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The Influence of EU Aviation Policy on the Strategic Direction of Irish International and Regional Airports.

Thesis presented by
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for the degree of
MRes Government and Public Policy

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2021

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Declaration

This is to certify that the work I am submitting is my own and has not been submitted for another degree, either at University College Cork or elsewhere. All external references and sources are clearly acknowledged and identified within the contents. I have read and understood the regulations of University College Cork concerning plagiarism and intellectual property.

Abstract

Since 1993, the stepped introduction of a liberalised air transport market within the European Union has dramatically altered the regulatory and economic landscape of air transport in Europe. Ireland's participation in the single aviation market has benefited both business and consumers and opened access to a previously restricted, uncompetitive market.

As an island nation Irish airports are critical to national infrastructure. The purpose and overarching objective of this research is to explore the impact of EU aviation regulation after 1993 on state owned Irish airports, in particular the effect of such regulation on the smaller regional airports of Cork and Shannon. The aim is to examine the main benefits and challenges posed by the current regulatory framework and whether it supports or hinders Irish airports. Using a qualitative approach, in the form of semi-structured interviews, data was collected from a small purposive sample group that consisted of eight senior management staff from the three state owned airports, Dublin, Cork and Shannon. The impact of EU air transport regulation over the past 30 years is examined through the lens of the varied managerial experience of each contributor. The responses are carefully analysed and considered in the context of liberalisation and the proposed objectives and advantages of a single aviation market within the EU.

The findings point to some of the key benefits of participation in the single market but also expose some challenges in implementing the regulations. This supports some of the main findings in current literature pertaining to the effects of liberalisation and the on-going issues experienced by airports throughout the EU. My research appears to confirm that the smaller regional airports in Ireland are finding it increasingly difficult to absorb the costs of implementing EU regulation and a number of factors, in particular, challenge the viability of the regional airports, namely:

1. Security, as the requirement to consistently update and maintain security systems is a costly prerequisite to participation in the market.
2. Ireland's commercially operated airports are geographically located in close proximity to one another. The airports are competing within the same catchment

areas and seeking to capture similar tourism markets.

3. Cork and Shannon airport lack the capacity of Dublin and have lower bargaining power when dealing with larger, well-established airlines. While the number of airlines continues to decrease worldwide, successful mergers, acquisitions and alliances have led to the emergence of increasingly dominant, commercially strong operators capable of exerting increased pressure as they seek to reduce costs.

Without access to state funding, and the cushioning support of state aid, Irish airports continue to explore opportunities to generate revenue as they attempt to become viable self-contained businesses operating in an increasingly competitive EU market.

The principle conclusion of the research is that Irish airports, particularly smaller regional airports, are under increasing pressure to survive in a very turbulent industry. Irish airports need to validate their viability in the global and EU market and employ measures to counteract the increasing power of low-cost airlines. In addition, the devastating impact of the current global pandemic presents a range of new unprecedented challenges in an industry not necessarily braced for such extensive and rapid change.

1. Introduction

> Today it is difficult to realise how much air travel has changed thanks to the European Union. The creation of the single market revolutionised mobility, not only providing cheaper and safer air travel, but also more jobs and economic growth. (Violeta Bulc, European Commissioner for Mobility and Transport, 2014-2019*)*

The European Union Aviation Strategy (2015) is focused on better connectivity and fairer competition. The introduction of the liberalised market in 1992 resulted in the implementation of various legislation and directives governing airport slot allocations, ground handling services, airport charges and state aid. In 2014, the European Commission (EC) introduced guidelines on state aid.

Air transport contributes over €400 billion to the European Unions (EU) overall economy. In 2015 almost 920 million passengers passed through 450 EU Airports, almost three times more than in 1992 (European Commission, 2017). Figures from 2018-2019 highlight continued growth in total air passenger numbers across most member states, including Ireland (IE). In 2019 1.34bn people in the EU travelled by air, an increase of 3.8% compared with 2018. Ireland experienced an increase of 4.4% during the same period.

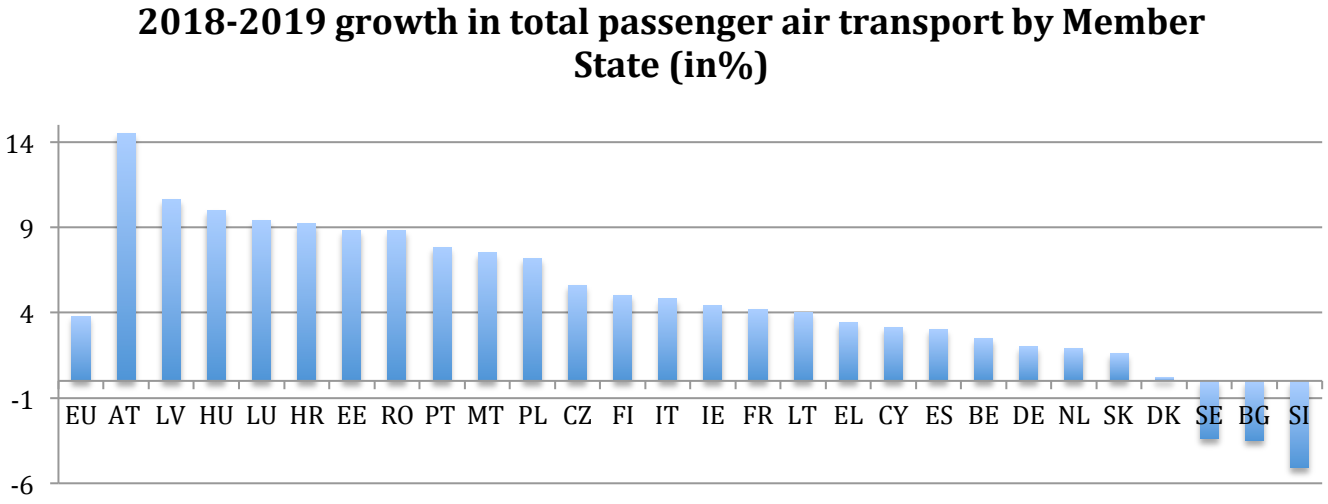


Figure 1 2018-2019 growth in total passengers by Member State (in %), 2020 (Source: Eurostat).

	Total Transport		National Transport		International Intra-EU-27 transport		International extra-EU-27 transport	
	Number of passengers	Growth (%) 2018-2019	Number of passengers	Growth (%) 2018-2019	Number of passengers	Growth (%) 2018-2019	Number of passengers	Growth (%) 2018-2019
EU-27 (*)	**1034144**	**3.8**	**160489**	**1.5**	**354727**	**3.4**	**518929**	**4.8**
Belgium (BE)	35385	2.5	11	21.1	23486	1.7	11888	4.2
Bulgaria (BG)	11713	-3.5	294	-6.7	7152	-6.3	4266	1.9
Czechia (CZ)	18833	5.6	19	-68.8	10470	5.5	8344	6.3
Denmark (DK)	34780	0.2	1883	-3.3	19833	-0.2	13065	1.4
Germany (DE)	226764	2.0	23182	-1.9	109713	1.5	93869	3.5
Estonia (EE)	3258	8.8	31	11.8	2301	7.0	926	13.3
Ireland (IE)	37948	4.4	97	-1.6	18076	7.0	19774	2.2
Greece (ÉL)	56089	3.4	8579	0.3	30023	2.6	17487	6.3
Spain (ES)	227189	3.0	42612	6.4	106881	2.5	77696	1.9
France (FR)	168730	4.2	31718	2.2	63780	5.2	73232	4.2
Croatia (HR)	10623	9.2	508	-3.8	6520	11.7	3595	6.8
Italy (IT)	160666	4.8	32399	0.7	78869	5.7	49398	6.2
Cyprus (CY)	11261	3.1	0*	-100.0	4335	-0.4	6926	5.3
Latvia (LV)	7786	10.6	16	47.4	4524	8.9	3246	13.0
Lithuania (LT)	6505	4.0	0	-96.0	3529	0.3	2975	8.8
Luxembourg (LU)	4366	9.4	2	109.6	3358	10.2	1006	6.8
Hungary (HU)	16701	10.0	0	478.7	10002	7.9	6699	13.5
Malta (MT)	7318	7.5	0	-52.8	4835	7.3	2483	8.0
Netherlands (NL)	81193	1.9	2	-41.0	39739	1.7	41452	2.1
Austria (AT)	35644	14.5	550	-6.0	21917	16.6	13177	12.1
Poland (PL)	46900	7.2	1969	3.6	24015	2.1	20915	14.0
Portugal (PT)	55008	7.8	5354	3.6	29798	6.7	19856	10.8
Romania (RO)	21546	8.8	1337	-5.9	13782	6.4	6427	18.4
Slovenia (Si)	1719	-5.1	0*	*	788	-8.5	931	-1.9
Slovakia (SK)	2840	1.6	2	-88.4	1278	-6.2	1559	10.6
Finland (FI)	23288	5.0	2966	-0.9	12608	3.6	7714	9.9
Sweden (SE)	37614	-3.4	6958	-8.9	20634	-1.5	10022	-3.2

(*) Double counting is excluded in the intra-EU-27 and total EU-27 aggregates by taking into consideration only departure declarations.
0 less than 500 passengers carried
(-) not applicable
0* real zero no passengers carried

Table 1: Overview of EU-27 air passenger transport by Member States in 2019: passengers carried (Thousands), 2021 (Source: Eurostat)).

