

What is the impact of ORR's inflation proposals on Network Rail?

Note prepared for Network Rail

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1 Introduction and summary

There is a well-established precedent for using some form of inflation in setting the path of prices for regulated companies. For CP5 ORR is proposing to diverge from precedent and to move to a fixed inflation allowance for all charges within CP5, based on a fixed assumption at the start of the price control. The preferred position outlined in ORR's consultation is:

... we are proposing to make, as part of PR13 (i.e. before CP5 starts), an upfront forward looking assumption for both general inflation and input price inflation in our determination of access charges for CP5, e.g. say, 3% per annum.¹

Oxera has been asked to provide a high-level analysis of the potential size of the risk faced by Network Rail as a result of ORR's proposed approach, and the potential impact on Network Rail's finances of changes in inflation if the proposed approach were to be implemented.

In the UK, general inflation indices have historically tended to be volatile, and market forecasts have become increasingly uncertain since the 2008–09 financial crisis. Furthermore, analysis of RPI data indicates that deviations from expectations tend to persist over time. To test the impact of likely deviations from inflation forecasts, Oxera has conducted a high-level illustrative analysis of the potential impact of ORR's inflation proposal on Network Rail, which indicates that under realistic assumptions (eg, £5 billion of exposure to inflation and a 2% deviation from ORR's projections) the total impact could be as much as 3% on debt/RAB by the end of CP5. Given the overall approach taken by ORR to allowing Network Rail to cover the impact of risks during CP5, this would represent a further material threat to Network Rail's financial position.

¹ ORR (2012), 'Consultation on financial issues for Network Rail in CP5', August, p. 8.

Furthermore, ORR's proposed approach to inflation would have implications for Network Rail's efficiency incentives. Oxera has found no evidence that Network Rail would be better able to manage inflation risk in CP5 than in prior periods, or that transferring the risk to Network Rail would increase efficiency incentives. On the contrary, it is possible that such proposals could weaken Network Rail's incentives to improve its efficiency. Rather than increasing Network Rail's exposure to inflation risk during the price control, a better way to incentivise efficiency savings would be to have a balance of 'carrots and sticks' to encourage Network Rail to improve its efficiency.

2 Regulatory precedent

For the last 20 years economic regulation in the UK has generally been based on the 'RPI – X' model of regulation. When introduced, this form of regulation included an RPI factor as part of the formula for all annual price changes, which was intended to protect the regulated company from the uncontrollable aspect of changes in costs—ie, those which move in line with trends in the wider economy.

Since then, the regulatory proposals in the UK which Oxera has reviewed have all used a form of inflation-adjusted prices, to allow regulated companies to manage such risks associated with their input prices. There has been extensive debate around the need to take account of industry-specific factors in choosing an appropriate inflation index, and in some cases regulators have made ex ante references to the presence of residual inflation risk when using general indices such as RPI,² but there has been relatively little debate about the need for some kind of link to inflation.

Table 2.1 indicates the choice of inflation index in the recent regulated settlements in the UK. It indicates that a number of regulators have sought to move to industry-specific inflation indices to better reflect the risks within the industry, but that in each case the principle of linking costs to inflation has been retained.

² For example, the PPP Arbiter took into account the risk associated with setting an ex ante assumption for 'differential inflation' between forecast input price inflation and the inflation index of RPIX used in the pricing formula in its period review proposals. See, for example, PPP Arbiter (2009), 'Analytical Approach to Periodic Review', March 2nd, p. 8.

Table 2.1 Summary of regulatory precedent for the selection of inflation

Sector	Method of general indexation	Method of input price indexation	Regulator's rationale for choice of indexation method(s)
Rail	RPI	IOPI	IOPI tracks costs in infrastructure sectors that have a similar mix of activities to Network Rail
Energy Gas and electricity distribution and transmission	RPI	TPI	Difficulty in identifying an alternative index that is not influenced by the companies themselves
Water England and Wales	RPI	COPI, BCIS	The COPI has a clear link to price limits and the bills that customers pay
Water Scotland	RPI	COPI	Cost of investment can be affected by factors that are not taken into account in the RPI
Airports Heathrow and Gatwick	RPI	TPI	Good reflection of the inflationary pressures facing companies
Air traffic control NATS	CPI	CPI	Mandated by European legislation (Single European Sky II)
Communications Wholesale broadband access Openreach	RPI	RPI	Not influenced by companies' actions, unlike telecoms-specific price indices Familiarity to stakeholders

Source: Regulators' decisions.

