# Appendix 3 – A Peer Review of CEPA & Taylor Airey's Efficiency Assessment

*Source: Frontier Economics*

# DUBLIN AIRPORT OPEX FORECAST

## A peer review of CEPA & Taylor Airey's efficiency assessment

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# EXECUTIVE SUMMARY

Dublin Airport is subject to price-cap regulation by the Commission for Aviation Regulation (CAR). In May 2019, CAR released for public consultation its draft determination on the maximum level of airport charges at Dublin Airport for the period 2020-2024. CAR will produce its final determination in August 2019.

One of the key building blocks that feeds into the overall determination is CAR's forecast of operating expenditure (opex) at Dublin Airport out to 2024. To inform this, CAR has commissioned a report from CEPA and & Taylor Airey[1] (CEPA/TA), who were tasked with assessing the efficiency of Dublin Airport's outturn opex in recent years using bottom-up analysis (they reviewed 22 separate cost areas), and then to forecast an efficient level out to 2024. We have been asked by daa to produce this peer review of the report.

The report takes place in the context of substantial opex growth at Dublin Airport in recent years, driven at least in part by rapid and unanticipated growth in passenger volumes. CEPA/TA are of the opinion that much of this opex growth has been inefficient, and that daa therefore has an efficiency gap that it should be expected to close today.

We have noted a number of issues in CEPA/TA's approach which we believe imply that the forecast out to 2024 is unachievably low. Regulatory targets should be challenging, but they do need to be at a level achievable by a reasonably efficient operator, given the external environment in which that operator finds itself. If not, the regulation may dissuade investors from making future investments; airport quality and the passenger experience may suffer as a result in the long run.

We have reviewed the approach taken for each cost item and have specific comments on some of the details for many categories. However, our general issues with the report are as follows:

- **Overall sense-check of results**: Total opex at Dublin Airport in 2017 was around €258m. Ultimately, CEPA/TA forecast that the efficient level of total opex in 2024 (excluding the CIP) is €274m. This implies a total growth over the period 6.1%. Given that passengers are forecast to grow by 27.8% over the same period, this implies an overall short-run elasticity between total opex and passengers of 0.22. We believe that this implied elasticity is unrealistically low, especially given the pressing need for Dublin Airport to expand its physical capacity to catch up with unprecedented growth over the last few years. We note that in the report, CEPA/TA carried out a literature review of estimates of such elasticities, and found them to be in the range of 0.3 to 0.7.[2] Therefore, the forecast appears to be unrealistically stretching compared to their own literature review.

[1] Dublin Airport Operating Expenditure: Bottom-up Efficiency Assessment, 3rd May 2019. CEPA & Taylor Airey

[2] They separately report a range of elasticities from the regulatory literature (0.3 to 0.5) and the academic literature (0.5 to 0.7). They attribute the discrepancy in ranges to differences in the treatment of variable capital, and interpret the lower range as a short-run and the higher range as a long-run estimate.

Similarly, CEPA/TA forecast that the efficient number of workers at daa at 2,576 in 2024, amounting to a change of [redacted] from daa's estimated 2019 level ( [redacted] staff). Compared to the growth in passengers over the same period, this implies an overall elasticity of -0.41. As an overall sense-check, we consider the growth assumption for employment to lack credibility.

Even taking CEPA/TA's baseline 2019 staff of 2,545 FTEs as given, we find that their staffing projections are unrealistic. Conservatively assuming a staff elasticity of 0.3 with respect to passengers (the minimum of CEPA/TA's suggested opex elasticity range), the expected passenger growth of 16% between 2019 and 2024 would imply 2,674 FTEs in 2024. This is 97 FTEs more than CEPA/TA have forecast for 2024. At a high level, the CEPA/TA staff growth rate is infeasibly low.

- **Pay assumptions**: Most of the opex at Dublin Airport relates to staff pay costs. CEPA/TA have come to the view that for many cost categories, daa's workers are overpaid compared to the growth in pay in the rest of the economy in recent years. Therefore, before forecasting out to 2024, for many cost categories, they first determine that the "efficient" starting point would be one with lower pay rates. From that point onwards, wages are assumed to grow in line with the average Ireland pay forecast, with the exception of workers on more favourable 'pre-2010' contracts, whose wages are assumed to grow at only half that rate. The "efficient" starting point amounts to real pay decreases for many staff categories, the practicalities of which are not addressed by the CEPA/TA report, although they elsewhere acknowledge the difficulties of nominal or real pay cuts. Aside from the practical issues, we believe that the approach may be based on a misunderstanding of the history of pay at Dublin Airport and inappropriate use of the limited available statistics:
  - The period between 2011 and 2014 is deemed by CEPA/TA to be a period in which wages were relatively efficient, and were substantially lower than current wages even accounting for inflation and national wage trends. This period is the result of a temporary, profit-contingent wage cut agreed with unions during a period of financial difficulty in 2010, cuts which were reversed in 2015 and from which two separate labour court mandated pay increases have arisen.
  - CEPA/TA choose 2015 as an achievable baseline level of unit payroll cost efficiency, from which they forecast to the present day using national-level wage trends. They choose 2015 rather than 2014, a year in which they are more confident efficiency occurred, due to the presence of legally mandated pay increases in the following year. However these pay increases (from union agreements and labour court judgements) actually occurred over a longer time period and are expected to occur in coming years also, making CEPA/TA's position inconsistent. If they accept the legally mandated wage increases as the actions of an efficient firm, 2015 is too early to act as a baseline.
  - The choice to inflate their efficient baseline year by national wage trends, and to forecast in the future using those trends, is a reasonable response to the available data but ignores the disproportionate economic growth (and likely associated wage growth) in Dublin over the last five years. Using this

unrealistically low rate of wage growth produces an unrealistically low unit payroll cost for Dublin Airport workers, both in the present (as forecasted from the 2015 baseline) and going forward.

- **Redundancies**: CEPA/TA have also come to the view that for many cost categories, daa is currently overstaffed. daa estimates [redacted] in 2019, whereas CEPA/TA consider that the efficient number is 2,545. In the main body of this report, we provide detailed comments on the approach taken for individual cost categories. (We have identified a number of issues which we believe ultimately result in CEPA/TA understating the efficient number of workers). Holding these issues to one side, CEPA/TA's findings imply that daa would need to make around [redacted] redundancies today, almost [redacted] employees which is inconsistent with CEPA/CAR's proposed "glidepath". Holding aside the practicalities of laying-off such a large proportion of the workforce, CEPA/TA have not included any costs associated with these redundancies.
- **Elasticities**: CEPA/TA argue that some cost categories – including central functions – are fixed and will not grow in future (aside from any price effects). In other instances – such as IT which on the surface would appear to have a similar link to passengers as central functions – they apply a very low elasticity of 0.1 with respect to passengers, with no discussion about the source of this number, other than that it is based on judgement. We would expect that any argument in favour of IT being variable with respect to passengers would also hold for central functions. In the medium to long run, we do not accept that there are 'fixed' functions. Some costs may grow with passenger numbers, some with capacity. But capacity also grows with passenger numbers. Larger airports imply a greater volume of work, and there are only so many hours in the day for workers working in fixed roles. This applies across the range from management roles, to security functions to cleaning.