In April 2020, due to the COVID pandemic, commercial flights in the EU dropped by 91.2%. Passenger numbers plummeted by more than 90% compared to 2019 in all EU Member States. All the top EU 30 airports, which include Dublin Airport, were severely affected by the flight restrictions (Eurostat, April 2021).

This research project focuses on the impact of the single aviation market on the three state owned Irish airports of Dublin, Cork and Shannon. It examines the challenges and opportunities gained through participation in the single market and whether the State airports can continue to operate as viable businesses within the current regulatory framework. Ireland, as an island nation, operates on the periphery of mainland Europe and is the last gateway to the West. Aviation transfers are hugely important to the market and Dublin Airport has established itself strongly as a main European hub. None of the

other Irish airports, including Cork and Shannon, have experienced anything like the growth of Dublin airport and there is a risk that if smaller regional airports are not fairly represented or considered at EU level they may disappear altogether. Larger, more lucrative airports with high connectivity and expansion options may be favoured within the EU and policies and laws may seek to protect more profitable businesses. This could have a dramatic impact at a local economic level and create regional imbalances throughout Ireland and other EU countries.

Ireland has five main airports (Dublin, Cork, Shannon, Knock and Kerry), and four regional airports (Donegal, Waterford, Connemara and Inishmore). Main airports are categorised as having in excess of 150,000 passengers passing through per annum, while regional airports have less than 150,000. The State airports of Dublin, Cork and Shannon are the primary gateways through which air traffic accesses Ireland while the regional airports of Knock, Kerry and Donegal are considered important for improving connectivity to their areas. Commercial flights to Waterford ceased in June 2016. Over the past thirty years Irish aviation activity has grown with figures from 2019 showing a record 36.6 million passengers travelling through Irish airports, with 31.5 million handled by Dublin Airport (Department of Transport, 2019). According to the Dublin Airport Economic Impact Study (2019), connectivity at the airport is enhanced by its position as a hub for travel between Europe and North America. In 2019 Dublin airport contributed €9.8 billion to the Irish economy, with Shannon contributing just in excess of €1 billion and Cork Airport contributing €904 million (Central Statistics Office, 2020).

Since 2008, Dublin Airport has grown exponentially at a rate that far outstrips Cork and Shannon airports. Between 2013 and 2018, passenger traffic increased by 56.7% at Dublin airport with Cork experiencing a compound growth rate of 5.7% year on year between 2015 and 2018. Dublin is clearly operating on a different scale and the regional airports of Cork and Shannon will need greater support from the EU and national aviation authorities, particularly in view of the recent stalling of air travel worldwide.

The COVID pandemic has laid bare some of the prior underlying issues within the Irish aviation sector. It is clear that both Shannon and Cork have an over-reliance on larger

airlines, particularly Aer Lingus and Ryanair. The decision by Ryanair to close both bases and the subsequent decision by Aer Lingus to pull their base from Shannon, while reducing activity in Cork until November 2021, will exacerbate problems and undoubtedly have devastating consequences. It is arguable that if the issue of regional imbalance had been addressed prior to March 2020 with Cork and Shannon Airports given the opportunity to share the windfall of passenger numbers experienced at Dublin, both airports could now be in a much better and stronger position to overcome the current crisis. Dublin could still have experienced growth and Cork and Shannon may well be financially better positioned to survive the fallout from COVID. The EU introduced legislation to create a fair and competitive single market but yet Dublin emerged as a dominant player and the very survival of Ireland's regional airports is threatened. Increased investment in the smaller regional airports would help address congestion issues at Dublin Airport but more importantly would help create a more robust market. Airlines, such as Ryanair[1], move and set up bases at smaller airports if they are incentivised to do so. There is an opportunity now to address the issues highlighted by COVID, most particularly the market power of Dublin Airport and the negative impact of investing in one State airport to the detriment of the regionals and smaller airports.

Working in the aviation sector for over thirty years, I have witnessed many changes across the Irish aviation sector. An increased freedom in movement was accompanied by a need for improved security systems and general facilities. Increasing passenger numbers required greater passenger facilitation and the arrival of the low cost airlines significantly altered the landscape. The dominance of Ryanair throughout the EU is the story of an Irish company that began by punching well above its weight but has ended with the airline dominating the EU aviation sector. The loss of duty free in 1999 also served a huge financial blow to Irish airport operations and severed a very lucrative and necessary revenue stream.

While there are currently nine airports in operation throughout Ireland, Dublin accounts for over 86% of all traffic, with Cork and Shannon managing the highest percentage of

[1] Ryanair operates over 2500 flights per day, across 242 airports in 40 countries. They have more international passengers than any other airline and with 79 bases across Europe and North Africa (Data Source: https://corporate.ryanair.com/ryanair-facts-and-figures/)

what remains. Increased pressure to update systems and remain compliant has resulted in high expenditure at Cork and Shannon. Prior to COVID Cork and Shannon could not access State funding under EU regulation. The State supports the smaller regional airports of Kerry, Knock, Sligo, Waterford and Donegal but questions loom as to whether the EU should revisit this situation. The Commission's view on the development of regional airports is that they are important for 'economic growth and territorial cohesion' but 'a proliferation of regional airports which leads to the duplication of unused or not efficiently used airport infrastructures should be avoided' (European Commission, 2014). There is a lack of research surrounding the viability, necessity and usage of smaller regional airports in light of the Commission's statement.

State airports were granted access to a state aid package of €26 million to help deal with the fall-out from the pandemic. In November 2020, the Irish Government offered an overall €80 million funding package that included €21.3 million for the Regional Airports Programme and €32.1 million for a new COVID-19 Regional State Airports Programme. Under these programmes, the airports of Donegal, Kerry, Knock, Cork and Shannon will have continued access to capital and operational supports in 2021. Over €200 million in additional funding is also available through support schemes such as the Employment Wage Subsidy Scheme. These general supports are to be extended until the end of June 2021 and have been approved by the EU (RTÉ, April 2021).

1.1 Theoretical Framework for Research

As a consequence of Article 119 of the Treaty on the Functioning of the EU (2009) which embraced the principle of operating an 'open market economy with free competition', the European Union air transport market was deregulated to encourage competition in what had previously been considered a monopolistic market. The aim of a single aviation market is to provide an increased number of connections at better prices, address the unfair commercial practices of those operating outside the EU, and boost the efficiency of airport services (ICAO, 2003; Burghouwt, 2015).

Over the past 30 years, through the gradual process of liberalisation, the EU has reduced barriers to entry for airlines (Christidis, 2016; Kappes and Merkert, 2013). Airlines are

now free to operate throughout member states and are no longer required to have a base in their home countries. Many EU, previously state-owned, airlines are now privatised throughout Europe and the number of legacy state-owned airlines continues to decrease (Bel and Fageda, 2009; steer davies gleave, 2016). Airport charges are more transparent and a recent EU ruling required all operators in an airport to be offered the same rates (European Commission, 2019). Competitive practice is monitored and member states are held accountable for breaches in EU competition law. Airlines, specifically low-cost airlines, have capitalised on opportunities within the liberalised market and EU carriers can operate any route within the EU without restriction on capacity or frequency (Burghouwt, 2015; Diaconu, 2012). All EU air carriers operate under the close supervision of the European Commission who apply and enforce regulation to ensure proper conduct and penalise any abuse of dominant market position. EU competition rules, including rules on State aid and merger regulation, are implemented to develop a sustainable and competitive market capable of supporting the local and European economy. Slot availability, safety, security and environmental conditions are all part of the EU strategy (European Commission, 2015) and it is within the context of the current EU regulatory framework that the impact of liberalisation on Irish airports is examined.

The EU Aviation Strategy (2015) outlines the objectives of the Union in respect of:

- business and passenger growth,
- improving connectivity,
- digitising the single market,
- developing a combined environmental strategy, and
- operating as a global actor in an increasingly competitive business environment.

