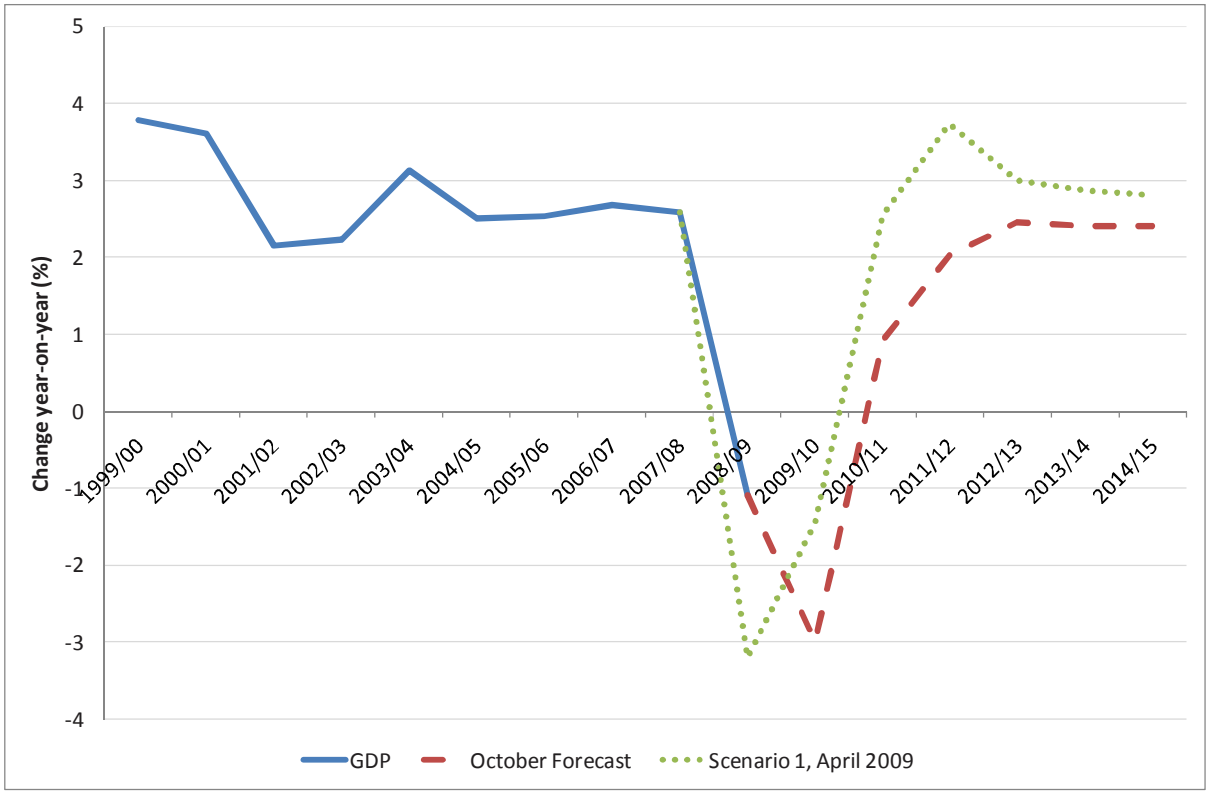
The current view of the prospects for the UK economy, based on forecasts in the August issue of 'Forecasts for the UK Economy', can be summarised as presenting a view in which key macroeconomic variables develop in the following manner:

- **GDP growth –** the trough of the recession was reached in the first half of 2009. GDP growth will slowly edge into positive territory and will settle back to its long-term historical trend by end-2012.
- **Unemployment –** the labour market tends to lag GDP growth by about one year. Unemployment is expected to continue to rise until end-2010, after which it will gradually decrease. Unemployment is expected to remain significantly higher throughout DPCR5 than at any time in the last 10 years.
- **Interest rates –** the expectation is that the Bank of England will begin to gradually raise its official rate in 2010; initially slowly, then more rapidly. By the end of DPCR5 the official Bank Rate is expected to return to its "normal" level of around 5%.
- **Sterling exchange rate –** the pound has already weakened substantially. It is expected to weaken somewhat further before 2009 is out, but to gradually strengthen in the years that follow. Nevertheless, it is expected that the exchange rate will remain weaker throughout DPCR5 than it was at any point in the previous 10 years.

Figure 2.3 illustrates the projected path of GDP growth through to the end of DPCR5. For comparison, we also plot our GDP forecast from Scenario 1 in April. Illustrations of the current views on unemployment, interest rates and the Sterling exchange rate are presented in Annex C.

[8] While more recent issues of the publication are available, the August issue is the latest in which forecasts are available beyond the usual two-year window covered by the publication. The August issue includes forecasts for most key macroeconomic variables going up to 2013.

Figure 2.3: GDP growth forecasts



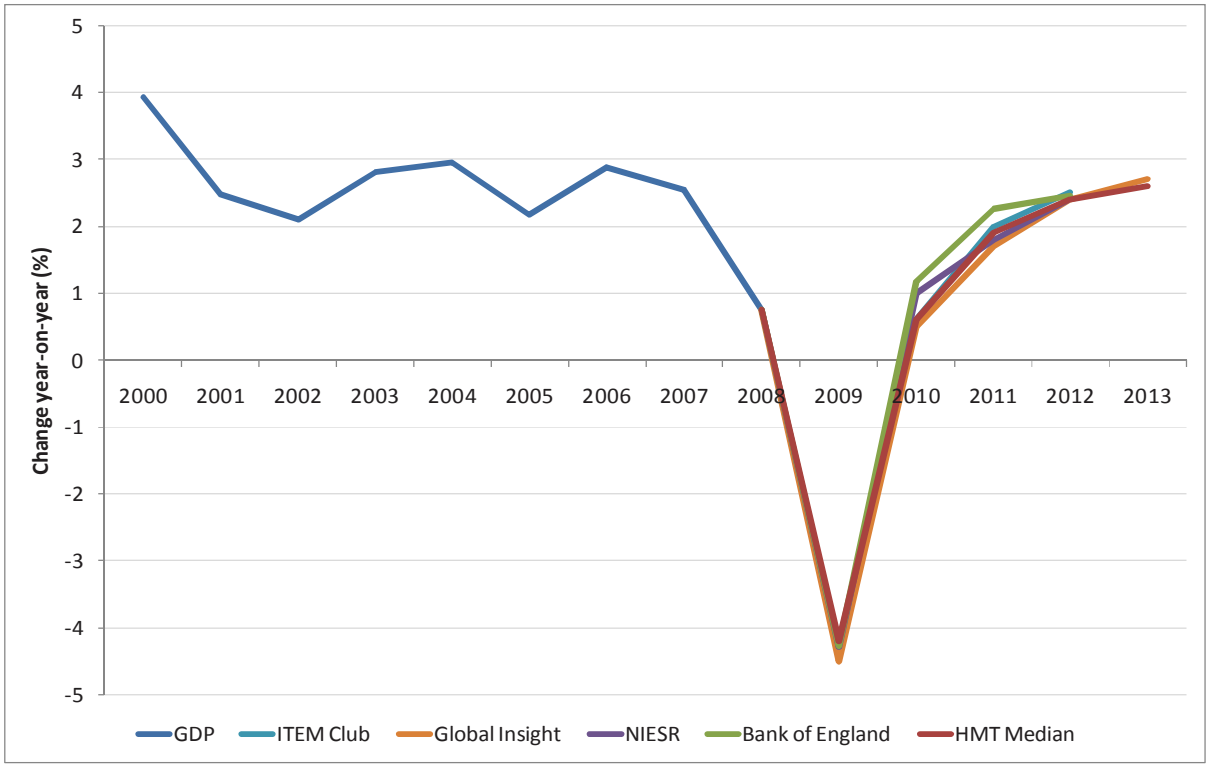
Sources: ONS, HM Treasury, CEPA analysis

2.5.1. Comparison with analysts' forecasts

In Figure 2.4 we plot the median GDP forecast from the August issue of 'Forecasts for the UK Economy' against the forecasts of a number of respected institutes, including the Bank of England's forecasts in its August Inflation Report.[9] As the figure shows, these forecasts are very close to one another, which supports the view of an emerging consensus with regard to future developments in the UK economy.

[9] Note that the forecasts are presented for calendar years and are, therefore, not directly comparable to the forecasts in Figure 2.3.

Figure 2.4: Comparison of analyst forecasts of GDP growth



Sources: ONS, HM Treasury, Bank of England

2.5.2. Comments on the data

In this report, we use historical data up to the end of 2008/09 (i.e. March 2009 for monthly data, Q1 2009 for quarterly data). The following points are worth nothing about our approach:

- RPI forecasts for 2009/10 are based on analyst forecasts of RPI in 2009 and 2010. Analysts take into account outturn inflation numbers when making their forecasts for the current year, hence our 2009/10 forecasts implicitly account for outturn RPI inflation since April 2009.
- Our General Labour wage growth forecasts for 2009/10 are based on analysts' forecasts of the AEI in 2009 and 2010. As in the case of RPI, our forecasts therefore implicitly take into account outturn AEI readings since April 2009.
- Our forecasts for General Materials, Specialised Materials, and Equipment and Plant are derived by relying on the historical correlation between the representative index and RPI. Our forecasts, therefore, do not account for outturn readings in each of these indices since April 2009, but rather assume that these indices have moved in accordance with their historical relationship to RPI.[10]

It is worth noting that in the April report, the cut-off point for our data was end-2007/08. This accounts for some of the difference (which is sometimes large) between our 2008/09 projections in April and the actual figure presented in this report.

[10] We note, for example, that BEAMA's Electrical Equipment index (our proxy for specialised materials) has averaged a -8.4% nominal change during April-August 2009, compared to our forecast of -4.1% for 2009/10.

3. FORECASTS

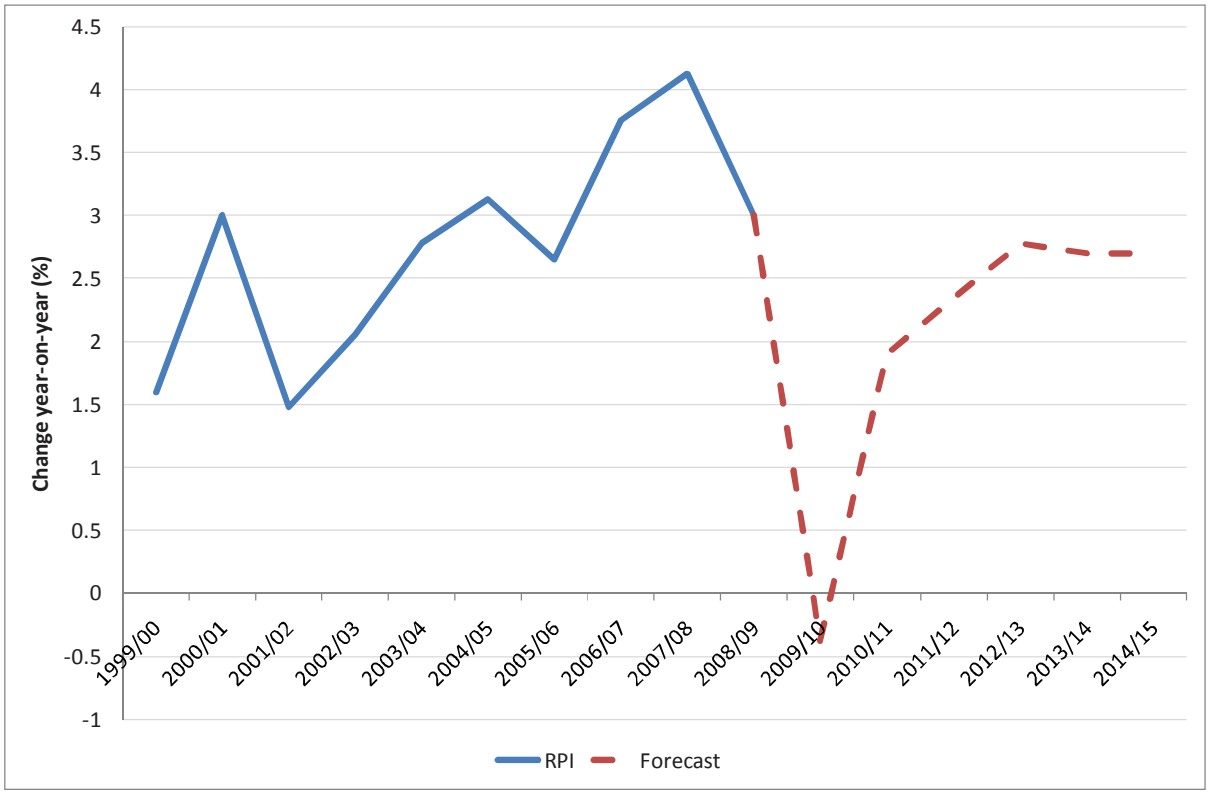
3.1. Introduction

In this section we provide forecasts of RPI inflation and RPEs for five categories of input prices: General Labour, Specialised Labour, General Materials, Specialised Materials, and Equipment and Plant. Forecasts for input prices are presented in real terms, as in the April report, but nominal forecasts are presented in Annex D. A detailed analysis of the sensitivity of our forecasts to the choice of indices is presented in Annex E.

3.2. RPI

Our forecast for RPI inflation is derived from the median forecast in the August issue of 'Forecasts for the UK Economy'. This provides us with RPI forecasts to 2013, after which we assume a trend growth rate of 2.7% per annum, which is the RPI inflation rate that corresponds to CPI inflation of 2% (i.e. in line with the Bank of England's target).[11] Figure 3.1 illustrates these forecasts and Table 3.1 presents the precise yearly forecasts.

Figure 3.1: RPI forecasts



Sources: ONS, HM Treasury, CEPA analysis

[11] For an analysis on the differences between RPI and CPI and how these differences affect the rates of inflation calculated by the two indices, see: Office of National Statistics (2003) 'The new inflation target: the statistical perspective', available at: http://www.statistics.gov.uk/downloads/theme_economy/New_inflation_target_031210.pdf.

Table 3.1: RPI forecasts by financial year

Period		Revised Forecast (%)	Scenario 1, April (%)
2008/09		3.0 (actual)	0.0
2009/10		-0.4	-2.0
DPCR5	2010/11	1.9	2.7
	2011/12	2.4	3.4
	2012/13	2.8	3.0
	2013/14	2.7	2.9
	2014/15	2.7	2.8
	Average	*2.5*	*3.0*
Average (2008/09-2014/15)		*2.2*	*1.8*

Source: CEPA analysis

We note that our average RPI forecast for DPCR5 of 2.5% is lower than the 3.0% projection in Scenario 1 of the April report (the range of average forecasts in April was -0.2% to 3.3%). This is because we forecast that inflation would converge to trend "from below" as opposed to the convergence "from above" assumed in Scenario 1 in April, although not in all the other scenarios. We also note that our average forecasts are lower than the ones provided by First Economics in its May report to WPD.

These forecasts are used to deflate our nominal input price forecasts, as well as in the correlation-based approached used to forecast the inflation rates for materials and equipment.

3.3. General Labour

Below we examine the specific comments from DNOs with regard to our RPE forecasts for General Labour. We then present our revised forecasts for this cost category.

3.3.1. DNO comments

One of the DNOs' main concerns regarding our report was with regard to our projected RPEs for wage growth of General Labour. DNOs and their consultants, First Economics, provided a number of comments, which we consider in detail below.

DNOs argued that our RPE projections for 2009/10 were too low and that they did not take account of the wage rigidities inherent in the contracts that DNOs had entered into. There are two issues here. The first relates to the relationship between the indices that we projected and the actual costs faced by DNOs: there may be some evidence that some DNOs had agreed deals at higher levels than our numbers in April suggested.

However, whilst we were not provided with actual wage settlement figures by the DNOs prior to our April report, we think that even if Ofgem was able to gather such data, setting the RPEs only according to actual figures potentially goes against the principles of incentive based regulation and could provide perverse incentives to DNOs. Whilst individual DNOs may argue that their actual numbers are in response to the incentives under the current price control, we do not

believe this to be the aim of the current exercise. Rather we consider that RPEs should be set with a view of the wage growth that a notionally efficient DNO could be expected to pay. Furthermore, a technical difficulty would arise were we to seek to use DNO's actual wage settlements, as we would potentially need to consider the value of benefits in kind and other aspects of pay settlements to ensure an appropriate comparison.

The second issue relates to how reasonable our projections for the index of choice were. Our preferred index for General Labour is the ONS' Average Earnings Index (AEI) for the private sector, inclusive of bonus payments. In April, we forecast an RPE of 3% for this index for 2009/10 in our Scenario 1. To date, the ONS has published wage growth data for the first five months of the financial year 2009/10 (April to August). In these five months, the AEI (private sector, inc. bonus) has exceeded the rate of inflation measured by RPI by an average of 2.8%, meaning that our forecast was marginally more generous than the reality.

