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1 IAA Passenger Forecast Methodology Limitations

1.1 Overview

1.1.1 This appendix provides additional detail, econometric evidence or otherwise of why some of the changes the IAA has undertaken do not have a solid econometric basis, nor are they balanced, justified, or calibrated to ensure no undue interaction with other elements of its model that risks double counting. The appendix should be read with the respective section in the Passenger Forecast as well as the Passenger Forecast as a whole to attain a full picture of the magnitude of the unbalanced non centreline forecast as proposed by the IAA in the Draft Determination and how it is contrary to regulatory precedent, historic approach or econometric best practice.

1.2 Data Sources

1.2.1 For GNI* the IAA proposes to use 3 data sources: the Central Bank, Department of Finance and ESRI. It is worth noting that while there may be multiple forecasts available for a given macroeconomic variable, it does not necessarily follow that they are equivalent in terms of methodology or historical forecasting accuracy. Differences in modelling approaches, assumptions and forecast horizons can result in materially different projections.

1.2.2 For GNI* the IAA has noted that only the ESRI has long term forecasts available. While the Central Bank does not regularly post long term GNI* outlooks for GNI*, in its 2024 Q4¹ Bulletin it did have long term projections for GNI* which Dublin Airport used in our Regulatory Proposition.

1.2.3 While Dublin Airport in 6.5.8 of our Regulatory Proposition did recognise that it may be necessary to impute GNI* forecasts through CAGRs, elasticities or other methods, this was under the scenario as specified in 6.5.8 where no long term forecasts were available and with the caveat that *'none of these are ideal as they all introduce added uncertainty which ultimately does reduce the accuracy of the forecast'*.

1.2.4 Dublin Airport does not view the IAA approach of using 3 GNI* data sources where half of the CBI values are imputed as methodologically sound. Imputation where not strictly necessary is not in line with regulatory best practice as it increases imprecision and forecast measurement error risk. The point of using an independent forecast in an elasticity estimate is that the forecast is more unbiased and based off institutional bodies who have resource to specialise in that forecasting output.

1.2.5 When CAGRs or other simplified imputations are used for forecasting the explanatory variable, then the forecast risks becoming skewed by fundamentals that might actually be uncorrelated with passenger number and in turn increase measurement error and the associated risk with a misaligned forecast.

Table 1 Central Bank Q4 2024 Bulletin Long Term GNI Projections*

¹ Quarterly Bulletin Q4 2024

Period	GNI*	TFP	Capital	Labour
2024 – 2030	2.3	0.9	0.6	0.8
2031 – 2040	1.7	0.6	0.7	0.5
2041 – 2050	1.4	0.6	0.7	0.2
2024 - 2050	1.8	0.7	0.7	0.4

Source: Central Bank of Ireland

1.2.6 This is since CAGRs assume that future GNI* growth will reflect past GNI* growth, which ignores the underlying macroeconomic fundamentals. The economy is rarely stable and transverse through various cycles. The proposed imputed GNI* growth rates from the IAA are 0.5% higher than the CBI's own 2029-2030 estimate from December 2024 and 1.1% higher than its 2031 estimate as per Table 1. It also is at odds with the Central Bank's latest Q2 Bulletin which notes that risk remains skewed to the downside.

1.2.7 These CAGRs also fail common sense checks whereby each institution forecasts a moderating of GDP and GNI*, with DFIN forecasting GNI* to reduce from 2.5% in 2027-2028 to 2.4% in 2029-2030. Yet, the implied 2.6% from the 2025-2031 CAGR does not appear consistent with the moderating relationship implied and risks overstating the elasticity and subsequent passenger forecast.

1.2.8 For GNI* the IAA should not be using imputed forecasts and instead either rely on the ESRI and CBI using the latest long-term outlook available from the CBI*, or if it is to include multiple sources, revert to the single source(s) for years for which forecasts for the further out years are only partially available. This would be consistent with its past regulatory approach of only using forecast sources which have available data.

1.2.9 For GDP the ESRI and IMF's forecasts for the upcoming period tend to be within a similar narrow range, whereas the Department of Finance's trails significant higher, while the Central Banks are even higher again.

1.2.10 The IAA in 6.5 of the Draft Determination states that *'While there is merit in relying on the IMF as an independent, unbiased forecaster of Irish GDP, its recent projections for Ireland have largely understated actual growth'*, which seems to be their justification for using ESRI, CBI and DFIN sources as well. While also stemming from Ryanair's response that domestic forecasts should be used and from the Aer Lingus commissioned Skylark Report which states *'IAA has historically used a univariate approach with Irish GDP as the main driver. Actual GDP growth has been greater on average in each of the past three price control periods...Historically, the IMF has tended to under-forecast Ireland's GDP. The recent 2024 forecast ended up with a gap of 11% lower forecast by 2025.'* The introduction of these new data sources is a divergence from previous regulatory practice.

1.2.11 The distortion from Irish MNC activity affects not only Irelands' figures but also that of the Eurozone. For Q1 2026 the 12.1% reduction in Irish GDP caused the Eurozone economy to contract – on paper. This slump was due to pharmaceutical MNC based in Ireland activity². When Ireland was excluded Eurozone Growth held at 0.2%. While Skylark notes the correlation between GDP and passenger numbers, it is unclear how such swings

² Irish GDP slump drags euro zone economy lower in Q1

that then drive forecast error in GDP can credibly be viewed as something that would affect the underlying relationship with passenger numbers.