The development of the internal EU aviation market contributes to the ambition of a Single European Sky (SES). SES is an established EU initiative that was designed in response to delays due to air navigation. The aim is to create a single European airspace and reduce fragmentation. If successfully implemented the SES should result in shorter flight times and a reduction in delays, reduced costs and a reduction in emissions (Regulation (EC) No 549/2004, Regulation (EC) No 550/2004, Regulation (EC)

No 551/2004, and Regulation (EC) No 552/2004, Regulation (EC) No 1070/2009). The EU is in support of using integrated technology to support capacity optimisation within the market.

Furthermore, the Commission focuses on the gradual development of a more coordinated external aviation policy as it works to negotiate agreements with 'third countries' (i.e. countries operating outside the EU). The EU strategy (2015) is focused on the principle of fair competition and practice and concentrates on the development of both internal and external policies to support this objective. In developing the single market, the EU facilitates internal competition and seeks to create robust policies to withstand competition from outside the EU.

> The Single Market in aviation is the stand-out achievement of the EU over the last 25 years. It has lowered airfares and enabled citizens to travel freely all over Europe. However, we need to tackle long-standing challenges such as the scandal of repeated ATC strikes, which disrupt the travel plans of millions, and remove ruinous aviation taxes and overpriced airport monopolies. (Michael O'Leary, CEO, Ryanair)

The implementation of the common aviation strategy is not without obstacles. The EU face continuous challenges with capacity restrictions along with the explicit and continuous need to operate high safety and security standards (Abate and Christidis, 2017; Burghouwt, 2015). The Commission is further tasked with generating resilient energy efficiency protocols and developing unified climate change policies. Irish airports, similar to their European counterparts, have adopted many EU directives since the liberalisation of the market in 1992. EU policy is integrated into the overall national aviation strategy. The three State airports act in compliance with EU directives, operating to very high standards, particularly in the area of safety and security. The low number of incidences reported at all three state airports since their foundation evidences this. According to the Irish Aviation Authority (2019), there were 4 accidents, none of which resulted in fatalities, and 15 serious incidents over the five-year period between 2015 and 2019.

Year	*2015*	*2016*	*2017*	*2018*	*2019*	*Total*
No. Flights at Irish Airports	253,223	274,058	273,440	293,961	279,799	1,374,481
No. Flight Hours in Irish	287,659	309,693	311,715	315, 776	319,775	1,544,618
Non-fatal accidents	2	0	1	1	0	4
Serious incidents	5	2	4	2	2	15

Table 2: Non-fatal accidents and serious incidents involving CAT (Commercial Air Transport) at Irish certificated and licenced aerodromes which provide ATC services, 2019 (Source: Irish Aviation Authority).

In the move towards a market-led economy, the EU has sought to break the monopolistic control of legacy airlines and institute a more competitive business environment. However, the theory of liberalisation and its probable benefits are not always realised and successful implementation does not always occur (Gudmundsson, 2015). The industry faces the increased challenges posed by the pandemic, rising fuel prices, increasing environmental pressures, and the costs incurred by an increase in security measures and systems. Congestion and lack of capacity poses a threat to safety, efficiency and competitiveness across the entire supply chain.

Enforcing rigid air transport rules and regulations without taking an individual member state's specific and distinctive requirements fully into consideration can impact negatively on that state's aviation sector. 'Many member states believe that more flexible cooperation will help to demonstrate the benefits of collective European action, and to overcome policy deadlocks. There is also a clear preference for flexible cooperation under existing EU treaty instruments' (European Council on Foreign Relations, 2017). Geographical location, current transport infrastructure and market demand are hugely important but not always given equal consideration in the push for liberalisation. The lack of flexibility and the 'one size fits all' approach currently in operation throughout the EU places pressure on the smaller airports such as Cork and Shannon as operational costs continue to rise. Member states need to endorse a more tailor-made and robust framework that offers a higher degree of flexibility.

1.2 Rationale for the Research

Irish airports operating within the EU must comply with both the EU and national aviation regulations. Regulation within the EU does not always take airport size or financial capability into consideration. The profitability and ability of an airport to fund infrastructural development to cope with increasing passenger numbers is an issue of concern for every European airport (European Parliamentary Research Service, 2016). The discussion paper 'Airports in the Aviation Value Chain' states 'an economically sustainable industry has to cover the cost of operations and provide a reasonable return on investment so that capital can be renewed. This must be achieved not only by the value chain in aggregate, but each sector of the value chain must achieve viability and financial sustainability' (OECD, 2013).

There is currently a lack of research surrounding the success or failure of the liberalisation process with respect to Irish airports. In my experience the continuous updates to the regulatory requirements and the need for airports to comply, irrespective of airport size or financial ability, can be counter-productive in developing a fair and competitive environment. Furthermore, continuous examination of airport performance and the financial contribution of Irish airports to both national and EU economies must bear consideration. The need for a robust and fair performance measurement system that measures the contribution and performance of individual airports, across a number of agreed factors, is vital to meet the EU objective of creating a 'level playing field'.

The purpose of my research is to examine the positive and negative impacts of the single air transport market for the three state-owned Irish airports and to determine if the current regulatory framework satisfies EU objectives and aligns with the strategic objectives of Ireland's national transport strategy. The results seek to inform and assist future research pertaining to the survival of smaller regional airports in Europe.

1.3 Aims and Objectives of the Research

The research seeks to address three areas, namely:

1. Identify the benefits and challenges for Irish airports operating within the single European aviation market.
2. Examine whether there is a need for further airports outside of the three state owned entities operating within the Republic of Ireland.
3. Explore whether sustaining commercially non-viable airports is conducive to both the national and EU aviation strategy.

This study could inform additional research into the current regulatory framework of the EU, the viability of sustaining state-subsidised airports and research pertaining to the most suitable business model for continued profitable operation within the EU's single air transport market.

The research design of collecting data through semi-structured interviews produced valuable insights into current Irish airport operations and the pressures of operating profitably in a declining and highly competitive market containing a variety of market players. I also examined information from internal company reports, external aviation reports and a number of industry conferences, discussion papers and webinars that have taken place over the past three years.

Several common themes related to deregulation and liberalisation of the air transport market are evident in the Irish aviation sector, opening the door to further research into how opportunities might be exploited and challenges might be addressed.

1.4 Organisation of Chapters

The research is comprised of five chapters, including the introduction.

- Chapter two examines a cross-section of available literature pertaining to liberalisation and its impact on the aviation sector. As well as identifying common challenges faced by airports operating within the single European air transport market, it also discusses the potential opportunities gained through Ireland's

participation.

- Chapter Three explains the research design and methodology used. It explains how the data was collected and analysed, details of the sample group chosen and outlines some of the potential limitations of the research.
- Chapter Four presents key research findings and how these findings compare with existing literature in the area.
- Chapter Five presents a summary of findings and offers a general discussion of the key points identified. It also suggests some recommendations for future research.

2. Literature Review

2.1 Introduction

This chapter discusses relevant literature surrounding the liberalisation of European aviation and its impact on European airports. The first section examines aspects of the current European Union (EU) regulatory framework including the Airport Charges Directive (ACD) and regulation governing State Aid. The second section examines the deregulation and liberalisation of the market and the opportunities and the challenges it poses for European airports. The third section discusses key changes in the aviation sector following liberalisation, followed by a discussion and summary of findings. The conclusion provides a general overview of the research within an Irish context.

2.2 Liberalisation

The aviation market was gradually liberalised by the introduction of three successive packages of measures. Lawton (1999) concluded that by the 1980s, many governments began to realise that the 'nationalistic, interventionist policies were no longer tenable' and that 'liberalisation of the sector was an inevitable global economic reality'. The thorny issue of state aid to airlines was heavily criticised by several European governments and by smaller private carriers. In a landmark case, the UK government took an action against the European Commission to the European Court of Justice, challenging the large aid package approved by the commission to Air France, arguing that the carrier had been using state aid money to fund cuts in air fares. International changes in air transport policy led the European Commission to exert pressure on national governments resulting in the gradual Europeanisation of air transport policy.

The European Single Market (or Internal Market) was created in 1993 and its core principle was the 'Four Freedoms' that refers to the free movement of goods, services, capital and people. The European Commission saw the strategy of liberalisation of the air transport market as vital to the success of the overall European project. The Commission aimed to open up competition across the sector to benefit consumers. At the same time, it wished to implement the liberalisation process in such a way that would not give an unfair advantage to the established organisations that might have previously enjoyed a

monopoly prior to liberalisation.

The European Commission has identified the main benefits of liberalisation to be:

1. consumers can choose the supplier offering the best conditions;

2. consumers benefit from lower prices and new services which are usually more efficient and consumer-friendly than before;

3. national economies become more competitive.[2]

Kinnock (1996) pinpointed a number of important achievements from the liberalisation process:

- the number of routes flown rose from 490 to 520
- 30 per cent of Community routes were now served by two operators and six per cent by three operators or more, against two per cent in 1993. The dominant carrier's market share often fell, to the advantage of the second carriers
- 80 new airline companies were created, 60 disappeared
- air fares fell on the routes where at least three operators were in competition, with 90 to 95 per cent of passengers travelling at prices significantly lower than those in operation in 1993.