First Economics argues that forecasts of wage growth should be made with reference to the *nominal* historical growth rate of the chosen index, rather than the *real* growth rate, as we did in April. It claims that in an economy with an inflation-targeting central bank (as the Bank of England is), workers' inflation expectations are anchored beyond the short term and, therefore, so are their wage growth demands. We are not convinced by this argument for the following reasons:

- First, the argument that workers care about nominal rather than real wage growth goes against the fundamentals of economic theory. In economic theory, real wage growth acts as compensation for improvements in labour productivity. To suggest that labour productivity growth would be constant, especially at a time of great economic upheaval, is a rather strong assumption.
- Second, our analysis in April explicitly assumed in Scenario 2 and Scenario 3 that inflation does not settle back to the Bank of England's official target in the medium term. This in turn would dislodge inflation expectations and, hence, there was a need to consider real wage growth rather than nominal.

Additionally, First Economics bases its wage growth forecasts on an average for the period 1998-2007, which it claims represents the economic "normal". However, it is now clear that the period in question represented unusually stable developments in all key economic indicators. So much so, in fact, that it has been termed "The Great Moderation".[12] Very few economists are predicting a return to the conditions that prevailed between 1998 and 2007 when the current recession is over and so relying on trends from that period alone would lead to misleading forecasts.

Lastly, First Economics initially based its forecasts on the AEI including bonuses (the same wage index we used in April). However, in a May report to WPD it switched to the version of the index that excludes bonuses. First Economics claimed the index that includes bonuses had become "distorted", but while the volatility in the index certainly increased in recent months it does not imply that the index is no longer reliable. In fact, we would argue that the index

[12] The phrase is most commonly associated with US Federal Reserve Chairman Ben Bernanke, who used it in a speech in 2004. However, it was coined in an academic paper in 2001. The speech can be found at: http://www.federalreserve.gov/BOARDDOCS/SPEECHES/2004/20040220/default.htm.

perfectly captured the sharp decline in bonus payments, which was a consequence of the economic downturn. We also note that First Economics reverted to using the AEI including bonuses in a more recent note to the DNOs on wage growth.

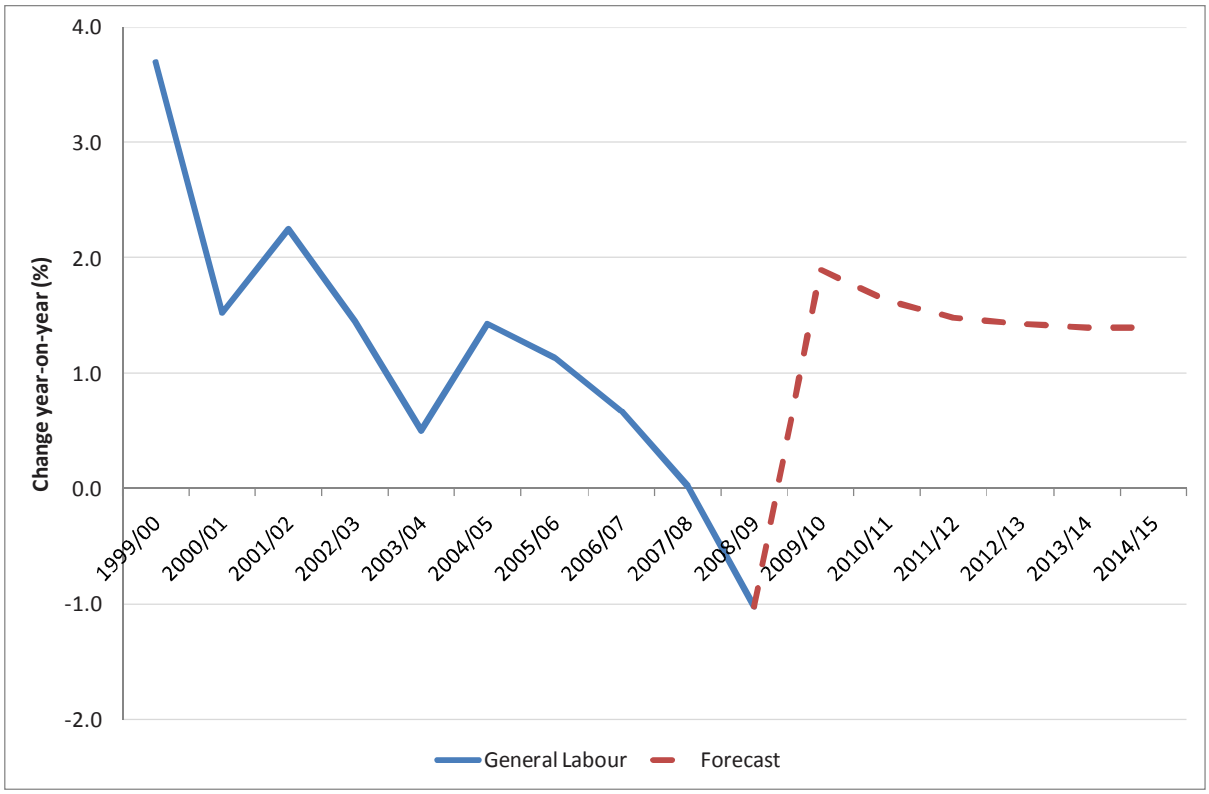
3.3.2. Analysis and forecasts

For our updated forecasts we continue to rely on the AEI for the private sector and inclusive of bonus payments. We consider this to be the most representative index of the wages private companies, such as the DNOs, would be paying for non-specialised labour. We develop wage growth forecasts in line with our single scenario:

- for the first two years, our forecasts are based on the median forecast of the AEI found in the August edition on 'Forecasts for the UK Economy';[13] and
- for the remainder of the forecast period we assume a gradual return to the historical trend growth rate of 1.4% (in real terms).

Our forecast of the RPEs for general labour are illustrated in Figure 3.2, with the precise forecasts presented in Table 3.2.

Figure 3.2: RPE forecasts for General Labour



Sources: ONS, HM Treasury, CEPA analysis

[13] The Treasury does not collect forecasts for this index beyond a two-year horizon.

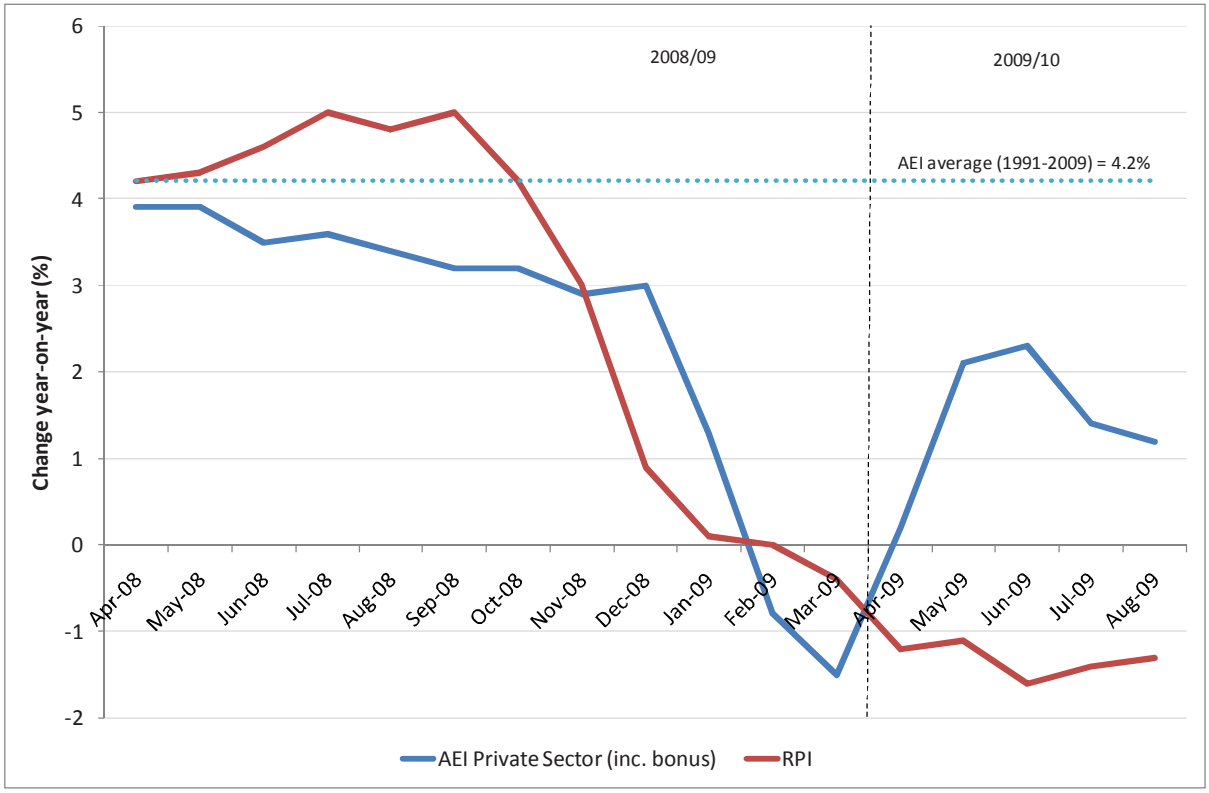
Table 3.2: RPE forecasts for general labour, by financial year

Period		Revised Forecast (%)	Scenario 1, April (%)
2008/09		-1.0 (actual)	2.2
2009/10		1.9	3.0
DPCR5	2010/11	1.6	1.2
	2011/12	1.5	0.9
	2012/13	1.4	1.0
	2013/14	1.4	1.1
	2014/15	1.4	1.1
	Average	*1.5*	*1.1*
Average (2008/09-2014/15)		*1.2*	*1.5*

Source: CEPA analysis

Table 3.2 shows that the RPE for General Labour was negative during 2008/09, which was a function of the unusual economic conditions that prevailed in that year, as shown in Figure 3.3.

Figure 3.3: AEI and RPI inflation in recent months



Source: ONS

During the first half of the year, rapid increases in oil and other raw material prices pushed RPI inflation above the AEI. The second half of 2008/09 was characterised by the recession, which initially saw RPI inflation drop rapidly as the previous raw material price increased reversed, while in the first three months of 2009 the AEI fell sharply as bonus payments (which are mainly paid during this time) were cut substantially.

As we noted in April, brief periods of negative real wage growth have occurred in the past. Hence, it can be argued that a short period of negative RPE is one of the risks attached to the "some you win, some you lose" approach to RPI-X regulation, and that this may be counteracted with higher than normal RPEs at a later date. We think, however, that the behaviour of the indices shown in Figure 3.3 is unlikely to be representative of the reality of labour costs faced by the DNOs during 2008/09. Many labour contracts are likely to be agreed on a multi-year basis and possibly indexed to RPI, which points to likely wage rigidities, especially towards the down side. As such, we think that a prudent approach would be to apply a zero RPE for general labour in 2008/09. However, we recognise that there are reasonable arguments that the actual figure generated should be used.

3.4. Specialised Labour

This was the main area of concern for the DNOs. We provide a detailed discussion of their concerns below and follow that with our revised forecasts.

3.4.1. DNO comments

DNOs have argued for a positive premium for specialised wage growth relative to general wage growth (in April we set a zero premium in Scenario 1 and a negative premium in Scenarios 2 and 3). The DNOs largely base these claims on a table provided by First Economics in which various measures of specialised wage growth are shown to have been higher than the AEI (private sector, inc. bonus) in the second quarter of 2009. However, this raises a number of questions, such as how have these indices behaved historically and do other relevant indices corroborate First Economics' view? We consider the specific arguments raised by the DNOs as to why a positive premium should be applied in detail below.

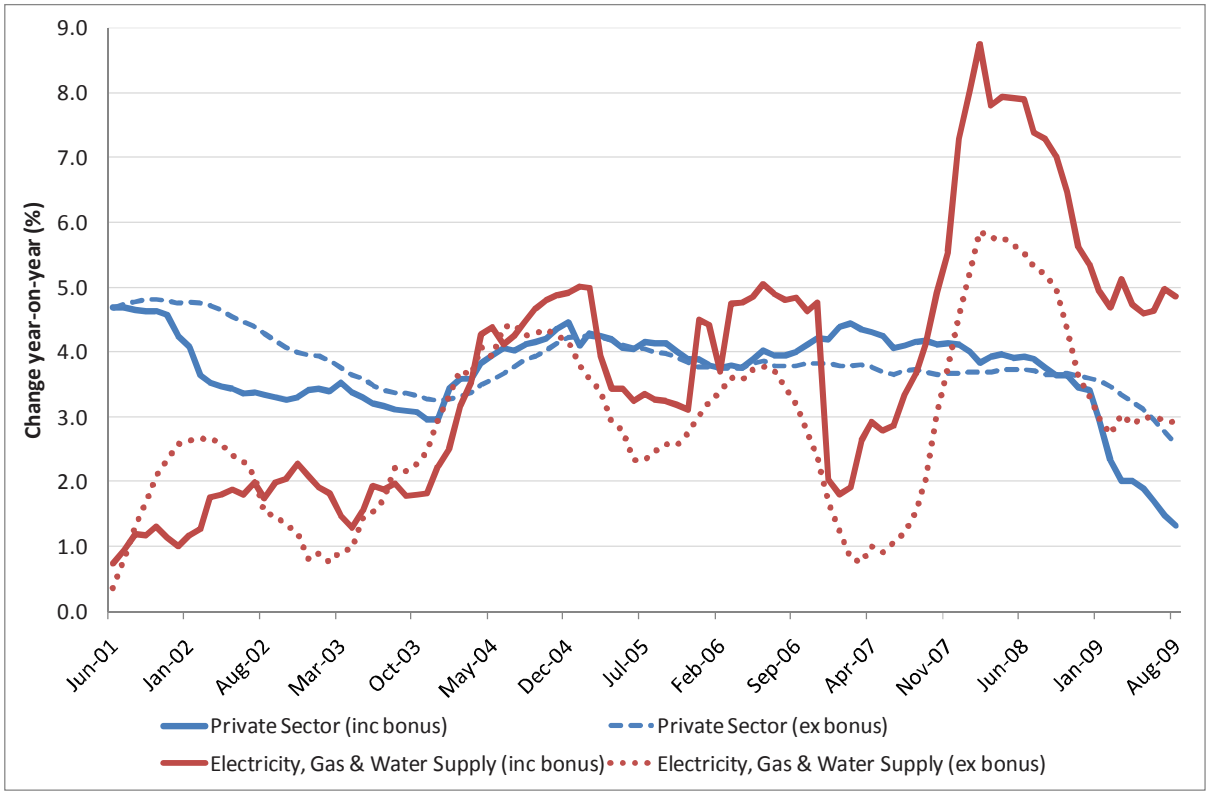
Issues specific to the electricity distribution sector

DNOs have argued that, given the large increase in capex planned for DPCR5, demand for specialised labour in the infrastructure sector (specifically electricity distribution) would not be materially affected by the economic crisis. We think this is a reasonable intuitive argument, albeit one that would be difficult to prove given the lack of specific data.

The ONS does provide an index on wage growth in the electricity, gas and water supply sectors as a component of the AEI, although this only dates back to 2000 and, as noted above, we have some concerns about using evidence from such a relatively short period of time. We see this as the closest proxy to wage growth in the electricity distribution sector. This index is plotted against our index for general labour in Figure 3.4.[14]

[14] The utilities index is extremely volatile on a month-to-month basis, so for ease of exposition we present in Figure 3.4 the 12-month moving average of both indices.

Figure 3.4: Wage growth in the utilities sector and in the private sector



Sources: ONS, CEPA analysis

We note the following from the above chart:

- up to 2004 wage growth in the utilities sector was notably lower than in the private sector as a whole;
- between 2004 and 2007 wage growth in the utilities sector was roughly level with the rest of the private sector;
- after initially plummeting, wage growth in the utilities sector spiked in 2007 before declining rapidly declining in 2008; and
- so far in 2009 the utilities sector has seen relatively steady wage growth, while the rest of the private sector has seen declining wage growth.

By comparing variations of the two indices that include and exclude bonus payments (shown in the dashed lines in Figure 3.4) we note that a key driver of wage growth in the utilities sector in the last few years has been bonus payments, while the sharp decline in private sector wage growth this year has been driven by a drastic decline in bonus payments, owing to the frailty of the financial sector. We do not think that high bonuses are representative of a supply shortfall, but rather that they are indicative of a successful industry, which is arguably what the utilities sector has been in the past five years or so.

In Table 3.3 we compare the effect of the crisis on the two indices. Over the entire series, the average growth rate of wages in both the utilities and private sectors has been the same (3.6%).

Table 3.3: Average wage growth in the private and utilities sectors

Period	AEI, Private Sector (inc. bonus)	AEI, Electricity, Gas & Water Supply (inc. bonus)
Entire series (July 2000 – Aug 2009)	3.6%	3.6%
Sep 2007 – Aug 2008	3.8%	7.3%
Sep 2008 – Aug 2009	1.4%	4.9%

Sources: ONS, CEPA analysis

However, in the last two years, the utilities sector has seen a significantly higher wage increase rate than the private sector as a whole. It is worth nothing, however, that the growth rates of both indices have moderated by the same same magnitude (2.4 percentage points) in the last 12 months compared to the previous 12 months, albeit wage growth in the utilities sector remains considerably higher than in the private sector. Overall, we observe that the growth rates of both the private sector AEI and the utilities AEI have moderated by the same amount in the last 12 months, which does not support the claim that wage growth in the electricity distribution sector has been less severely affected by the recession.

