December 2021

H7 IP OPEX REVIEW

A report prepared for Heathrow

In this report we review the CAA's Initial Proposals for opex for H7, focusing specifically on the topics of inflation and frontier shift, and set out recommendations for Heathrow's RBP Update 2.

KEY FINDINGS

- **High level sense check:** The opex forecast produced by CEPA/TA ultimately implies an overall top-down passenger-to-opex elasticity of 0.16 over H7. However, as noted by CEPA/TA, academic literature and regulatory precedents suggest that opex elasticities tend to lie within the range of 0.3-0.7. Also, as part of our previous work for Heathrow on opex elasticities, we estimated the outturn elasticities at a sample of 35 large airports over the period 2013-2017. The lower quartile of the sample (where 'lower' means more stretching) was [✂]. Therefore, as a high level sense-check, compared to the precedent and empirical estimates, CEPA/TA's forecast appears to be unrealistically stretching. Heathrow's own opex forecast implies an overall top-down elasticity of 0.21, which already appears significantly stretching relative to the precedents and empirical estimates. However, this result seems to have gone largely unrecognised by the CAA, calling into question whether Heathrow faced appropriate business planning incentives.
- **Frontier shift:** CEPA/TA's frontier shift assumption for H7 ignores recent productivity outturns across the economy. Since the financial crisis, the UK has experienced weak productivity growth - both across the economy as a whole and within similar sectors similar to airports. More recently, supply-side shocks and pandemic scarring also point towards increased downside risks to medium-term productivity. The sole use of historical productivity estimates prior to the financial crisis therefore skews up CEPA/TA's frontier shift assumption and away from recent productivity experience. Also, the CAA is proposing a significantly reduced capex plan for H7 relative to Heathrow's plan, as well as outturn capex during Q6. Given the synergies between capex and opex, it seems unrealistic to believe that Heathrow should be expected to perform in line with historical performance if its capex programme has been significantly reduced, and arguably a less stretching forecast should be used.
- **Inflation**: Ideally bespoke forecasts should be used for individual cost categories based on the most recent and most credible information available. And in the absence of any compelling bespoke forecasts, it would seem reasonable to us to apply CPI. We have carried out a high level assessment of the most appropriate approach for each cost category.

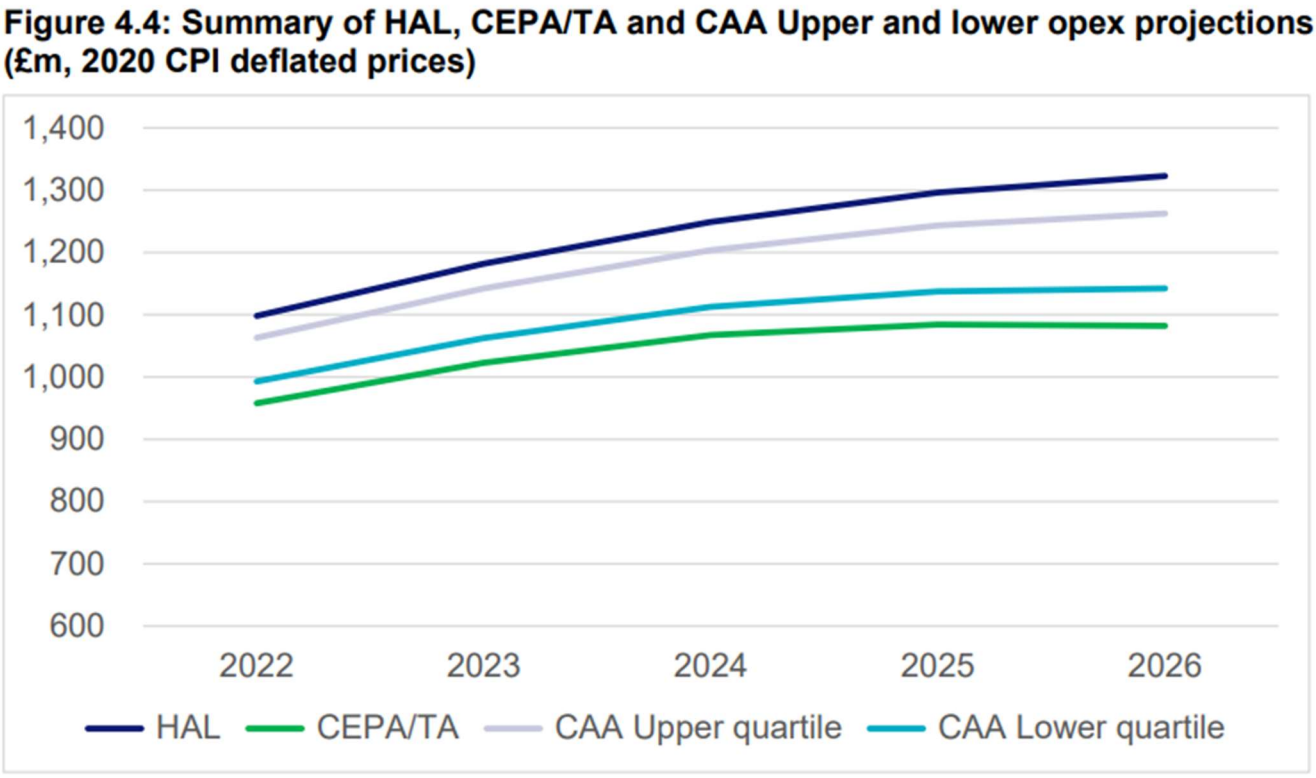
1. Introduction

Background

The CAA has recently published its Initial Proposals (IP) for H7.[1] For opex, it commissioned CEPA and Taylor Airey (CEPA/TA) to review Heathrow's own opex forecast and to produce an independent view. For its initial proposals, the CAA has produced a range which lies in between Heathrow's forecast and CEPA/TA's forecast.

[1] https://www.caa.co.uk/Commercial-industry/Airports/Economic-regulation/H7/Consultations-and-policy-documents/