Table 2 Irish GDP Forecast Error of multiple sources

Macro Var	Source	Forecast				Outturns			Forecast Error		
		2022	2023	2024	2025	2023	2024	2025	2023	2024	2025
GDP	DFIN	10.0%	4.7%	3.3%	3.8%				7.2%	0.7%	-8.5%
	CBI	9.1%	4.8%	4.4%	-	-2.5%	2.6%	12.3%	7.3%	1.8%	-
	ESRI	8.1%	4.4%	-	-				6.9%	-	-
	IMF	9.0%	4.0%	4.0%	3.0%				6.5%	1.4%	-9.3%

source: IMF, CBI, DFIN & ESRI

1.2.12 Dublin Airport notes there are a few issues with using a blend of Irish GDP forecasts. Forecast inaccuracy is not unique to the IMF as Table 2 shows (since the last Determination) and instead is a systemic issue with trying to forecast a highly unstable variable which is highly skewed by MNC activity, with little downstream effect on individual's wealth and is internationally recognised as a uniquely Irish problem. The source of forecast inaccuracy has largely been MNC activity with external geopolitical events such as tariffs resulting in massive swings in pharmaceuticals MNCs headquartered in Ireland booked activity.

1.2.13 Dublin Airport struggles to see how the under-forecasting by the IMF in some years of Irish real GDP is relevant if the main source of error is something that is largely external to the relationship between GDP and passenger numbers that the elasticity relationship aims to capture, which is a proxy for economic wealth and disposable income.

1.2.14 It is unclear why the IAA has decided to deviate from its past regulatory practice and decided to include new forecasts, while simultaneously not providing any analysis as to whether these institutions have historically been better at forecasting GDP, and what the net benefit from moving away from regulatory precedent is. Nor has the IAA examined what the source of GDP forecasting error is, which is in turn largely affecting the residual and not the elasticity point estimate.

1.2.15 As a result given that a large share of forecasting error in GDP forecasts arises from MNC activity which has little downstream relevance to the actual Irish economy as experienced by its citizens and the fact that GDP is sparingly used by Irish institutions who instead favour GNI*, it is far more appropriate for the IAA to stick to regulatory precedent and continue to use fully independent IMF forecasts rather than the inclusion of additional data sources that do not always have data for the full regulatory period and which are themselves prone to imprecision from trying to predict the same unstable Irish GDP variable and in turn tend to increase measurement error, without it being demonstrable that this actually relates to increased explanatory power.

1.2.16 This is illustrated empirically by regressing the gap between GDP and GNI* on passenger numbers from 2000 to 2025 with Covid Dummies included. The resulting elasticity is 16.8 with an R-squared of 99%. As explained earlier there is little reason for

MNC activity to be correlated and certainly not to this extent with Dublin Airport passenger numbers.

1.2.17 The extremely high R-squared is a textbook telltale sign of a potential spurious regression, one that suggests the capturing of strong common time trends rather than an inherent statistical relationship between two regressed variables.

1.2.18 Moreover, inclusion of GNI* will already in part resolve the distortions and forecast activity from MNC activity this in the first place as it removes the main source of forecast uncertainty of GDP: MNC activity.

1.2.19 Lastly, the IAA in 6.13 note that *'We expressed a preference for an independently developed, simple and transparent forecast.'* over a more complex one and in 6.53 they write *'As we have noted before we are not convinced that a more complex model would significantly improve the predictive power to the extent it justifies the added complexity. More complex models introduce more variables which are themselves uncertain'*. 8.18 also echoes this position *'Transparency may be reduced due to the number of inputs and assumptions to be made'*.

1.2.20 The inclusion of 4 separate source of GDP estimates and 3 separate sources of GNI* estimates and imputations run contrary to the IAA's own position in 6.53 as they have included more sources and inputs which themselves are uncertain. This increase complexity and reduces transparency as it requires more work to independently validate the model and understand the cause of the discrepancies. Which is exacerbated by the use of imputations. In turn the IAA has not followed its own criteria when deciding to add 5 additional data sources without demonstrating how this has increased the performance of the model and outweighs the additional complexity introduced. Dublin Airport has explained how it risks increasing measurement error and to quote the IAA this appears to be *'a solution in search of a problem'*.

1.2.21 Dublin Airport is not disputing that there may be merit in considering multiple sources of economic forecasts. However, the IAA has not demonstrated that averaging IMF, CBI, ESRI and Department of Finance GDP forecasts improves forecast accuracy relative to the historic IMF-based approach. Nor has it shown that the source of GDP forecast error identified by the IAA, namely the divergence caused by multinational activity, is reduced through averaging forecasts from institutions attempting to predict the same underlying GDP series. In the absence of such analysis, the addition of further forecast sources appears judgement-based rather than evidence-based.

1.2.22 Dublin Airport would note that the IAA has not provided any significant analysis either as to why 1/3 weighting of GDP, GNI* and Eurocontrol produces the best forecasting accuracy as opposed to a different weighting. The IAA with regard to their independent model, which nevertheless is also a blended model states in 6.47 of the Draft Determination that *'there is a stronger relationship between outturn GDP and passenger numbers'* compared to with GNI*. The IAA has not justified why if they find without any substantive analysis stating otherwise what may drive the difference in standard errors and statistical significance, the reason for giving equal weight rather than the more

econometrically logical standpoint (abstracting away from airline/airport/regulator) of giving more weight to the more correlated variable of GDP, which would all else equal exert downward pressure on the forecast. While they attribute this in Appendix 3 to likely from the constructed nature of GNI* this ignores that GDP is also a constructed variable. Moreover, GNI* removes elements of GDP unrelated to domestic activity so in theory it could be less and not more constructed than GDP.