Issues relating to skilled employees in general

DNOs have also argued that specialised labour (in April we defined this as a range of skilled engineers) would command a positive premium because its supply is outstripped by its demand (owing to developments in the time span covered by DPCR5, such as the London Olympic Games and the development of the Crossrail). Again, we think that this is a reasonable intuitive argument but one that is difficult to prove in an objective manner.

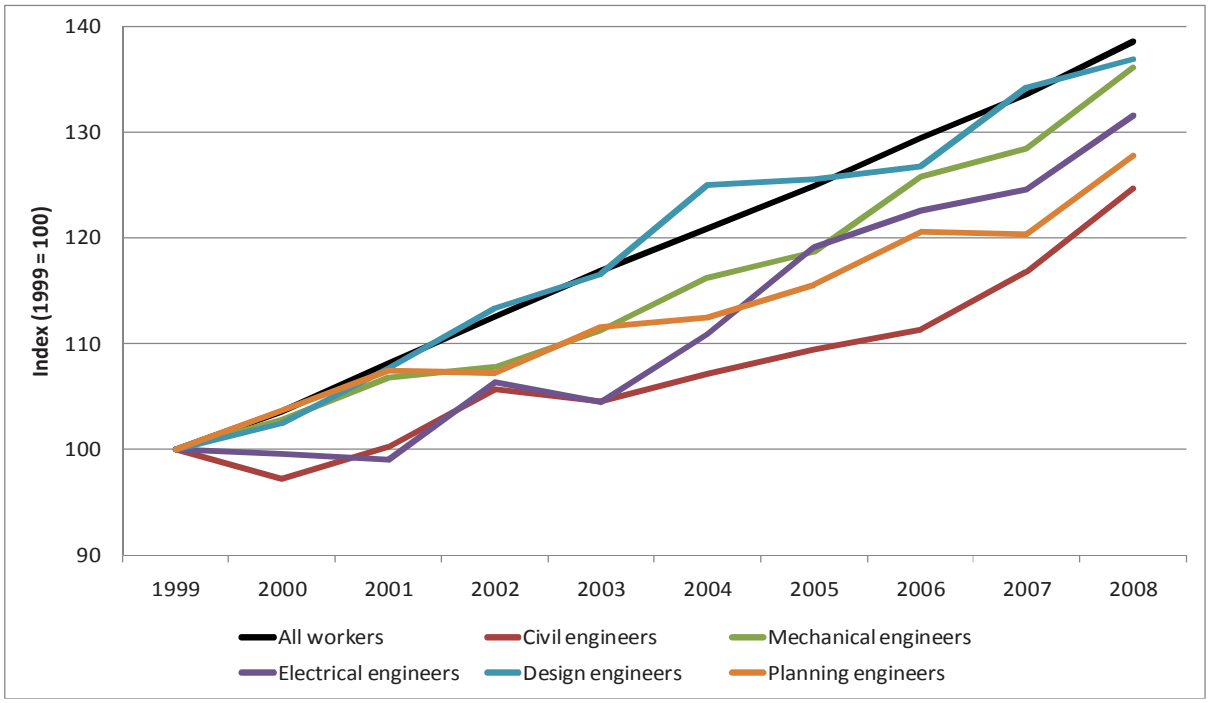
The most comprehensive and detailed information on wages of different types of workers can be found in the ONS' Annual Survey of Hours and Earnings (ASHE). Using ASHE for analysis such as ours has the advantage of ensuring that we are comparing like with like, as the figures for all worker categories are calculated in the same way, whereas if we were to use a range of different sources we could not be certain about the consistency of the methodologies used to compile the indices.

Below we examine the wage growth rate of general labour (i.e. the economy-wide average) according to ASHE against the growth rate for a number of engineering groups that we consider relevant for the activities of DNOs. These are:

- electrical engineers (used both in opex and capex);
- civil and structural engineers (capex only);
- mechanical engineers (capex only);
- planning and quality control engineers (capex only); and
- design and development engineers (capex only).

Figure 3.5 shows how wages of these various categories have risen over the period 1999-2008.[15] It is clear from the figure that engineering wages have grown at a slower pace than the economy-wide average for the period in question, with the exception of design engineers, whose wages have grown at roughly the same rate.

Figure 3.5: Nominal wage growth for various worker types



Sources: ONS, CEPA analysis

In Table 3.4 we detail the average growth rate of wages in each of the categories mentioned above. As the table shows, the average increase in wages in the various engineering categories was 0.6 percentage points lower than the economy-wide average. While we have used an unweighted average, given the figures even a weighted average could not lead to engineers wages exceeding the economy-wide average.

Table 3.4: Nominal wage growth for various worker types

Category	Average annual increase over 1999-2008 (%)
All workers	**3.7**
Civil engineers	2.5
Mechanical engineers	3.5
Electrical engineers	3.1
Design engineers	3.6
Planning engineers	2.8
All engineers (unweighted average)	**3.1**

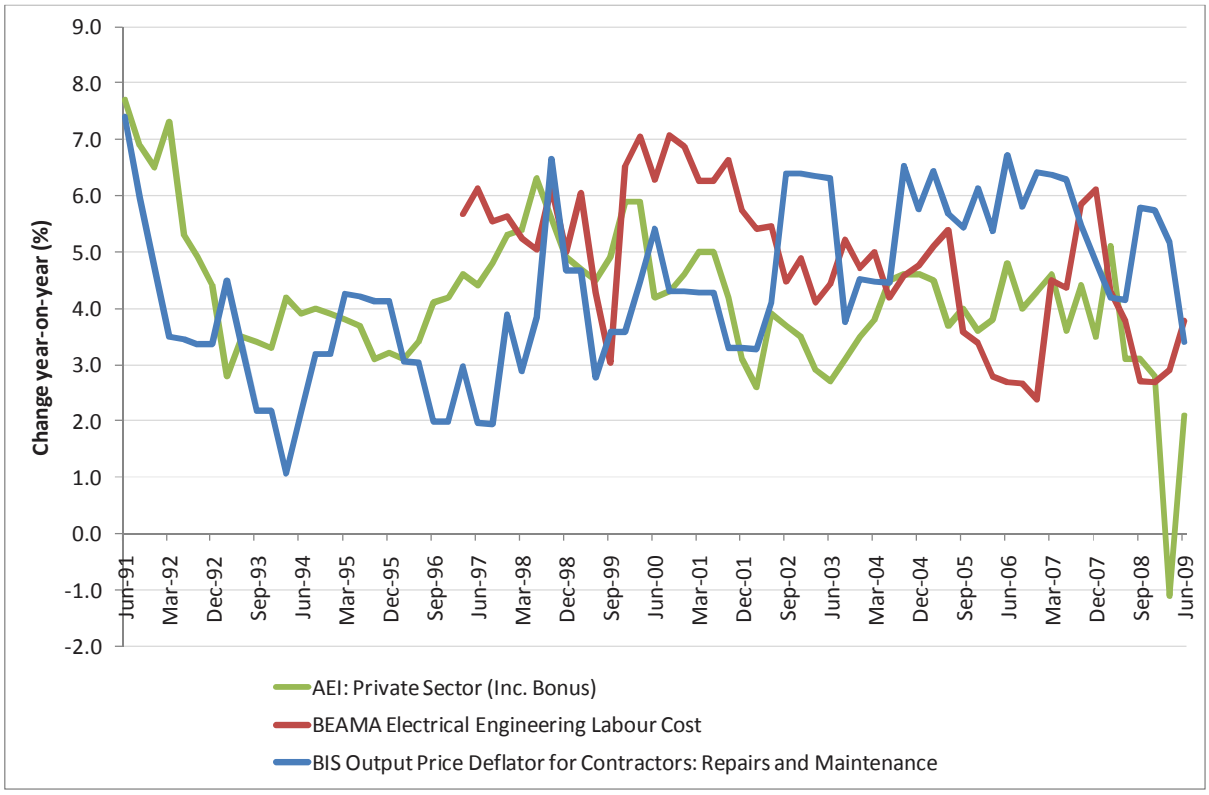
Source: CEPA analysis

[15] The ONS publishes ASHE data from 1997 onwards, but not all engineering categories are represented prior to 1999.

We think that the argument for a premium for specialised labour may be the result of DNOs confusing wage *levels* with wage *growth*. For example, over the period used above, the average wage of an electrical engineer was £16.5 per hour, while the economy-wide average wage was just £9.1 per hour. However, the *growth rate* of the latter was higher, meaning that the difference between the two in terms of wage *levels* gradually narrowed between 1999 and 2008.

In their latest note to the DNOs, First Economics have highlighted the Electrical Engineering Labour Cost index that is produced by the British Electrotechnical and Allied Manufacturers Association (BEAMA) and noted that it shows a positive "premium" against the AEI. Figure 3.6 plots this index against our preferred AEI index and also plots an index of contractor costs produced by the Department for Business, Innovation and Skills (BIS, formerly the Department for Business, Enterprise and Regulatory Reform (BERR)).

Figure 3.6: Nominal wage growth rates of general labour, electrical engineers and contractors



Sources: ONS, BEAMA, BIS, CEPA analysis

As the figure shows, the BEAMA index has generally shown a higher growth rate than the AEI and has, in fact, been rising since the third quarter of 2008. The BIS index has been higher than the AEI for the majority of this decade, having previously shown wage inflation of a similar (and sometimes lower) rate to the AEI.

In Table 3.5 we compare the effect of the financial crisis on the AEI and BEAMA index.

Table 3.5: Average wage growth according to the AEI and BEAMA index

Period	AEI, Private Sector (inc. bonus)	BEAMA, Electrical Engineering Labour Cost Index
Entire series (Jan 1997 – Aug 2009)	4.1%	4.8%
Sep 2007 – Aug 2008	3.8%	4.5%
Sep 2008 – Aug 2009	1.4%	3.3%

Sources: ONS, BEAMA, CEPA analysis

As indicated by the graph, the BEAMA index exhibited a higher wage inflation rate over the period in question. The final two rows of the table show that the wage inflation rate measured by the BEAMA index has declined by half as much as the AEI as a result of the current recession. These findings support First Economics and the DNOs' views.

3.4.2. Summary of analysis

Overall, our analysis in this section presents conflicting evidence as to whether Specialised Labour enjoys a higher or lower wage inflation rate than General Labour. While either could occur in the short term, we think that there is no intuitive reason to expect a premium for the growth rate of electricity distribution network specialists to sustain in the medium to long term. The experience in the UK since 2004 has shown that, where domestic shortages in skilled labour have existed (particularly in construction activities), skilled Eastern European workers have moved to the UK to fill these roles and, by boosting competition in the sector, have depressed wage growth. Given that the UK has a number of internationally-known infrastructure projects scheduled for the next decade or so, it is not unreasonable to expect that some of the increased demand for infrastructure specialists would be met by immigration, or international specialists (depending upon movements in the exchange rate).

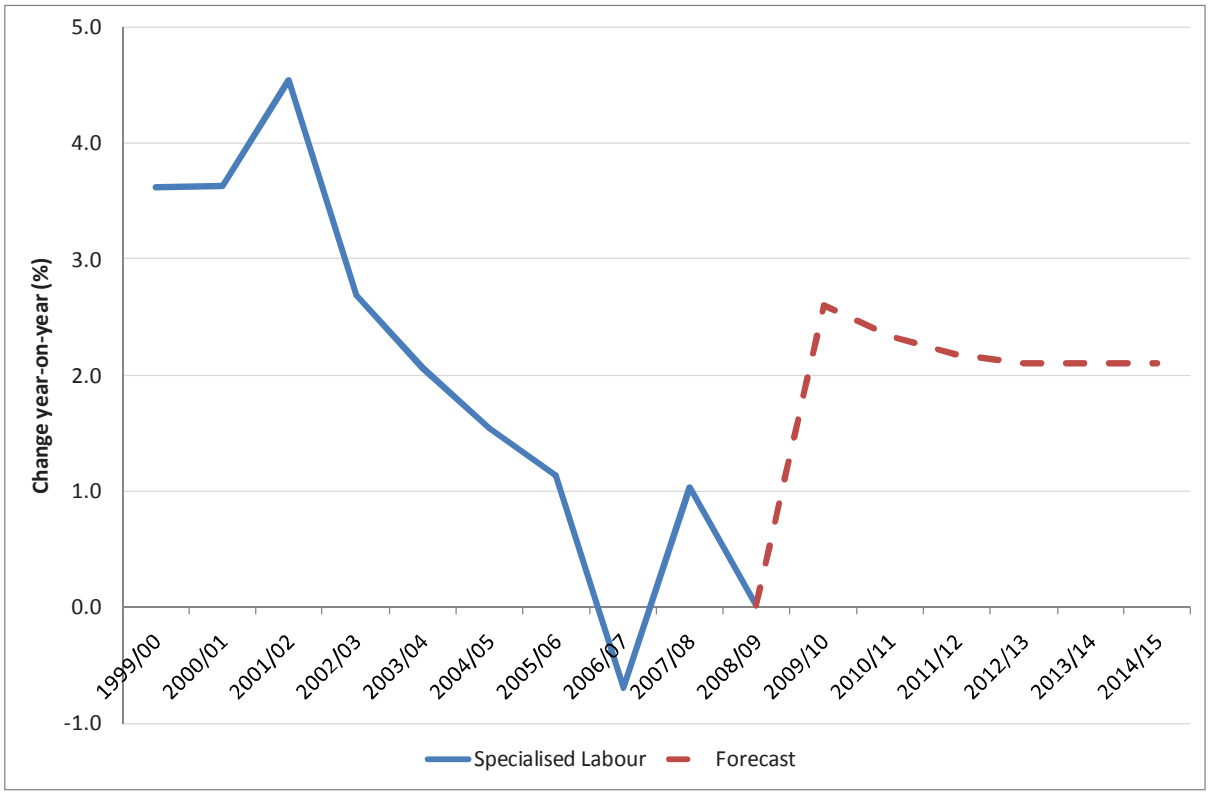
Whilst we are sceptical that a premium would be present in the medium to long term, given the aforementioned conflicting nature of evidence reviewed, we cannot be completely confident that no premium would be present in the short term. Indeed, there are challenges in reaching a firm conclusion as to what an appropriate level of any premium might be; however, the same evidence leaves us unconvinced that the premium is as large as the DNOs have suggested.

Before reaching a conclusion, ideally we would have liked to gather more evidence from organisations with experience of the specialised labour market on a day to day basis, such as recruitment agencies, but this has proven difficult to do in the timescales available. In coming to a view on an appropriate premium, having looked at the indices discussed above, and recognising the considerable difficulties in making an estimate, we are suggesting a premium of 0.7 percentage points. However, this should be seen as a point within a potential range for a reasonable premium which could start at zero, but which would be unlikely to extend to the level proposed by the DNOs. Given the available evidence that might be drawn in reaching a view on this issue, Ofgem will need to consider whether the premium proposed is appropriate.

3.4.3. Forecasts

In Figure 3.7 and Table 3.6 we present our forecasts for Specialised Labour. Historical figures are represented by the unweighted average of the BEAMA Electrical Engineering Labour Cost index.

Figure 3.7: RPE forecasts for specialised labour



Sources: BEAMA, CEPA analysis

Table 3.6: RPE forecasts for Specialised Labour, by financial year

Period		Revised Forecast (%)	Scenario 1, April (%)
2008/09		0.0[16]	2.2
2009/10		2.6	3.0
DPCR5	2010/11	2.3	1.2
	2011/12	2.2	0.9
	2012/13	2.1	1.0
	2013/14	2.1	1.1
	2014/15	2.1	1.1
	Average	*2.2*	*1.1*
Average (2008/09-2014/15)		*1.9*	*1.5*

Source: CEPA analysis

[16] Actual using the BEAMA Electrical Engineering Labour Cost index.