  In the retail area they apply an elasticity of 0.2 with respect to passengers, with a recognition that the function is driven by both floor space as well as passenger throughput. (And there is no discussion about the source of this number, other than that it is based on judgement). However, for cleaning, they argue the function is driven by floor space only, and apply an elasticity of 0.4 with respect to floorspace. And because floorspace is not expected to increase (excluding the CIP), cleaning costs are forecast to be held constant in real terms. We believe that, like retail, cleaning is manifestly driven by both floor space as well as usage, i.e. passenger throughput, and to assume the same cost level in real terms is unrealistic.

  We recognise that many activities are not driven by just one single driver, and that it is challenging to produce formulaic relationships. However, taken all together, we believe the approach with respect to fixed costs and elasticities should be revisited, with a greater regard for consistency across services and functions, and more evidence needed to justify some very low elasticities.
- **Benchmarking:** A large part of CEPA/TA's efficiency assessment is based on comparing various productivity metrics between T1 and T2, and between terminals over time. If one terminal is found to be less productive than the other, based on metrics such as passengers per worker, and workers per $m^2$, they argue that productivity in that terminal should rise to the level achieved in the

other terminal (amounting to redundancies). However, there are many reasons why two terminals can perform differently on certain metrics, and any difference should not necessarily be interpreted as inefficiency. In particular the intensity of use of the two terminals is different, as is the passenger mix. This difference is very largely outside daa's control, has a material impact on the operation of the two terminals, but goes unremarked in the CEPA/Tailor Airey report.

For retail for example, the report highlights that revenue per worker is higher in T2 than in T1. They also highlight that T1 has more workers per $m^2$ than in T2. And as a result, they argue that between 2019 and 2024, the number of retail workers in T1 should fall by [redacted] . However, T2 has more long haul network carriers, whereas T1 has more short haul low cost carriers: the two terminals are different. Although T1's retail is more space-constrained, resulting in higher FTEs per square metre, it also has more transactions than T2, which is driven by passenger throughput. We believe that highlighting differences in high level metrics between terminals is not a robust assessment of efficiency. Cherry-picking the higher 'productivity' from one terminal and applying it to the other can only ever result in a finding that one terminal is inefficient, and it ignores the reality of the situation. We also note that CEPA/TA comment that daa is "considered an effective retailer by airlines".

We also question the use of opex and staffing levels in 2014 as a benchmark for efficiency going forward, given subsequent changes that affect opex and staffing, such as updates to the security environment and increases in low-cost carrier passengers. Applying short-run elasticities to a baseline benchmarked against 2014 omits shifts in Dublin Airport operations that occurred between 2014 and 2019 from baseline figures.

In light of the issues raised above, we consider the CEPA/TA forecasts to be unachievably low and not a fair view of forecast efficiency.

# 1 INTRODUCTION

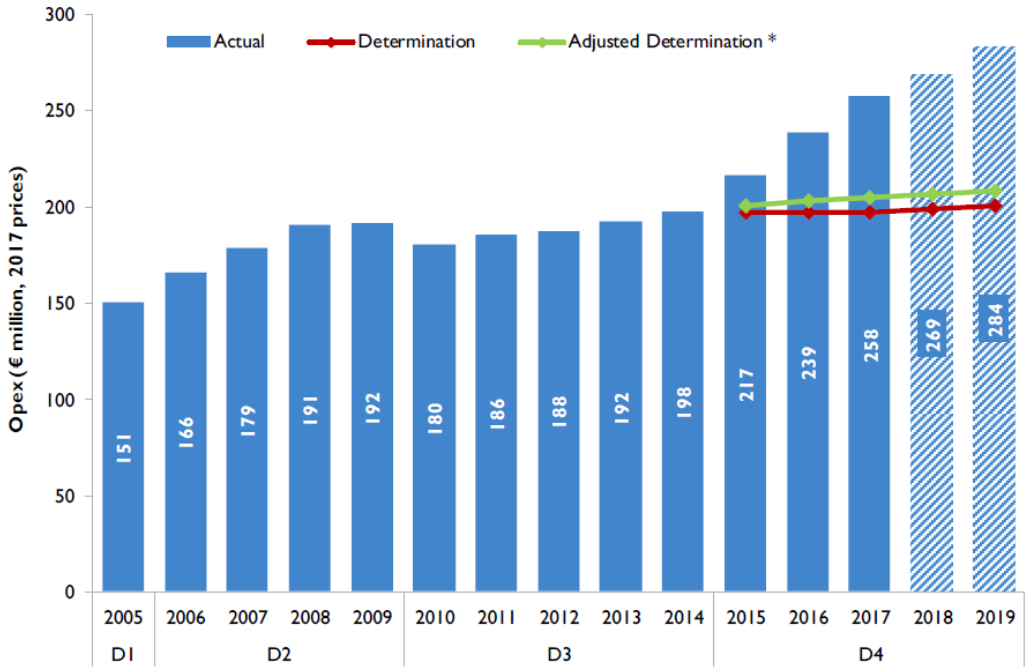
## 1.1 Background

Dublin Airport is subject to price-cap regulation by the Commission for Aviation Regulation (CAR). In May 2019, CAR released for public consultation its draft determination on the maximum level of airport charges at Dublin Airport for the period 2020-2024. CAR will produce its final determination in August 2019.

One of the key building blocks that feeds into the overall determination is CAR's forecast of operating expenditure (opex) at Dublin Airport out to 2024. CAR's proposed opex forecast is largely based on a report commissioned from CEPA/TA[3]. CEPA/TA were tasked with assessing the efficiency of Dublin Airport's outturn opex in recent years using bottom-up analysis, and then to forecast an efficient level of opex for the next regulatory period.

A key issue at the heart this determination – which CAR also recognises – is that that in recent years, traffic at Dublin Airport has grown significantly, and at a much faster rate than the growth anticipated by CAR in its 2014 determination. In parallel, opex has also been significantly higher than CAR's forecasts in 2014. In their report, CEPA/TA have carried out some ex post analysis to show that even if CAR's traffic forecasts had been correct in 2014, then actual opex would still have exceeded CAR's adjusted opex allowance. This is shown below:

**Figure 1 Outturn opex at Dublin Airport**




*Source: Dublin Airport Operating Expenditure: Bottom-up Efficiency Assessment, 3rd May 2019. CEPA & Taylor Airey*

CAR itself has proposed the following as possible explanations for this difference:

[3] Dublin Airport Operating Expenditure: Bottom-up Efficiency Assessment, 3rd May 2019. CEPA & Taylor Airey

- The elasticity assumptions which CAR used in its previous determination were unrealistically low;
- Dublin Airport failed to realise efficiencies that were potentially achievable;
- The growth in passengers was so large and unexpected that even a hypothetical efficient operator would also have been taken by surprise: an efficient response was unrealistic; or
- A combination of the above.

CEPA/TA have considered these explanations. Ultimately, they conclude that opex at Dublin Airport has exceeded the efficient level, even after controlling for the large growth in traffic in recent years. They believe that Dublin Airport's preliminary budgetary opex estimate for 2019 is around [redacted] greater than the efficient level, equal to around [redacted] of the efficient level. Therefore, in their analysis, CEPA/TA have made initial efficiency cuts to Dublin Airport's current opex, and have then forecast from that point onwards out to 2024.