A number of challenges however were also identified in the research including:

1. Instances of excessive fares, which would require legislation to correct.
2. Capacity restrictions in terms of runway limitations as well as air terminal facilities to cope which increased passenger numbers. Increased number of flights was also beginning to put pressure on air traffic management.
3. High air transport costs, where infrastructure costs accounted for 25 per cent of all operational costs, which was up to 40 per cent higher than in the US.
4. Increased competition and globalisation led to the rapid development of alliances and associated practices such as code-sharing and franchising arrangements. Extra vigilance would be required to ensure that alliances did not become a disguised means of restricting the market.

[2] Source: https://ec.europa.eu/competition/general/liberalisation_en.html

Kinnock suggested that the Commission should use its powers under EU competition rules to investigate perceived or actual abuses of a dominant position and pursue an ever-stricter approach to state aid. Burghouwt et al. (2015), in their analysis of the longer term impacts of liberalisation, detail the fall in market share experienced by national or 'flag' airlines as competition increased. They also found that 'the growth of hub-and-spoke networks during the 1990s, which was still rooted in the old national airport-national airline concept, also resulted in oversupply of hubs in the EU market'. The research found there was an increase in 'mergers, take-overs and bankruptcies among full-service carriers' which they believe was a direct result of the Commissions block on state aid. Consolidation figures amongst low-cost carriers was found to be significantly lower. The authors conclude that liberalisation has benefited the consumer through greater choice and lower fares. Consumers have access to an increased number of routes and flight frequencies along with improved connectivity as a result of the increase in hub networks. Today, almost half of international passengers worldwide are carried by European airlines (ICAO, 2019).

2.3 Regulatory Framework of the European Union Aviation Sector

The EU is recognised as a single body working on behalf of its members, developing both internal and external aviation agreements and policies. The European Commission (EC) formulates legislation, policies and directives to which each member state must agree. Much of the overarching framework for aviation law is set at international level through the International Civil Aviation Organisation (ICAO) from which the EU draws its framework. The EU governs key areas within aviation including:

- air traffic management,
- competition,
- passenger rights,
- safety and security

(Regulation 261/04; Regulation 1107/06; Directive 2015/2302; Regulation 300/2008; Regulation 2015/1998).

In addition, the EU is responsible for directives governing licensing, ground handling (Regulation 96/67), slot allocation (Regulation 95/93) and airport charges (EC Directive 2009/12).

Each member state's interests are represented at EU level and all regulations are currently subject to a vote by each member state. Ireland's aviation policy is maintained and controlled nationally but as a member of the EU, Ireland is bound by EU aviation policy and legislation. The EU, the ICAO, the European Aviation Safety Agency (EASA) and national aviation authorities (in Irelands case the Irish Aviation Authority (IAA)), ensure member states act in compliance with international, EU and national aviation laws.

The purpose of the EU aviation policy framework is to regulate and harmonise operational and competitive activity within the industry. Initially it was designed to break the quasi-monopolistic control of legacy airlines and to give all airlines fair and equal access to the market. Liberalisation increased competitiveness leading to price reductions, improved connectivity and increases in passenger numbers (Fu et al., 2010). However, deregulation also contributed to unanticipated anti-competitive behaviour leaving many airlines and airports excluded and unable to compete (Christidis, 2016). 'Unfair competition takes many faces. More and more airlines are seeking competitive advantage through market-distorting business practices, such as social dumping and 'forum shopping'. They try to benefit from light regulation and favourable taxation regimes in countries that serve them as a 'flag of convenience'' (European Cockpit Association, 2014).

The EU regulatory framework has been criticised by member states for the pace at which legislation is enacted and the lack of uniformity in implementation across the EU. The liberalised market is still to some extent protected, unequal and favours airlines and airports with stronger market power (European Commission, 2015; Thelle et al., 2012).

2.3.1 The European Common Aviation Area (ECAA)

In force since December 2017, the ECAA is a multilateral agreement implemented to extend the European aviation area. The ECAA promotes growth through improved

connectivity and currently covers 36 countries and more than 500 million people. Since the introduction of the ECAA, connectivity and passenger movement have both increased (European Commission, 2017). Ireland, as part of the ECAA, benefits from the larger market in terms of growth and accessibility, with the total number of flights handled by Irish air traffic control substantially increasing over the past 10 years. While the number of flights fell significantly to 95,309 in 2020, the previous year saw 273,558 flights accommodated in Ireland (CSO, 2021). The number of passengers has also increased across Irish airports.

Airport	Quarter 4				January to December			
	2017	2018	2019	% change 2018-2019	2017	2018	2019	% change 2018-2019
Dublin	6,805,197	7,292,712	7,385,982	+1.3	29,454,474	31,319,419	32,676,251	+4.3
Cork	493,363	520,533	550,423	+5.7	2,301,450	2,387,806	2,585,466	+8.3
Shannon	341,394	353,012	341,416	-3.3	1,599,390	1,677,661	1,616,422	-3.7
Knock	160,780	170,600	180,453	+5.8	748,505	775,063	805,443	+3.9
Kerry	75,744	82,273	82,678	+0.5	335,480	365,339	369,836	+1.2
Total	**7,876,478**	**8,419,130**	**8,540,952**	**+1.4**	**34,439,299**	**36,525,288**	**38,053,418**	**+4.2**

Table 3: Number of passengers handled by main airports, Quarter 4 and Year 2017-2019 (Source: Central Statistics Office).

2.3.2 The European Court of Justice

The European Court of Justice (ECJ) is tasked with ensuring the correct and legal implementation of EU aviation policies and directives. Rulings by the court have a direct impact on airport operations throughout member states. In a recent ruling on airport charges (file no. C-379/18), the ECJ ruled that airports negotiating charges, not in line with those previously approved by the EU and the national supervisory authority, would be in direct violation of EU Directive 2009/12 and undermine its direction towards transparency, fairness and non-discrimination. The ruling means airports offering reduced rates to airport users must make known the terms to all airport users and offer equal rates to all.

Rulings made in the ECJ affect all member states and as the EU seek to strengthen liberalisation policy, many European airports struggle to comply and cover the costs of compliance and non-compliance.

2.3.3 Airport Charges

'An airport's 'Charging Strategy' encompasses all elements that could affect airport charges, including the menu of charges, any rebates or discounts, incentive schemes, Service Level Agreements or bilateral contracts (where allowed)' (Thessaloniki Forum of Airport Charges, January 2021).

The independent Commission for Aviation Regulation (CAR) regulates and sets charges at Dublin Airport following submissions from daa, airlines and other interested parties (daa, 2021). Airport charges include:

- runway landing, aircraft parking and take-off charges;
- charges for air bridge usage;
- passenger service charges;
- airport security charges; and
- charges for non-aeronautical services (i.e. charges levied from the granting of concessions, rental or leasing of premises and land, cark parking charges etc.).

The Airport Charges Directive (ACD) was approved by member states in 2009, to help establish 'a common framework regulating the essential features of airport charges and the way they are set' (Directive 2009/12/EC). The objective of the ACD was to increase the bargaining power of airlines when dealing with dominant airports. It was implemented to ensure fairer access to airports, greater transparency in negotiations and pricing agreements and encourage non-discriminatory rates. Under the directive, airport management can no longer offer favourable rates to a select few or give preferential treatment to dominant airlines. Airlines have equal access to the same rates. Prior to its introduction, airports were free to offer low rates to established airline partners. Some legacy airlines thus controlled the market and enjoyed much-reduced rates, further

strengthening their market position. Pricing structures contributed to a non-competitive environment that sought to block new entrants (Burghouwt et al., 2015). The development of common rates and a capping on prices at larger airports within the EU has resulted in a more transparent and competitive environment. Airline bargaining power increased (particularly at larger airports) and airport charges were reduced (European Commission, 2019). The ACD applies to airports with at least 5 million passengers annually or the largest airport operating in a member state if lower. The prices set must generate sufficient revenues for airports to maintain, build and improve airport infrastructure to an optimal level while equally supporting new business development and improving customer experience (Directive 2009/12/EC). A full analysis of the ACD conducted by the European Commission in 2017 found that in 2009 the Directive covered 68 airports, handling 75% of passengers in Europe, In 2017, 89 airports were covered, handling 85% of passengers. From 2009 to 2017 passenger numbers at the airports covered grew by 55.2%, from 1.0 billion in 2009 to over 1.5 billion in 2017 (CAPA, 2019). The report also found that the directive led to improvements in the setting of airport charges but that it has not fully met its original objectives (CAPA, 2019). The Commission found that some airports continue to charge high prices and extract terms that benefit airports more than airlines. There is clear disparity in the application of non-discriminatory pricing and an increase in the differentiation of charges across EU airports. The differentiation is driven by an increase in the incentives offered by airports and the requirements of air carriers. The report also highlighted a further issue. The EC found evidence of diverging charging systems in member states and a lack of transparency in how they are developed.