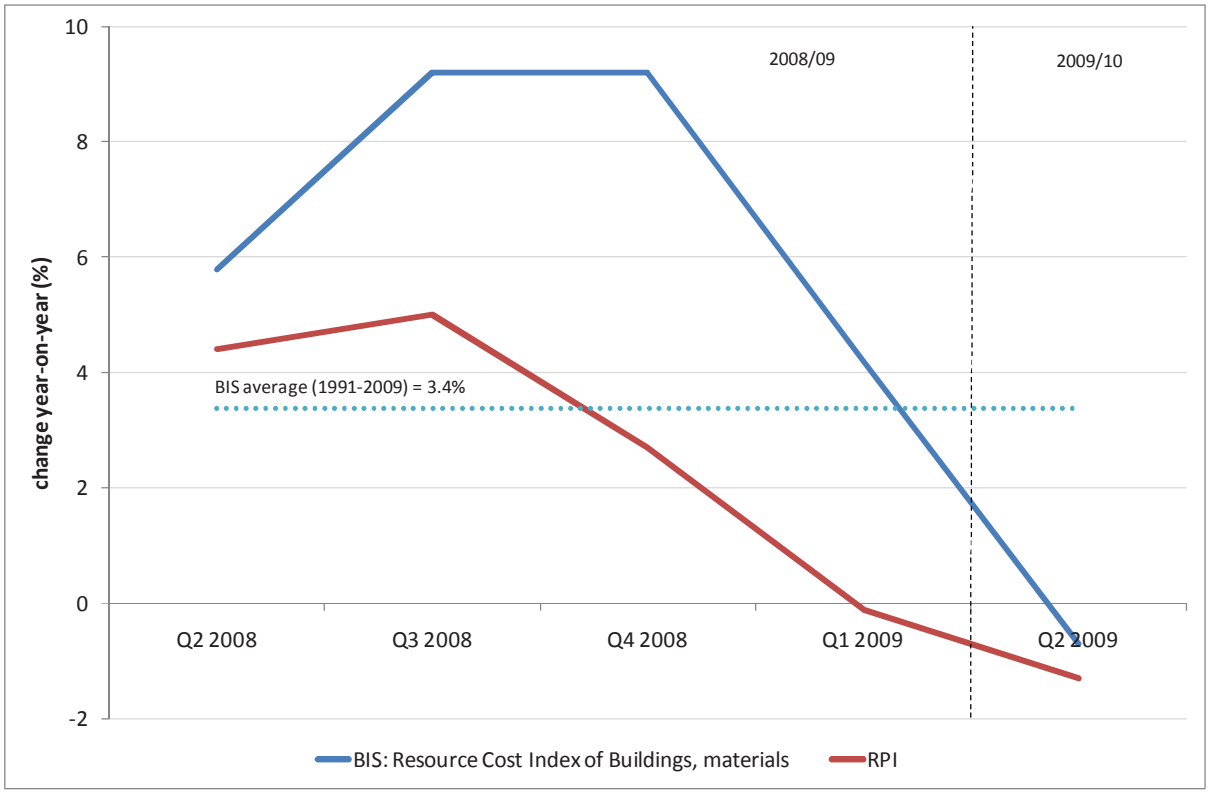
3.5. General Materials

By General Materials we refer to construction materials excluding metals. We maintain our view from April that the Resource Cost Index for building materials, which is produced by BIS, represents the most appropriate proxy of DNO costs in this cost category. We also continue to rely on the correlation-based approach to forecasting which we adopted in April. While we acknowledge the drawbacks of this approach, as we noted in April, the lack of historical cost data for the DNOs means that we are forced to adopt a second-best alternative. Correlation-based forecasting has the advantage of being transparent and objective – two qualities that we consider important given the degree of uncertainty associated with the future costs of the items we are attempting to forecast.

3.5.1. The latest data

In Figure 3.8 we plot the growth rate of the BIS series against the rate of inflation measured by RPI.

Figure 3.8: General Materials and RPI inflation in recent quarters



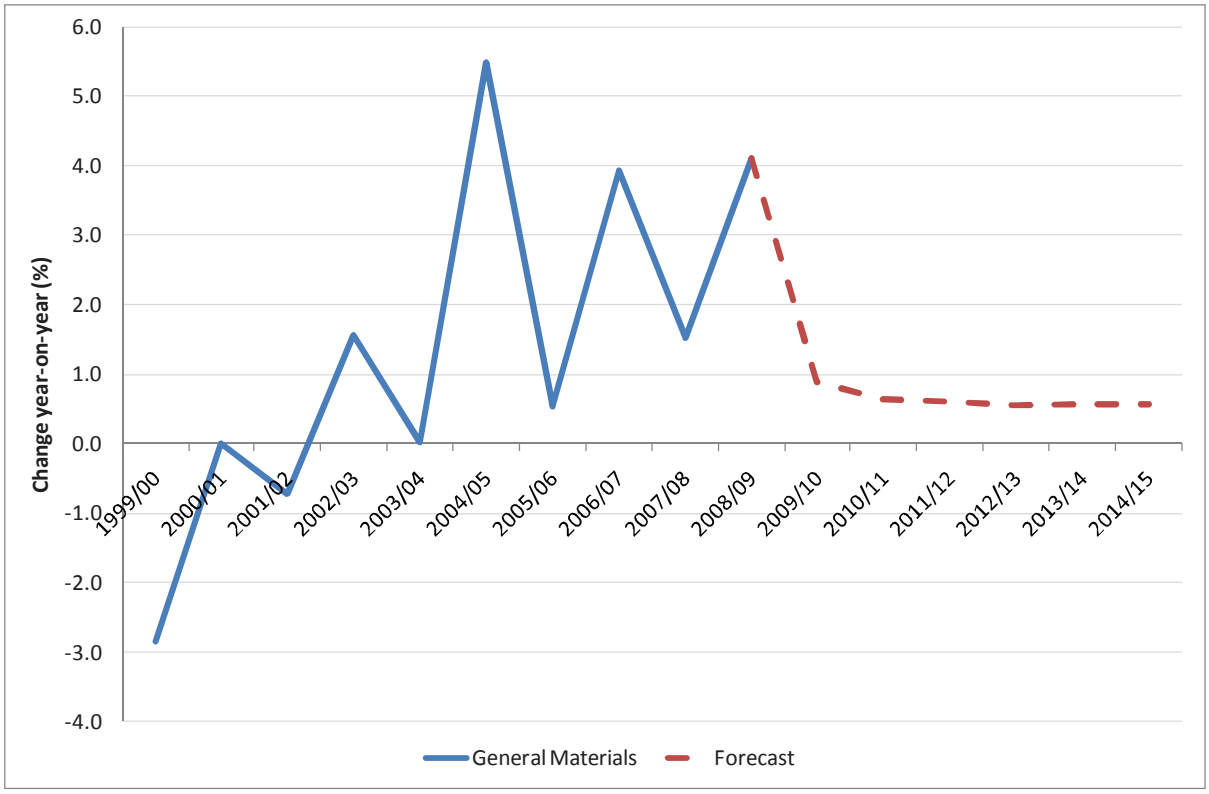
Sources: BIS, ONS

The Figure shows that the BIS index grew significantly more rapidly than the RPI during 2008/09, owing to the sharp rise in the price of internationally traded commodities. However, the global recession has seen a reversal of this trend, with the growth rate of the BIS index plummeting sharply in the first two quarters of 2009. It is reasonable to expect that as long as global economic activity remains depressed, the inflation rate of general materials will be subdued.

3.5.2. Forecasts

Updated forecasts of the RPEs are illustrated in Figure 3.9, with the precise forecasts presented in Table 3.7.

Figure 3.9: RPE forecasts for General Materials



Sources: BIS, CEPA analysis

Table 3.7: RPE forecasts for General Materials, by financial year

Period		Revised Forecast (%)	Scenario 1, April (%)
2008/09		4.1 (actual)	1.8
2009/10		0.9	2.2
DPCR5	2010/11	0.6	1.3
	2011/12	0.6	1.2
	2012/13	0.6	1.3
	2013/14	0.6	1.3
	2014/15	0.6	1.3
	Average	*0.6*	*1.3*
Average (2008/09-2014/15)		*1.1*	*1.5*

Source: CEPA analysis

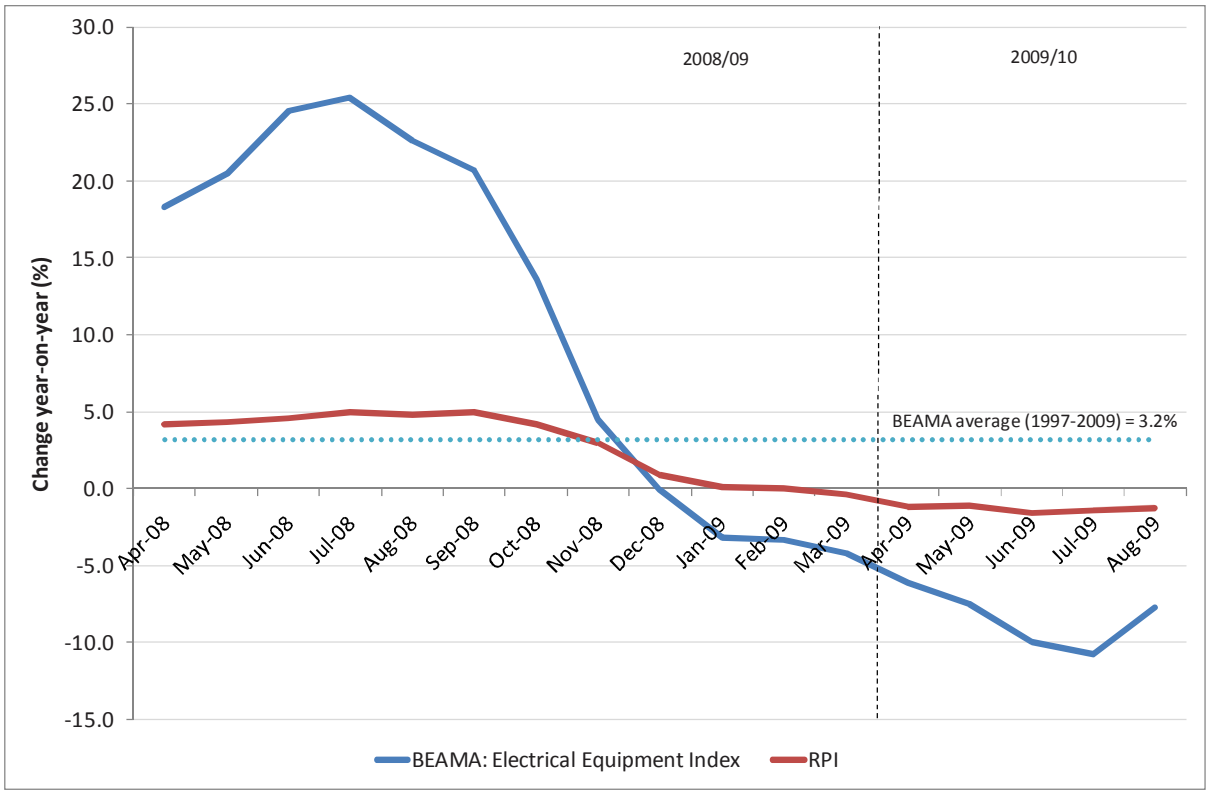
3.6. Specialised Materials

Specialised Materials include cables, cable containment, transformers, switchgear and more. We continue to rely on BEAMA's Electrical Materials Cost Index and use the correlation-based approach to develop forecasts for this cost category.

3.6.1. The latest data

Figure 3.10 plots the BEAMA index against RPI inflation for 2008/09 and the data that has been published to date for 2009/10.

Figure 3.10: Specialised Materials and RPI inflation in recent months



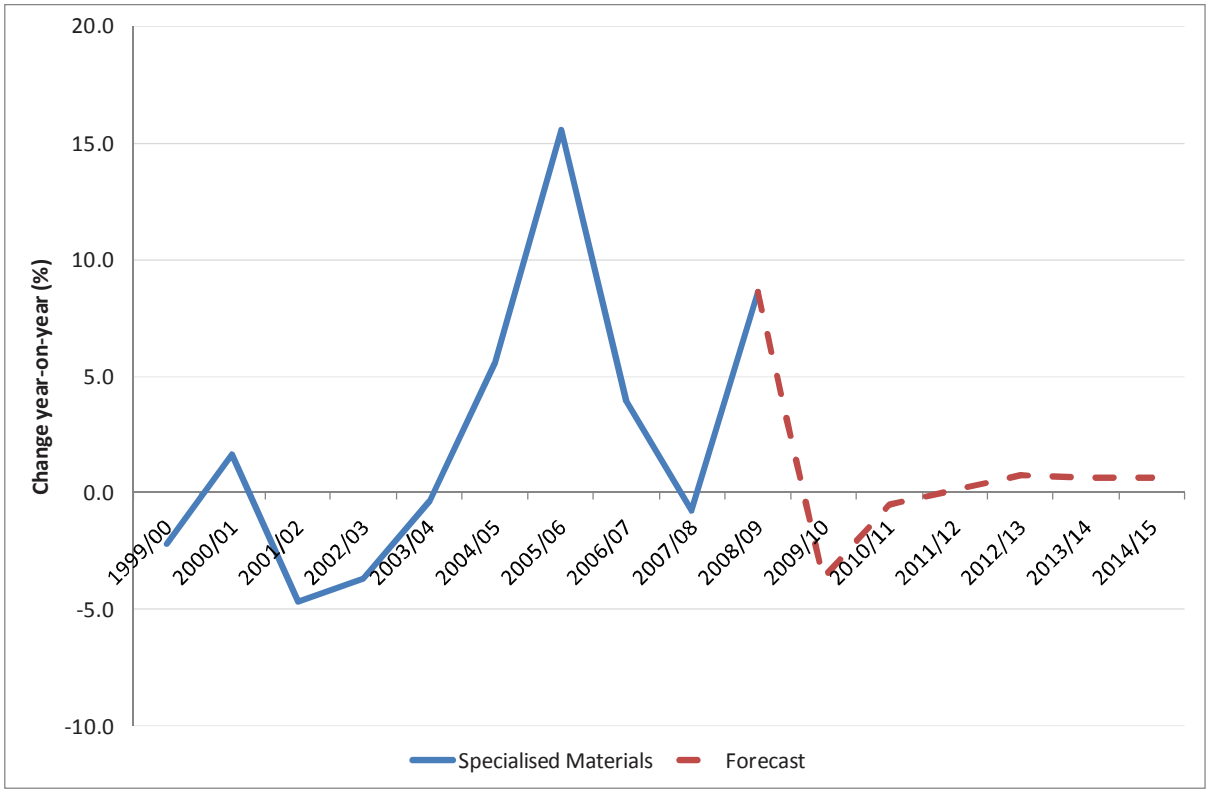
Sources: ONS, BEAMA

The price of electrical materials was rising sharply at the start of the period above, in line with the trend that prevailed in global commodity markets. However, the onset of the global crisis saw a sharp downturn in the BEAMA index, which has recorded strongly negative inflation so far in 2009. The extent to which the BEAMA index returns to normal levels will depend on the pace of the global economic recovery. However, it is not expected that double-figure inflation rates will be recorded again between now and 2015.

3.6.2. Forecasts

Updated RPE forecasts are illustrated in Figure 3.11, with the precise forecasts presented in Table 3.8.

Figure 3.11: RPE forecasts for Specialised Materials



Sources: BEAMA, CEPA analysis

Table 3.8: RPE forecasts for Specialised Materials, by financial year

Period		Revised Forecast (%)	Scenario 1, April (%)
2008/09		8.6 (actual)	3.4
2009/10		-3.7	5.1
DPCR5	2010/11	-0.5	1.1
	2011/12	0.2	0.5
	2012/13	0.7	0.8
	2013/14	0.6	0.9
	2014/15	0.6	1.0
	Average	*0.3*	*0.9*
Average (2008/09-2014/15)		*0.9*	*1.8*

Source: CEPA analysis

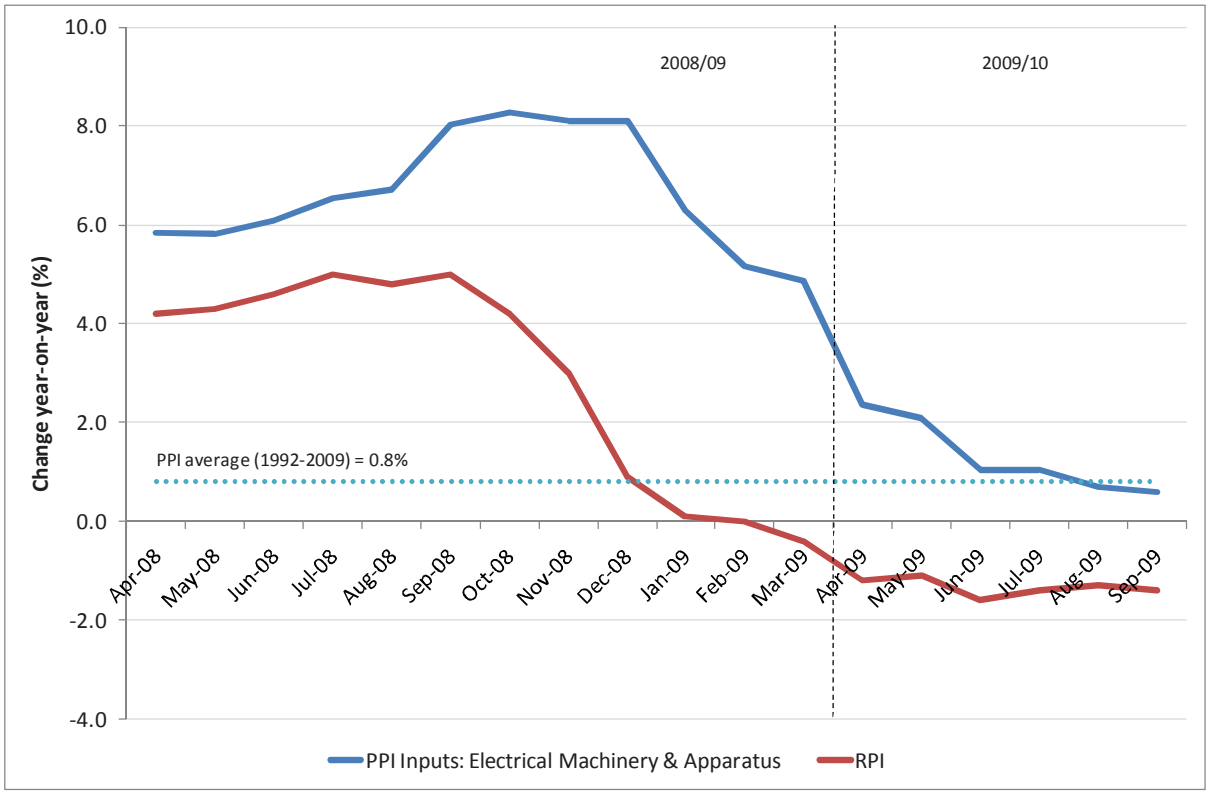
3.7. Equipment and Plant

This category refers to all equipment used in various manufacturing works (such as welding and lifting equipment), equipment that is not an integral part of the networks but is used on site (such as mobile generators, testing equipment), transport equipment and plant costs (such as mobile offices). We continue to rely on the ONS' Producer Price Index (PPI) for Electrical Machinery and Apparatus inputs. Forecasts are derived using our correlation-based forecasting approach, as in April.