They carried out the efficiency assessment and then the forecast for 22 separate cost areas, and then added them together to derive their total opex forecast. In addition to the 22 cost areas, daa also submitted to CAR its proposed Capital Investment Plan (CIP). The CIP sets out daa's estimated additional opex and capex associated with the upcoming expansion at Dublin Airport. CEPA/TA have reviewed the opex associated with the CIP and have increased their forecasts in instances where they believe the costs are reasonable and efficient. The table below shows their final forecast.

**Figure 2 CEPA & Taylor Airey's opex forecast**

| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| ***Payroll*** | | | | | | |
| Security | 37.8 | 39.0 | 39.9 | 40.9 | 41.8 | 42.8 |
| Maintenance | 15.3 | 15.5 | 15.6 | 16.0 | 16.1 | 16.2 |
| Central functions | 23.1 | 23.6 | 24.0 | 23.9 | 23.8 | 23.8 |
| Facilities and cleaning | 21.5 | 21.6 | 21.6 | 21.6 | 21.6 | 21.6 |
| Campus services | 21.9 | 22.4 | 22.7 | 23.1 | 23.5 | 23.8 |
| IT | 7.0 | 7.2 | 7.3 | 7.5 | 7.7 | 7.8 |
| Retail | 16.9 | 16.0 | 15.4 | 15.2 | 15.1 | 14.9 |
| Airside operations | 6.5 | 6.7 | 6.8 | 6.9 | 7.0 | 7.1 |
| Car parking | 1.7 | 1.8 | 1.8 | 1.7 | 1.7 | 1.7 |
| Capital projects | 1.9 | 2.4 | 2.8 | 2.8 | 2.9 | 2.9 |
| ***Non-pay*** | | | | | | |
| Maintenance | 13.1 | 13.1 | 13.2 | 13.4 | 13.4 | 13.4 |
| Facilities and cleaning | 3.7 | 3.6 | 3.6 | 3.6 | 3.5 | 3.5 |
| IT | 8.9 | 8.9 | 8.8 | 8.7 | 8.6 | 8.5 |
| Car parking | 4.8 | 4.9 | 5.0 | 5.1 | 5.2 | 5.3 |
| Employee-related overheads | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.1 |
| Rent and rates | 14.2 | 14.2 | 14.2 | 14.2 | 14.2 | 14.2 |
| Consultancy services | 6.1 | 6.3 | 6.3 | 6.4 | 6.5 | 6.6 |
| Marketing | 7.4 | 7.5 | 7.6 | 7.7 | 7.8 | 7.9 |
| Insurance | 3.7 | 3.8 | 3.8 | 3.9 | 4.0 | 4.0 |
| PRM | 8.2 | 8.5 | 8.7 | 9.0 | 9.3 | 9.5 |
| Other overheads | 21.6 | 23.6 | 23.7 | 22.9 | 23.0 | 23.1 |
| Utilities | 7.4 | 7.6 | 7.9 | 8.0 | 8.2 | 8.4 |
| ***Totals*** | | | | | | |
| Pay | 153.8 | 156.0 | 157.8 | 159.6 | 161.1 | 162.8 |
| Non-pay | 105.2 | 108.0 | 108.9 | 109.0 | 109.7 | 110.6 |
| **Total opex (excluding CIP)** | **258.9** | **264.1** | **266.7** | **268.6** | **270.9** | **273.3** |
| CIP | | 0.5 | 3.4 | 14.7 | 18.3 | 17.2 |
| **Total opex (including CIP)** | **258.9** | **264.6** | **270.1** | **283.3** | **289.1** | **290.5** |
| Opex per passenger, excl. CIP (€) | 8.0 | 7.9 | 7.7 | 7.5 | 7.4 | 7.2 |
| Opex per passenger, incl. CIP (€) | 8.0 | 7.9 | 7.8 | 7.9 | 7.9 | 7.7 |

*Source: Dublin Airport Operating Expenditure: Bottom-up Efficiency Assessment, 3rd May 2019. CEPA & Taylor Airey*

We note that CAR has not adopted the forecasts above in full in its draft determination. It recognises that in reality the forecasts above may not be immediately achievable, and instead it has proposed a two year glidepath to give Dublin Airport more time to catch up to the efficient level still leaving a significant target to achieve from day 1 i.e. 2020. This is shown below:

**Figure 3 CAR's draft opex allowance**

| Year | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Draft allowance (€m) | 273.1 | 273.1 | 283.9 | 289.7 | 291.1 |
| CEPA (€m) | 265.1 | 270.6 | 283.9 | 289.7 | 291.1 |

*Source: CAR: Maximum Level of Airport Charges at Dublin Airport, 2020-2024, Draft Determination*

## 1.2 The scope of this report

In 2018 we were commissioned by daa to produce our own independent opex forecast. We have now been asked by daa to produce an independent peer review of the CEPA/TA report and to give our view on the reasonableness of its approach and its findings.

## 1.3 The structure of this report

The rest of this report is structured as follows:

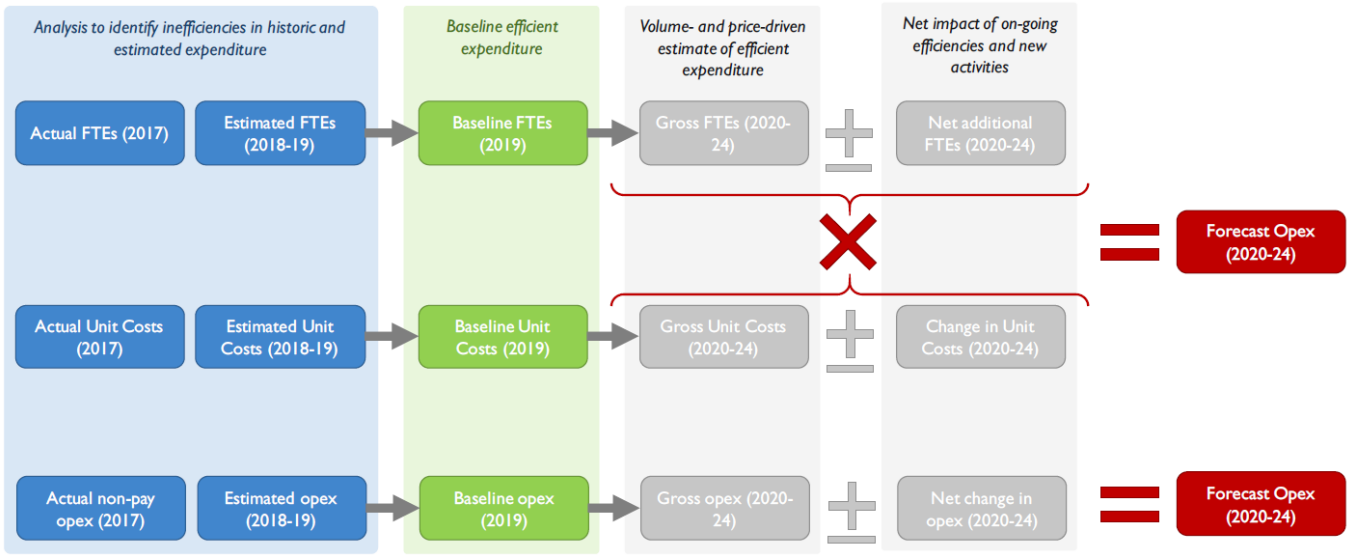
- In **Section 2** we provide a high level overview of the overall approach taken by CEPA/TA;
- In **Section 3** we comment on the details of their approach with respect to elasticities and the variability of costs with respect to traffic (and other drivers);
- In **Section 4** we comment on the details of their approach with respect to pay; and
- In **Section 5** we provide our overall conclusion.