To address these concerns, in March 2019, the EC introduced a performance and charging scheme with the intention of enhancing airport performance (Regulation (EU) 2019/317). Key performance indicators are defined for areas including, safety, the environment, capacity and cost efficiency. Members are given indicative target areas but must draft performance plans that include details of incentive schemes, measures employed, traffic forecasts and major planned investment, amongst other key performance areas. Targets will be assessed and agreed between the EC and individual

member states. The introduction of the performance management system will contribute to increased efficiency and early identification of poor performance and enable fairer charging systems. The cost of implementing such a system should not outweigh the benefits and should also paint a clearer picture of how airports throughout the EU are performing in relation to one another. This depends on suitable performance indicators being clearly identified at the outset (Bezerra and Gomes, 2016). In the past, the lack of uniformity in implementing regulation concerning airport charges was due to the existence of previously agreed charges, as well as outright non-compliance by some EU members (European Commission, 2019). Some disparity is still evident and the EU faces criticism from airline groups for the inefficient and fragmented implementation of the directive. The International Air Transport Association (IATA), the trade association for over 290 airlines worldwide, recently stated that 'many airports are able to charge prices that would not otherwise be achieved in a competitive market'. They argue that regulators should be given stronger powers to stop airports abusing their market power.[3]

Airports not governed by the ACD can continue to charge above competitive levels. 'There has been an increase in the differentiation of charges across EU airports, mainly driven by LCC requirements and also by more incentive schemes offered by airports to support traffic growth' (CAPA, 2019). However, where member states have transposed the EU directive into national legislation, the ACD 'has led to a statistically significant reduction in the level of airport charges, although it took some years for the effect to materialize' (Conti et al., 2019).

IATA proposed the ACD be upgraded to regulation arguing that if properly implemented costs for airlines could be further reduced (IATA, 2019). However, should the EU enforce its adoption through legislation, airports throughout the EU could face possible closure, particularly airports with already low market power. Airports with a reliance on charges as the dominant source of revenue may be unable to cover operational costs due to pricing restrictions. The current ACD protocols consider airport size rather than market power as the determining factor of whether airport charges should be regulated. Airports

[3] https://centreforaviation.com/analysis/reports/eu-airport-charges-directive-iata-and-aci-differ-on-evaluation-report-488839

need to recoup fixed operational costs and they rely heavily on airport charges to do so. If the pricing structure at airports is overregulated, it could lead to disincentivisation and give unfair advantage to the larger airports throughout the EU.

Airports Council International (ACI-Europe) argue that regulators should step back and allow commercial entities resolve their own agreements under the protection of the EU's competition rules. Conversely, it is argued that stronger more robust regulation is required to protect the interests of airlines and consumers by diminishing the power of airports to charge high prices (IATA, 2019).

'Airport charges are not unique, they vary accordingly to a number of factors such as size of the aircraft, the number of passengers, the load factor, the flights schedule (time of the day), parking time and other flight characteristics together with the types of services used at the airport' (Conti et al., 2019). There is no standard pricing system used across European airports. Different financial models are utilised when determining and setting charges making it difficult to sufficiently compare across EU airports. The operating cost per passenger in 2018 was calculated at €8.51 at Dublin Airport. CAR set a reduced price of €7.87 per passenger for 2021 which fell far below a revised price proposal of €9.65 deemed necessary by the daa. Cork and Shannon currently charge €7.15 per departing passenger. The daa must now determine how the shortfall can be made up as investment is still required to update and maintain airport infrastructure.

2.3.4 State Aid

Pre-COVID, Dublin Airport contributed €9.8 billion to the Irish economy and helped create almost 130,000 jobs. The much smaller Cork Airport contributed close to €1 billion and facilitated over 12,000 jobs (CSO, 2020). The contribution of airports to the economy is well documented. Airports facilitate new business development, generate employment, both directly and indirectly, and contribute to tourism (ACI-Europe, 2019; CAPA, 2019).

Airports are considered key transport infrastructure and integral to local and national economic development and therefore receive the political and financial support of local

authorities (Dobruszkes et al., 2017; Barbot, 2006; Laurino and Beria, 2014). State support was distorting competition and giving unfair advantage so in 2014 the EC introduced legislation governing state aid. The aim is to ensure airports and airlines, regardless of whether they are state owned or private commercial entities, have access to necessary public funding, provided they satisfy specific criteria and conditions. Under current EU regulation (2014/C 99/03), support funding can be used for operational or development purposes.

Ireland adheres to EU law and EC guidelines on state aid. Certain regional airports, including Kerry, Waterford, Knock and Donegal, receive financial assistance under public service obligation (PSO) schemes and different government assistance programmes. Irish state aid helps develop new strategic air routes, provides investment finance for airport infrastructure and encourages regional development. In the case of small airports facilitating less than 3 million passengers, finance is available to cover operating losses and help airports achieve profitability.

However, it is argued that the provision of state aid distorts the competitive landscape (Van Hove, 2020). While the European Strategy for Growth (2020) recognises the importance of airports and the provision of suitable infrastructure where it is needed, fairness takes precedence when developing a competitive market. The EC initially wanted to eliminate all subsidies by 2024 in view of its objective 'to create a fair and competitive single market, one that is accessible to all'. Healthy and fair competition is an important facet of liberalisation. The development of the national road infrastructure in Ireland has increased the size of Irish airport catchment areas and introduced new challenges to the viability of small airports operating in cross-over markets.

Smaller airports regularly struggle to attract private financing for often high-investment low-return infrastructure projects (European Union, 2015). Such airports are often situated outside main cities with low passenger potential and therefore rely heavily on state aid to cover operational and development costs (Kazda et al., 2017). Larger airports are more successful in attracting outside investors and have less reliance on the state to provide suitable financing. The EC's impact assessment (European Commission, 2017)

on the phasing out of state aid states that 'no airports over 500,000 passengers are likely to close but smaller airports may be at increased risk'. Research shows airports that are unable to increase revenues or improve overall efficiency face a higher threat of closure (Oxera, 2019; Grimme, Maertens and Schröpfer, 2018). Lower passenger numbers and dominant legacy and low cost airlines such as Ryanair, Lufthansa, Air France and EasyJet, hinder cost recovery for smaller airports. These dominant players remain intent on exerting pressure on airports to exact more favourable terms (Warnock-Smith and Potter, 2005; Zuidberg, 2017). 'In 2020, low cost carriers (LCCs) in Europe had 44.5 percent of the total seat capacity in the region. Despite a difficult year, Ryanair is still the busiest airline group in Europe, transporting 51.7 million passengers in 2020' (Mazareanu, 2021).

Airports are increasingly investigating new ways of doing business to circumvent the loss of state funding. Successful ventures include increased investment in non-aeronautical services, including retail and business parks. Grimme, Maertens and Schröpfer (2018) suggest that public bodies could take over non-economic airport functions, including air traffic control, airport police, customs, fire-fighting services and cover all the necessary investments relating to the equipment and infrastructure necessary to perform those functions. They further suggest a possible increase in the number of air services operating as public service obligations (PSOs) could circumvent the loss of state finance.

In addition to enhancing competition, a further key argument in favour of the elimination of state subsidies is the financing of airports that contribute little economic value (Debyser, 2016). As mentioned previously, the Commission's view on the development of regional airports is that they are important for 'economic growth and territorial cohesion' but 'a proliferation of regional airports which leads to the duplication of unused or not efficiently used airport infrastructures should be avoided' (European Commission, 2014). Investment by the state diverts necessary finance from other key infrastructure and transport projects and is at odds with Europe's strategy to develop a fair yet competitive market. EU state aid guidelines warn against 'funding airports where catchment areas overlap, where similar destinations are served and where there is already underused capacity'. In Ireland, domestic air travel is no longer a priority due to the vast

improvements in the national road network. This is evidenced by the fact that there are currently no connecting flights between the cities of Dublin and Cork since the opening of the M8 motorway. Despite the improvements State PSOs continue to support this business model.

Many regional airports in Ireland are loss making and heavily subsidised. Subsidies are used to cover operational and development costs. However smaller airports cannot achieve the required economies of scale and the division of traffic prevents the potential growth of better, more viable airports (Debyser, 2016).

A recent report by the European Federation for Transport and Environment (2019), prepared as a contribution to the EU consultation on state aid for airports and airlines, investigated the potential state aid received by Ryanair's airports in the EU. The group suggested 'the closure of all small regional airports across Europe unable to achieve profitability within a 5-year period'. The report brought widespread condemnation and was considered 'a total disregard for the societal value of air connectivity' (ACI-Europe, 2019). The EU State Aid Guidelines (2014) sought to preserve 'good connections between the regions and the mobility of European citizens, while minimizing distortions of competition'. Operating aid therefore was considered a necessary support to help smaller regional airports deal with profitability issues caused by higher costs per passenger and lower aeronautical and commercial revenues per passenger.