This indicates that the regulatory precedent would point towards seeking to use a measure of inflation which would be as well matched as possible to the actual inflation faced by Network Rail. For the purposes of this analysis, Oxera has assumed that, in the absence of the proposed approach to move to an ex ante allowance, ORR would have maintained the approach of using IOPI or an index closely comparable to Network Rail's actual cost inflation for indexation of input prices.

3 Potential implications for incentives

ORR has indicated that its proposed approach is largely driven by a desire to provide efficiency incentives for Network Rail. ORR's consultation states that:

We think that the key issue with the automatic adjustment approach to the indexation of allowed revenues is the effect on incentives, as there are other ways that Network Rail can be appropriately compensated for inflation risk. In our view, the automatic adjustment approach as described above may, in some circumstances, provide weaker incentives on Network Rail to efficiently manage the inflation risk that it faces.³

As described in section 2, the standard regulatory approach is to include an appropriate measure of inflation within the allowed prices for the regulated company. This provides an incentive for the regulated company to manage its input costs such that they do not increase in real terms (depending on efficiency assumptions).

As a result of ORR's proposals, and in order to manage the resulting inflation risk on its input costs, Network Rail would have an increased incentive to seek to agree contracts over a number of years with fixed inflation. However, as a result of the overall link between input costs and general inflation within the economy, this would expose suppliers to risk. Beyond a

³ ORR (2012), op. cit., p. 8, para 17.

short period, either suppliers would be unwilling to contract at fixed rates, or they would be likely to demand a risk premium. In addition, it is unlikely that it would be efficient for Network Rail to commit to contracts of up to six years even if suppliers were willing to accept the inflation risk, as this could significantly reduce its operational flexibility in managing its costs over the period. It is unlikely that such actions would therefore significantly reduce Network Rail's exposure to inflation.

Therefore, either because it is impossible or inefficient to enter into contracts until 2018–19, Network Rail is likely to retain a considerable exposure to inflation risk for the later years of the control, which is also the period that is furthest away and therefore for which the consequent impact of inflation risk over the interim period is most uncertain. Network Rail would therefore face the greatest inflation risk during the period when it has least ability to manage that risk.

Under a normal RPI – X price control, in which tariffs are indexed by inflation each year, companies do not tend to bear general inflation risk. This means that, as a result of ORR's proposed approach, Network Rail's risk would increase relative to a normal price control. As recognised by ORR, such an increase in risk should in general be expected to be reflected in the financial framework.⁴ Specifically, the regulated company would expect to receive, all else equal, a higher cost of capital or some other mechanism of ensuring that the risk–return trade-off remains appropriately balanced (such as the risk buffer which ORR proposed to remove in CP5). The proposed approach to inflation could also create uncertainty around the treatment of inflation and inflation risk within any concessions or alliances proposed by Network Rail.⁵

While, as discussed above, Network Rail may have an incentive to manage the inflation risk, and some limited ability to manage that risk, ORR also indicates that its proposal is intended to provide efficiency incentives. However, the analysis above does not indicate that it would be more efficient for Network Rail to manage the risk; rather, if ORR were to decide to set an ex ante inflation allowance, Network Rail may consequently face a risk premium that should be taken into consideration in concluding on the overall approach to inflation, including the level of any ex ante inflation assumption.

Oxera has also considered whether the effect is likely to be that Network Rail faces improved efficiency incentives more generally as a result of ORR's proposal. In practice, as discussed below, inflation is likely to diverge from ORR's forecast. However, it is not clear that efficiency incentives would be stronger under either scenario. The underlying principle of RPI – X incentive regulation is that in each period the company will already face a fixed revenue allowance, and therefore Network Rail will have incentives to minimise its costs regardless of the treatment of inflation.

In theory, divergences from expected inflation could change the strength of the incentives on Network Rail. If inflation is lower than forecast, ORR's efficiency targets would effectively be easier to meet, which could weaken incentives. Alternatively, if inflation is higher than forecast, ORR's efficiency targets could appear to be strengthened, as they would be even greater in real terms. However, there is a risk that this could make the targets appear unachievable, which could, again, weaken their effectiveness.

Rather than increasing Network Rail's exposure to inflation risk during the price control, a better way to incentivise efficiency savings would be to have a balance of 'carrots and sticks' to encourage Network Rail to improve its efficiency.

⁴ ORR (2012), op. cit., p. 9, para 19.