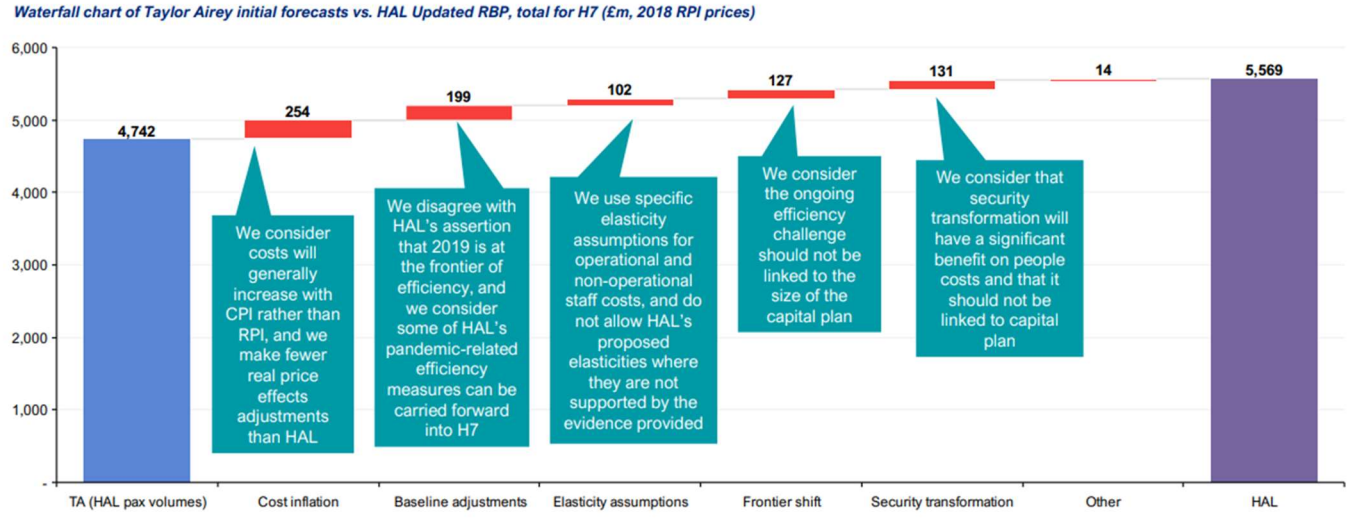
Figure 1 Opex forecasts



Source: CAA H7 Initial Proposals (CAP2265B)

The chart below – from the CEPA/TA report – sets out the differences between CEPA/TA's forecast and Heathrow's.

Figure 2 Opex forecasts – differences between TA and HAL



Source: CAA H7 Initial Proposals (CAP2265B)

Controlling for passenger volumes, CEPA/TA's forecast is around £830 million (15%) lower than Heathrow's over the whole of H7. As highlighted above, two of the main differences are:

- Inflation: CEPA/TA have assumed that input costs will generally increase with CPI, whereas Heathrow has used RPI, which is generally higher; and
- Frontier shift: CEPA/TA have applied a larger ongoing efficiency challenge compared to that applied by Heathrow.

The CAA has invited views from stakeholders on the key issues raised in the CEPA/TA report. However, it has not yet provided its own views on the issues, and has simply produced a range in between the two sets of forecasts rather than engaging in the details. In hindsight, this calls into question whether Heathrow faced appropriate business planning incentives. Based on the CAA's approach of selecting a range in between the two sets of forecasts, it would appear that if Heathrow had produced a lower / more stretching opex forecast in its business plan, the CAA's range would also have been lower.

The scope of this report

We have been commissioned by Heathrow to review CEPA/TA's approach, focusing on inflation and frontier shift in particular, and to make recommendations for Heathrow's RBP Update 2 which it plans to submit to the CAA in December.

The structure of this report

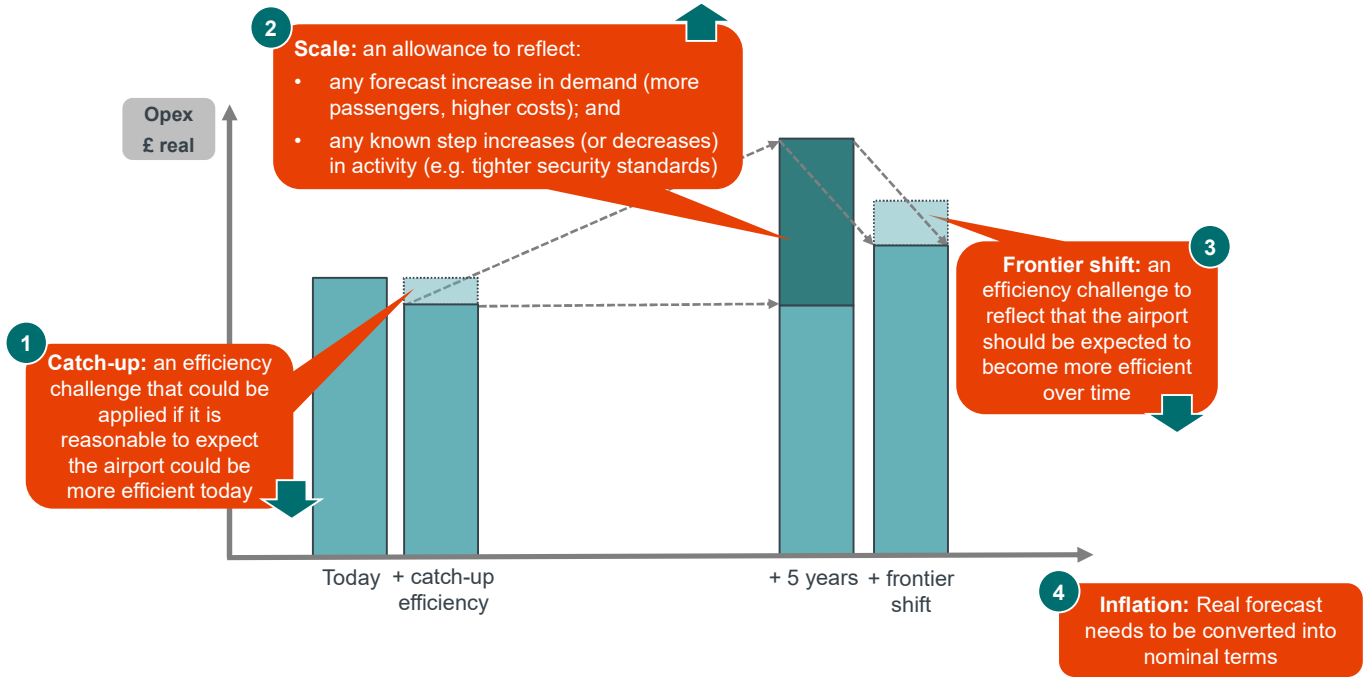
The rest of this report is structured as follows:

- In **Section 2**, by way of background, we present a **high level framework** for forecasting an efficient level of opex.
- In **Section 3**, we set out a high level overview of **Heathrow's approach** to forecasting opex and **CEPA/TA's approach**.
- In **Section 4**, we set out a high level **sense check** of CEPA/TA's forecast, which ultimately implies a passenger-to-opex elasticity which is significantly more stretching than the accepted ranges discussed in regulatory precedents and academic literature, and our own empirical estimates of outturn elasticities at a large sample of airports.
- In **Section 5**, we discuss the **productivity shift assumptions** made by Heathrow and CEPA/TA and whether we believe they are reasonable.
- In **Section 6,** we discuss the **inflation assumptions** applied by Heathrow and CEPA/TA and whether we believe they are appropriate.
- In **Section 7**, we present our overall **conclusions** and recommendations for Heathrow's RBP Update 2.

2. Forecasting an efficient level of opex

By way of background, the chart below provides a high level framework for forecasting an efficient level of opex.