# 2 OVERVIEW OF APPROACH

## 2.1 Introduction

In this section we provide a high level overview of the overall approach taken by CEPA/TA in producing their final opex forecast. The chart below provides a high level illustration of their approach.

**Figure 4 High level overview of CEPA/TA's approach**




*Source: Dublin Airport Operating Expenditure: Bottom-up Efficiency Assessment, 3rd May 2019. CEPA & Taylor Airey*

They describe the following steps in their approach:

- Identifying the efficiency gap;
- Establishing baseline expenditure – i.e. resetting opex in 2019 based on the results of the efficiency gap analysis; and
- Forecast expenditure forwards.

We describe these points in turn below.

## 2.2 Identifying the efficiency gap

For each of the cost areas listed in Figure 2, CEPA/TA compared what actual opex has been in recent years and compared this to the levels in CAR's 2014 determination. They then considered whether any differences were driven by the higher-than-anticipated volume growth, or some other reasonable justification, or whether they were incurred inefficiently.

Some cost areas are made up of pay costs (i.e. the functions and services are provided by daa's own staff on daa's payroll), whereas others are non-pay costs (such as utilities and consulting services). For pay costs, CEPA/TA split out total opex into staff numbers and salary costs, and assessed the efficiency of both separately.

In assessing efficiency, CEPA/TA used benchmarking and qualitative evidence provided by the airport and airlines, as well as expert judgement. Benchmarking includes:

- Internal benchmarks: This involves identifying any evidence, such as productivity measures, which could suggest, for instance, that T2 was less efficient than T1 on comparable activities. It could then be argued that if T1 were as efficient as T2 then costs could reasonably be expected to be lower in T1; and
- External benchmarks: This involves benchmarking various productivity / output measures at Dublin Airport with those at broadly comparable airports.

CEPA/TA note that this analysis was carried out using 2017 data.

## 2.3 Establishing baseline expenditure

Following the previous step, in instances where CEPA/TA have identified an efficiency gap, they have then adjusted the current levels of opex accordingly to produce their 'baseline' expenditure. With respect to 'current' levels, there is a timing consideration. The efficiency analysis was based on 2017 data. CEPA/TA have therefore taken one of the following two approaches for each cost item:

- Adjust 2017 costs (or staff levels) based on the efficiency gap and then produce a forecast to 2019 (which is the main starting point of the forecasting analysis for 2020-2024. The forecasting up to 2019 is broadly in line with the approach described in the next step); or
- Adjust Dublin Airport's 2019 cost estimate (or staff levels) and remove the efficiencies identified in 2017 from those levels.

CEPA/TA note that they have applied judgement in deciding whether to subtract all or part of the efficiency gap based on whether they believe the efficiency savings to be immediately achievable.

## 2.4 Forecast expenditure forwards

Having then established its view of the efficient starting point in 2019 for each cost item, CEPA/TA have then produced forecasts out to 2024. This is based on applying elasticities that link a growth in traffic to a growth in costs (or staff numbers in the case of pay categories). In some instances other approaches have been used – e.g. energy costs are assumed to be linked not to traffic but to fuel cost forecasts. CEPA/TA have then made some adjustments to account for step changes that are not captured in the approach above – e.g. in the event of new cost items.

# 3 REVIEW OF APPROACH WITH RESPECT TO ELASTICITIES

## 3.1 Introduction

This section discusses the use of elasticities in the CEPA/TA forecasts. In the first subsection, we provide a high-level overview of their approach. In the second subsection, we discuss various aspects of their use of elasticities, in particular how the bottom-up cost estimation aggregates as an overall elasticity, as well as a discussion of the individual elasticities applied to particular cost items. We find some internal inconsistencies between the elasticities applied to individual cost categories, and also question the logic used to justify fixing particular categories. Where elasticities are selected without clear reference sources, the particular choice of figure can appear arbitrary. We find that the aggregate impact of these individual elasticities is unrealistic; CEPA/TA's forecasts do not allow the growth in opex and staffing that one would expect given projected passenger growth and the results of their literature review. In the final subsection, we quantify the high-level impact of adjusting the forecasting elasticities for total opex and staff, such that the elasticities fall within the range from the literature (i.e. 0.3 to 0.7).

## 3.2 Overview of CEPA/TA approach

A substantial component of the efficiency assessment involves determining the applicable relationship between cost and traffic. This analysis is divided into two parts:

- The backwards-looking assessment of how costs have evolved over the relevant period. This consists of comparing cost trends over the previous period with an efficiency "standard", based on a combination of benchmarking and backwards-forecasting using elasticities. From this standard, CEPA/TA determine their suggested 2019 baseline cost level.
- The forward-looking prediction of how efficient costs could evolve, again based on elasticities. For each individual price or volume, CEPA/TA identify a single driver of the price or volume.

These exercises are carried out for each individual cost category in terms of the unit price and in terms of volumes, and the price and volume forecasts are then combined to form the overall cost estimates.

## 3.3 Our views

Our review of the CEPA / Tailor Airey approach is divided into two parts. First, in order to first understand the aggregate impact of the CEPA/TA modelling decisions, we perform a high-level sense check of their results. We compare the CEPA/TA total opex and staffing forecasts with benchmark figures they provided. In the second part, we comment on individual choices of elasticities used in their forecasting.

### 3.3.1 Benchmarking the implied total opex and staffing elasticities

Here we perform a simple sense check of the CEPA/TA forecasts by reviewing elasticities with respect to total passengers for total opex and staffing volumes. As noted in the CEPA/TA report, total opex and total staffing elasticities are of limited use for forecasting, and they are not used as inputs to the model. We perform this exercise as a concise high-level check of the bottom-up forecast.

In their introduction, CEPA/TA provide reference ranges of total opex elasticities: "[t]he 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 of 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."[4] As we do not have visibility of the reference sources for these figures, we cannot comment on their interpretation of these values as short- vs long-run estimates. We note that, as the regulatory period under question is a period of capacity expansion, the higher set of elasticities (0.5 to 0.7) may be the appropriate range for comparison.

With those ranges in mind, we perform the following sense check of the forecast growth in opex between 2017, the baseline for the CEPA/TA forecasts, and 2024. We note that the CEPA/TA forecast of total opex (omitting the CIP) in 2024 is €273m**,** implying a growth since the base for CEPA/TA forecasts, total opex in 2017, of 6.1%. Given that passengers are forecast to grow over the same period by 27.8%, this implies an overall short-run elasticity between total opex and passengers of 0.22.

We believe that this implied elasticity is unjustifiably low, given that it is below the range of short-run benchmark elasticities (0.3 to 0.5) supplied by CEPA/TA. Moreover, as this regulatory period will see capacity expansion such that higher total opex is likely an appropriate benchmark, this figure is even more problematic.

We repeat this calculation using various baselines, and these are tabulated in Figure 5. As the CEPA/TA forecast for total opex in 2024 is below the daa estimate for 2019, the implied elasticity is negative. Even comparing the CEPA/TA adjusted 2019 baseline to the 2024 opex produces an elasticity of 0.33, at the low end of the range 0.3 to 0.5. Given the planned capacity expansion during this period, and the opex reduction included in the adjusted 2019 baseline, this implied elasticity suggests that the forecast trajectory may be unachievably stretching.