⁵ ORR has indicated (sections 4.9–4.15) that in this case it would intend to allow an adjustment to the regulatory framework for the relevant portion of the price control, but it is not clear how the difference between actual and forecast inflation would be taken into consideration.

The remainder of the note assesses the possible scale of the impact of ORR’s proposals, which will influence the importance of the factors discussed above.

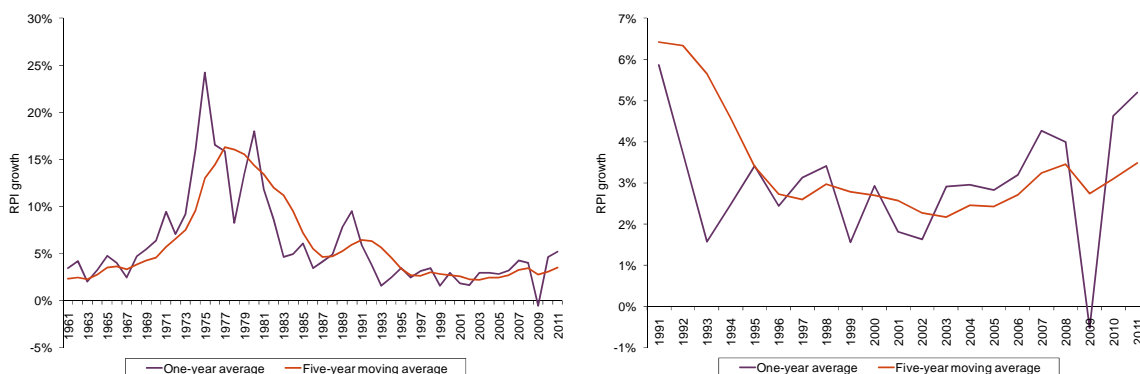
4 Analysis of the potential paths for future inflation

As a result of ORR’s proposals, Network Rail would be exposed to the differences between the actual inflation it faces over the CP5 period and ORR’s ex ante forecast. Specifically, Network Rail would be exposed to the difference between the cumulative actual and forecast inflation from the point at which ORR’s ex ante forecasts are developed—ie, the exposure is to the total change in price between the base year (at which time ex ante forecasts were made) and the final year of the price control. Network Rail is therefore particularly exposed to changes in inflation that persist over the CP5 period.

Historically, inflation has tended to fluctuate and be volatile. In addition, divergences from the median level of inflation over time have tended to persist for some time.⁶ This reflects the underlying nature of the economic factors that cause inflation to rise or fall, such as global or national changes in demand, which can have an impact on inflation for a number of years. It also reflects the lag between increases in inflation and the impact of any policy response from government.

Figure 4.1 shows RPI inflation in the UK over the last 50 years, both on a per-annum basis and the five-year moving average. It demonstrates that inflation is volatile, and also that the variances to long-term trends have tended to persist over a five-year period. The figure also shows this pattern for the last 20 years, when government has included an explicit inflation target as one of its policy outcomes.

Figure 4.1 50-year RPI inflation history (left) and 20-year RPI inflation history (right)



Source: ONS data on RPI inflation.

Figure 4.1 shows that the level of fluctuations has diminished over time, particularly following the introduction of the inflation target in 1992, but has not been eliminated. Specifically, over the last five years average RPI inflation has been around 1% above the government’s previous target of 2.5% for RPI. In addition, while the presence of an inflation target is likely to lead to mean reversion in the medium term, another possibility is that the government could respond to changing market conditions by a change to the target.⁷ There are therefore a number of realistic scenarios where inflation could diverge from forecasts and that this could persist over a number of years.