1.2.23 The increased risk of the forecast being overstated especially if the IAA opts to continue to rely on imputed GDP and GNI* estimates, serves as another reason why aiming up should not be removed from the WACC estimate as in contrast to prior determinations, the IAA has increased the risk of measurement error in the passenger forecast.

1.3 Time Sample

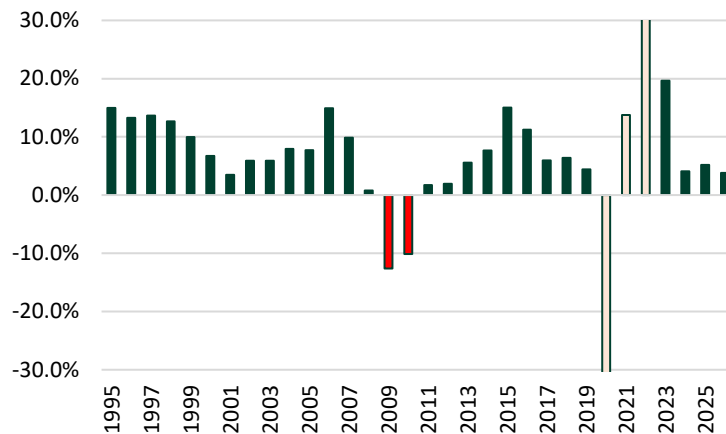
1.3.1 In 6.49 of the Draft Determination the IAA state *'We do not agree with Dublin Airport that data pre-2000 is irrelevant to the present/future relationship, as no significant change to the operating conditions of the airport occurred at this time....the model with the most data points have the lower standard errors and the higher R^2 values, which indicates a model with a better fit.'*

1.3.2 Dublin Airport notes that Skylark and the IAA state the historical precedence of using data from 1997. With Skylark stating *'daa has only taken the time period from 2000 for its regression analysis, unlike previous approaches, which was based on the longer time period from 1997'*. However, in the previous Determination the sample 1997-2022 would be equivalent to 2000-2025, $n=26$. What this point misses are that with each Determination period, the distance from prior Determination year starting points increases and the sample size will change if using the same starting point. A direct comparison therefore cannot be made between the same time periods between Determination periods. It is rather arbitrary to assert that 'previous approaches' starting point should be maintained.

1.3.3 The first issue with starting from 1997, is that there is no valid econometric reason provided for using it as a starting point. It is an arbitrary starting point, rolled forward, because that is what has historically been applied, without accounting for the time distance changes between regulatory periods.

1.3.4 Skylark state that the higher growth rates in 1997-1999 saw higher growth than 2000-2003 which were negatively impacted by the post-9-11 attack impact on propensity to travel. This overstates the impact of 9-11 which would have had less of an impact on travel outside US destinations, especially when the US market from Dublin Airport was fairly underdeveloped than compared to more recent periods. Additionally, this does not account for the fact that between 1997-1999 there was double digit passenger growth in passenger numbers which is above the average growth rate for either of the 3 time periods starting from 1995, 1997 or 2000 (excluding Covid years). These double-digit growth years are the exception and not the norm. Skylark, also justify the 1997-2025 time sample on the basis that the R^2 is higher.

Figure 1 Dublin Airport YoY Passenger Change 1995-2026



Source: Dublin Airport (2026 May LE)

1.3.5 The IAA justifies using the 1997 start point for 2 reasons:

1. There was no significant change to the operating conditions of the airport that occurred at this time.
2. The R^2 is higher and standard errors are lower for the 1997-2025 model vs 200-2025 model.

1.3.6 With regard to the first point there are a number of structural factors that make 1997-1999 a poor reflection of 2026-2031. These include:

1. Substantially different airport layout.
2. Celtic Tiger Boom – characterised by falling high unemployment, high consumer spending leaning on over-confidence and low inflation.
3. Disruptive low-cost carriers shaking up the industry vs. established low-cost carriers with significant market presence.
4. High growth emerging airport vs. established hub airport with mature route network.

1.3.7 The period between 1997-2000 was before the completion of Pier C later replaced by Pier D in 2007 (now Pier 1), used by Ryanair. The airport was at that stage far smaller and in a significant high growth stage. Ryanair still a disruptive low-cost carrier was overshadowed by Aer Lingus who still maintained the dominant market share position at the time. Ryanair was a rapidly expanding disruptor airline penetrating massively into the underserved low-cost segment at the time. The infrastructure expansion at the time was in part to enable their continued high growth, as they were still in their relative infancy.

1.3.8 At the same time in the 1990s Ireland was in the Celtic Tiger era where the economy was structurally changing from an economy of high unemployment to one with low unemployment and high growth. 1995 marked the beginning of the Celtic Tiger. With high optimism, economic growth and consumer expenditure. This is starkly different from the current economic environment where growth is concentrated mainly in MNCs, outlook is far more cautious, unemployment is low, and inflation is high, with significant supply side constraints persisting. Which tend to invariably contribute to persistently higher prices, without structural changes in consumption as long as structural supply issues prevail.

1.3.9 In turn the macro environment of high growth and excessive consumer confidence, combined with the expansionist disruptive low-cost carrier is far different than the current cautious and constrained consumer outlook and mature network of Dublin Airport and established dominant low-cost carrier. As Dublin Airport has become an increasingly mature market with most European and US destinations served, with the Asia and South America being the core unserved regions, the growing time distance from 1997 has become more significant as that era becomes increasingly unrepresentative of the mature Dublin Airport of today vs. the massively expanding high growth far smaller airport of the 1990s.