Figure 3 Forecasting an efficient level of opex



Source: Frontier illustration

This can be split into four main parts:

1. **Catch-up**: First, we need to consider the airport's current level of performance with respect to opex and determine whether this represents an efficient starting point. In other words, is it reasonable to expect that Heathrow could already be more efficient? One approach to making this assessment would be to benchmark Heathrow's performance with that at other comparable airports and to identify whether it appears to be performing above or below other airports.
2. **Scale**: Second, we need to take into account that the airport is forecast to grow over time, and – all other thing being equal – with more passengers we would expect higher opex. A passenger-to-opex elasticity could be used to help capture this volume effect. We also need to consider whether there are any known upcoming changes which might impact on opex that are not captured by volume effects, such as changes in capacity, new security standards, etc..
3. **Frontier shift**: Third, we then need to consider whether it is reasonable to apply a 'frontier shift' on top of the baseline forecast. This captures the fact that – all other things being equal – the airport might reasonably be expected to identify cost savings over time – e.g. through improved approaches to procurement, rostering, automation, and efficiencies delivered through capex.
4. **Inflation**: The forecast then needs to be converted into nominal terms. In principle, for each cost category we need to determine how input prices are expected to change going forward.

3. High level overview of approaches

The table below provides a high level overview of how Heathrow and CEPA/TA have produced their respective forecasts, and how this fits in with the framework presented above.

Table 1 High level overview of approaches

		Heathrow	CEPA/TA
Catch-up		▪ No catch-up applied.	▪ CEPA/TA apply a catch-up.
Scale	Volume	▪ Heathrow generally applies a passenger-to-opex elasticity of [✂]	▪ CEPA/TA broadly accepts Heathrow's elasticity of [✂]
	Step changes / overlays	▪ Heathrow makes some adjustments - e.g. to remove costs associated with expansion.	▪ CEPA/TA have reviewed Heathrow's proposals and make some downwards adjustments.
Frontier shift		▪ Heathrow applies a frontier shift of 0.1%, and an additional 1.1% which is linked to its capex plan.	▪ CEPA/TA apply a frontier shift of 1% based on regulatory precedent
Inflation		▪ Heathrow has applied bespoke forecasts for some cost categories, and generally RPI for other cost categories.	▪ CEPA/TA have applied different forecasts for some cost categories, and generally CPI for other cost categories.

We expand on some of these points below.

4. High level sense check of opex forecasts

First, as an overall sense check, we have estimated the overall top-down passenger-to-opex elasticity implied in CEPA/TA's forecast, and in Heathrow's:

Table 2 Top down sense check

	Heathrow	CEPA/TA
Forecast growth in opex over H7	15%	13%
Forecast growth in passengers over H7	73%	80%
Implied elasticity	0.21	0.16

Source: Frontier analysis of Table 4.1 and Table 4.2 in CAA H7 Initial Proposals (CAP2265B) https://publicapps.caa.co.uk/docs/33/CAP2265B%20H7%20Overall%20approach%20and%20building%20blocks%20(p).pdf

CEPA/TA forecast that opex will grow by 13% over H7, while passengers are assumed to grow by 80%, implying an overall elasticity of 0.16. (This figure is lower than the [✂] elasticity referred to in Table 1 because it also takes into account other factors such as applying a frontier shift.)

We note that this elasticity appears significantly more stretching than accepted ranges in academic literature and regulatory precedents, as well as our own estimates of outturn opex elasticities at a sample of large airports.

- **Academic literature and regulatory precedent:** For instance, as part of their work for the Commission for Aviation Regulation (CAR) in Ireland to forecast an efficient level of opex at Dublin Airport, CEPA/TA themselves noted:

  > *"The general consensus of the regulatory studies is that the elasticity of opex with respect to passenger numbers is between 0.3 and 0.5, whilst the academic papers estimate an elasticity in the range 0.5 to 0.7. One explanation for this difference is that academic papers may take a long-run approach to estimating airport elasticity where capacity is treated as variable. If airports increase capacity in the long-run in response to growing passenger numbers, this can explain why academic studies find higher elasticity estimates than their regulatory counterparts"*[2]

- **Empirical estimates of elasticities:** As part of our previous work for Heathrow on opex elasticities[3], we estimated the outturn elasticities at a sample of 35 large airports over the period 2013-2017 – i.e. for each airport in the sample, we divided the growth in opex (in real terms) over that period by the growth in passengers over the same period. The results are shown below.

Figure 4 Outturn opex elasticities 2013-2017

[✂]

Source: Frontier analysis based on ATRS data

The lower quartile of the sample (where 'lower' means more stretching) was [✂]. In other words, if all of the airports in our sample had been set a target elasticity of [✂] in 2013 out to 2017, then 75% of them would not have met the target.

Compared to this evidence, CEPA/TA's figure of 0.16 and Heathrow's figure of 0.21 appear to be significantly stretching. They both lie well below the range from academic literature and regulatory precedents (0.3-0.7), and well below the lower quartile from our empirical estimates ([✂]).

Therefore, as an initial sense check, we highlight that both opex forecasts appear to be significantly stretching – including Heathrow's, which seems to have gone largely unrecognised by the CAA. This calls into question whether Heathrow faced

[2] https://www.aviationreg.ie/_fileupload/2019/Draft%20Determination/2020-2024%20Draft%20Opex%20Efficiency%20Study.pdf

[3] 'Developing opex and commercial revenue elasticities for H7'

appropriate business planning incentives. Based on the CAA's formulaic approach of producing a range in between the two sets of forecasts, it would appear that if Heathrow had produced a lower / more stretching opex forecast in its business plan, the CAA's range would also have been lower.

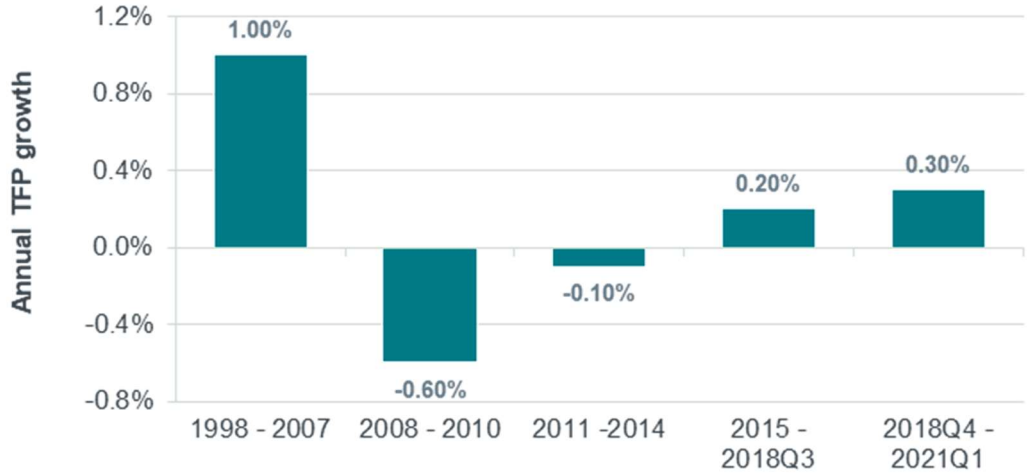
5. Review of frontier shift assumptions

We have reviewed Heathrow's approach and CEPA/TA's approach to applying a frontier shift.