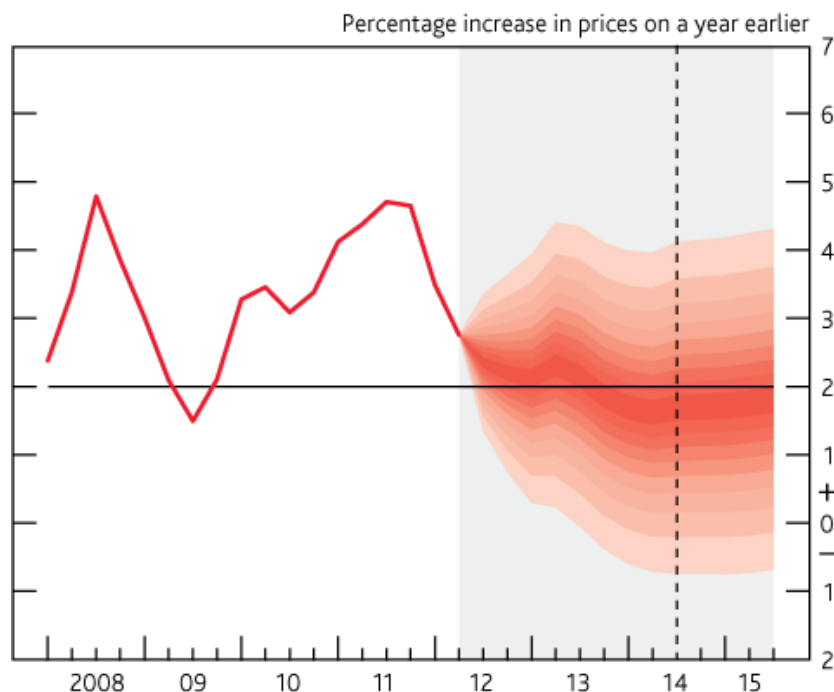
⁶ The main exception was the temporary deflation towards the end of the last decade.

⁷ As suggested by various economists, such as Paul Krugman in a recent interview with *The Independent*. Source: <http://blogs.independent.co.uk/2012/05/30/krugman-the-full-transcript/>.

Evidence from markets of the risks around future inflation forecasts

The Bank of England (BoE) produces regular forecasts of the future path of inflation. In these forecasts BoE provides analysis of the size of uncertainty over the forecast rate of inflation. The most recent forecast shows that while CPI inflation is forecast to be on target at around 2% by 2015, there is the potential for the level to reach as high as 4% or as low as -0.5% (as illustrated in the BoE 'fan chart', which is reproduced in Figure 4.2 below).

Figure 4.2 BoE CPI inflation 'fan chart' (August 2012)



Source: Bank of England, available at: <http://www.bankofengland.co.uk/publications/Pages/inflationreport/irfanfch.aspx>, accessed August 21st 2012.

The BoE has also recently published further analysis informed by a range of survey and market evidence of the variability in the level of inflation over time and against forecasts.⁸ This indicates that while both expert forecasts and market-derived forecasts have been broadly constant over time, the implied uncertainty around these forecasts has been high—and increased significantly in 2008–09 following the financial crisis—with market-implied standard deviations of RPI forecasts being as high as 2.5%.

Oxera has also tested the accuracy of market inflation forecasts against the actual outturn for inflation over a five-year period. This analysis indicates that over the last 20 years, the actual average inflation over the five-year period has been at least 1% per year outside expectations around half of the time, confirming that there is a significant probability that inflation could be materially different to market expectations likely to be used by ORR to forecast inflation. In addition, while there is less data around comparable market expectations for industry-specific indices, the fluctuations of such indices are likely to be higher because of the lack of a policy imperative to reduce such inflation back to a target level.

⁸ See Bank of England (2012), 'Quarterly Bulletin: 2012 Q2; How has the risk to inflation from inflation expectations evolved?', available at: <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb120201.pdf>.

Based on this analysis, it is proposed that a realistic range of sensitivities for presenting a high-level analysis of the risk faced by Network Rail is an average difference of 1–3% per year between actual and forecast inflation across CP5, where:⁹

- 1% per annum on average across the period represents a moderate level of deviation from forecasts, consistent with historical precedent, the BoE's own analysis of potential uncertainty over the future level of inflation, and differences in views between market participants; and
- 3% per annum would be less likely, particularly as an average differential over the period, but a feasible upper bound for the deviation of inflation from forecast levels, consistent with both market-based estimates for the potential scale of future fluctuations around the level of inflation, the higher levels of fluctuation seen in recent years, and the potential impacts of a further shock within the financial system.

5 Impact of changes to inflation on Network Rail

ORR is proposing that all inflation assumptions for CP5 will be fixed ex ante, including its forecast of the cost of renewals. Although not clearly stated, it seems clear that this would therefore apply to the assumption made for all charges, including both those funded through track access charges and through network grants. The consultation states that, as an alternative to the CP4 approach of using RPI for access charges and RAB indexation, and using IOPI for renewals expenditure, that in CP5:

[ORR will] determine an ex-ante forward looking assumption of inflation for PR13 (i.e. before CP5 starts), e.g. say, 3% per annum. This estimate would include both general inflation, e.g. RPI, and the effect of specific inflation faced by Network Rail (input price inflation).¹⁰

It is also clear from the summary that this is intended to cover renewals expenditure as well as operating costs, although the RAB would continue to be indexed with inflation. ORR states:

We are not proposing that we adjust Network Rail's renewals expenditure for movements in IOPI (or another inflation measure) as we think we will improve incentives by including an upfront estimate of input price inflation in our inflation assumption and we are proposing to continue to uplift Network Rail's RAB by the actual movements in general inflation, as otherwise the real value of its asset base would be eroded.¹¹

ORR's consultation does not provide details of how this would work in practice, or how it would calculate the level of specific ex ante inflation assumption to be made for different cost categories. It does, however, highlight the costs that would be subject to inflation adjustment (see Table 5.1 below).