3.7.1. The latest data

Outturn PPI data for recent months is plotted against RPI inflation in Figure 3.12 below.

Figure 3.12: PPI and RPI inflation in recent months



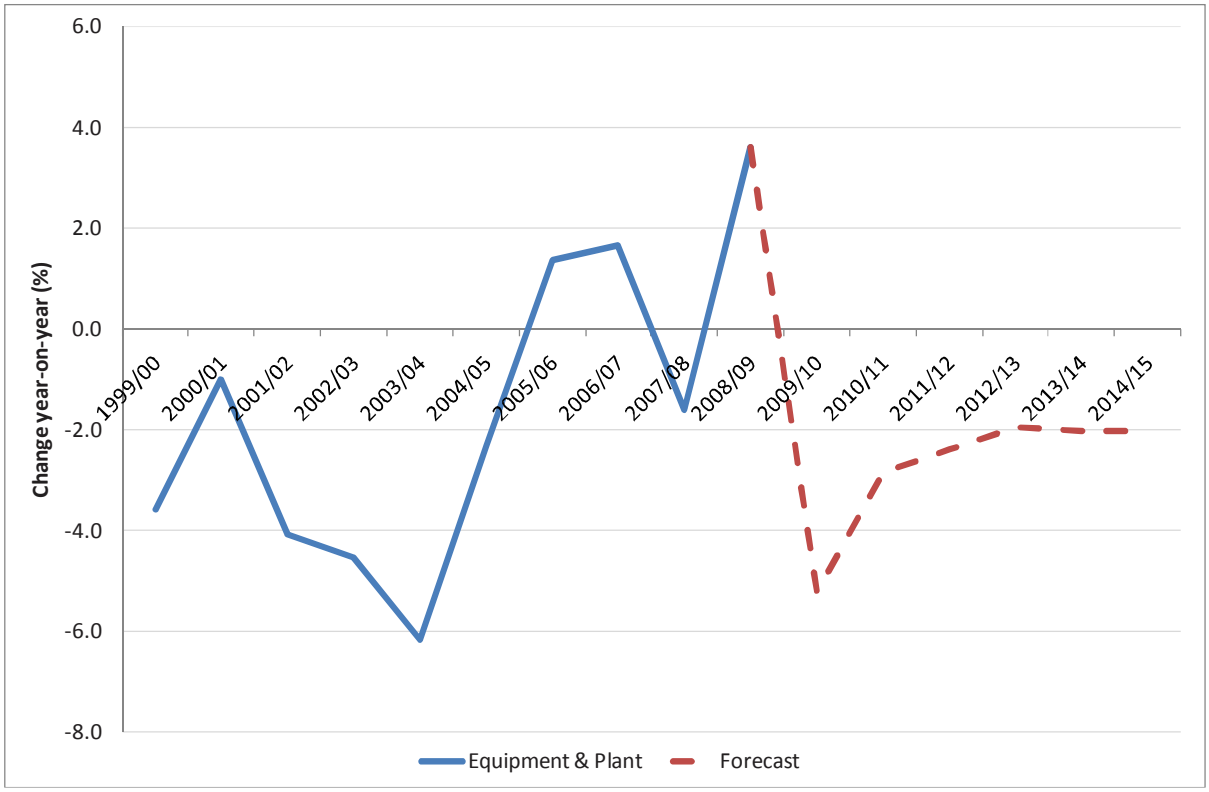
Source: ONS

There was clearly a positive RPE for equipment and plant throughout the period shown in Figure 3.12. This was largely driven by the prices of raw materials in international markets. In the second half of the period shown above, however, the two series converged and it may be expected that the RPI will eventually begin to outstrip the PPI, as has often been the case historically (see Figure 3.13).

3.7.2. Forecasts

Our forecasts of the RPEs are illustrated in Figure 3.13, with the precise forecasts presented in Table 3.9.

Figure 3.13: RPE forecasts for Equipment and Plant



Sources: ONS, CEPA analysis

Table 3.9: RPE forecasts for Equipment and Pplant, by financial year

Period		Revised Forecast (%)	Scenario 1, April (%)
2008/09		3.6 (actual)	-2.2
2009/10		-5.2	-2.4
DPCR5	2010/11	-2.9	-1.9
	2011/12	-2.4	-1.9
	2012/13	-2.0	-1.9
	2013/14	-2.0	-1.9
	2014/15	-2.0	-1.9
	Average	*-2.3*	*-1.9*
Average (2008/09-2014/15)		*-1.8*	*-2.0*

Source: CEPA analysis

4. SUMMARY OF FORECASTS

In this section we pull our analysis together and summarise our RPE forecasts for the five cost categories.

Annex D shows that, in nominal terms, all of our forecasts have declined relative to Scenario 1 in April. This is because in Scenario 1 it was assumed that a short recession would be followed by a quick bounce to above-trend growth (and hence inflation) and that the economy would settle to a trend rate that corresponds to the pre-crisis period. Our forecasts now are based on the consensus analyst view, which sees the recovery from the recession as slow and gradual, and expects a convergence to a growth (and inflation) trend rate that corresponds to the long-term historical averages (which are lower than the pre-crisis averages). In the terminology of our April report, the current economic view can be seen to lie somewhere between Scenario 1 and Scenario 3.

The above has implications for our RPE forecasts, as our nominal forecasts for materials and equipment fall by more than the decline in our RPI forecast, while the opposite is true for the two labour categories. Hence, for the price control period covered by DPCR5, our RPE forecasts have declined for materials and equipment and increased for labour. These forecasts are summarised in Table 4.1. For comparison, we present our forecasts for Scenario 1 in the April report. We also present First Economics' RPE estimates from their May report for WPD. Some of our forecasts are higher than First Economics' while others are lower.

Table 4.1: Average forecasts by input price category

Category	CEPA October (%)	CEPA April, Scenario 1 (%)	First Economics, May (%)
Average RPE forecasts for 2010/11-2014/15			
General labour	1.5	1.1	1.1
Specialised labour	2.2	1.1	2.7
General materials	0.6	1.3	1.1
Specialised materials	0.3	0.9	2.1
Equipment & plant	-2.3	-1.9	1.1
Average RPE forecasts for 2008/09-2014/15			
General labour	1.2	1.5	1.3
Specialised labour	1.9	1.5	3.0[17]
General materials	1.1	1.5	0.6
Specialised materials	0.9	1.8	0.3
Equipment & plant	-1.8	-2.0	0.0

Sources: First Economics, CEPA analysis

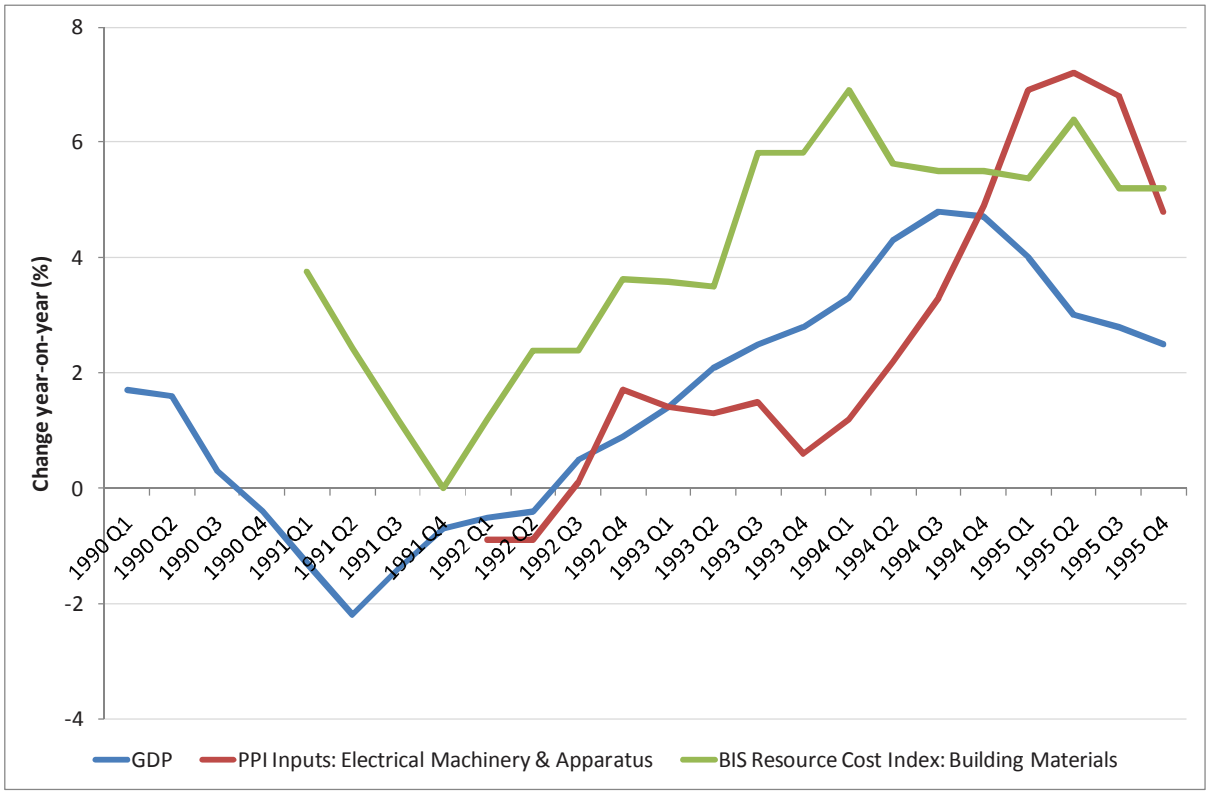
The increase in our labour RPEs is due to expected downward rigidity in wages, in accordance with economic theory. In contrast, the price of materials and equipment is likely to be more

[17] Implied.

strongly influenced by the slower pace of growth. In particular, it is now expected that there will be more spare resources and slack productive capacity during the period to end-DPCR5 than was expected by Scenario 1 in April. This, in turn, will tend to push down the price of materials and equipment by more than it will depress the RPI.

A good illustration of the above can be seen by considering what happened to materials and equipment prices during the UK recession of the early Nineties. The BIS series on building material prices dates back to 1991, while the PPI series of electrical machinery and apparatus goes back to 1992.[18] Both of these are plotted in Figure 4.1 against GDP growth for the period covering the early Nineties recession and subsequent (gradual) recovery.

Figure 4.1: Materials and equipment price inflation in the early Nineties



Sources: ONS, BIS, CEPA analysis

The figure shows that the inflation rate of materials and equipment rose sluggishly and lagged behind GDP growth in recovering from the trough of the recession, owing to the excess spare capacity that was created by the initial drop in output. We have little reason to expect these indices to behave any differently this time around should the recovery be slow and gradual as is currently anticipated.

[18] We understand that BEAMA's Electrical Materials Cost Index is also available for the period but we have not been able to access this data.

ANNEX A – TERMS OF REFERENCE

Ofgem requires an update of these forecasts to take into account comments raised by stakeholders on the report and any new information that has arisen since April.

There are two work streams where we are seeking consultancy support:

1. **Review of responses relating to CEPA's RPE forecasts** – since the publication of the CEPA paper in April, Ofgem has received the following responses:

   - responses to the May methodology paper, which are available from the Ofgem website;
   - responses to Initial Proposals which again are available on the Ofgem website,
   - a First Economics report submitted by a DNO in June 2009 which updates FE's earlier work in this area and also comments on the CEPA report;
   - a First Economics report submitted by the ENA in September 2009 which focuses on wage inflation; and
   - two short submissions by a DNO on RPEs.

   We require these responses to be reviewed and taken into account when modifying/updating RPE forecasts in the second work stream. In reviewing these responses we require particular attention to be focussed on arguments relating to wage inflation in 2009/10 and to the wage growth premium of contractor labour.

2. **Update of RPE forecasts** – Ofgem requires the RPE forecasts to be updated taking into account the following:

   - any lessons from the review in work stream 1, e.g. different data sources or forecasting methodology;
   - more up-to-date economic forecasts and the latest available data; and
   - any other lessons from similar analysis undertaken since April.

   Updated forecasts of RPEs are only required for a single economic scenario which should be for a well defined consensus view. For both operating and capital activities, Ofgem requires RPE forecasts for general labour, contractor/specialist labour, materials (including equipment/plant where relevant), and other cost items.

ANNEX B – FIRST ECONOMICS' FORECASTS

In the process of our work on RPEs for Ofgem we were granted access to a number of reports produced by First Economics for the DNOs. The table in this annex summarises the indices used by First Economics in its forecasts and the actual forecasts derived. Some of the DNOs have criticised us for adopting a scenario-based approach in April, rather than providing point-estimates, but we think that the strength of our approach is illustrated by the fact that First Economics have had to revise their forecasts in each of the reports provided to the DNOs.

Table B.1: Summary of First Economics' forecasts

Category		July 2008	December 2008	May 2009
RPI	Forecast	09/10 onwards 2.5%	Uses Treasury forecasts from Nov. 2008 Pre-Budget Report 2.5% assumed for 2014/15	Uses Treasury forecasts from April 2009 Budget 2.5% assumed for 2014/15
General Labour	*Index*	*ONS AEI, Private Sector inc. bonus*	*ONS AEI inc. bonus (implied)*	*ONS AEI ex. bonus*
	Forecast	09/10 onwards 4.25%	09/10 2.5% 10/11 3.5% 11/12 onwards 4.25%	09/10 2.5% 10/11 3.0% 11/12 onwards 4.25%
Specialised Labour	Forecast	09/10 onwards 0.75% premium for electrical engineers 1.5% premium for infrastructure specialists	09/10 and 10/11 1.5% premium for electrical engineers 2% premium for infrastructure specialists 11/12 onwards 0.75% premium for electrical engineers 1.5% premium for infrastructure specialists	09/10 and 10/11 1% premium for electrical engineers 2% premium for infrastructure specialists 11/12 onwards 0.75% premium for electrical engineers 1.5% premium for infrastructure specialists
General Materials	*Index*	*BERR Resource Cost Index, infrastructure materials; BERR Resource Cost Index, building materials*	*BERR Resource Cost Index, infrastructure materials*	*BERR Resource Cost Index, infrastructure materials*
	Forecast	09/10 onwards 5.0%	09/10 -4.0% 10/11 onwards 4.5%	09/10 1.0% 10/11 onwards 4.0%