CEPA/TA agreed with Heathrow that the frontier shift is likely to come from both total factor productivity (TFP) and efficiencies beyond TFP – such as those arising from capital investment. Heathrow's baseline frontier shift estimate of 0.1% was based on a recent Bank of England TFP forecast and a further 1.1% was applied linked to efficiencies arising from capital substitution in the Optimal capex plan. However, CEPA/TA rejected Heathrow's overall frontier shift methodology and instead relied solely on precedent from previous price controls to recommend an overall frontier shift estimate of 1%.

As part of its IBP submission, Heathrow commissioned First Economics to review the regulatory precedent and current context around productivity growth. First Economics highlighted that recent regulatory determinations point towards a relative consensus of ongoing efficiency estimates around 1% per annum. However, these determinations rely primarily on productivity data prior to the financial crisis in 2008. Since then, the UK has experienced relatively low productivity growth.

Figure 5 The UK has experienced persistently weak productivity growth since the financial crisis



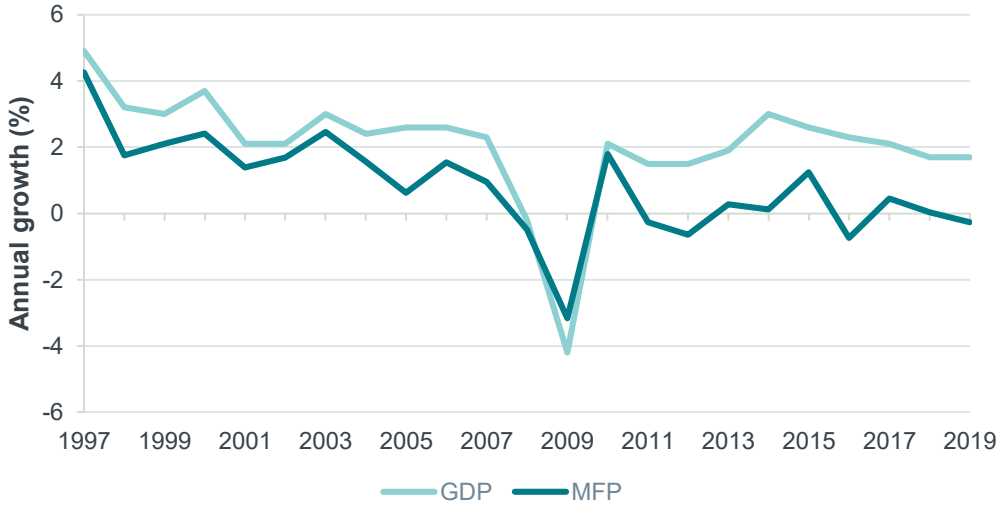
Source: Bank of England Inflation Report February 2019

In the recent energy and water appeals, the CMA agreed with the regulators' approach of using a relatively long term time horizon to estimate productivity gains. In the case of the energy determinations, this covered the years 1997 – 2016[4] and

[4] Paragraphs 7.77 to 7.104, *Cadent Gas Limited, National Grid Electricity Transmission plc, National Grid Gas plc, Northern Gas Networks Limited, Scottish Hydro Electric Transmission plc, Southern Gas Networks plc and Scotland Gas Networks plc, SP Transmission plc, Wales & West Utilities Limited vs the Gas and Electricity Markets Authority Final determination*, CMA, October 2021.

in water this covered 1990 – 2007[5]. Longer time horizons are used as productivity is generally considered to be pro-cyclical, but recent literature and data may indicate a break in the cyclicality since the financial crisis. A Bank of England study on the UK "productivity puzzle" found that business cycle factors cannot explain recent weakness productivity given strong employment and output growth[6], and similar reductions in productivity's cyclicality have also been observed in the US[7].

Figure 6 Productivity has not recovered alongside wider economic growth following the GFC, pointing towards lower cyclicality



Source: *ONS and OECD data*

Note: *"Multifactor productivity (MFP) reflects the overall efficiency with which labour and capital inputs are used together in the production process" - OECD*

Another part of the CMA's reasoning for discounting more recent productivity estimates in recent appeals was due to the argument that regulated sectors tend to be shielded from this trend of low productivity. For instance, the CMA's final determination for the PR19 appeals in water state that *"the water sector will be less affected by many of the factors which led more recent UK-wide productivity growth to be lower than the long-term average"*[8]. However – as shown below – First Economics has examined productivity data since the financial crisis in sectors that operate in similar conditions as Heathrow, and this also shows evidence of relatively stagnant productivity growth.

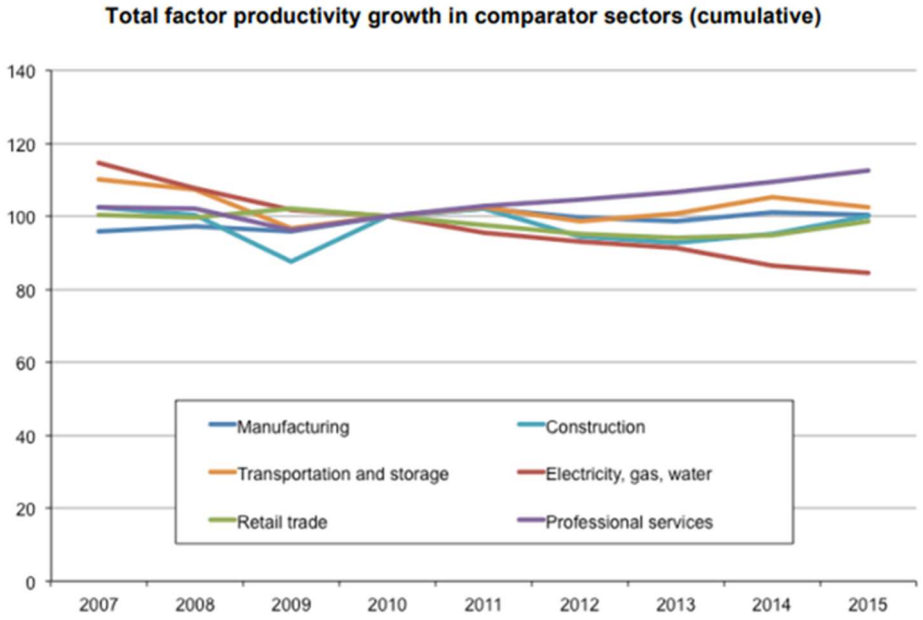
[5] Paragraphs 4.533 to 4.537, *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations Final report*, CMA, March 2021

[6] "the protracted weakness of labour productivity — still 4% below its pre-crisis peak six years after the onset of recession — and the recent strength in employment growth suggest that cyclical factors alone are unlikely to fully explain the productivity puzzle." - The UK productivity puzzle, Bank of England (2014)

[7] Fernald, John G., J. Christina Wang. 2016. "Why Has the Cyclicality of Productivity Changed? What Does It Mean?" Federal Reserve Bank of San Francisco Working Paper 2016-07.