⁹ The analysis presented in this note implicitly assumes that inflation risk is symmetric. Further analysis would be needed to determine whether asymmetric inflation risk would better characterise future inflation realisations.

¹⁰ ORR (2012), op. cit., p. 25, para 3.19.

¹¹ ORR (2012), op. cit., p. 26, para 3.24.

Table 5.1 ORR analysis of Network Rail's costs for 2011–12

	2011–12 (£m)	As % of expenditure before financing
Operating costs	2,466	35%
Controllable	906	13%
Non-controllable	420	6%
Maintenance	968	14%
Schedule 4 & 8	172	2%
Investment costs	4,532	65%
Renewals	2,455	35%
Enhancements	2,077	30%
Total rail expenditure	6,998	100%
Financing costs	1,470	21%
Total expenditure	8,468	121%

Source: ORR (2012), 'Consultation on financial issues for Network Rail in CP5', August.

The inflation assumed would affect Network Rail's allowed revenue in each area. ORR intends to assume that inflation would be set ex ante (eg, at 3% per year) for each category of expenditure. Therefore, the difference in each year between actual cumulative inflation faced by Network Rail and ORR's assumption for cumulative inflation would translate into a profit or loss for Network Rail, and an increase or reduction in required debt financing above that assumed in setting the price control.

ORR's initial advice to ministers indicated that the gross revenue requirement would be around £6.2 billion per year over CP5 (£30.8 billion in total) in 2011–12 terms, of which less than £1 billion per year would come from other single-till income, and over £5 billion from track access charges and network grants.¹² In practice, Network Rail may be able to link to inflation the portion of its other single-till income which is not linked to regulated prices, but the significant majority of the exposure would in any case relate to track access charges and network grants.

In practice, some of Network Rail's costs are unlikely to vary exactly in line with inflation. A proportion of Network Rail's financing costs relates to fixed-rate debt and would therefore be fixed over the period. Some of Network Rail's costs may be more fixed or more controllable than the average inflation assumed by the index, particularly given the incentive to manage such inflation risk. ORR has indicated that it intends to provide Network Rail with an incentive to manage inflation risk, and Network Rail's purchasing power may provide it with some ability to manage some of this risk for certain types of costs.

A more extensive exercise could seek to model the level of uncontrollable inflation risk in greater depth. For the purposes of this note, it is assumed that the majority of inflation risk remains uncontrollable, which is consistent with the regulatory precedent of applying inflation adjustments. In particular, the analysis assumes that:

- Network Rail is exposed for the full five-year period of CP5 to differences between ex ante and actual inflation, and that this exposure applies to a two- to six-year inflation forecast (ie, forecast from a base year of 2012–13 to a final year of 2018–19);

¹² ORR (2012), 'Advice to the Secretary of State for Transport on Network Rail's costs and outputs in CP5', March 15th, available at: <http://www.rail-reg.gov.uk/pr13/PDF/pr13-advice-to-ministers-ew.pdf>.

- the actual inflation on the exposed costs is perfectly correlated with the inflation index. This is consistent with assessing the impacts of ORR’s policy proposal. In practice Network Rail’s actual inflation risk may be even higher than this, since its input inflation will not be correlated with the index, but some of the exposure would have been incurred even in the absence of ORR’s revised approach;
- between £4 billion and £6 billion, in nominal terms, of Network Rail’s cash costs are exposed to inflation but are funded by fixed revenues, after allowing for the share of costs which may be fixed and the share of single-till income which will be linked to inflation.¹³

In principle, the risk exposure is symmetrical, but this will depend on the exact method of implementation used by ORR. In the context of ORR’s proposed adjusted WACC approach, which—combined with the removal of a P&L risk buffer—would leave Network Rail highly exposed to adverse cash-flow fluctuations, this analysis focuses on scenarios where actual inflation exceeds ORR’s ex ante forecasts. The analysis tests the potential downside impact of ORR’s proposal on two financial measures if inflation is higher than forecast by ORR:

- profit margin, measured as a percentage of assumed revenue, based on the average annual revenue requirement over the period of £6.2 billion (in 2011–12 prices), as per ORR’s advice to ministers;¹⁴
- debt/RAB ratio, measured as a percentage of ORR’s indicative closing RAB of £65.8 billion.¹⁵

Table 5.2 presents the results from this high-level analysis.