[4] CEPA/TA report, p16.

**Figure 5 Total opex elasticity with respect to total passengers, as implied by CEPA/TA forecasts[5]**

| Opex figures | | | Implied elasticity |
|---|---|---|---|
| Total opex in 2017 | and | CEPA/TA forecast opex in 2024: | 0.22 |
| daa estimate of total opex in 2019 | and | CEPA/TA forecast opex in 2024: | -0.22 |
| CEPA/TA forecast opex in 2019 | and | CEPA/TA forecast opex in 2024: | 0.33 |

*Source: Frontier Economics calculation from CEPA/TA model*

We also calculate the elasticity with respect to passenger volume that are implied by the CEPA/TA staff forecasts, which are tabulated in Figure 6. Assuming that staffing and total opex elasticity are roughly comparable, we can compare the staffing elasticities to the short-run and long-run total opex elasticity ranges discussed above. As an additional point of reference, we note that CEPA's estimates of staff number elasticities for particular employment categories range from 0.1 to 0.69.[6] Using 0.69 as an upper limit for staffing elasticity implies very significant economies of scale across all staff categories, and we question whether these projections are realistic.

**Figure 6 Staff elasticity with respect to total passengers, as implied by CEPA/TA forecasts**

| Staffing figures | | | Implied elasticity |
|---|---|---|---|
| daa staff in 2017 | and | CEPA/TA forecast staff in 2024: | 0.10 |
| daa staff in 2019 | and | CEPA/TA forecast staff in 2024: | -0.41 |
| CEPA/TA forecast staff in 2019 | and | CEPA/TA forecast staff in 2024: | 0.07 |

*Source: Frontier Economics calculation from CEPA/TA model*

Figure 6 compares various staffing baselines--2017, 2019, and CEPA/TA's adjusted baseline for 2019--with 2024. The elasticities implied by these comparisons are all implausibly low, especially for the comparison between daa staff in 2019 and the 2024 CEPA/TA forecast. As this 2024 forecast is below the daa staffing levels in 2019, this elasticity is -0.41, which may be unattainable. To achieve the CEPA/TA target, daa would likely face significant financing difficulties.

A significant contributor to CEPA/TA's opex and staffing forecasts for 2024 is their choice of 2019 baseline. CEPA/TA's baseline was calculated using 2014 as a benchmark for efficiency. We find that 2014 is a problematic benchmark, given the subsequent changes that have affected opex and staffing, such as updates to the security environment and increases in low-cost carrier passengers. Applying short-run elasticities and incremental costs from 2020 onward to a baseline

[5] These figures omit the CIP, as we believe that removing investment in increased capacity captures the relevant historical trend. Including the CIP in forecast opex yields the following implied elasticities.

Total opex in 2017 and forecast opex in 2024 imply: 0.46. Total opex in 2019 and forecast opex in 2024 imply: 0.14. Total opex in 2019 and forecast opex in 2024 imply: 0.73

[6] CEPA/TA report, pp17-18.

benchmarked against 2014 omits shifts in Dublin Airport operations that occurred between 2014 and 2019.

### 3.3.2 Elasticities applied to individual cost categories

In this section we provide individual views on elasticities by cost section. Although the elasticities used in the CEPA/TA analysis for forecasting are broadly aligned with those in the daa/Frontier analysis, we highlight some concerns below.

#### Choice of drivers

CEPA/TA have followed a strict approach of choosing a single driver for any particular cost category, even when an argument can be made for multiple relevant drivers. An example of this is in facilities and cleaning costs, where CEPA/TA have argued that "higher passenger numbers do not necessarily directly drive cleaning costs upwards. The placement of cleaning staff is largely dependent on the terminal space that they can cover given travelling distances, rather than the volume of cleaning activity."

We would argue that CEPA has taken an extreme position with respect to passenger levels as a driver, and that both floor space as well as the volume of cleaning required (for example, in cleaning spills, littered rubbish, washrooms) both drive cleaning staffing. Suggesting that cleaning costs are unrelated to the intensity of usage by passengers seems to fail a straight face test.

In the case of retail staffing, CEPA/TA have acknowledged that both passengers and floor space are drivers of retail staff: "To the 2017 baseline, we apply an elasticity of 0.2 to reflect that retail floor staff numbers will partly increase as passenger numbers increase. We do not believe this to be a very strong link, as we believe the number of staff required is more closely related to the area of floor space dedicated to retail as well as passenger throughput."

Although we agree that both floor space and passenger volume drive retail staffing, we find their approach unconvincing. It is inconsistent that they acknowledge the role of two drivers for retail but not cleaning staff. They supply no reference for their 0.2 retail staff elasticity, and the choice appears to be arbitrary.

In a related way, we find inconsistencies in their modelling of car parking costs. In choosing the driver for car parking staff, CEPA/TA note that revenue has increased with staff, which suggests that the driver for car parking staff is number of used parking spaces (car park traffic). Instead, they choose to set no elasticity for this category, which we believe is unreasonable.

In forecasting non-pay car parking costs, they state that "we do not apply a passenger volume-based elasticity, as the shuttle service nature of car park buses means that it is relatively unaffected by passenger growth in the short term." We find it implausible that, over a five year period, daa would not adjust their shuttle scheduling in order to accommodate increased passenger demand. More generally, at busy points in the shuttle schedule where the buses are running at close to passenger capacity, an increase in passenger volumes will require an increase in shuttles.

In insisting on single drivers for particular cost categories, CEPA/TA tends to add a downward bias to their results. Their forecasts will only reflect cost growth related

to the drivers they have selected, and fail to include cost growth related to the drivers they have omitted. This approach risks setting cost trends that are not achievable, and we believe a more flexible and realistic approach would be necessary in order to forecast stretching but realistic targets.

### Fixed (inelastic) cost categories

In a few instances, CEPA/TA have argued that entire categories or components of categories are fixed. We think this is unreasonable. For example, in fixing central finance staffing, their approach would imply that a 5 mppa airport would require the same number of accountants as a 50 mppa airport. We believe one would expect a material increase in staffing for these functions between small and large airports relating to processing of payroll, suppliers, etc. There are so many hours in the day for staff in fixed roles.

Specific narrow functions may be "fixed" in the sense that every airport must supply the function, and over some restricted range of passenger traffic, a certain number of FTEs would be able to cover the role. However, this logic is only applicable in the short term. If applied over a longer term, this logic would lead to unsustainable opex targets. Once the staff roles have been aggregated to forecasting categories and then considered over the length of a regulatory period, it is unreasonable to consider the category fixed. For example, it is reasonable to expect that an airport will increase marketing, procurement, concessions, finance, and accounting staff as passenger volumes increase. As the ARI retail revenue increases, it is also reasonable to expect ARI retail to require greater administrative support.