[8] Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations – Final report (April 2020)

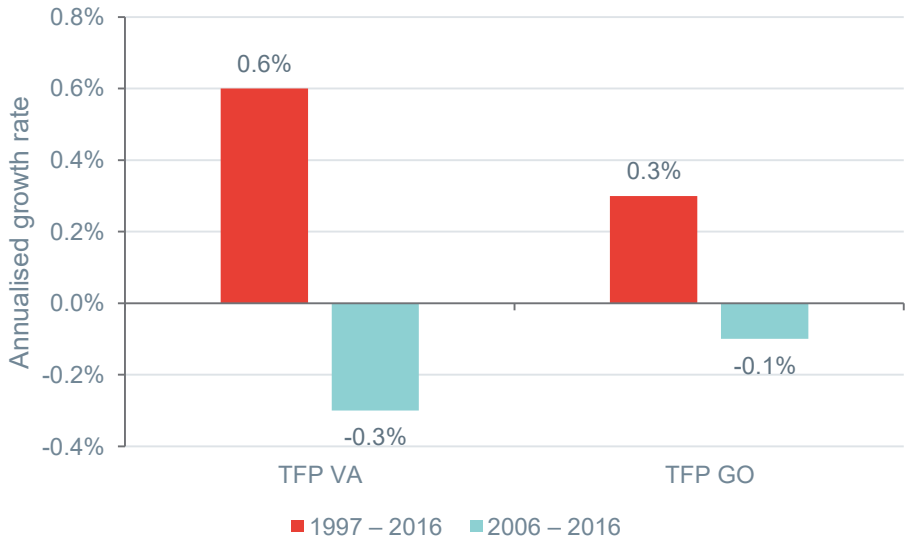
Figure 7 The fall in productivity growth is also experienced in comparator sectors



Source: First Economics analysis of EU KLEMS data

As part of their supporting analysis for the RIIO-2 draft determinations, CEPA themselves observed a reduction in productivity for comparators sectors relevant to regulated energy networks. Therefore, we would urge caution in placing significant weight on historical data prior to the financial crisis when determining a baseline for ongoing efficiency at Heathrow, as this does not appear supported by trends in comparator sectors since then.

Figure 8 CEPA's own analysis of comparators revealed a significant reduction in productivity growth



Source: RIIO-GD2 and T2: Cost Assessment – Frontier shift methodology paper, CEPA (May 2020)

Note: TFP estimates for both value added (VA) and gross output (GO). Selected comparator industries include: Construction; Wholesale and Retail Trade: Repair of Motor Vehicles and Motorcycles; Transportation and Storage; Financial and Insurance Activities

More recently, Covid has also resulted in supply-side shocks and potential productivity 'scarring' which point towards increased downside risks to medium-term productivity. The Bank of England and the OBR have both stated that there is likely to be scarring on future productivity growth stemming from the pandemic – albeit with relatively high uncertainty on the overall impact.[9] However, it is not unreasonable to take into account the downside effects of a prolonged supply chain crisis and generally low investment across the economy when it comes to estimating the frontier shift.

These post-financial crisis productivity outturns and potential pandemic impacts all point towards a relative dampening of productivity growth compared to previous price controls. These factors were reflected in Heathrow's baseline frontier shift assumption of 0.1% based on a recent Bank of England forecast.

Also, in the particular case of Heathrow, demand over H7 is uncertain and it is not unreasonable to expect that an efficient airport operator may struggle to ramp up or ramp down opex in an efficient way in response to sudden changes in demand. An example of this is in security resourcing where a mixture of factors, including changing characteristics of demand, a high proportion of fixed security resource and a historically tight labour market, can all influence Heathrow's ability to rapidly adjust to changes in demand. Heathrow have informed us that there are risks to future demand not only around the overall volumes, but also around its peakiness as recent demand profiles have been more peaky than in the past, and Heathrow therefore has to increase security resource to manage the peaks. However, due to standard shift lengths, resource is now relatively underutilised for the remainder of the shift compared to the past. Heathrow has also informed us that around a third of its security staff are used to manage fixed posts and secure the airside boundary. These posts must be secured regardless of passenger volumes, meaning that a high proportion of Heathrow's security resource are inelastic to changes in demand. Lastly, due to a historically tight labour market[10], any changes Heathrow will want to make to security resource will be highly influenced by the external labour supply of security staff.

CEPA / TA's analysis did not discuss the lower levels of productivity experienced across the economy since 2008, as the regulatory precedent cited relied primarily

[9] "The scarring effects from Covid on supply predominantly reflect the impact on productivity. Business investment growth has been weak over the past year, lowering the capital stock relative to what it would have been in the absence of the pandemic. Lower investment is also expected to have reduced growth in 'total factor productivity'"- Monetary Policy Report, Bank of England (May 2021)

"Since the start of the pandemic, a key assumption underpinning our medium-term economic forecast has been the extent to which the pandemic has done lasting damage to the path of potential output – also known as 'scarring.' This scarring effect can come from the pandemic's adverse impact on the size of the future labour force, the capital stock, and the level of total factor productivity" – Economic and fiscal outlook, Office for Budget Responsibility (October 2021)

"Although potential supply growth is expected to return to its pre-Covid trend, the level of potential supply is expected to be around 2% lower at the end of the forecast period than would have been implied by the MPC's pre-pandemic projections. In part, that reflects longer-term effects resulting from Covid, for example from a drag to productivity from foregone investment and learning on the job, as well as lower migration leading to slower population growth since 2020" - Monetary Policy Report, Bank of England (November 2021)

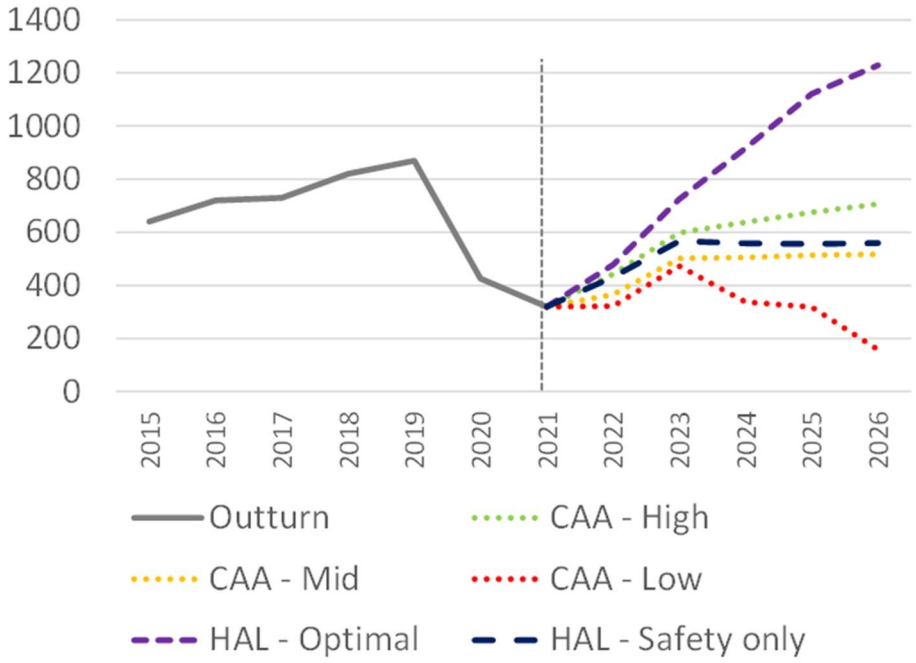
[10] "The recent growth in vacancies over the preceding periods has been the major contributing factor to the July to September 2021 unemployed person per vacancy ratio falling to a record low of 1.3" – Vacancies and jobs in the UK, ONS (November 2021)