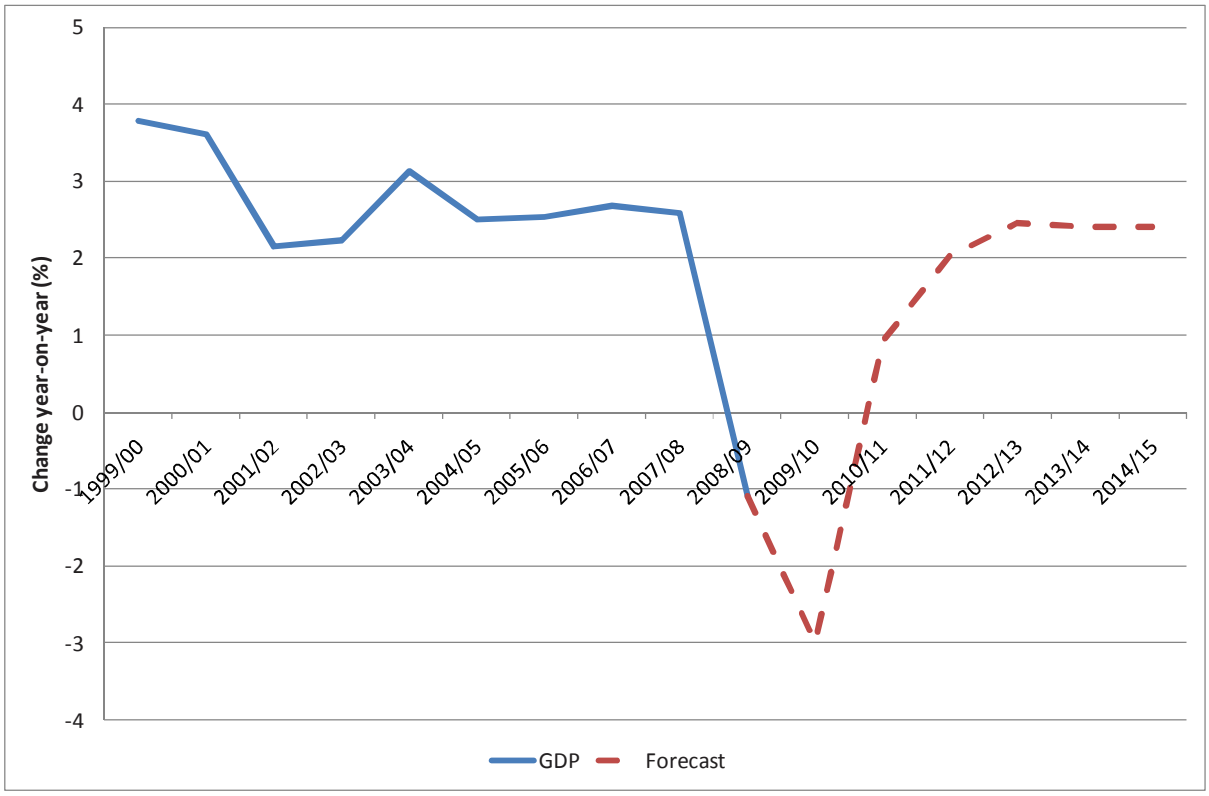
Category		July 2008	December 2008	May 2009
Specialised Materials	*Index*	*BEAMA Electrical Equipment index*	*BEAMA Electrical Equipment index*	*BEAMA Electrical Equipment index*
	Forecast	09/10 onwards 5.0%	09/10 -5.0% 10/11 onwards 5.0%	09/10 -6.0% 10/11 onwards 5.0%
Equipment & Plant	*Index*	*BERR Civil Engineering plant & vehicles; ONS PPI Inputs, machinery & equipment*	*BERR Civil Engineering plant & road vehicles*	*BERR Civil Engineering plant & road vehicles*
	Forecast	09/10 onwards 5.0%	09/10 -3.0% 10/11 onwards 4.5%	09/10 -3.0% 10/11 onwards 4.0%

Source: First Economics

ANNEX C – DETAILS OF ECONOMIC SCENARIO

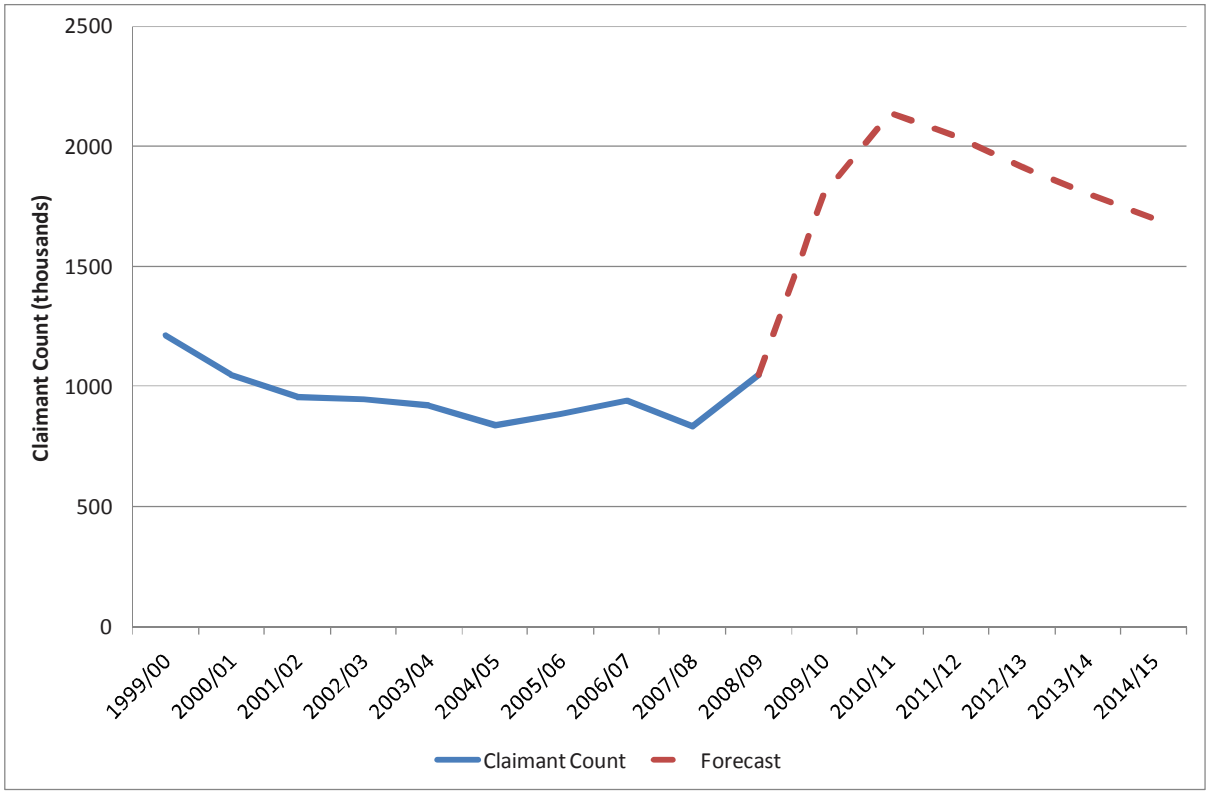
As described in Section 2.5, our forecasts in this report are based on an outlook for the UK economy which matches the current consensus view of analysts. This view of economic developments between now and 2014/15 are based on the median forecasts found in the August 2009 issue of HM Treasury's 'Forecasts for the UK Economy' publication. An illustration of what these forecasts are for the key macroeconomic variables of GDP growth, unemployment, interest rates and Sterling exchange rate are provided in Figures C.1-C.4.

Figure C.1: Illustration of GDP growth scenario



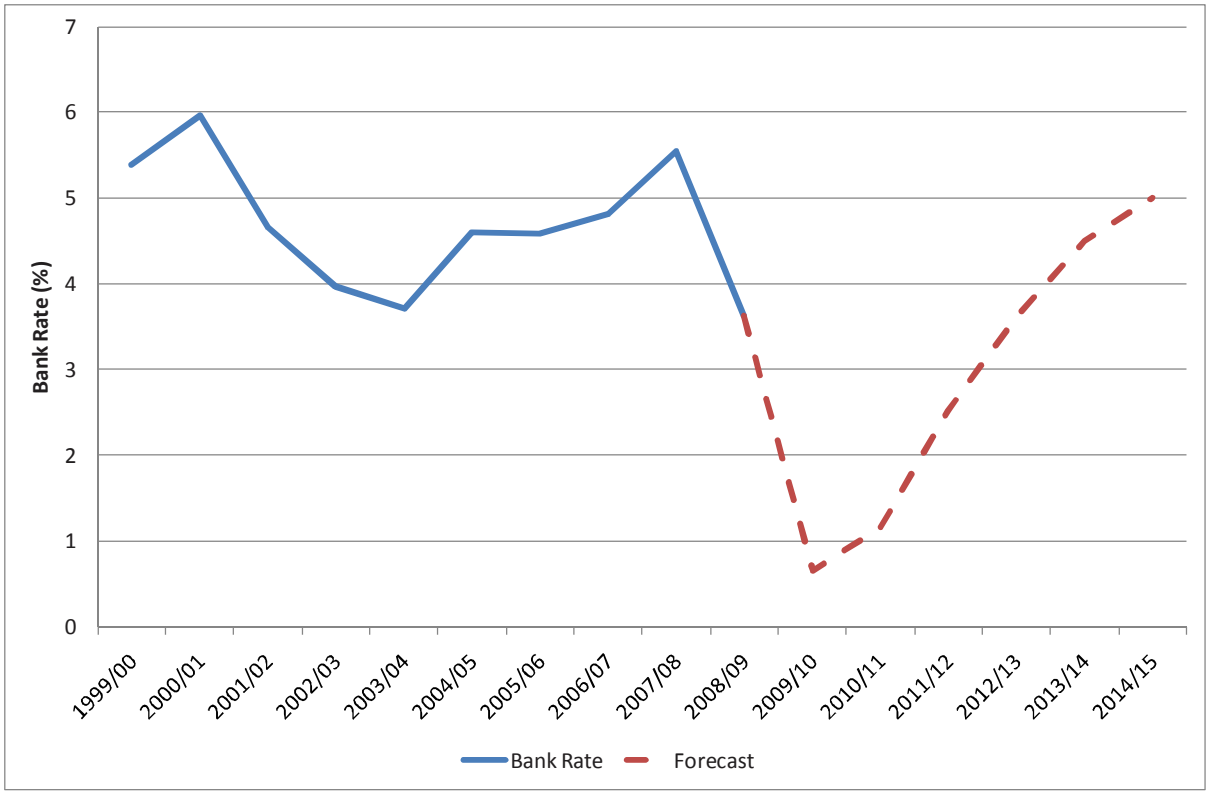
Sources: ONS, HM Treasury, CEPA analysis

Figure C.2: Illustration of unemployment scenario



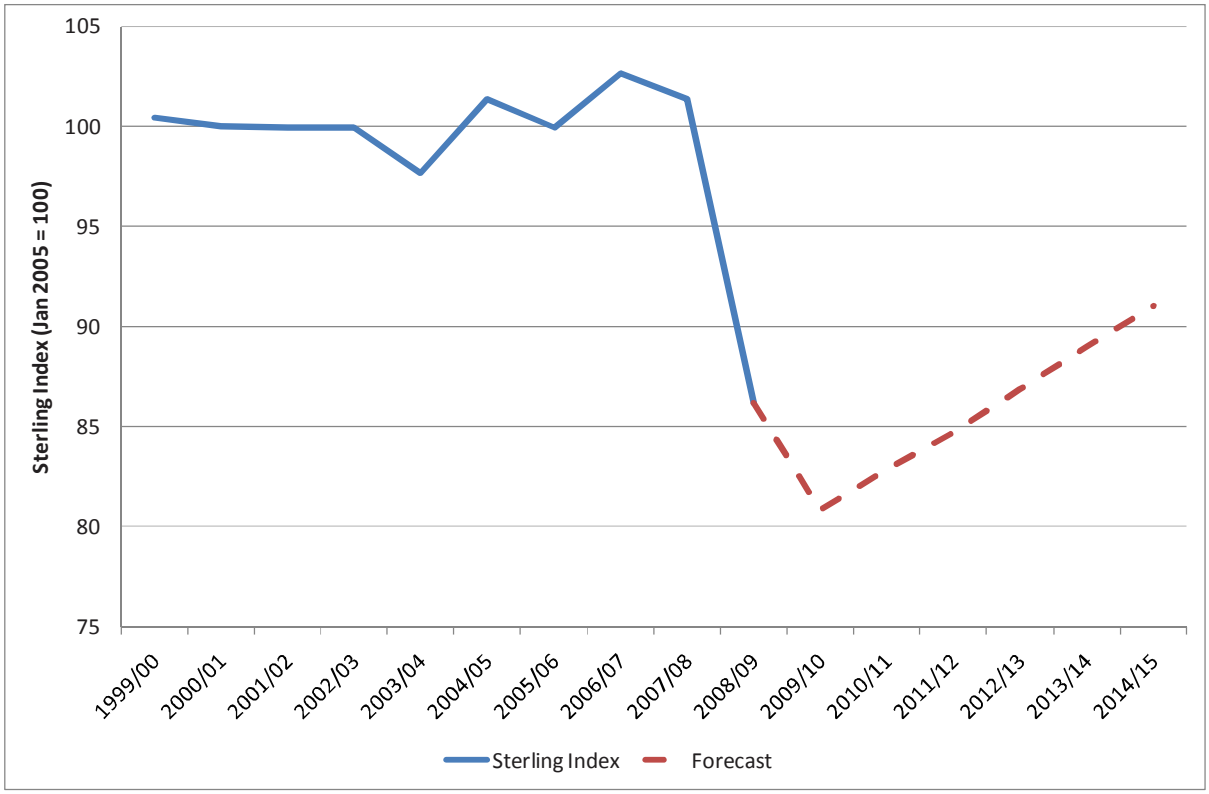
Sources: ONS, HM Treasury, CEPA analysis

Figure C.3: Illustration of interest rate scenario



Sources: Bank of England, HM Treasury, CEPA analysis

Figure C.4: Illustration of exchange rate scenario



Sources: Bank of England, HM Treasury, CEPA analysis

ANNEX D – NOMINAL INPUT PRICE FORECASTS

In both this and the April report we presented our forecasts for input prices in terms of RPEs, as these were the figures relevant for Ofgem's purposes. In this annex, we present our forecasts from this report and from Scenario 1 in the April report in nominal terms, so that the readers may be able to better understand what is driving the different RPE figures that we presented in the body of the report.

Table D.1: Nominal forecasts (percentage change year-on year)

Period		RPI	General Labour	Specialised Labour	General Materials	Specialised Materials	Equipment and Plant
2008/09 (actual)		3.0	2.0	3.0[19]	7.1	11.6	6.6
2009/10		-0.4	1.5	2.2	0.5	-4.1	-5.6
DPCR5	2010/11	1.9	3.5	4.2	2.5	1.4	-1.0
	2011/12	2.4	3.8	4.5	2.9	2.5	-0.1
	2012/13	2.8	4.2	4.9	3.3	3.5	0.8
	2013/14	2.7	4.1	4.8	3.3	3.3	0.7
	2014/15	2.7	4.1	4.8	3.3	3.3	0.7
	Average	*2.5*	*3.9*	*4.6*	*3.1*	*2.8*	*0.2*
Average (2008/09-2014/15)		*2.2*	*3.3*	*4.1*	*3.3*	*3.1*	*0.3*

Source: CEPA analysis

[19] Actual using the BEAMA Electrical Engineering Labour Cost index.

Table D.2: Nominal forecasts in Scenario 1, April 2009 (percentage change year-on year)

Period		RPI	General Labour	Specialised Labour	General Materials	Specialised Materials	Equipment and Plant
2008/09 (forecast)		0.0	2.2	2.2	1.8	3.4	-2.2
2009/10		-2.0	1.0	1.0	0.2	3.2	-4.4
DPCR5	2010/11	2.7	3.9	3.9	4.0	3.8	0.8
	2011/12	3.4	4.3	4.3	4.6	3.9	1.5
	2012/13	3.0	4.0	4.0	4.3	3.8	1.1
	2013/14	2.9	4.0	4.0	4.2	3.8	0.9
	2014/15	2.8	3.9	3.9	4.1	3.8	0.9
	Average	*3.0*	*4.0*	*4.0*	*4.2*	*3.8*	*1.0*
Average (2008/09-2014/15)		*1.8*	*3.3*	*3.3*	*3.3*	*3.7*	*-0.2*

Source: CEPA analysis

ANNEX E – SENSITIVITY ANALYSIS

E.1. Introduction

As noted in the body of the report, we have not changed our indices from the ones used in April. In the April report we took into account three factors when selecting our indices:

- how representative we felt the composition of the index was for the costs captured in a particular input price category;
- the strength of correlation of the index with RPI, as this was indicative of the stability of the relationship between the two as the accuracy of our forecasts in the scenario-based approach that we adopted in April depended on there being a stable relationship; and
- whether the index had been used by the DNOs' consultants, as we felt we would need a strong reason to depart from the indices selected by First Economics and NERA.

Indeed, all of the indices that we refer to in both this and the April reports were also used or considered by First Economics and NERA.

In this annex, however, we analyse the extent to which our forecasts are dependent on the indices selected to represent each cost category, as there may be reasonable arguments that other indices may be similarly relevant and could potentially result in different forecasts. Given the way in which our forecast are derived, there are three main points to examine in this regard:

- The long-term trend of each index – given that in this report we assume a return of RPI inflation to trend by the end of DPCR5, our forecasting methodology implicitly assumes that the rate of inflation for each input price category will also settle back to trend by the end of DPCR5.
- The impact of the recession on the index – a key factor in our forecasts is the extent to which the index has declined as a result of the global/ domestic slowdown as this affects short-term forecasts, which in Ofgem's calculations of the RPE allowance are compounded over time.
- The strength of correlation with RPI – this is a loose indicator of how dependent the index is on the overall economic conditions in the UK and reflects the expected pace of recovery to trend. As we noted above, a robust correlation also provides greater assurance that, assuming our RPI forecasts are realistic, the forecasts for input prices will be reasonable.