Regional airports, such as Kerry Airport, struggle to provide a basic level of connectivity due to the seasonality of their traffic. They operate in less densely populated catchment areas and have access to less affluent customer bases. However, they continue to operate in close proximity to other larger and better-serviced airports thus diluting the market. Over-supply reduces funding for potentially more profitable airports that could benefit from a further injection of state backing.

With increasing costs, governments remain under pressure to justify the expenditure in supporting airports that are not financially viable. In response, ownership models have

changed over the years as governments off-load loss-making airports and attempt to create more profitable, sustainable business.

2.3.5 Airport Ownership Models

The transfer of airport ownership from state to private entities is common throughout Europe. Over the past number of years the considerable growth in air travel resulted in an increase in private and semi-private ownership throughout Europe (Graham, 2020). Semi-privatisation occurred in Vienna (1992), Copenhagen (1994), Frankfurt (2001), Brussels (2005) and Paris (2006). All major Spanish airports were semi-privatised in 2011. Ireland chose not to follow suit and all the major airports (Dublin, Cork and Shannon) remain under semi-state ownership. They are run as commercial enterprises by the Dublin Airport Authority (daa). Concession ownership is another model employed throughout Europe where private operators run the airport for an agreed time but do not own the airport. Operators may change at the end of the contracted period.

Examining and comparing cost efficiencies of airports is made difficult by the differences in ownership models (i.e. whether they are public, private or mixed ownership). Determining what performance measurements to use is problematic. There are many differentials making it difficult to compare by size only and therefore hard to fully determine which business model is most efficient and profitable (Frank, 2011).

Liberalisation means airports will no longer operate as natural monopolies. They face direct competition from other European airports and therefore must be cost efficient and continuously seek to innovate and overcome potential hurdles (Kalakou and Macário, 2013). Objectives differ between public and private businesses. The responsibilities and activities of publically owned airports are tied to the socio-economic objectives of national governments. For this reason, airport management at state or semi-state owned airports often make decisions that may not yield the highest financial return but are considered imperative to regional development. Investment is thus driven by political agenda as opposed to the conventional business strategy of a for-profit organisation. In such circumstances, the concept of Value For Money (VFM) may take precedence over

the desire for simply higher profit. Measuring success under the VFM concept would see a greater focus being put on efficiency, effectiveness and economy (often referred to as the Three E's). Efficiency measures the relationship between inputs and outputs (getting out as much as possible for what goes in). Effectiveness measures the relationship between outputs and objectives (getting done what was supposed to be done). Economy focuses on obtaining the right quality and quantity of inputs at lowest cost.

Adler and Liebert (2014) suggest that in the absence of competition, fully private airports perform better than public airports in terms of cost efficiency but mixed ownership airports do not tend to be as cost efficient as privatised or publicly owned airports. The mixed ownership model is most dominant in Europe and airports therefore may not be operating as efficiently as possible (Frontier Economics, 2019).

Privatisation has increased due to a number of member states choosing to offload national airports (Graham, 2020). In such cases, the cost of maintaining airport infrastructure is often deemed unviable by government and budgetary constraints make it difficult to fund costly projects. Publically owned airports tend now to be corporatised and managed on a commercial basis, such as Dublin and Cork airports being managed by the daa in Ireland.

The main function of airports is to facilitate air travel but as commercial businesses operating in a competitive market, they must create value in other ways to retain and gain market share. Investments in non-aeronautical activities, such as retail, accounts for up to 50% of revenue in some airports throughout Europe (ACI-Europe, 2020). High performance at airports is achieved through efficient capacity utilisation in terms of airlines, passengers and cargo, whether using in-house or outsourced resources. Adler and Liebert (2014) suggest that business ownership models are not as important as the competitiveness of the market when it comes to efficiency. The EC therefore continue to develop a regulatory framework that enhances competitiveness.

2.4 European Aviation Market after Liberalisation

Market liberalisation stimulates competition (Love and Lattimore, 2009). Prior to the liberalisation of the air transport market, each member state, including Ireland, was

governed by established national rules and policies and wholly responsible for negotiating agreements with other countries. The market was non-competitive and dominated by state owned airlines and airports, working in conjunction with one another to stifle competition and block new airline entrants. Liberalisation countered the dominance of national airlines and state owned airports, reduced barriers to entry and increased competition within the EU (ICAO, 2014). The EU modernised the industry by encouraging growth and dismantling anti-competitive behaviour. Acting as one voice for member states, the EU created the single aviation market to allow free movement of European passengers, improve connectivity and increase competition to reduce prices.

The slow and uneven adoption of EU aviation directives and rules has hindered the process in a market that is quickly evolving (Gudmundsson, 2015; Christidis 2016). The framework is often criticised and considered fragmented (Schulte-Strathaus, 2017). Unforeseen loopholes were identified early and exploited by airlines that capitalised on opportunities to access cheaper labour markets and base themselves in countries offering more favourable tax regimes (European Commission, 2015). Such moves resulted in litigious friction between the EU and participating airlines and member states further slowing the process.

Participating airports must absorb the cost of participating in the liberalised and deregulated market. Decisions made at EU level are passed to the appropriate authorities at national level. In Ireland the Irish Aviation Authority (IAA) are directly responsible for the implementation of EU rules and encourage strict adherence. The implementation of new directives, adherence to policy and alignment to EU strategy increase both capital expenditure and operational costs for airports (ACI, 2020).

Liberalisation also led to a dramatic rise in low cost air carriers. As a direct consequence the demand for infrastructure grew and the number of airports increased and competition increased dramatically (Burghouwt et al.,2015).

The total economic impact of the aviation sector is currently estimated at €400 billion across the EU (ACI-Europe, 2020). Prior to COVID-19, European aviation facilitated the movement of approximately 900 million passengers throughout Europe. However, such

movement is not distributed evenly, with larger primary airports operating close to full capacity, and many smaller regional airports operating below par unable to compete with prime city-based aerodromes (ICAO, 2019; European Commission, 2019).

2.4.1 Airport Capacity

Expansion of the European aviation market has left larger primary airports experiencing issues with capacity constraints and higher levels of congestion. Smaller airports have the inverse problem, with capacity often underutilised, impacting efficiency (European Commission, 2015). As a direct consequence of capacity constraints, airlines sought to improve the efficiency of their flight networks. 'Hub' airports began to emerge. Dublin Airport, for example, is a 'hub' airport, operating a 'hub-and-spoke' system. 'Hub' airports require high levels of demand and an extensive network of inward flights and outbound 'spoke' destinations. Most hubs are situated in major cities and as routes and connections increase, capacity issues are exacerbated (Burghouwt, 2013).

However, passenger trends are changing with passengers choosing more direct routes over low prices and periphery airports. Airlines are adapting accordingly and offering a mix of flight options across varying price ranges while operating from primary and secondary airports (Eurostat, 2019). Many European airports are already operating at or approaching full capacity. With a lack of development options to facilitate new infrastructure, primary airports must address how they can accommodate further increases in flights and passenger numbers. Conversely, new generation aircraft are capable of flying longer distances and soon may have the capacity to bypass airports they might have traditionally flown to as they can reach further airports now, creating a threat to some airports and opportunity for others.[4]

Prior to the COVID pandemic, in 2018, ACI-Europe estimated that airports would experience much higher levels of congestion and predicted global passenger traffic to reach 22 billion by 2040. Increases in the number of airports operating with limited

[4] https://www.weforum.org/agenda/2019/05/planes-can-now-fly-for-21-hours-non-stop-but-are-humans-ready/

capacity by 2040 is forecast to lead to an increasing number of delays during peak times (Eurocontrol, 2018). Furthermore as primary airports reach full capacity the need for supporting secondary airports increases (Garcia, 2017). Pre-Covid the number of passengers and flights was predicted to increase year on year (Department of Transport, 2018).

	Passengers		**ATMs**	
	Millions	**Average annual growth rate 2017-2050**	**000s**	**Average annual growth rate 2017-2050**
Dublin - 2016	**28**	**-**	**216**	**-**
Baseline – 2050	54	2.0	365	1.6
Upside – 2050	61	2.3	409	1.9
Downside - 2050	49	1.7	329	1.3
Cork - 2016	**2.2**	**-**	**50.9**	**-**
Baseline – 2050	4.1	1.8	71.6	1.0
Upside – 2050	4.6	2.2	75.9	1.2
Downside - 2050	3.7	1.5	68.3	0.9
Shannon - 2016	**1.8**	**-**	**19.1**	**-**
Baseline – 2050	3.3	1.9	32.9	1.6
Upside – 2050	3.8	2.2	36.2	1.9
Downside - 2050	3.0	1.5	30.5	1.4

Table 4: Summary of passenger forecasts, by scenario, 2018 (Source: Department of Transport, Tourism and Sport).