### Magnitude of elasticities

In a number of places, the justification for the particular choice of elasticity is unclear. We would highlight the following instances:

- Retail. As noted above, CEPA/TA set an elasticity of 0.2 with respect to passenger volumes, saying that both volumes and floor space are relevant for staffing, but without justifying the choice of 0.2.[7] (We note that in our opex forecast, we found evidence for an elasticity of 0.46). They then benchmark retail staff per square metre between the two terminals in order to estimate the efficient level of staff. Having just allowed that passenger volumes drive retail costs, CEPA/TA make no adjustment in this benchmarking exercise for quantity of foot traffic, which is internally inconsistent. Furthermore, we do not think this simple comparison between the two terminals is valid. Terminal 1 houses Ryanair and other short-haul carriers, whereas Terminal 2 has primarily long-haul departures. The consumer patterns for these two passenger segments are different, and consequently the intensity of floor space and staffing will also differ between terminals. Given these demographic differences between terminals, it is important to consider the average size of retail transactions. We note that Terminal 1 has lower revenue per transaction compared to Terminal 2. Given the higher number of transactions Terminal 1 requires in order to achieve a given level of revenue, and also given that each transaction requires the time of an individual member of staff, we would expect Terminal 1 to have higher retail staffing requirements compared to Terminal 2.

[7] CEPA/TA report, p88

- Campus services. CEPA/TA have allowed a weak link between passenger volumes and campus services staff. They set the elasticity of campus services staff with respect to passengers at 0.1, but do not explain the source for this figure.[8]
- IT. CEPA/TA propose an elasticity of 0.1 for IT FTEs with respect to total passengers, explaining that they do not find a strong link between these categories and passenger growth, [9] but do not explain the rationale for choosing this specific figure. They assume that IT non-pay expenditure is fixed,[10] and we find this choice inconsistent. Realistically, the pay and non-pay categories are highly related expenditures, and should move approximately in line over the medium term.
- Transfer product and terminal services. CEPA/TA have set the elasticity of transfer product staff to 0.2, "to reflect that that the number of staff required is broadly driven by the number of transfer passengers".[11] There is no clear source for the 0.2 figure. Similarly, they set the elasticity of terminal services staff at 0.2 with respect to passengers, without justifying this choice.[12]
- Airside operations. CEPA/TA conduct the backward-looking estimation exercise (to set 2019 baseline airside operations staff) with an elasticity of 0. However, in the forward-looking forecast, they then use an elasticity of 0.1 with respect to passenger numbers. These figures are internally inconsistent and are not explained.

## 3.4 Quantification of impact

Here we extend the high-level calculation in the previous section, in order to quantify the impact of adjusting the forecasting elasticities.

Given that total opex in 2017 (excluding the CIP) was around €258m and the forecast growth in passengers between 2017 and 2024 is 27.8%, if we allow an elasticity of 0.3 (the lower point of the range CEPA/TA supplied), this would imply a total opex in 2024 of around €279m. This figure is around €6m higher than the 2024 CEPA/TA forecast.

We conduct a similar exercise for staff, and this is provided below in Figure 7.

**Figure 7 Staffing implied by elasticity of 0.3 with respect to passengers**

| Baseline figure | Baseline FTEs | FTEs implied in 2024 by 0.3 elasticity | Implied FTEs in 2024, less 2024 CEPA/TA forecast |
|---|---|---|---|
| Staff in 2017 | 2503 | 2,711 | 136 |
| Staff in 2019 | 2765 | 2,904 | 328 |
| Efficient staff in 2019 | 2545 | 2,673 | 97 |

*Source: Frontier Economics calculation from CEPA/TA model*

[8] CEPA/TA report, p70.
[9] CEPA/TA report, p77.
[10] CEPA/TA report, p77.
[11] CEPA/TA report, p56.
[12] CEPA/TA report, p64.

Applying an elasticity of 0.3 to the staff level in 2017 implies a total staff of 2,711 in 2024, which is 136 more staff than CEPA/TA forecast. Performing the same calculation, but using daa's staff in 2019 would predict 328 more staff in 2024 than CEPA/TA have forecast.

But, most strikingly, if we use the CEPA/TA estimate of efficient staffing in 2019, and apply a 0.3 elasticity, it implies 97 more FTEs in 2024 than CEPA/TA have forecast. Given that CEPA/TA assert that their 2019 baseline is an efficient staffing level, it is in our view unreasonable that they do not allow staffing growth that at least meets the minimum level that is predicted by the regulatory literature.

# 4 REVIEW OF APPROACH WITH RESPECT TO PAY

## 4.1 Introduction

This section discusses the unit payroll costs in CEPA/TA's determination and forecasts of efficient costs. We discuss their approach, our views on that approach and the potential impacts of their approach on estimates of efficient operating costs.

We acknowledge that for benchmarking wage levels and wage trends at Dublin Airport, accurate data is limited. However we find that CEPA/TA have inappropriately used statistics in a number of places, and insufficiently acknowledged potential sources of bias. In addition, their treatment of non-market factors, specifically labour court decisions and union actions, is logically inconsistent. Overall, much more evidence is needed to establish the presence of inefficiency in Dublin Airport wages and to accurately forecast efficient wages out to 2024.

## 4.2 Overview of CEPA/TA approach

To establish an efficient estimate of staff-related expenditure, CEPA/TA separately estimate the efficient number of staff in each role and the efficient average wage for staff in each of those roles. The approach to determining efficient wages is therefore important, as the estimated efficient wage is multiplied by the number of employees to give overall efficient staff-related expenditure.

The broad approach of the CEPA/TA approach is as follows:

- Establish the presence of inefficiency in wages
- Choose a relatively and achievably efficient baseline
- Track how wages would have efficiently evolved from that baseline

Taken together, these steps give an estimated level of efficient costs for each year and justification for why they diverge from outturn or Dublin Airport estimates of unit payroll costs.

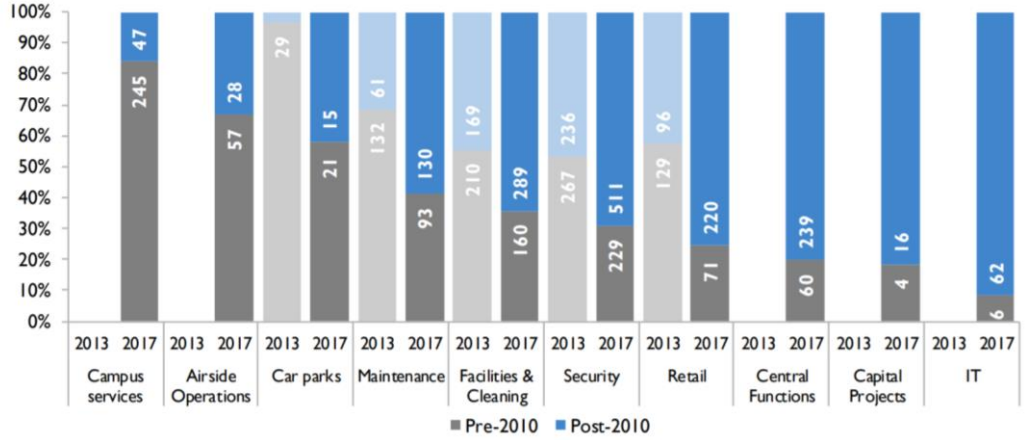
### Establishing the presence of inefficiencies

The CEPA/TA report does not appear to attempt to directly compare the wages of Dublin Airport workers to workers elsewhere, but instead uses variation over time and between terminals to evidence an inefficiently high level of wages at present.