We discuss a range of indices for general labour, general materials, specialised materials, and equipment and plant in turn below. A detailed discussion of various indices for specialised labour was presented in the body of the report and is not repeated here.

E.2. General labour

We think that the Average Earnings Index (AEI) produced by the Office of National Statistics (ONS) is undisputedly the most appropriate measure of labour costs. The debate, however, is with regard to which variation of this index to use. This can be split into two separate questions:

- whether to use an index for the whole UK economy or just for the private sector; and
- whether to use an index that includes bonus payments or excludes them.

These questions lead to four variations of the AEI that are worth considering and these are described in Table E.1. The indices are plotted in Figure E.1.

Table E.1: Summary of general labour indices

Source:	**ONS**	**ONS**	**ONS**	**ONS**
Index:	**Average Earnings Index**	**Average Earnings Index**	**Average Earnings Index**	**Average Earnings Index**
Component:	**Private Sector inc. bonus**	**Whole Economy inc. bonus**	**Private Sector ex. bonus**	**Whole Economy ex. bonus**
Coverage	March 1991 – August 2009	March 1991 – August 2009	May 1997 – August 2009	May 1997 – August 2009
Frequency	Monthly	Monthly	Monthly	Monthly
Historical average	4.2%	4.2%	4.0%	4.0%
Average for last 10 years	3.8%	3.9%	3.9%	3.9%
Correlation with RPI[20]	0.61	0.59	0.34	0.27
Impact of the recession[21]	-2.4	-1.8	-0.9	-0.7

Source: CEPA analysis

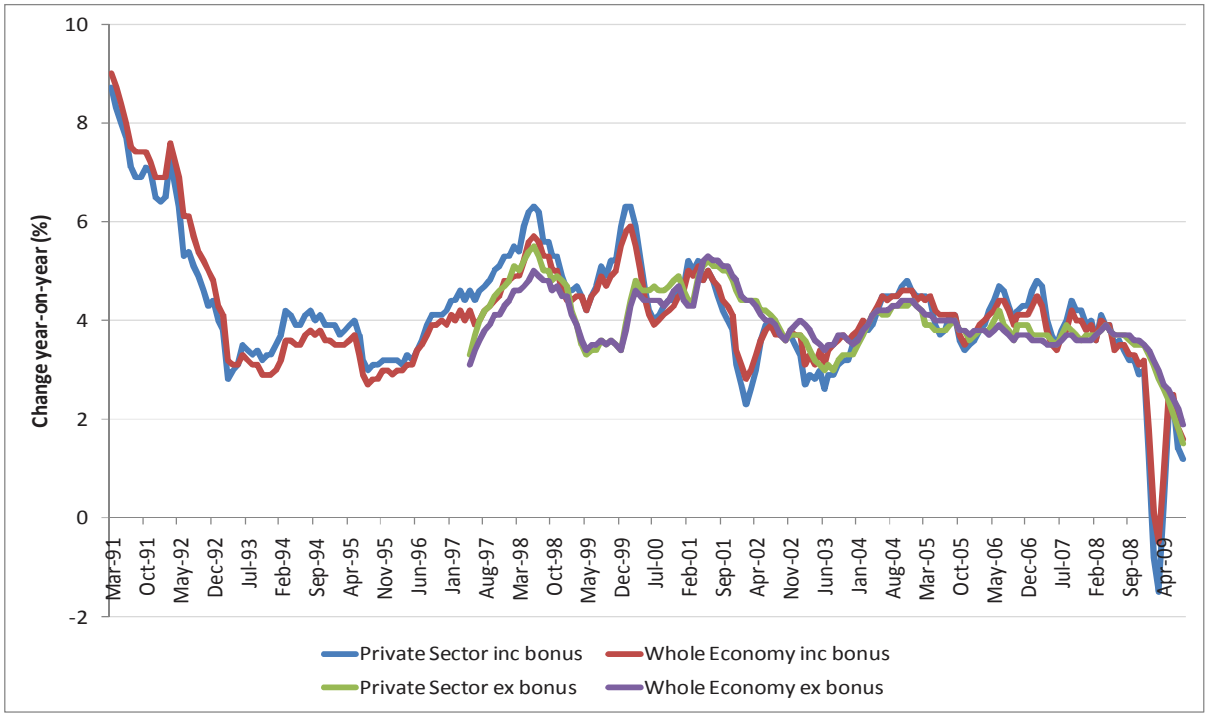
We make the following observations from Table E.1:

- The versions of the AEI that include bonuses have been published for longer and, therefore, represent wage growth under a wider range of economic conditions.
- The versions of the AEI that include bonuses share a stronger correlation with RPI. This is to be expected as inflation is a reflection of overall economic activity and bonus payments generally depend on how profitable businesses have been.
- By the same token, the versions of the AEI that include bonuses have reacted more strongly to the current recession than the ex-bonus versions. As Figure E.1 shows, bonuses have tended to be highest just prior to the "dot com" crush and the credit crisis and lowest in the period that immediately followed the onset of these crises.
- The historical average of the AEI was marginally higher in the versions that include bonus payments. This is because these indices also cover a period before the Bank of England adopted an explicit inflation target. As inflation expectations were less well anchored, wage growth during this period tended to be higher.

[20] Throughout this annex, the correlation coefficient presented refers to the entire history of each index.

[21] Difference between average growth rate during September 2008-August 2009 and September 2007-August 2008.

Figure E.1: Indices for general labour



Source: ONS

Based on the above, relying on any of the alternative indices would result in slightly higher nominal forecasts (and therefore real forecasts) in the short-term and slightly lower nominal forecast (and therefore real forecasts) in the long term. Our real price effects (RPE) forecasts based on the alternative indices are plotted in Figure 1.2 and summarised in Table 1.2.

Figure E.2: Alternative forecasts for general labour

Source: CEPA analysis

Table E.2: Summary of RPE forecasts for general labour

	AEI Private Sector inc. bonus	AEI Whole Economy inc. bonus	AEI Private Sector ex. bonus	AEI Whole Economy ex. bonus
Average forecast for 2008/09-2014/15	1.2%	1.2%	1.4%	1.5%

Source: CEPA analysis

Our chosen index for the Ofgem report (AEI for the private sector, inclusive of bonuses) results in the joint-lowest RPE forecasts. We think that the longer history of this index, as well as the fact that it is more strongly correlated with the performance of the UK economy make it the most appropriate index for our purposes. Regardless of the index chosen, since all four indices move closely to one another, the difference in forecasts is very small.

E.3. General materials

We look at three representative indices:

- BIS' Resource Cost Index for building materials;
- BIS' Resource Cost Index for infrastructure materials; and
- BEAMA's Materials for Mechanical Engineering cost index.

The indices are described in Table E.3 and plotted in Figure E.3.

Table E.3: Summary of general materials indices

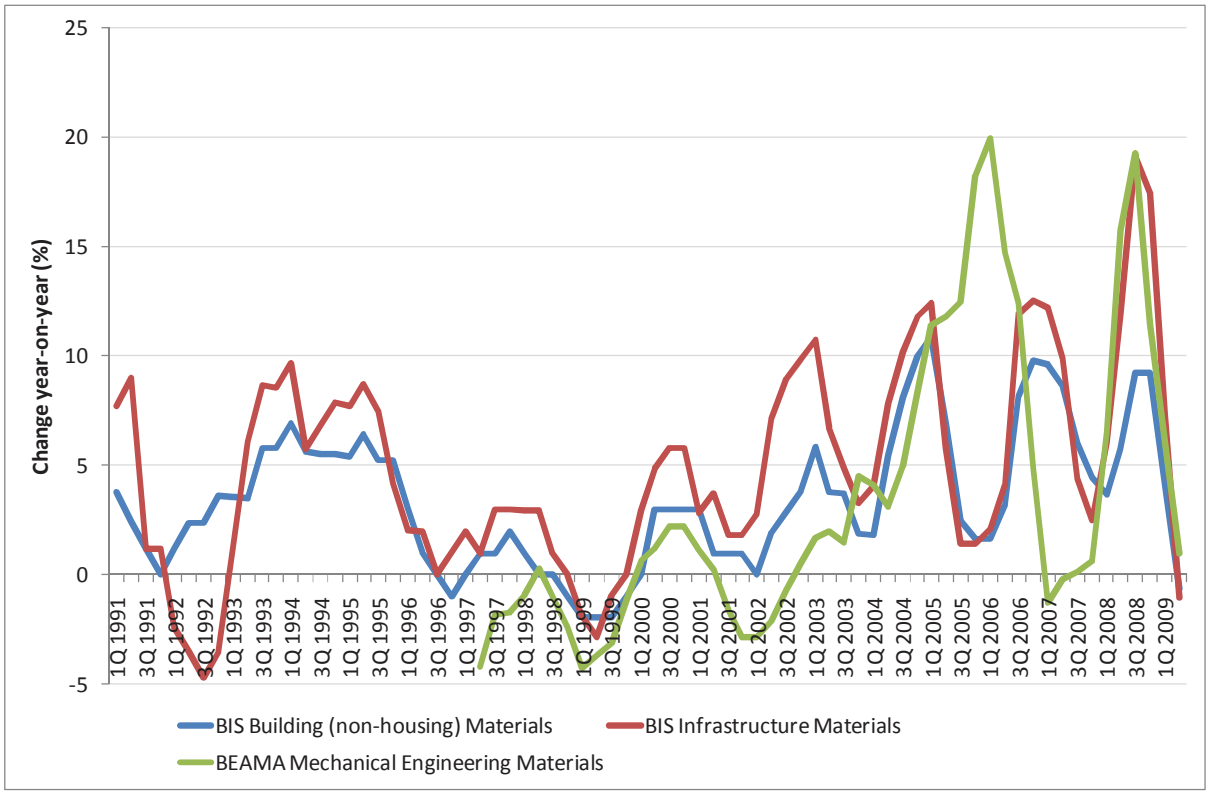
Source:	**BIS**	**BIS**	**BEAMA**
Index:	**Resource Cost Index**	**Resource Cost Index**	**Materials for Mechanical Engineering**
Component:	**Building (non-housing) Materials**	**Infrastructure Materials**	**n/a**
Coverage	Q1 1991 – Q2 2009	Q1 1991 – Q2 2009	March 97 – August 2009[22]
Frequency	Quarterly	Quarterly	Monthly
Historical average	3.4%	4.9%	3.3%
Average for last 10 years	4.1%	6.4%	4.7%
Correlation with RPI	0.31	0.25	0.28
Impact of the recession[23]	-0.3	+1.1	-1.4

Source: CEPA analysis

[22] We understand that older data is also available for this series but we have not been able to access it.

[23] Difference between average growth rate during Q4 2008-Q2 2009 and Q4 2007-Q2 2008.

Figure E.3: Indices for general materials



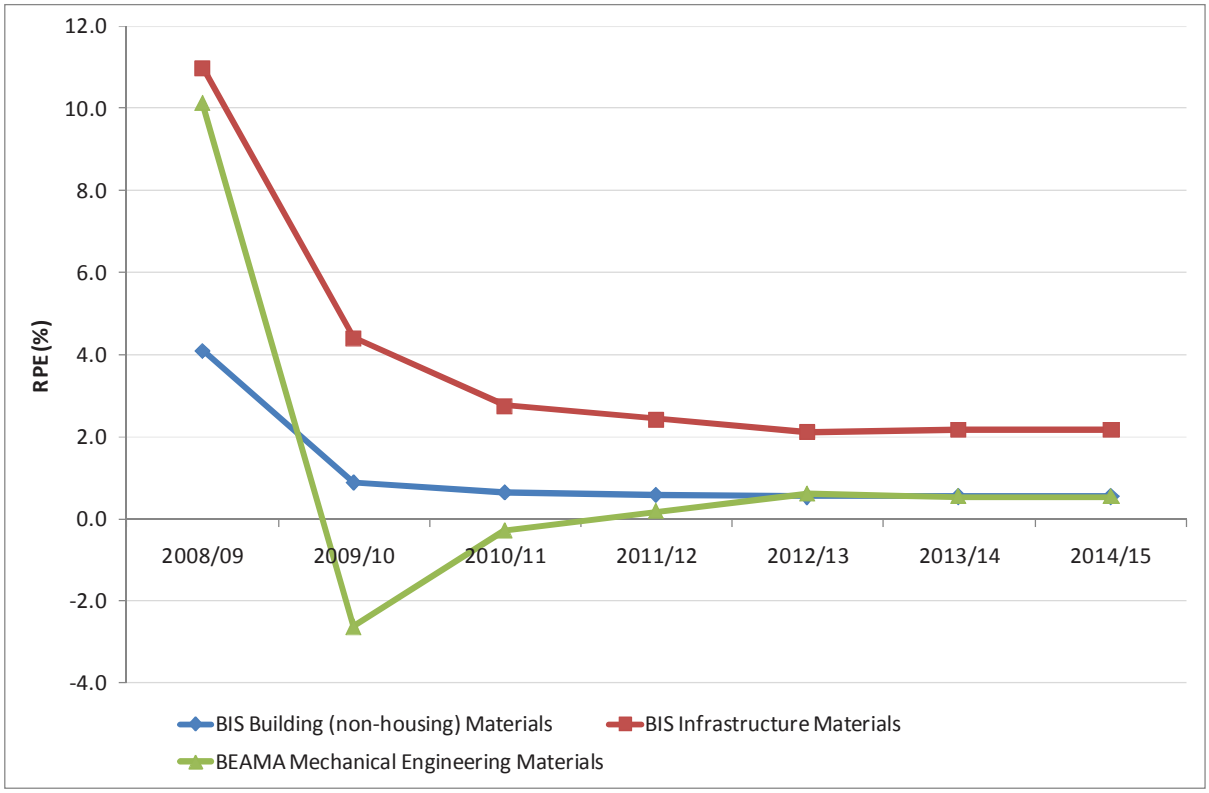
Sources: BIS, BEAMA

We make the following observations about the indices:

- The BIS indices are available for a longer time period.
- In the last 10 years or so, all three indices exhibited a similar cyclical pattern that is unrelated to the performance of the UK economy over this time. This is reflected in all three indices' low correlation with RPI.
- The table shows that on average the infrastructure materials index was the only one to rise at a faster rate following the onset of the recession. However, looking at Figure E.3, the average statistic is misleading as it is clear that the infrastructure materials index fell more sharply than the other two indices, albeit from a higher starting point.

Figure E.4 plots the alternative forecast paths for RPEs based on our correlations-based forecasting methodology, while Table E.4 summaries the forecasts.

Figure E.4: Alternative forecasts for general materials



Source: CEPA analysis

Table E.4: Summary of RPE forecasts for general materials

	BIS Building (non-housing) Materials	BIS Infrastructure Materials	BEAMA Materials for Mechanical Engineering
Average forecast for 2008/09-2014/15	1.1%	3.9%	1.3%

Source: CEPA analysis

The correlation–based forecasting methodology fails to fully capture the extent to which the infrastructure materials series has declined recently and, as such, results in an over-estimation of the RPEs, particularly in the short-term. We think that our preferred index (BIS building materials) represents the most balanced forecast path out of the three options.

E.4. Specialised materials

We consider four indices:

- BEAMA's Materials for Electrical Equipment cost index;
- the BIS Resource Cost Index electrical components in building (non-housing);
- the PPI of inputs for fabricated metal products; and
- the PPI of output for fabricated metal products.

PPI Inputs refers to the price of raw materials for manufacturers, and would be appropriate for our analysis if DNOs bought raw materials. The PPI Outputs index refers to the price of materials that have been processed by manufacturers, and would be appropriate for our analysis in the more likely case that DNOs buy materials that have already been fabricated into performing particular functions.[24]

The indices are described in Table E.5 and plotted in Figure E.5.