In line with the predicted increase in passenger numbers the Irish Government investigated the capacity requirements of Dublin, Cork and Shannon.

Dublin

Infrastructure component	Year when capacity constraints start	Additional capacity needs to meet demand to 2050
Stands	2025-35	39 to 89
Terminal 1 baggage reclaim hall	2020-25	Up to 35 percent increase in reclaim carousel capacity, and up to 80 percent increase in space
Terminal 1 boarding gates (Pier 1)	2025-30 (driven by crowding, assuming it is not possible to spread demand to Pier 2)	Up to 10 gates
Terminal 1 boarding gates (Pier 3)	2025-30 (driven by gate availability, assuming it is not possible to spread demand to Pier 2)	Up to 8 gates
Terminal 1 immigration (queue times)	2030-35	10 to 20 passport verification desks
Terminal 1 immigration (crowding)	2030-2035	Approximately 300m2 to 900m2 of space
Terminal 1 passenger security screening (queue times)	2035-45	Up to 8 x-ray lanes

Infrastructure component	Year when capacity constraints start	Additional capacity needs to meet demand to 2050
Terminal 2 TSA compliant screening (queue times)	2020-25	4-9 x-ray lanes
Terminal 2 bussing gates	2025-35	2 to 4 gates by 2050
Terminal 2, eastern check-in zone	2020	Up to 19 desks
Terminal 2 immigration (crowding)	2030-40	233m2 to 649m2 of space
Terminal 2 CBP pre-clearance border checks	2030	6 to 13 desks
Terminal 2, western check-in zone	2030-35	Up to 15 desks
Terminal 2 hold baggage screening	2035-40	Up to 4 HBS machines
Terminal 2 baggage reclaim (carousel capacity)	2040-45	20 percent increase
Terminal 2 passenger security screening (queue times)	2035-40	Up to 10 x-ray lanes (unless system can be upgraded to automatic tray return, similar to T1)
Terminal 2 baggage reclaim (area)	2035-45	Up to 40 percent increase in floor space

Table 5: Airport Capacity Requirements to 2050, Dublin (Source: Department of Transport, Tourism and Sport, 2018).

Cork

Infrastructure component	Year when capacity reached	Additional capacity needs to meet demand to 2050
Immigration area (queue times and crowding)	2020	5 lanes and 50 percent increase in space
Passenger security screening (queue times)	2020-25	3 to 5 x-ray lanes
Boarding gates	2030-35	Up to 3 gates
Stands	2030-35	4 to 6 stands
Departure lounge space (excluding space occupied by food and beverage outlets)	2030-35	60 percent increase in space
Passenger security screening at central search (crowding)	2035-45	50 percent increase in space

Table 6: Airport capacity requirements to 2050, Cork (Source: Department of Transport, Tourism and Sport, 2018).

Shannon

Infrastructure component	Year when capacity reached	Additional capacity needs to meet demand to 2050
Baggage reclaim carousels	2020	2-3 carousels
Passenger security screening (queue times)	2020-25	5 x-ray lanes
Departure lounge space (excluding space occupied by food and beverage outlets)	2025-35	Up to a 75 percent increase in waiting space excl. food and beverage outlets to meet peak demand over relatively short periods of the day, principally in the summer months
Stands	2035	Up to 12 stands
CBP pre-clearance desks	2035-40	Up to 7 desks
Immigration area (queue times)	2040-45	2 desks

Table 7: Airport Capacity requirements to 2050, Shannon (Source: Department of Transport, Tourism and Sport, 2018).

It is expected that capacity will be reached at all airports between 2025 and 2040. Airport capacity restriction is difficult to overcome. Expansion is often restricted by political intervention, regulation, planning and environmental laws. Airports can also lack the resources to expand and can be restricted by geographic location (EuroControl, 2018; Department of Transport, Tourism and Sport, 2015). It is predicted that airport congestion will continue to affect aviation and that different approaches to expansion and growth should be considered (EuroControl, 2018). Rather than looking towards expansion as a means of relieving scarcity of capacity, airports must consider more effective ways of efficiently using and allocating existing capacity (Cavusoglu and Macário, 2021). According to Jimenez and Suau-Sanchez (2020) available capacity of smaller regional airports is often left unused. Another key area of concern is capacity duplication. This exists when airports are developed in close proximity to one another, as is the case in Ireland. Airports, therefore, are looking to minimise aviation ground movement in their bid to improve turnaround efficiency and alleviate capacity issues. The EU are working towards the development of an integrated Air Traffic Management System, SESAR. 'As one of the most innovative infrastructure projects ever launched by the European Union, SESAR's role is to define, develop and deploy what is needed to increase ATM performance and build Europe's intelligent air transport system'.[5]

It must be noted that COVID-19 has led to a dramatic fall in passenger numbers and airport capacity figures will need to be revised to reflect this. Some European airports have lost up to 90% of traffic. EuroControl (2020) predict that air traffic volumes may possibly return to 2019 levels by 2024 depending on vaccination success and uptake. While demand for air travel remains temporarily suppressed, airline capacity is reduced and capacity restrictions less problematic. However it is not only the lack of availability or over supply of airports that is of concern. The inability to sufficiently manage capacity and maximise efficiency across the EU to enable future cost reductions and the development of leaner business models must continue to be addressed.

[5] https://www.sesarju.eu/discover-sesar

2.4.2 Slot Allocations

Slot allocations are important to the viability and competitiveness of airports. They are a means of attracting airlines and are imperative to commercial success. Access to slots at peak times contributes to the level of competition amongst airlines and the extent of choice for consumers.

The EU framework is centred on equal opportunity and gaining access to and from even the most congested airports. EU regulations governing slot allocation (EEC 95/93; EC 793/2004) are designed to ensure transparency and non-discriminatory practice. In the past prime slots were allocated to national carriers and dominant airlines making it difficult for other airlines to compete. Currently the EU operate 'Grandfather Rights' and 'Historical Slots – Time Adjustment' rules meaning that once air carriers operate a specific series of slots at least 80% of the time during the season, they automatically retain access to those slots (Cavusoglu and Macário, 2021). 'Grandfather Rights' are favoured over outright ownership of slots and the rule has proven to improve flight frequency at times of lower passenger demand (Sieg, 2010). However, the approach also has its negatives with airlines holding onto underused slots rather than exchanging or transferring them for better use by other airlines (steer davies gleave, 2011; Ranieri et al. 2013). The system continues to favour dominant airlines and restrict market entry (Gillen and Morrison, 2008; Gillen and Starkie, 2015) as well as contribute to airport inefficiencies due to underused slots.

Competition is also affected. Airports attract airlines through service offerings and slot allocations. Lack of suitable allocations could result in passengers choosing different airports with better offerings. Passengers drive revenue and if EU airports cannot offer suitable slots, supply is affected (Christidis, 2016). Consolidation within the industry has provided airlines with access to additional slots at both primary and secondary airports. This however has also increased the market power of consolidated airlines. EU slot allocation rules should be adapted to implement 'market-compatible mechanisms', such as slot trading, to promote healthier competition (Guiomard, 2018). A proposal to review EU slot regulation policy was brought forward in 2011. The aim was to establish a fairer

and more equitable system of allocation and dismantle the current 'grandfather rights' system. Under the proposal, a neutral and unbiased coordinator, unaffiliated in any way to airlines or airport management, would oversee future slot allocation. It also included a request to raise the slot series usage rate to 85%. The proposal was rejected but the European Parliament agreed to implement penalties for late hand-back of slots by airlines, recognising the current system prevents airports from operating at optimal capacity.

Guiomard (2018) further proposes that slots should be allocated using market prices to enable more efficient use of existing 'expensive airport infrastructure' and airports should seek to more effectively manage runway capacity, deferring the costly investment in infrastructure expansion until it is entirely necessary. In addition a more efficient system of slot allocation could help airports manage capacity more efficiently. Airports are an integral link in the aviation value chain. Implementing market based pricing strategies throughout the EU could help create more efficient and competitive airports.