"Nine in ten recruiters (88%) say that labour shortages are their biggest concern for the remainder of 2021" – Labour and skills shortages, REC (November 2021)

on pre-financial crisis productivity estimates. CEPA/TA's sole use of regulatory precedent rather than independent analysis is therefore skewed towards pre-crisis productivity estimates which recent analysis highlights may not be realistic going forward.

Also, CEPA/TA's approach does not acknowledge the stretching capex forecasts the CAA has proposed and the likely impacts on achieving historical levels of opex, which would have been supported in part by its capex plan. In its Initial Proposals, the CAA is proposing a significantly reduced capex plan compared to Q6, and Heathrow's proposal for H7. This is shown below.

Figure 9 Capex forecasts - £m, 2020 CPI real prices



Source: Frontier analysis based on the CAA's IP

The CAA's 'Mid' case is 8% lower than HAL's 'Safety Only' plan and around 20%-30% lower than the Q6 projections for capex.[11] With this significant reduction in capex, Heathrow will need to operate in a considerably more constrained world and therefore it would seem less plausible that it can achieve a frontier shift comparable with that seen in previous years. This is because in practice a sizeable portion of opex efficiency gains can only be facilitated through capital substitution. For example, this could represent increased investment in automation to substitute opex inputs in existing processes. Setting aside the fact that CEPA/TA's frontier shift appears to be based on pre-financial crisis levels of productivity, as well as Covid, it seems unrealistic to believe that Heathrow should be expected to perform in line with historical performance if its capex programme has been significantly reduced, and arguably a less stretching forecast should be used.

CEPA/TA accept in their analysis that that the primary objective of the Safety Only Plan is "to deliver on mandatory requirements rather than enhance the asset base".

[11] The Q6 projections of £2,885 million in 2011/12 prices are inflated to 2020/21 prices in CPI terms: c. £3,070m and RPI terms: c. £3,540m. These are compared to the H7 IP Mid case of £2,401m in 2020 prices.

However, they still maintain that Heathrow will be able to achieve significant operating cost efficiencies alongside this plan. Part of their reasoning is that newly replaced assets will require less maintenance opex than the assets they replace. By way of precedent on this point, we note that Ofwat commissioned Europe Economics to assess the appropriate level of frontier shift for PR19.[12] When looking at 'botex', a measure of opex and capital *maintenance* expenditure, Europe Economics maintained that a capital substitution effect should be applied to the frontier shift estimate to account for *enhancement* capital expenditure which falls outside botex. By the same argument, CEPA/TA's argument can only support a partial capital substitution effect for opex, as it would be excessive to attach a full capital substitution effect to the Safety Only Plan when its primary purpose is to maintain and not enhance the capital base.

Taking these considerations as a whole, CEPA/TA's approach is based on a judgement that does not appropriately reflect historical data nor considers the constrained world in which Heathrow will be operating in future.

6. Review of CEPA/TA's inflation assumptions

Principles

When converting the cost forecast into nominal terms, in principle, a bespoke inflation forecast for each cost category should be used which best reflects the expected trend in input prices for that cost category going forward. In the absence of any compelling bespoke forecasts, a general inflation trend could be used. Any difference between a bespoke forecast and general inflation for the price control is a "real price effect" (RPE).

However, criteria are often used by regulators when determining when to use a bespoke series, i;e; when to apply RPEs. The CMA's May 2021 redetermination in water used the criteria from Ofwat's assessment of real price effects[13]:

- Criterion 1A – Is the expected value of the wedge between the changes in the input price and the level of inflation significantly different from zero during the price control period?
- Criterion 1B – Does the wedge exhibit high volatility over time? This criterion may also justify RPEs, particularly true-ups to address cost volatility.
- Criterion 2 – Are there sufficient and convincing reasons to think that CPIH does not adequately capture the input price?
- Criterion 3 – Is the input price and exposure to that input price outside management control for the duration of the price control? For example, can management reduce the volume of the input or reduce exposure by signing long-term contracts?

[12] Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations. Europe Economics (Dec 2019)

[13] CMA (2021) Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations Final report https://assets.publishing.service.gov.uk/media/60702370e90e076f5589bb8f/Final_Report_---_web_version_-_CMA.pdf

The CMA considered but rejected an additional materiality criterion, noting that it did not rule out its usefulness as a possible improvement on Ofwat's approach.

The CMA noted in its final decision that the criteria are helpful because companies have an information advantage on their costs and are more likely to use examples where the costs are higher with bespoke series; the criteria help to reduce the number of RPEs which avoids the need for many line by line adjustments; and the criteria help preserve the incentives for companies to control costs. In particular, these criteria capture whether the differences between the expected value of the bespoke series and CPI(H)[14] are significant, whether there is substantial uncertainty around the level of input prices and whether management control could mitigate impacts and remove the need for RPEs.

We have used these criteria to assess the need for bespoke input series / RPE. In line with the CMA we do not apply an additional materiality threshold to the criteria.[15] We note that some of Heathrow's cost categories use a single input price series, while some are a blend of different series, reflecting that the cost category is made up of different cost components (e.g. labour, material, power). Therefore we consider both the appropriateness of the input price series as well as the split across series for some cost categories in our assessment against the CMA's real price effect criteria. This matrix of cost categories and input price series that Heathrow has suggested is set out below.

Table 3 Cost categories and input price series

Cost category	RPI	Wages/ Labour	Materials	Power
People		100%		
Utility costs excl. distribution contract				100%
Facilities and maintenance costs		60%	40%	
Operational costs excl. insurance	15%	55%	30%	
General expenses	50%	50%		
Insurance	100%			
Rates	100%			
Distribution contract	100%			

Source: Frontier analysis of Heathrow information and CEPA/TA H7Review_InitialProposals_FinalReport_2ndSep

In carrying out this assessment we must first decide what the average inflation series that the bespoke input series are compared to is: whether RPI or CPI is more appropriate. CEPA/TA argue that CPI is more appropriate than RPI because CPI is a national statistic and is recommended for use by the Office of National Statistics (ONS), whereas RPI is not recommended for use for general inflation[16]. Recent regulatory precedent from Ofwat for PR19 and Ofgem for RIIO-2 uses CPI

[14] Ofwat, and the CMA, use CPIH as the average inflation series for PR19

[15] We note that the materiality threshold used by CEPA/TA does not determine whether a cost category requires a RPE.