1.3.10 In terms of the second point raised by the IAA in opting for the 1997-2025 time sample, Dublin Airport would caution on using standard errors and the R^2 to compare the two different time samples. Given the structure of the data of both GNI*/GDP and passenger numbers, this means current values are strongly related to preceding past values. In turn, observations close to one another are less independent of one another, which can result in positive autocorrelation. This is confirmed by conducting a Durbin Watson test for autocorrelation where with either time sample the Durbin Watson statistic is significantly lower than 2 indicating significant positive autocorrelation.

1.3.11 This is problematic as the presence of autocorrelation results in standard errors that are too low through underestimation as OLS assumes that errors are independently distributed. The deflated standard errors contribute to inaccurate t-statistics, as these are built off standard errors. Moreover, adding more sample periods may simply reflect the addition of more highly correlated observations rather than better forecasting performance from out of sample fit, the increased R^2 might then be due to the former rather than the latter.

1.3.12 Dublin Airport therefore, also has reservation with the IAA's assessment that '*As shown in Table 6.5, the models with the most data points have the lower standard errors and the higher R^2 values, which indicates a model with a better fit.*'. While the first part of their statement is correct, the better fit within sample does not necessarily imply better out of sample accuracy. The better fit likely reflects the inclusion of additional years which are highly autocorrelated with existing observations, rather than new years that provide significant new information regarding the relationship between GNI*/GDP and passenger numbers to strengthen the model's forecasting accuracy out of sample.

1.3.13 In summary based off the macroeconomic and market structural differences that exist, in conjunction with the issues of serious autocorrelation which induces econometric challenges Dublin Airport disputes both Skylark and the IAA's preliminary conclusion that 1997-2025 is the most appropriate time sample. We therefore invite the IAA to reexamine their time sample and to adjust it appropriately to reflect a more suitable representative sample time period.

1.4 Baking in of Constraints

1.4.1 One of the justifications the IAA provides for disregarding constraints is that '*to the extent such constraints have, in the past impacted on the level of traffic, that will be picked*

up in our GDP and GNI elasticity calculations. That would mean that an element of constrained operation is already built into our forecasting such as elasticities.*’. Unfortunately, this is an oversimplification and Dublin Airport disagrees with the IAA’s assessment. The IAA has not quantified or provided analysis otherwise to demonstrate the extent to which this theoretical baking in occurs.

1.4.2 From a simple theoretical standpoint, a simple univariate regression elasticity model will have an elasticity estimate X_i which captures the change in Y_i from a change in X_i . There will usually however, be other factors that affect Y_i that are independent of X_i , these are captured in the residual or the error u_i . In the GDP/GNI* model this means that variation in Dublin Airport passenger numbers that is not captured by GDP/GNI* is captured in the error. In other words it is not explained by the elasticity.

1.4.3 The IAA may be correct that *‘an element of constrained operation is already built into our forecasting such as elasticities’*, if constraints are correlated with GDP/GNI*. We note the IAA has not provided any theoretical nor empirical assessment as to why this may be the case in order for their assumption of elasticities baking in some constraints to hold.

1.4.4 Despite Dublin Airport not viewing a top-down approach as sufficient for capturing the effect of constraints, it is happy to provide some analysis as to why GDP/GNI* may be correlated with constraints in part. It is possible that when the economy is growing and so too are real wages, then the impact of constraints can be more pronounced as airlines have a greater demand pool to meet in turn putting more pressure on existing airport infrastructure. However, that is only one part of the equation.

1.4.5 Due to the design of the slot regime which results in a suboptimal Nash equilibrium where the dominant strategy is to retain slots and delay hand back, something the IAA has acknowledged in previous Determinations, this means that when there is a contraction or moderation of GDP, the alleviation in constraints that should follow from reduced demand may not always arise or to the extent that would otherwise be implied.

1.4.6 Instead, airlines may choose to hold onto existing slots, to stop future competitors from getting desirable slots, in turn this becomes somewhat decoupled from GDP. This can then have impacts on the flipside, where these constraints to slot retaining can happen independent of where in the GDP/GNI* cycle the economy is. Once the airport is slot constrained and the incumbent carriers have their established slots pairs, the dominant strategy is generally to retain as many as possible – Covid where the severe downturn occurred which would have increased substantially the cost of stockpiling, had a suspension of the 80/20 use it or lose rule, meaning that the relationship becomes further delinked from GDP/GNI*. It therefore follows that even if some of the constraints are correlated to GDP/GNI* it is not clear that the extent of the correlation is significant enough that it meaningfully shows up in the elasticity estimate rather than overwhelmingly in the residual, which by definition is not explained by the elasticity estimate.

1.4.7 The dominant strategy of holding onto as many slots as possible is consistent with the observations of the Oxera study, whereby airport congestion is a major predictor of higher

air fares. In a congested airport, the more slots an airline holds, the greater its market power and the greater price-setting power it yields³.

1.4.8 Furthermore, there is an internally inconsistency in the IAA to claim that there has been no structural change between 1997-1999 to warrant these years removal from the time sample, while at the same time acknowledging that constraints generally became particularly pronounced from 2007 when Dublin Airport became slot coordinated and were exacerbated between 2015-2019 *‘Dublin Airport has been slot coordinated since 2007, because demand has consistently exceeded the ability of the infrastructure to fully accommodate it at the requested times. Over the period 2015-2019, for example, the airport was significantly constrained by runway capacity (despite which, passenger traffic grew by 8m).’*

1.4.9 Given that the IAA has acknowledged constraints exist and if it believes that they are to some extent reflected in the elasticities, though it notes they have eased but not been eliminated since 2019, then the time sample they should be using is one where the airport is significantly constrained, such as 2007 onwards when slot coordination restricted releasable capacity and not from 1997. The IAA has failed to follow its own reasoning here by not removing 1997-1999 because it claims there were no structural differences while at the same time claiming that the elasticities partially bake-in the effect of constraints, but then gives no regard to how unconstrained years or years where the airport was less constrained and not slot coordinated will bias the forecast upwards where the airport faces infrastructure constraints.