Table 5.2 Sensitivity analysis of profit margin and debt/RAB ratio to increases in inflation for Network Rail, 2018–19 (%)

Assumed exposure to inflation (per annum across each year to the end of CP5)	Debt/RAB			Profit margin		
	£4 billion	£5 billion	£6 billion	£4 billion	£5 billion	£6 billion
Inflation 1% higher than forecast	1.2	1.5	1.9	–3	–4	–5
Inflation 2% higher than forecast	2.5	3.1	3.8	–7	–8	–10
Inflation 3% higher than forecast	3.8	4.8	5.8	–10	–13	–16

Source: Oxera analysis.

The table indicates that, under the assumptions detailed above, ORR’s proposed approach to indexation would have a considerable impact on Network Rail’s gearing and operating margins. For example, assuming Network Rail is exposed on around £5 billion of its regulated costs:

- if inflation is 1% above the forecast average over the period, consistent with recent experience, Network Rail’s debt/RAB would be 1.5% higher than expected;

¹³ Total cash costs would be likely to be higher than revenue over CP5 because of a level of investment required by Network Rail that exceeds the current level of amortisation. This analysis does not consider the impact from these costs, which would be larger after CP5 given that these costs would be capitalised into Network Rail’s RAB.

¹⁴ ORR (2012), ‘Advice to the Secretary of State for Transport on Network Rail’s costs and outputs in CP5’, March 15th, p. 75, Table A.3.

¹⁵ ORR (2012), ‘Advice to the Secretary of State for Transport on Network Rail’s costs and outputs in CP5’, March 15th, p. 78, Table B.5.

- if inflation is 2% above the forecast over the period, then Network Rail's debt/RAB would be likely to be over 3% above ORR's forecast. In addition, Network Rail's profit margin would be 8% below expectations by the end of the period, and the financeability ratio of AICR would fall below 1.0, even in ORR's 'high' case (as presented in ORR's advice to ministers).¹⁶

ORR's proposed approach is outlined in paragraph 3.19 of its consultation. It does indicate that it 'could' make adjustments in CP6 to reflect efficient differences between actual and assumed inflation, and that it will review how Network Rail manages inflation risk. It also highlights the risks of complexity that could be associated with such a mechanism.

Within its proposed approach, ORR also provides illustrative examples of a 'deadband' of 1% to 5% or 2% to 5%, based on a 3% ex ante inflation assumption. It indicates that if inflation falls outside such a deadband then there may be a review of the need for a re-opener.

These measures could mitigate some of the risk faced by Network Rail, but within the current consultation are only provided as one possible approach, and, based on the illustration in the consultation, would be likely only to take effect after the impact on Network Rail's finances had taken place. The analysis in this note does not therefore seek to adjust for these possible mechanisms. In addition, if there were to be an adjustment to the RAB in future periods, this would result in a change in pricing, and an inter-generational timing issue as the impact of current inflation would be felt in future periods.

6 Conclusions

The UK regulatory precedent identified by Oxera points to allowing some form of inflation adjustment to the revenue of regulated companies to cover the risks the companies face in managing input costs. Analysis of RPI data illustrates that inflation is volatile, and that diversions from expectations tend to persist over time. Oxera has found no evidence that Network Rail would be better able to manage inflation risk in CP5 than in prior periods, or that transferring the risk to Network Rail would increase efficiency incentives.

Oxera has performed a high-level analysis of the potential impact of ORR's inflation proposal on Network Rail, which indicates that under realistic assumptions (eg, £5 billion of exposure to inflation and a 2% deviation from ORR's projections) the total impact could be as much as 3% on debt/RAB. Given the overall approach taken by ORR to allowing Network Rail to cover the impact of risks during CP5, this would represent a further material threat to Network Rail's financial position.

The analysis in this note represents some simplified downside scenarios. More in-depth analysis could be undertaken to quantify the extent of this risk in greater detail; however, this note indicates the scale of risk that would be identified by such analysis.

¹⁶ Based on estimates reported in ORR (2012), 'Advice to the Secretary of State for Transport on Network Rail's costs and outputs in CP5', March 15th, Table 7.4.