They note that an important factor in wages at Dublin Airport is the difference between pre-2010 and post-2010 contracts. The newer contracts were introduced at a time of financial difficulty for daa and have generally lower levels of pay, as well as more flexible conditions. As the figure below shows, the proportion of staff on old contracts has declined naturally over time due to attrition and growth, but many staff continue to be employed under those conditions. CEPA/TA conclude,

in line with studies from the 2014 determination, that the differential in pay and productivity between staff on old and new contracts is a form of inefficiency.

**Figure 5 Number and proportion of staff on pre-2010 v. post-2010 contracts, 2013 and 2017**



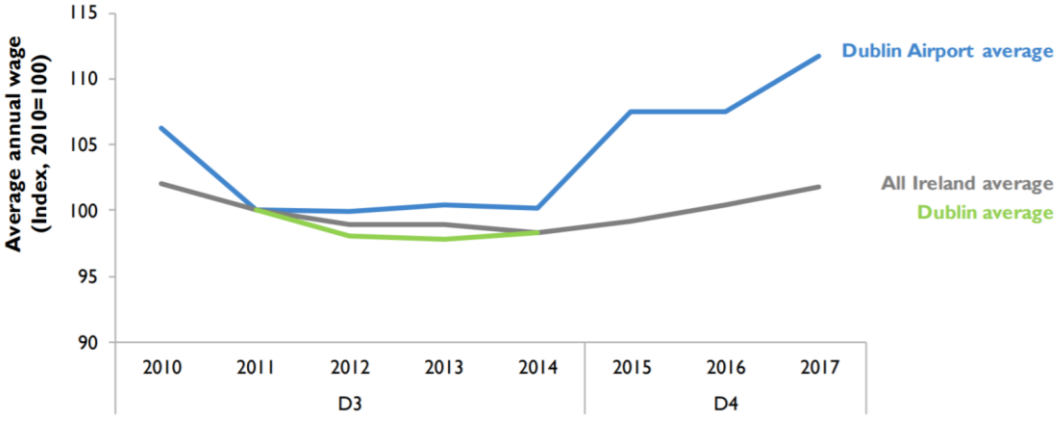

*Source:* *Dublin Airport; CEPA analysis*

*Note:* *Figure 4.1 in the CEPA/Taylor Airey report*

CEPA/TA do not have access directly to unit payroll costs of pre-2010 v post-2010 staff, but do show the difference in unit costs between terminals. Wages in Terminal 1 are substantially higher than those in Terminal 2, although the differential has declined significantly in recent years. They believe this is a useful proxy for the difference in payroll costs driven by old and new contract mix, and that it is an example of inefficiently high wages paid at Dublin airport.

Finally, they compare unit payroll cost growth to the growth in wages in the Irish economy more generally. They show a disparity between Dublin Airport and the Ireland average, especially since 2014, that they state is evidence of inefficiency. The trends in question are shown in the figure below.

**Figure 6 Nominal wage growth at Dublin Airport and in Ireland, 2010-2017**




*Source:* *Dublin Airport; CSO Average Annual Earnings and Other Labour Costs by Type of Employment; CEPA analysis*

*Note:* *Figure 4.4 in CEPA/Taylor Airey report*

### Choosing an efficient baseline

In evidencing the presence of inefficiently high wages at Dublin Airport, CEPA/TA acknowledge that many of the drivers of inefficiency cannot realistically be removed, especially in the short term. In particular, they note that there have been some unavoidable increases in wages due to the reversal in 2015 of an agreement with unions made in 2010, and labour court judgements mandating wage increases starting in 2014.

With this in mind, they come to three conclusions about efficient wage baseline:

- Unit payroll costs for staff at Terminal 1 are less efficient than payroll costs for staff at Terminal 2, and that this is explained by the differences in pre-2010 and post-2010 contract mix
- It would be difficult for an efficiently run company to implement wage reductions (whether nominal or real), but wage rises since 2014 have been inefficient
- Costs between 2010 and 2014 can be considered relatively efficient, and 2015 may have been efficient

They then choose 2015 as a baseline efficient year, as the large increase in wages between 2014 and 2015 may have been efficient given the legal judgements, but subsequent increases are deemed to be excessive. To account for difficulties in hiring and retaining security staff, CEPA/TA instead choose 2017 as the efficient level for security unit payroll costs.

### Efficient changes over time

In determining both current efficient levels, and forecast future efficient levels, CEPA/TA multiply their assessment of their efficient baseline (wages in 2015) by appropriate trends in unit payroll costs. In their view, the counterfactual efficient increase in wages is their core wage forecasts from the CSO, which measure overall wages in Ireland with some breakdown by economic subsector.

Efficient wages in 2019, then, are determined to be wages in 2015 inflated by Ireland-wide wage trends for the appropriate economic subsector. The one exception is for security staff, for whom wages in 2017 are used.

## 4.3 Our views

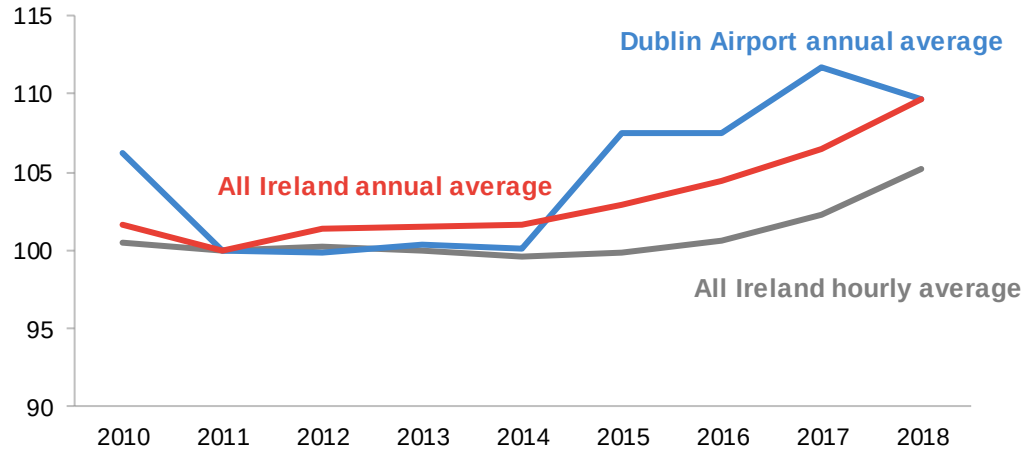
In pursuing their approach to unit payroll costs, the CEPA/TA report has dealt with data limitations and non-market factors in a way that sets wages unrealistically low. In this section, we will detail where and how these decisions may be unjustified.

### Aggregate evidence of inefficiency

A key piece of evidence used to suggest the presence of inefficiency in unit payroll costs is the difference between Dublin Airport and Ireland trends in wages. Putting aside whether it is appropriate to use national level trends as the driver of Dublin Airport unit payroll costs, it is not immediately clear that past increases have been inefficient. The figure below recreates the earlier figure on wage trends from the

CEPA/TA report, but adds annual rather than hourly wage trends in red, and extends the time series to 2018.