1.4.10 Even though regulatory precedent and best practice for constraints is the use of a bottom-up supply approach and not a top-down demand approach as both Steer the Consultant commissioned by the CAA and the CAA have applied for the H8 Initial Proposals, acknowledging the IAA’s preference for the elasticity model, the time sample should not include years where supply was not affected by material constraints. The IAA has accepted that constraints exist and provided largely descriptive reasons for why in their view they will be mitigated, but they have then included 10 years of data, where airport infrastructure was largely unconstrained, or not constrained to the extent it has been post becoming slot coordinated and where the airport was not slot coordinated, Which is unrepresentative of the current airport infrastructure environment.

1.4.11 The existence of constraints and the IAA’s reluctance to empirically account for them elsewhere, means that if it believes that they are baked into elasticities, the extent to which this holds which Dublin Airport retains qualms about, then at a minimum the time sample must only include those years where meaningful constraints exist. Otherwise, the forecast produced is not a centreline as it is skewed by years where supply is unconstrained or where it was not materially impeded from gradually emerging constraints. This serves yet another reason why the starting point should not be 1997.

Table 3 GNI/GDP Elasticities Different Time Samples*

³ WHAT REALLY DRIVES AIR FARES: *Debunking the myth about airport charges & setting the record straight on airline competition, airport capacity and scarcity rents.*

Time Sample	GNI*			GDP		
	Elasticity	R-squared	p-value	Elasticity	R-squared	p-value
1997-2025	1.68	0.77	0.00	0.87	0.78	0.00
2000-2025	1.67	0.72	0.00	0.82	0.74	0.00
2007-2025	1.41	0.71	0.00	0.72	0.70	0.00
2015-2025	1.11	0.71	0.18	0.73	0.70	0.19

Source: Dublin Airport; IMF; Central Bank of Ireland

1.4.12 Comparing the elasticities in Table 3 it is evident that as more further time distant time samples are removed, the more the elasticity between both GNI* and GDP to passenger numbers declines. This could indicate a number of different things that may either be independent or compound together. Including but not limited to:

1. Structural factors that are impacting the relationship between GNI*/GDP and passenger numbers contributing to lower elasticities with more recent time samples.
2. As the IAA deems constraints limiting the demand that can be facilitated which becomes correlated with GDP/GNI* and passenger numbers.
3. The impact of constraints becoming more pronounced as the manoeuvrability around them decreases, while the workarounds employed increases diminishing the remaining pool of options available.
4. The maturing of Dublin Airport, with the rapid growth of Ryanair moderating in the late 2000s.
5. Diminishing returns to passenger growths as an airport becomes maturer, the growth it can achieve reduces as the new route and connection opportunities decline and the presence of more incumbents generates barriers to entry.
6. The untapped demand pool shrinking as increasing shares of the population access flying.
7. Most desirable slot pairs becoming unavailable reducing route viability for prospective airlines in turn reducing growth.

1.4.13 Alternatively, it may signal that the relationship between GDP/GNI* and passengers is not stable overtime or an element of both, changing structural factors and underlying instability in the relationship. In turn outlining yet another reason why a roll forward of a previous starting period of 1997 is inappropriate.

1.4.14 The same caveats apply to p-values due to the presence of serious positive autocorrelation therefore while we report them, we do not comment on them. Likewise, for R^2 due to autocorrelation common trends and persistence could be inflating the R^2 , through the inclusion of more highly correlated data points. For 2015-2025 the time sample is relatively small, which means the p-values are naturally more uncertain.

1.4.15 Table 3 also contests the IAA assertion in 6.46 that *'The GDP forecast for Ireland have consistently not predicted the large year-on-year fluctuations which have been observed, which has likely weakened the elasticity estimate'*. The second part of this assessment is

not consistent with the observed weakening over time of not just the GDP elasticity but also of GNI* elasticity. This illustrates the risk of making qualitative value judgements without validating these empirically.

1.5 IAA's Qualitative Constraints Assessment:

1.5.1 Apart from the partial baking in of constraints into elasticities, the IAA provides a number of other qualitative reasons for not taking account of constraints. In summary the reasons they provide for constraints being immaterial for consideration into the forecast model are:

1. Aircraft up gauging
2. Aircraft off-base flying
3. Load factors
4. Winter growth
5. Off peak times growth
6. Bussing

1.5.2 They go even further by deeming that *'Finally, based on the analysis of other building blocks, it appears likely that the price cap per year in the next regulatory period will be lower than the current price cap. If that does materialise, then we expect airlines, and in particular low-cost carriers such as Ryanair, to respond with more seat capacity at Dublin. While we have not currently built such an assumption into our draft forecast, we do consider that it provides a source of significant upside risk to our forecast'*.

1.5.3 Dublin Airport does not in principle dispute that these factors can alleviate constraints. Indeed, in the constrained forecast set forth in the Regulatory Proposition we computed the demand that can be facilitated through mitigatory measures 1-5. In contrast to Dublin Airport the IAA has not provided an empirical quantitative analysis to corroborate that its qualitative analysis for why constraints can be disregarded in a forecast model hold.