[16] https://www.ons.gov.uk/economy/inflationandpriceindices/articles/shortcomingsoftheretailpricesindexasameasureofinflation/2018-03-08

(or CPIH which includes owner occupiers' housing costs) for input prices. Therefore it does appear sensible to use CPI as the average inflation series to forecast input prices in nominal terms, unless Heathrow can provide evidence that RPI is more appropriate than CPI. In principle, RPI could be used as a bespoke inflation series for some cost categories. For instance, Heathrow may have contracts with subcontractors which stipulate that costs will rise in line with RPI.

Using CPI as the general trend would result in a lower nominal forecast overall as CPI is lower than RPI on average by around 1%. However, unless Heathrow can provide additional evidence to support using RPI, this lower nominal value arguably represents the most reasonable approach, and follows ONS guidance and regulatory precedent. In the rest of this section, we discuss each cost category in turn and consider whether it is appropriate to use CPI or a bespoke input price series. We also set out the views of Heathrow and CEPA/TA.

People costs: labour price input series

Both Heathrow and CEPA/TA propose to use a labour price series for people costs, although they differ slightly on which OBR labour series to use as the input price series.

Table 4 Assessment of people costs

Criteria	Yes/ no	Comments
Criterion 1A – is there a wedge?	Yes	In line with regulatory precedent from the CMA, Ofwat and Ofgem we see a persistent difference between labour costs and CPI.
Criterion 1B – Does the wedge exhibit high volatility over time?	Yes	
Criterion 2 – Are there sufficient and convincing reasons to think that CPI does not adequately capture the input price?	Yes	
Criterion 3 – Is the input price and exposure to that input price outside management control for the duration of the price control?	Yes	Heathrow has aligned its salaries to market rates and will move with market pressures: ie the OBR wages series.

Source: Frontier analysis of Ofwat/CMA criteria

We consider that it is appropriate to use a bespoke price series for people costs, in line with CEPA/TA and Heathrow's findings. And while there are minimal differences[17] in the OBR sources used by CEPA/TA and Heathrow, we suggest using the wages series used by CEPA/TA as this is consistent with what the CMA used in its decision for the PR19 appeals.[18] We note that the wages series is higher than the average earnings series, and we would expect the most up to date OBR forecast to be used for the nominal projections.

[17] The average earnings uses the wages and salaries but averages the changes across the number of employees. See https://obr.uk/forecasts-in-depth/the-economy-forecast/labour-market/#averageearnings

[18] This is also what Ofwat used it its Final Determination.

Based on our discussions with Heathrow we understand that Heathrow has recently benchmark its salaries to market rates, and adjusted salaries to reflect those market rates. We understand that Heathrow has reflected where these changes in salaries have reflected a cost saving elsewhere in this price control. The salaries continue to be subject to market forces and therefore it is not appropriate to implement a nominal pay freeze in the labour price forecasts. We recommend that Heathrow provide the evidence to support our understanding of this, and subject to this, we disagree with CEPA/TA's finding that there should be a nominal pay freeze in 2020 and 2021.

Utilities excluding insurance costs: power input series

Both Heathrow and CEPA/TA propose to use a power price input series for utilities excluding insurance. CEPA/TA uses a forecast by BEIS: Heathrow had previously also used this but has moved to using a more recent forecast by EIC.

Table 5 Assessment of utilities costs

Criteria	Yes/ no	Comments
Criterion 1A – is there a wedge?	Yes	In line with Heathrow and CEPA/TA we find that power has greater price volatility and would not adequately be captured by CPI.
Criterion 1B – Does the wedge exhibit high volatility over time?	Yes	
Criterion 2 – Are there sufficient and convincing reasons to think that CPI does not adequately capture the input price?	Yes	
Criterion 3 – Is the input price and exposure to that input price outside management control for the duration of the price control?	Yes	Heathrow may have some control through the energy price contracts it chooses.

Source: Frontier analysis of Ofwat/CMA criteria

For power, we support the use of a bespoke series and in general support the use of a more up to date projection as used by Heathrow with the EIC series. We have not conducted a detail comparison of the BEIS and EIC methodologies.

Facilities and maintenance: labour and materials

Heathrow proposes to split this cost category between labour and materials. CEPA/TA proposes to split this cost category between labour and CPI, with a slightly lower weighting on labour than Heathrow uses (50% compared to 60%).

As with the people costs, we find that the labour price input series is most appropriate for wage costs. CEPA/TA have not provided evidence why a 50% weighting for labour has been used whereas Heathrow has provided facilities and maintenance costs from 2019 that show labour costs represent close to 60% of costs. In our view using a 60% weighting for labour costs is reasonable for facilities and management costs, and therefore a bespoke series is appropriate.

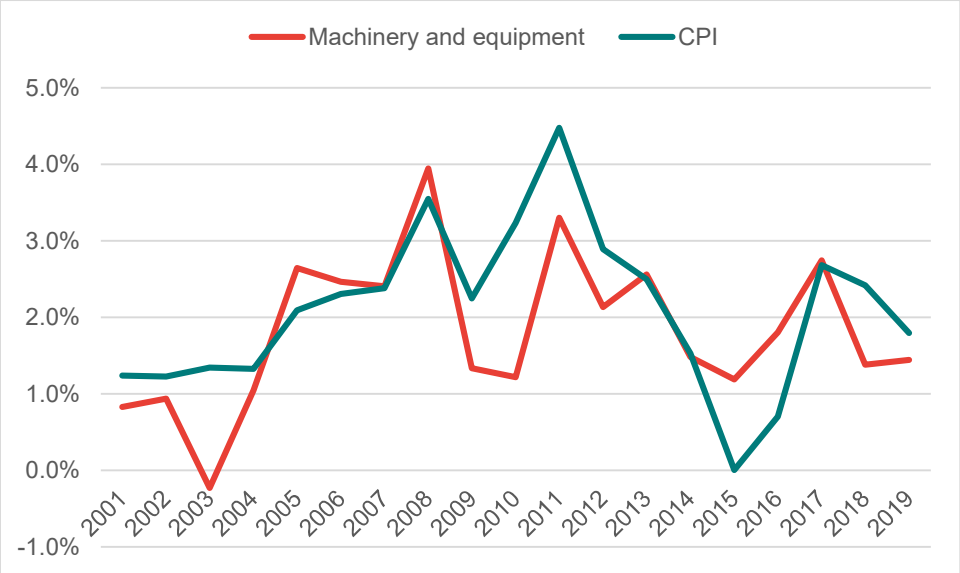
We assess whether the materials input series component is appropriate in the following table.