**Figure 7 Hourly vs. Annual wage growth at Dublin Airport and Ireland, 2010-2018**




*Source:* *Dublin Airport; CSO Average Annual Earnings and Other Labour Costs by Type of Employment; Frontier analysis*

*Note:* *Partial recreation of Figure 4.4 in CEPA/Taylor Airey report*
*The "All Ireland annual average" series refers to Average Total Labour Costs in nominal terms*

The CEPA/TA report inappropriately compares Irish trends in hourly wages with Dublin Airport trends in annual wages when comparing to Irish annual wages suggests a different conclusion. While the trends at Dublin Airport are less consistent due to the non-market factors discussed above, the change between 2011 and 2018 at Dublin Airport and all of Ireland in terms of average annual labour costs per worker are very similar.

For reasons discussed below, we believe that national level wage trends are an inappropriate indicator of the drivers of Dublin Airport's unit payroll costs. However, appropriate use of these statistics contradicts the narrative of the CEPA/TA report.

## Pre-2010 and post-2010 contracts

While we understand the logic of CEPA/TA and past efficiency studies in comparing these two groups, we would urge caution in interpreting the difference between the two as representing solely relative efficiency. We note that it is unlikely unions would agree that accepting temporary wage cuts in 2010 implies they are overpaid more generally.

When CEPA/TA forecast the expected increase in wages for those on legacy contracts, they expect them to be half of the increases for other workers, to gradually diminish the difference between the two groups. While the broad point that the discrepancy will disappear appears reasonable in principle, a justification for the 0.5 parameter is not immediately clear.

## Choosing 2015 as the baseline year is logically inconsistent

In justifying their choice of 2015 as the baseline year, CEPA/TA state the following:

> *Over the period 2011 to 2014, average wages at Dublin Airport closely tracked unit payroll costs in the Dublin area and in the Irish economy more broadly … Since then however, payroll costs at Dublin Airport have risen at a much greater pace than wages in the economy as a whole. While the increase between 2014 and 2015 may be justified because of the labour court judgement and the reversal of salary cuts implemented in 2010, subsequent increases are less justifiable.*

The choice of 2015 rather than 2014 is therefore expected to account for all of the legal obligations faced by daa due to the Cost Recovery Agreement in 2010 and the following labour court disputes and judgements. This is not an accurate reflection of the scale or timeline of wage increases imposed legally on Dublin Airport during the period.

The labour court decision being referenced recommended a 2% increase in wages each year for two years meaning the shift to 2015 as a baseline includes only half of the legally unavoidable unit payroll increase. Furthermore, a much more substantial increase in wage costs faced by daa occurred in 2016. In 2010, unions agreed with Dublin airport reduction in wages of around 5.5%, to be reversed conditional on profit targets for the airport. These targets were met in 2015, and wages were duly increased in 2016, meaning pay restoration for more than 1,000 employees with an average nominal pay increase of around 5%.

No hypothetical efficient company in this situation could have avoided this increase in unit payroll costs – these large increases were legally mandated. CEPA/TA have shown that they accept this point in abstract by shifting the efficiency baseline from 2014 to 2015 in the first place, however this change does not coherently account for the issue they are acknowledging, since the timeframe of the legal drivers of wage costs are not restricted to this particular one-year difference.

If the determination maintains the position that 2014 was the most recent efficient year, the legal, non-market drivers of average wages ought to be dealt with explicitly, rather than implicitly by arbitrarily choosing a different baseline year.

### National Irish wage trends are lower than efficient Dublin wage trends

CEPA/TA use aggregated wage trends when determining the efficient path for unit payroll costs. These aggregate trends will only give inappropriate forecasts where the specific drivers for wages at Dublin Airport diverge from the aggregate data used. In our opinion, there is good reason to believe that wages in Dublin are increasing at a substantially higher rate than the national average would suggest. To estimate the current efficient level of wages, and future efficient levels, CEPA/TA multiply their efficient baseline year by national average trends. Since Dublin Airport has grown more than the national average, the efficient level of unit payroll costs is below the outturn level.

Looking again at earlier figure on wage growth, growth in average wages at Dublin Airport seems closer to growth in Ireland and Dublin wages between 2011 and 2014 than it does now. In fact, Dublin wages grew slower than the national average during that time, or even fell, while Dublin Airport wages remained largely flat.

By including Dublin-specific wage trends between 2011 and 2014 in the comparison, CEPA/TA are acknowledging the possibility that Dublin faces different labour market conditions from the rest of the country. During the period in question, that is not the case (at least in growth rather than level terms). The reason they show only 2011 to 2014 is that this is the most recent estimate of wages produced by the CSO at a regional level.

While there are no more recent official estimates of wage trends, there is some evidence that wages in Dublin are increasing faster than wages elsewhere, and that efficient wage increases since 2015 are higher than the figure used by CEPA/TA. For example, the most recent national accounts available by region (2016)[13] show income per person in Dublin increasing by 4.5% while across Ireland the same figure increased by 3.1% - in other words, economic growth in Dublin was 50% higher than the national average.

More significantly for labour market purposes, the vacancy pressures faced by Dublin Airport have persisted, even as their wages increased at supposedly inefficient rates. CEPA/TA themselves accepted that logic, in excepting security staff wages and choosing 2017 as a baseline. It does not seem likely that there have been macroeconomic conditions increasing security staff wages in Dublin without increasing those for maintenance, cleaning and retail staff also.

In our view, appropriately estimating the trends in efficient wages for staff at Dublin Airport is made extremely difficult by the lack of regional data. Nonetheless, we strongly believe that national level wage trends produce an inappropriately low estimate of wages for workers.

## 4.4 Quantification of impact

Overall, CEPA/TA's forecasts of payroll costs at Dublin Airport are substantially lower than daa estimates, however this is also influenced by differences in FTE estimates addressed elsewhere in this report. Actual payroll opex in 2018 was €164 million (in 2017 € terms), which we previously modelled as rising to [redacted] million in 2019 (again in 2017 € terms). The CEPA/TA model suggests total efficient staff costs of €154 million in 2019, however some of the difference will be attributable to different FTE numbers (addressed elsewhere in this report). If daa forecasts for 2019 staff volumes are used alongside CEPA/TA unit costs, the estimated total payroll cost is [redacted], implying an additional cost of around [redacted] in 2019 due to unit payroll costs. This difference will grow, especially if wage trends continue to be inappropriately low.

Since more reliable figures for wage trends and wage forecasts in Dublin are not available, it is not possible to quantify the impact of CEPA/TA's wage trend decisions against a meaningful counterfactual.

To produce more accurate estimates of the efficient unit payroll costs, more detailed work would be needed to fill in the gaps in available official statistics, such as:

[13] CSO County Incomes and Regional GDP

- Produce plausible forecasts for Dublin Airport wages (both in the recent past and through to 2024)
- Specifically benchmark efficient wage levels in contemporary Dublin (e.g. for security staff)
- Explicitly model the historic and future unit payroll cost impact of legal decisions and union agreements

# 5 CONCLUSION

We were commissioned by daa to produce an independent peer review of the CEPA/TA report and to give our view on the reasonableness of its approach and its findings.

We have noted a number of issues which we believe imply that the forecast out to 2024 is unachievably low and undermine confidence in the forecast more generally.

Regulatory targets should be challenging, but they do need to be at a level achievable by a reasonably efficient operator, given the external environment in which that operator finds itself. If not, the regulation may dissuade investors from making future investments; airport quality and the passenger experience may suffer as a result in the long run.

Using accurate and coherent methods for forecasting, rather than an *ad hoc* approach for each area, would allow for greater confidence in the overall process.

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