1.5.4 Part of the IAA's qualitative descriptive analysis of constraints follows from bilateral conversations it has held with Ryanair and Aer Lingus individually and claims these airlines have put forward in their engagement with the IAA prior to its publication of the Draft Determination. However, as the IAA has acknowledged in its Issues Paper and Draft Determination airlines have an incentive to misstate the forecast by proposing one that is excessively high, to exert downward pressure on the price cap. *'Airlines, on the other hand, may seek high forecasts to reduce the per passenger cap, but may also want reduced cost allowances, arguing against further expenditure on the grounds of lower passenger forecasts.'*⁴ Yet, despite these ulterior incentives, it has taken many of the airlines claims on constraints and how they will be worked around at face value, with no empirical work to corroborate this. Moreover, in the case of Aer Lingus as mentioned earlier they have

⁴ [2026-determination-on-airport-charges-at-dublin---issues-paper-consultation.pdf](#) 5.26

reduced their fleet which was only public announced immediately after the publication of the Draft Determination.

1.5.5 In 6.74 the IAA writes *'We agree with the airline's submissions that the prospect of upgauging, in particular by Ryanair and Aer Lingus, can allow for increased demand to be met without requiring additional aircraft processing capacity'*. Which follows from a Ryanair response summarised in 6.69 of the Draft Determination where Ryanair claims it will prioritise its Boeing Max 10 aircrafts for airport with stand or runway constraints. It then makes reference to Aer Lingus also up gauging aircraft, who themselves make reference to fleet plans.

1.5.6 The IAA in this descriptive assessment does not account for some of the evidence contrary to this assessment. For example, despite Ryanair's claim, in W24 when the Dublin Airport passenger cap was applied and in turn the airport became significantly more capacity constrained, it pulled all of its higher capacity 737 Max 8 aircraft as Dublin Airport highlighted. Therefore, actual observed behaviour from Ryanair conflicts with the assertion of the IAA that increased airport constraints necessarily led to utilisation of higher-capacity aircrafts.

1.5.7 It is worth noting that because this was aircraft downgauges, but not movement reduction, the capacity change while significant is not high enough to risk losing slots under the 80/20 rule, therefore such behaviours can align with the slot regime dominant strategy while also reducing capacity. The two are not necessarily mutually exclusive.

1.5.8 This illustrates that there are a multitude of competing factors that influence where airlines base their aircraft that are not contingent on the capacity at a single airport. This is since airlines in contrast to airports have a network wide optimisation problem. They look at their allocation not in isolation but based off what provides the optimal return overall. Even if constraints exist in Dublin, very generous incentives for next gen aircraft or routes elsewhere, more severe slot constraints elsewhere or just higher yields elsewhere etc. can result in an airline allocating their fleet there instead. Given the past volatility of aircraft fleet allocation and with network plans proposed by airline not being binding, it is inappropriate to take these at face value and as a reason for disregarding constraints, as this is prone to understating the downside risk from a footloose industry that can easily reshuffle aircraft.

1.5.9 With regards to Aer Lingus, the messaging surrounding expanding fleet plans is in direct contention with the downsizing and removal of based aircraft which was announced only immediately after the issuance of the Draft Determination. This will in 2026 alone result in a loss of -93k seats and -426k seats in 2027. Given the change in course of Aer Lingus and the current downsizing arising, as-well as Aer Lingus removing 4 narrow bodies and 2 widebodies from its fleet, the IAA should not be putting meaningful weight on their growth as a centreline scenario.

1.5.10 Moreover, this illustrates the immense volatility faced in the aviation industry. Even if an airline has planned growth this can change quite abruptly at the whim of shareholders, management or otherwise.

1.5.11 Insofar as load factor growth is concerned, the IAA has already applied a load factor assumption in their forecast mathematically, including it separately qualitatively as a reason not to consider constraints presents the risk of potential double counting the same mechanism twice through two separate channels. This is confounded by the fact that load factor growth has a limit and cannot grow indefinitely.

1.5.12 Something the IAA has in Dublin Airport's view not principally appropriately reflected in their Commercial Revenue forecasts either. Moreover, load factor tends to grow the most when capacity is entirely fixed. When capacity grows, load factors tend to stay flat or decline. The IAA has not sufficiently calibrated for how load factors are already baked into their forecast through their Eurocontrol TNSU component of the forecast, nor how it interacts with capacity and seats.

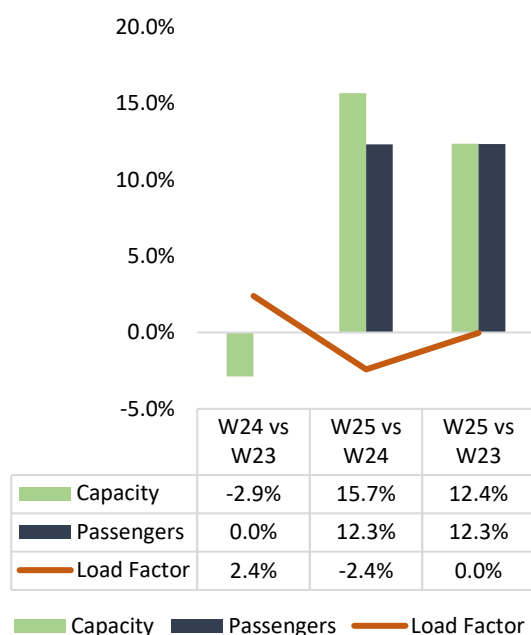
1.5.13 Furthermore, implicit in the capacity constraints qualitative assessment is that airlines optimise for load factors and not yields or margins. This is despite evidence from Oxera that demonstrates airlines earns significant scarcity rents from airport congestion which is the biggest predictor of air fares as-well as the most recent network decision by Aer Lingus at Dublin Airport which prioritises yield management and margins through the removal of less profitable routes despite high load factors such as Denver and Las Vegas. It also left Manchester not because it was not profitable or there was an absence of demand, but rather because it was not profitable enough. There is a nativity in only looking at the commercial incentives of the airport but not airlines as the two interact and airline commercial incentives may not be consistent with maximising passenger growth.