Table 6 Assessment of materials costs (excluding labour input price component)

Criteria	Yes/ no	Comments
Criterion 1A – is there a wedge?	No	Figure 10 shows that machinery and equipment historic inflation has a wedge of 0.3% on average from 2001 to 2019 compared to CPI, which is not a large wedge.
Criterion 1B – Does the wedge exhibit high volatility over time?	Yes	Figure 10 shows that there is more volatility in the machinery and equipment index than in CPI
Criterion 2 – Are there sufficient and convincing reasons to think that CPI does not adequately capture the input price?	No	There is no forecast specifically for machinery and equipment, and on average CPI captures the change. Over the period 2001- 2019 machinery and equipment was 1.8% and CPI was 2.1%.
Criterion 3 – Is the input price and exposure to that input price outside management control for the duration of the price control?	No	Heathrow may have some control through the contracts it chooses.

Source: Frontier analysis of Ofwat/CMA criteria

Figure 10 Comparison of CPI and machinery and equipment



Source: Frontier analysis of ONS data

In conclusion, while the evidence is not clear cut, we do not find that materials is sufficiently different from CPI to justify a bespoke series. Therefore we agree with CEPA/TA's conclusion that it is appropriate to use labour and CPI for the facilities and maintenance bespoke series, but based on Heathrow's operational cost information we agree that a 60% weighting for labour is appropriate.

Operational costs: labour, materials and RPI

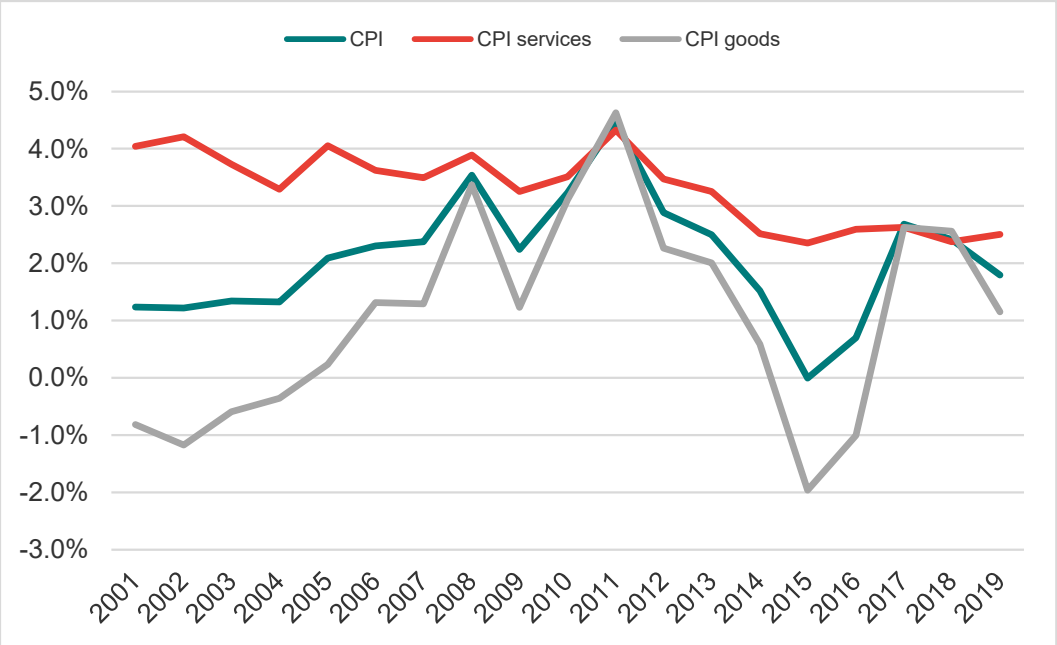
Heathrow proposes to split this cost category across labour, materials and RPI. CEPA/TA proposes to use CPI for this cost category: to not have a real price effect.

As with the people costs, we find that the labour price input series is most appropriate for wage costs, and Heathrow was provided evidence in its 2019 operational cost information that labour is 55% of costs.

Consistent with our analysis of facilities and maintenance, we do not find the evidence against the criteria that this is different to CPI. And as we find that the general price series is CPI, we therefore find that the bespoke series is 55% labour costs and 45% CPI.

We note that CPI is a blend of goods and services, and some input prices may be driven more by goods or services. Where Heathrow can provide evidence that across the cost categories that a specific category is predominantly either goods or services, it may be more appropriate to use CPI specifically for goods or services. However, our understanding is that CPI forecasts (needed for the nominal forecasts) are not split out in this way, and the wedge between CPI services and CPI goods is not consistent over time. This is set out in Figure 11, showing that it would be difficult to project nominal changes for CPI services or CPI goods.

Figure 11 CPI, CPI services and CPI goods over time



Source: Frontier analysis of ONS data

General expenses: labour and RPI

Heathrow proposes that this cost category has a bespoke series split between labour and RPI. CEP/TA proposes to use CPI.

While we have found that labour price input series is most appropriate for wages, we have not seen evidence from Heathrow that people costs are a key input to general expenses. We have also not seen evidence that RPI is more appropriate for general expenses than CPI. Without this evidence we cannot do the criteria-based assessment and conclude that CPI is most appropriate for general expenses. We recommend that Heathrow provides further details.

As set out in the previous section, it may be the components of CPI are more relevant than the whole series but there is not a projection of this available for nominal forecasts.

Insurance, rates and distribution contract: RPI

As set out previously, we find CPI to be the appropriate general inflation series. Therefore where general inflation is the appropriate input series for these cost categories we find that CPI should be used.

RPI may be appropriate where it is used as a bespoke series. We recommend that Heathrow provides additional evidence against the criteria to show that CPI does not adequately capture the input price and that it is outside of management control. On the latter this could be through existing contracts that are linked to RPI.

RPI would pass the other criteria as it has more volatility and has a wedge of around 1% compared to CPI.[19]

7. Conclusions and recommendations

We have reviewed CEPA/TA's frontier shift assumptions. Ultimately, we find that their 1% figure for H7 ignores recent productivity outturns across the economy. Since the financial crisis, the UK has experienced weak productivity growth - both across the economy as a whole and within similar sectors similar to airports. More recently, supply-side shocks and pandemic scarring also point towards increased downside risks to medium-term productivity. The sole use of historical productivity estimates prior to the financial crisis therefore skews up CEPA/TA's frontier shift assumption and away from recent productivity experience. Also, the CAA is proposing a significantly reduced capex plan for H7 relative to Heathrow's plan. Given the synergies between capex and opex, it seems unrealistic to believe that Heathrow should be expected to perform in line with historical performance if its capex programme has been significantly reduced, and arguably a less stretching forecast should be used.

Finally, with respect to inflation, ideally bespoke forecasts should be used for individual cost categories based on the most recent and most credible information available. And in the absence of any compelling bespoke forecasts, it would seem reasonable to us to apply CPI. We have carried out a high level assessment of the

[19] See for instance: https://www.ofwat.gov.uk/publication/indexation-of-future-price-controls-in-the-water-sector/

most appropriate approach for each cost category, following the CMA's PR19 criteria to assess the use of bespoke series.