Table E.5: Summary of specialised materials indices

Source:	**BEAMA**	**BIS**	**ONS**	**ONS**
Index:	**Materials for Electrical Equipment**	**Resource cost Index**	**Producer Price Index (Inputs)**	**Producer Price Index (Outputs)**
Component:	**n/a**	**Building (non-housing) Electrical**	**Fabricated Metal Products**	**Fabricated Metal Products**
Coverage	March 97 – August 2009[25]	Q1 1991 – Q2 2009	January 1992 – September 2009	January 1992 – September 2009
Frequency	Monthly	Quarterly	Monthly	Monthly
Historical average	3.2%	4.2%	2.8%	2.1%
Average for last 10 years	4.9%	4.1%	4.4%	2.5%
Correlation with RPI	0.43	0.65	0.49	0.37
Impact of the recession[26]	-13.7	+0.6	+0.3	+3.4

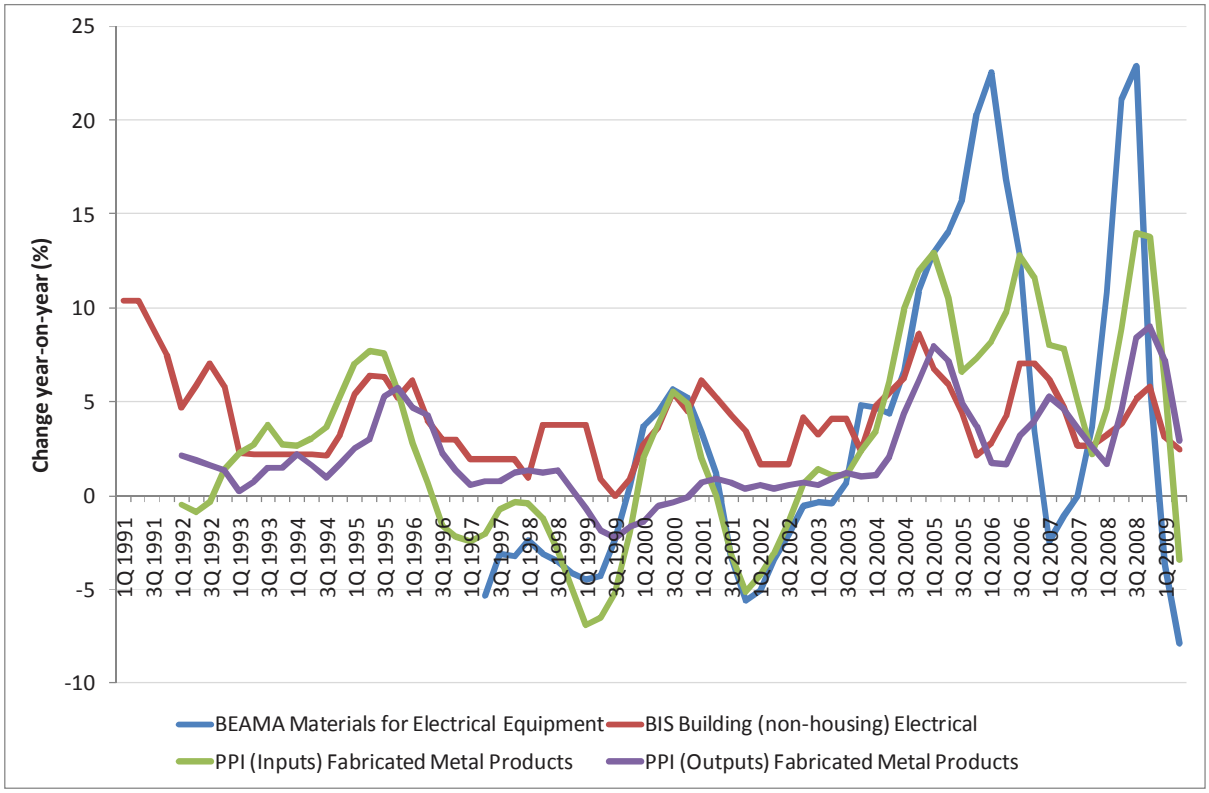
Source: CEPA analysis

[24] An example might clarify this: PPI Inputs refer to, for example, a copper sheet, while PPI Outputs refers, for example, to encased copper wires.

[25] We understand that older data is also available for this series but we have not been able to access it.

[26] Difference between average growth rate during Q4 2008-Q2 2009 and Q4 2007-Q2 2008.

Figure E.5: Indices for specialised materials



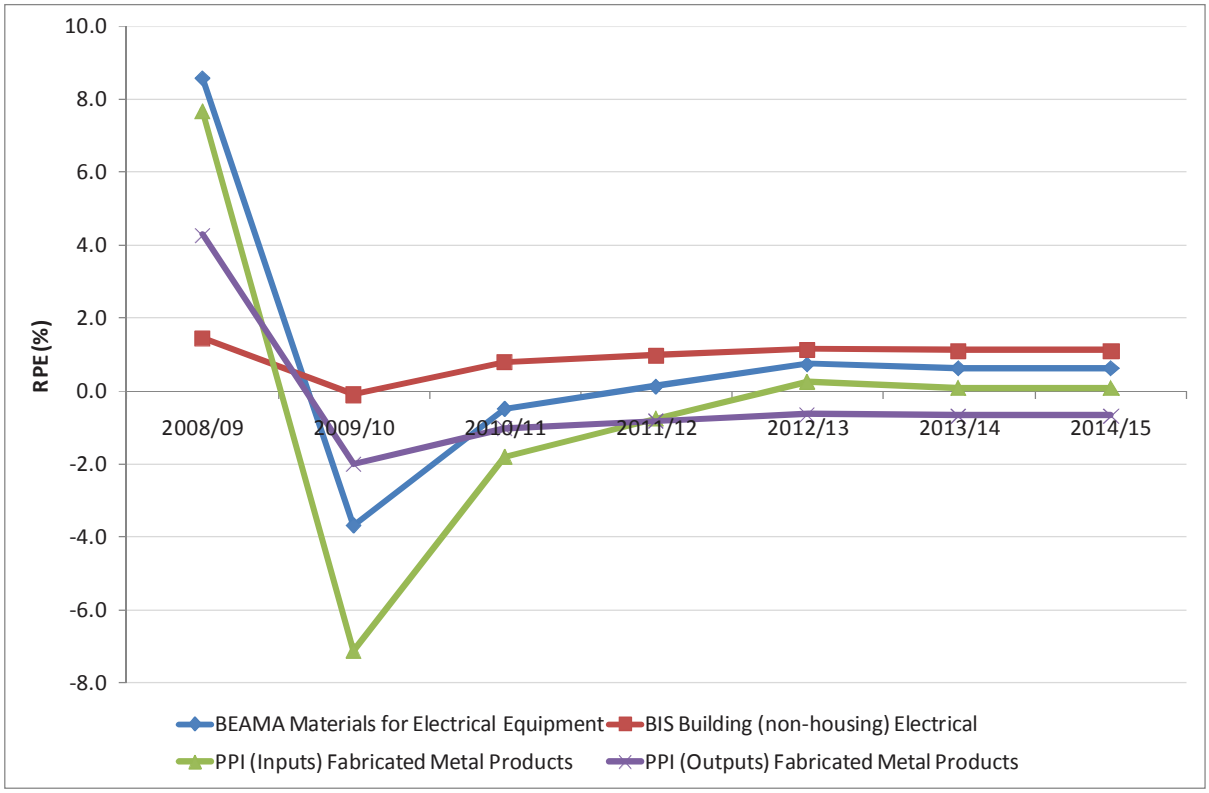
Sources: BEAMA, BIS, ONS

We make the following observations:

- The BIS index is the least volatile of the four and also the only one not to have exhibited a significant increase over the past 10 years compared to its history.
- The high volatility of the PPI Inputs and, especially, the BEAMA indices indicate that they are more representative of raw materials, while the BIS and PPI Outputs indices likely incorporate a degree of labour input in the manufacturing process, which makes their inflation rates less volatile.
- While the BEAMA index is the only one that has shown a lower average rate of inflation as a result of the recession, Figure 3.1 shows that all four indices peaked in Q3 2008 and have been falling sharply since then.

Given the above, we would expect forecasts using our correlation-based methodology to show sharper declines in the BEAMA and PPI Inputs indices, while the BIS and PPI Outputs indices may be expected to produce more stable forecasts. Figure E.6 plots the alternative forecast paths for RPEs and Table E.6 summaries the forecasts.

Figure E.6: Alternative forecasts for specialised materials



Source: CEPA analysis

Table E.6: Summary of RPE forecasts for specialised materials

	BEAMA Materials for Electrical Equipment	**BIS Building (non-housing) Electrical**	**PPI (Inputs) Fabricated Metal Products**	**PPI (Outputs) Fabricated Metal Products**
Average forecast for 2008/09-2014/15	0.9%	0.9%	-0.2%	-0.2%

Source: CEPA analysis

Given the fact that the BIS index implicitly accounts labour input in the production process of specialised materials, as well as its long history, relative stability and strong correlation with RPI, it could be seen as a good representative for this input price category. However, we note that the average RPE forecast is the same as using the BEAMA index, and hence the choice between the two has little overall impact.

E.5. Equipment and plant

We examine three indices that may represent costs in this category:

- the PPI (Inputs) for electrical machinery and apparatus;
- the same component from the PPI (Outputs); and
- the more general machinery and equipment component of the PPI (Outputs).

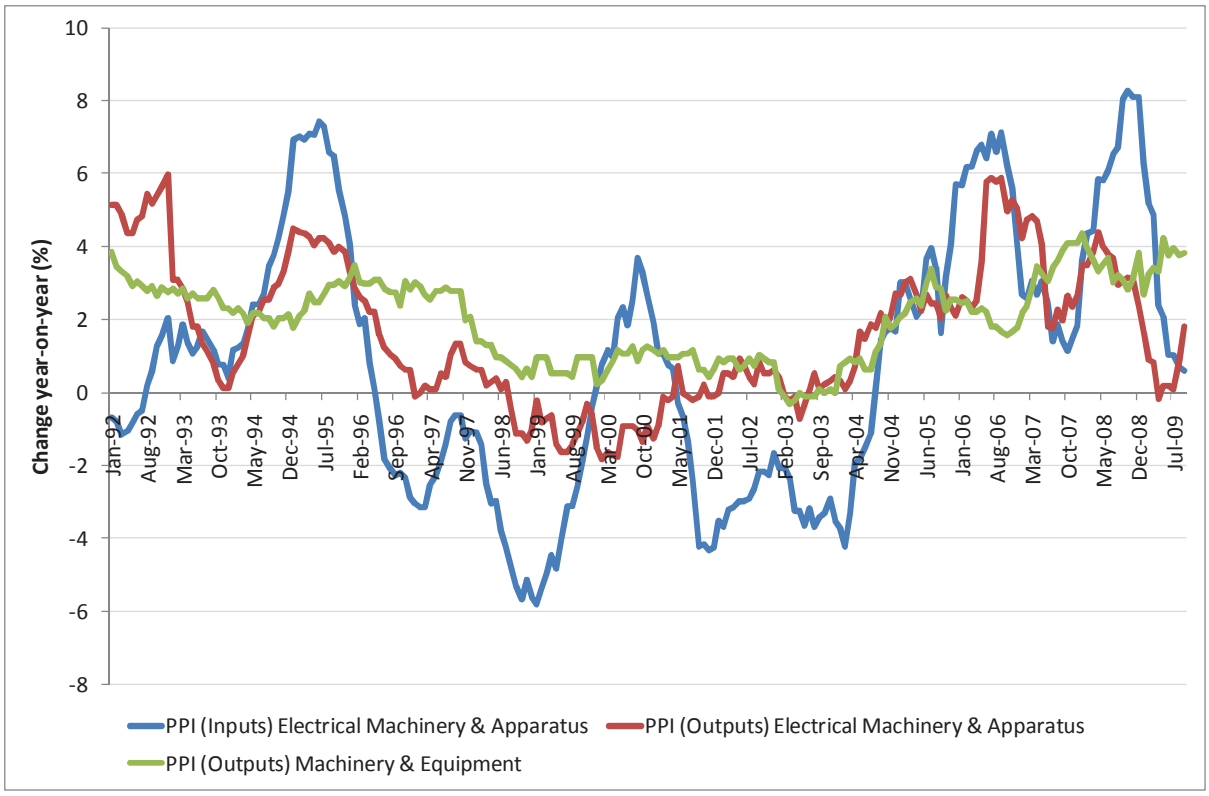
The same arguments regarding the PPI (Inputs) and PPI (Outputs) apply as in Section E.4. The indices are described in Table E.7 and plotted in Figure E.7.

Table E.7: Summary of equipment and plant indices

Source:	**ONS**	**ONS**	**ONS**
Index:	**Producer Price Index (Inputs)**	**Producer Price Index (Outputs)**	**Producer Price Index (Outputs)**
Component:	**Electrical Machinery & Apparatus**	**Electrical Machinery & Apparatus**	**Machinery & Equipment**
Coverage	January 1992 – September 2009	January 1992 – September 2009	January 1992 – September 2009
Frequency	Monthly	Monthly	Monthly
Historical average	0.8%	1.6%	2.0%
Average for last 10 years	1.3%	1.4%	1.8%
Correlation with RPI	0.24	0.46	0.11
Impact of the recession[27]	+0.8	-1.9	-0.3

Source: CEPA analysis

Figure E.7: Indices for equipment and plant



Source: ONS

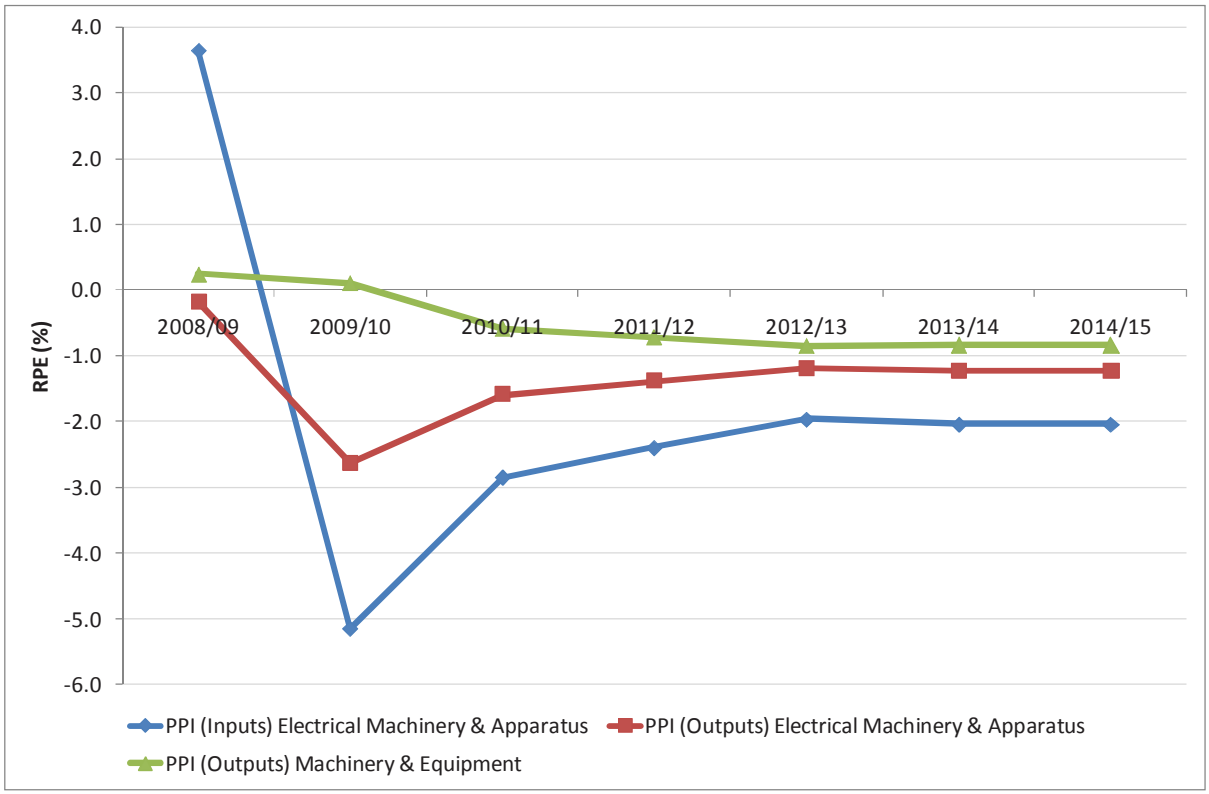
[27] Difference between average growth rate during September 2008-August 2009 and September 2007-August 2008.

We make the following observations:

- The PPI Inputs series is considerably more volatile than either of the PPI Output series. The Machinery and Equipment series is the least volatile, but also the least correlated with RPI.
- The PPI Inputs series has shown a markedly lower inflation rate over its entire history than either of the PPI Output series, but this gap has narrowed somewhat in the last 10 years. This suggests that it is the labour input in the manufacturing process that has pushed up the inflation rate of the finished equipment compared to the raw materials.
- The PPI Inputs series declined more sharply following the onset of the financial crisis.

Overall, we would expect our correlation-based forecasting methodology to result in lower RPEs both in the short term and in long term when applied to the PPI Inputs index. Figure E.8 plots the alternative forecast paths for RPEs and Table E.8 summaries the forecasts.

Figure E.8: Alternative forecasts for equipment and plant



Source: CEPA analysis

Table E.8: Summary of RPE forecasts for equipment and plant

	PPI (Inputs) Electrical Machinery & Apparatus	**PPI (Outputs) Electrical Machinery & Apparatus**	**PPI (Outputs) Machinery & Equipment**
Average forecast for 2008/09-2014/15	-1.8%	-1.3%	-0.5%

Source: CEPA analysis

E.6. Summary

In this annex we presented analysis of how RPE forecasts may be different if alternative indices are used to represent each of the input price categories that we use. We note that some of the alternative indices shown may be as appropriate for the purposes of our analysis as the indices that we have chosen, but that the difference in forecasts in these cases is largely immaterial.