1.5.14 Where capacity constraints exist, airlines may not sell to maximise load factors, but instead to maximise yields. In turn in a constrained scenario airlines may have stagnant or declining load factors but higher yields from the more inelastic passenger segments at the expense of losing a few price sensitive customers, who are more than subsidised from higher yielding inelastic customers.

1.5.15 This is particularly problematic in Dublin Airport's view as the IAA has disallowed rolling schemes for Car Parking due to capacity constraints meaning revenue growth would likely come from yield increases. While at the same time it has baked in those yields in a stretched car parks forecast which is passed onto airlines. It has not however, reflected on the flip side how capacity constraints which it acknowledges in principle at Dublin Airport may by the same logic as car parks be used by incumbent airlines to maximise yields rather than to increase passengers through higher load factors or by delaying handing back of slots so as to restrict access for new entrants.

1.5.16 This of course is not consistent with the IAA's statutory objectives of promoting the interest of both incumbent and prospective airlines if it considers the claims of incumbent airlines as near fact when their revealed behaviour is sometimes contrary to their stated behaviour in turn contributing to distortions that impose additional hurdles for new entrant airlines.

Figure 2 Dublin Airport Passenger Trends W23, W24 and W25



1.5.17 Comparing W25 v W23 as or by delaying handing back of slots so as to restrict access for new entrants.

1.5.18 This of course is not consistent with the IAA's statutory objectives of promoting the interest of both incumbent and prospective airlines if it considers the claims of incumbent airlines as near fact when their revealed behaviour is sometimes contrary to their stated behaviour in turn contributing to distortions that impose additional hurdles for new entrant airlines.

1.5.19 Figure 2 shows saw capacity rise almost 1 for 1, with load factor growth being flat, whereas W24 vs W23 where capacity was flat load factor absorbed some but not all of the reduction. In W25 vs W24 capacity grew more than passengers while load factors also fell. While the IAA does talk about the W24 load factor increase and then correction in W25, what it misses that passenger numbers were flat in W24. Load factor growth absorbed some of the capacity reductions, it did not however generate passenger growth. This may reflect yield management taking place, no-shows who were booked making the achievable load factor lower than 100% in practice or simply that load factor is not a sufficient mitigatory mechanism in magnitude compared to capacity, Load factors improvements are limited, limit bound and prone to uncertainty. The IAA has currently put all potential factors that can mitigate capacity constraints into one bucket without adequately considering the level of interaction between these measures and how they might counteract with one another.

1.5.20 The IAA has stated that Dublin Airport has not properly considered how bussing could be used to alleviate constraints even citing that Ryanair is open to exploring the option despite not viewing it as ideal. Dublin Airport would note that the introduction of bussing is not as simple as implied by the IAA's assessment. It requires significant opex and coordination to make work as well as airline willingness to use bussing. Ryanair has been

reluctant to use it as it increases frictions in their efficiency model, in particular the accomplishment of 25-minute aircraft turn times.

1.5.21 Cumulatively, the presence of significant limitations to the above qualitative measures means that what the IAA has proposed putting aside the potential counterbalancing nature of some of these measures, is a high scenario and not a centreline forecast. If the regulator relies on an assumption that all possible measures that alleviate constraints will transpire and used it as grounds to disqualify and not assess in any meaningful ways the numbers behind the constrained forecast, then what it has produced is a heavily simplified optimistic high case scenario. A centreline does not assume all upside risks transpire, which the IAA implicitly has assumed.

1.5.22 This is further accentuated by the IAA not including an asymmetric risk adjustment nor an aiming up to the WACC. While the IAA says it has not factored in Ryanair's growth from a charge reduction, this has not been demonstrated through any mathematical model and instead relies on an assertion. Given capacity constraints especially at Pier 1, Dublin Airport may not be able to facilitate such hypothetical growth. Moreover, Ryanair makes up around 45% of the market share so some of the IAA's assumptions and Eurocontrol forecast model would naturally rely on Ryanair in the first instance, again raising the concern of double counting of a mechanism which dilutes the hypothetical positive risk Dublin Airport is exposed to.

1.5.23 Moreover, the IAA has not considered that even though there is a charge reduction, that since the Boeing Max 10s are due to arrive later in the period, combined with the potential triggering of Capex projects might contribute to Ryanair actually reducing or holding capacity flat to protest the Capex which it has been very vocal in its opposition to as part of the Draft Determination process. This is not dissimilar to when it lodged a formal complaint to the IAA, when one of the discounts it complained about, they would be a net benefactor of, while also pulling all their Max 8s in turn subjecting themselves to a higher overall average airport charge.

1.5.24 Given the countervailing buyer power of Ryanair, Dublin Airport is faced with significant downside risk without adequate upside which is only exacerbated by constraints to which the IAA has adopted an unrealistically high descriptive case scenario. Dublin Airport is not the only airport exposed to such risk, with regional Spanish Airports, Portuguese Airport, German Airports, Vienna, Charleroi to name only a few have also experienced passenger reductions following decisions by Ryanair to cut capacity at these airports often citing charges related to airports, air traffic or government taxes. Given the current aircraft shortages this only makes more pronounced these network effects, where the bases heavily footloose airlines can reallocate at short notice their aircrafts to are higher.

1.5.25 In summary Dublin Airport has serious concerns about the IAA's approach to constraints where they have treated a pool of potentially counterbalancing constraint mitigating measures as near certain rather than probabilistic. While at the same time not providing any analysis to quantify their individual effect nor how their interaction effects can affect the outturns.

1.5.26 The IAA in 1.8 of the Draft Determination writes *'We aim to generate a centreline traffic forecast where there is a broadly even balance between upside and downside risk.'*, while in 1.9 it states *'we do not expect that such constraints will, in practice, prevent traffic growing to (or beyond) our demand-led forecast.'* Their expectation which is not based of any corroborative quantitative analysis or modelling but rather qualitative and generalised observations is not sufficient grounds for disregarding constraints. Especially, when the IAA's baseline is a downside Capex scenario illustrated through disallowances and minimum spend requirement for Trigger A, which is not reflective of their high case passenger forecast.

1.5.27 This ultimately results in an overly optimistic passenger forecast and not a reasonable centreline scenario, while making it very difficult to assess as elements of the IAA's qualitative assumptions are in direct contention with the mathematic part of the IAA model. In the absence of quantitative analysis to verify their qualitative assertions it becomes very difficult to ascertain the extent to which their overall forecast has double counted components and ultimately significantly reduces the transparency of their forecast.

1.6 Eurocontrol TNSU Forecast

1.6.1 While both Dublin Airport and the IAA used the Eurocontrol forecast in their passenger forecast models, the way they have been applied and the weighting provided differs.

1.6.2 Dublin Airport applies a 10% weight to the Eurocontrol forecast while the IAA applies a 33.3% weighting. Dublin Airport computes the elasticity between TNSU and passengers and applies that to the CAGR of TNSU forecast to compute the predicted demand. Historical TNSU data is harder to find but whether using 2015-2025 or 2019-2025 the elasticity appears broadly stable in the 1.47 range. Implying that when TNSU increase by 1% passengers increase by 1.47%.

1.6.3 While the R-squared of this regression is 99% which can be a cause of concern due to it being unusually high, in contrast to the GDP/GNI* gap there are more reasons for TNSU to be correlated with Dublin Airport passengers than MNC activity. Nevertheless, while TNSU is a decent proxy, it is not perfect either. This is since there are factors that influence TNSU that are generally independent of passenger demand, this includes cargo demand, general aviation, aircraft fleet composition changes (which can be related to demand but may also be network level decisions).

1.6.4 Therefore, it would follow that there should be a sizeable residual regressing TNSU and passengers that captures the correlation in passengers not driven by TNSU. In other words there is variation in TNSU that is unrelated to variation in passengers and this should show up in the error. The high R-square therefore does in part likely capture a common shared upward trend and is in part at least indicative of that rather than significant model explanatory power. For these reasons Dublin Airport can recognise why there may be reservations to using passengers to TNSU elasticity.

1.6.5 That being said, while in principle Dublin Airport does not have issue with the inclusion of the Eurocontrol TNSU forecast in the model as a form of independent forecasting, the way that the IAA has applied it, does raise concerns for Dublin Airport.

1.6.6 The IAA has made a simplifying assumption that seats grow one-for-one with TNSUs. TNSUs are a measure driven by aircraft movements and weight (MTOW) at an airfield, as the IAA has also explained in 6.28 of their Draft Determination. Terminal does not refer to the layman term in this case, but rather to the air navigation service charging zones, terminal charging zones and approach/departure air traffic services. That is the instruments relating to movements at an aerodrome that charges are levied on. This means that if aircraft movements or aircraft size/weight composition changes then so too will the TNSU. In turn commercial passenger flights are not the only drivers of TNSU, as cargo, general aviation and any movement for which terminal charges are levied can also influence TNSU. It does not hence follow that the growth rate of TNSU will be equivalent to the growth in seats, though we acknowledge this is a simplifying assumption made by the IAA for their modelling.

1.6.7 The second issue is that assuming 1 for 1 capacity growth contends with the IAA recognition that constraints exist. While the IAA has noted it envisages constraints to be mitigated by numerous factors previously discussed, some of which can increase capacity (such as off-peak flying) which we have already outlined as to why they do not hold to the level the IAA assesses. Relying on simplifying assumptions that don't disregard capacity growth where it cannot arise easily e.g. the morning peak can expose the methodology to skewing towards a high case scenario.

1.6.8 This is further exacerbated by both capacity and load factors projected to grow in this forecast, despite load factor growth having a limit and its tendency to be diluted or even nullified when capacity grows. In 2025 load factors fell -0.5% while capacity grew 5.1%. Similarly in 2018 load factors decline -0.2% when capacity increase 3.8%. Having capacity growth combined with load factor growth risks double counting and overstating the passenger forecast. Which is only compounded by the inconsistency with such an approach in a constrained airport.

1.6.9 Additionally, TNSU captures movements and aircraft weight in Cork and Shannon as well, which are unrelated to Dublin. The European Presidency in 2026 has increased general aviation which drives up TNSU while not having any real link to passenger numbers. This potentially explains some of the starker rise in TNSUs for 2026 compared to the other lower growth forecasted years in the determination period – this can also be impacted by fluctuations in pharmaceutical exports which caused GDP to slump in 2026. Another area where the distortion of Irish GDP introduces complexity. The IAA must consider what external variables their forecasts bake-in which can skew their forecast, as the EU presidency risks introducing upward bias.

1.6.10 Moreover, the Boeing Max 10 up gauging is listed as a factor that will alleviate constraints. However, this would already partially be captured in the Eurocontrol forecast as Max 10s have higher MTOWs than Max 8s or 737s which again raises concern about magnitude when it is already counted once in the Eurocontrol forecast.