2.4.3 Safety & Security

Airport investment in safety and security systems has increased over the years with the EU continuing to develop new rules and regulations. It is estimated that European airports security systems now account for over 20% of airport operational costs (ACI-Europe, 2020). Over 1.1 billion people travelled by air in the EU during 2019 (Eurostat, 2020). The safety of all passengers is a primary concern for the EU and member states. However security costs continue to rise and such costs are difficult to absorb, especially for smaller airports. Recent EU requirements to update screening baggage systems are estimated to cost European airports in excess of €15 billion to implement (ACI Europe, 2020). For Irish regional airports, including Kerry, Donegal, Knock and Shannon, the cost of installing the necessary equipment is expected to cost in the region of €14 million. If these costs are not subsidised, they are passed to airlines and passengers thereby further reducing airport competitiveness. While the EU and national aviation regulators continue to mitigate against security risks, airports face increasing costs to

continually maintain, upgrade or implement new and more advanced systems. The disruption to business and absorption of security costs must be accounted for and airports must ensure wait times and passenger delays are minimised. Maintaining competitiveness is increasingly difficult for those not in receipt of state subsidies.

2.4.4 The Emergence of Low Cost Carriers

The creation of the single aviation market resulted in an early burst of low-cost carriers (LCCs) to the market, increasing the need for suitable infrastructure and an increase in the number of European airports. Liberalisation offered airlines the freedom to enter and exit markets more easily thus altering the relationship between airports and airlines (Starkie, 2009). In 2018, it was estimated that LCCs serviced over 29% of the global market (IATA, 2018). The growth of LCCs marked considerable changes to airport business (Jimenez et al., 2013) and created opportunities for smaller, regional and secondary airports throughout Europe (Burghouwt and DeWit, 2015). LCCs, restricted by the dominance of legacy and incumbent airlines at primary airports, exploited under utilised secondary and regional airports as a means of increasing flights (Jimenez and Suau-Sanchez, 2020) and flying 'point-to-point', directly from one airport to another.

Operating from smaller secondary airports was considered a prerequisite for LCCs as a necessary means of reducing costs and increasing capacity. Ryanair and EasyJet were the first to recognise the benefit of operating from secondary airports and adopted an aggressive expansion strategy establishing links between hundreds of smaller, secondary airports. Ryanair's approach breathed life into many underused regional airports throughout the EU.

However not all LCCs adopted the same approach, with some choosing to locate at primary airports. For example, EasyJet operate mainly from larger airports and choose to compete directly with larger airlines (Dobruszkes, 2013). Whether an airport is considered primary or secondary is not as relevant as it once was for low-cost services (Jimenez and Suau-Sanchez, 2020) with primary airports competing directly with smaller airports to attract new airlines. LCCs most often associated with secondary and regional

airports are making bold moves to establish themselves at primary airports as part of their expansion and growth strategy (Dobruszkes et al., 2017).

LCCs targeted secondary airports to gain operational efficiencies and avoid the higher charges of primary metropolitan airports. As more airports opened, LCCs could switch providers easily to create value. LCCs use the increased bargaining power to pressurise airports to reduce charges and improve service offerings (Christidis, 2016). Airports struggle for market share as more and more LCCs leave the market, leaving a few dominant airlines.

The increased bargaining power of airlines affects smaller, regional airports more than larger airports throughout Europe. LCCs exert their dominance in the market to secure lucrative deals designed to stifle competition, increase market share and block new entrants. Dziedzic and Warnock-Smith (2016) suggest that smaller airports experience a greater fall out from changes in airline strategies.

Increased competition means smaller airports must expand their service offerings and compete with much larger airports across Europe. Primary airports are often in a much stronger position to offer better services, with some airports, such as T3 in Paris Charles de Gaulle (CDG), building dedicated terminals for airlines. LCCs, however, have contributed to the growth of some secondary airports, to the point where they are considered primary airports. This was the case with London-Stansted, one of Ryanair's largest bases up to 2019. However these airports are exposed to even greater business risk when after significant infrastructural investment and development, airlines opt to depart without warning in favour of more lucrative offers. In April 2020, Ryanair announced it was to close its base at Frankfurt Hahn. The airport, previously a US military base airport, had made significant investment to facilitate Ryanair when Ryanair took over in 2004.

LCCs depart smaller airports for many reasons including a lack of suitable infrastructure and a fall off in demand. Runway length and permissible times of operation, due to noise and environmental regulation, can limit airport activity and push airlines to consider more viable options. LCCs choosing to focus on more lucrative markets with higher passenger

numbers may pull away entirely from smaller airports in their bid to grab further market share (Jimenez and Suau-Sanchez, 2020).

Consumer trends have changed and an increasing number of passengers want to fly direct to and from main cities (Eurostat, 2019). However many LCCs have been unable to compete and ceased operations entirely while others have been absorbed by larger airlines seeking to increase their market power.

Airline bankruptcies have resulted in huge losses for airports. Competitors have been quick to replace failed national airlines throughout Europe. The failure of Italy's national airline, Alitalia, caused problems for Italy's Milan Malpensa, when the airline ceased its hub operations. Low Cost Carriers (LCC's) moved swiftly to avail of the excess capacity leaving the airport to deal with more aggressive players focused on discounts and incentives to operate.

2.4.5 Passenger Growth Post-Liberalisation

Pre-COVID, passenger numbers throughout Europe were on an upward trajectory year-on-year (Eurostat, 2019). According to IATA there is direct correlation between aviation demand and economic growth. In 2018, the total number of passengers passing though Irish airports exceeded 36 million. Dublin Airport accounted for over 85% of the total with other Irish airports handling the remainder (CSO, 2019). The disproportionate spread of passengers across Irish airports reflects similar trends throughout the EU. Primary airports facilitate disproportionate passenger numbers and regional airports compete for what remains.

Passenger satisfaction is directly linked to passenger growth. Bogicevic et al. (2013) state that 'airport passengers tend to appreciate cleanliness of the facilities, shopping options, Wi-Fi and adequate seating'. They identified that 'major dissatisfaction with the airport service happens during the security screening procedures'. Airports contribute to the overall passenger experience. Faster check-ins, car parking and efficient service offerings contribute to the quality of experience and passenger satisfaction ratings. Airports continue to invest in the overall passenger experience, developing retail space and other

non-aeronautical services that contribute to overall service. The daa invested €637 million to develop T2 at Dublin Airport and €160 million to build the new terminal at Cork Airport.

The growth of a 'greener', more sensitive and environmentally aware population has contributed to airports seeking to reposition in the greener market. Increased investment in environmental planning and seeking greener alternatives to current operations has encouraged smaller airports to consider facilitating smaller electric or hybrid aircraft (Jimenez and Suau-Sanchez, 2020). Whether such traffic could sustain airports is questionable. It seems more likely that smaller airports linked to well designed and accessible transport infrastructure, such as roads and rail, might present a more viable alternative in mainland Europe (Lin, 2013).

2.4.6 Competitive Environment following Liberalisation

As already stated, airport revenues stem from aeronautical and non-aeronautical activities with higher profitability airports generating a higher percentage of revenues from non-aeronautical services (Oum, Adler and Yu, 2006). Competition has increased dramatically and is not just limited to airports operating in close proximity to one another but between all airports operating throughout Europe, irrespective of size. With more and more LCCs establishing a presence at primary airports, competitive boundaries have extended.

Increasingly smaller regional airports are competing with larger primary airports in a bid to keep and attract airlines. Competition between airports is based on airport charges, service offerings, location and capacity (Francis et al., 2004; Gillen and Lall, 2004). Capped charges at primary airports can limit regional airport competitiveness but strategies based solely on lowering airport charges to attract airlines are no longer sufficient.

The EU maintains control over competitive practice and member states adhere to EU competition law. There are a number of factors contributing to the overall competitiveness within the aviation market, including cost-focused airline business

models, improved technology, better airport services and increased customer choice. The increased bargaining power of airlines and the ability to switch airports easily has also heightened competition. Currently, 60% of air passengers in Europe travel through only 25 airports (IATA, 2018). Primary airports in main European cities facilitate the majority of EU passengers (EuroStat, 2019).

With the significant increase in competition, airports must adapt to survive and it is argued that EU regulation should not be a 'one-size-fits-all' framework but instead attempts should be made to identify where low levels of competition exists so suitable regulatory actions can be implemented (Avogadro et al., 2020). Market power varies immensely from airport to airport (ACI, 2018) and so the EU must ensure that a small number of airports and airlines do not dominate the competitive landscape as this would contradict the objective of liberalising the market. Airports in the past operated as natural monopolies with the ability to charge excessive prices (Avogadro et al., 2020). ACI Europe (2018) suggest that the EU should consider the market power of individual airports and adjust regulation accordingly.

Airport size and the extent to which airports engage in competitive behaviour suggest that larger hub airports are not as proactive as smaller markets but all airports are subject to competition (Bilotkach and Bush, 2020). Increased competition could reduce the likelihood that airports will abuse market power . While Marques & Brochado (2008) discuss the relevance and importance of regulation, polices and directives designed to encourage competition can also have the opposite effect (Littlechild, 2018). Airports are not always in a position to compete effectively due to the constraints of EU regulation.

Competition may vary immensely between airports (Thelle and Sonne, 2018) and airports seem to compete with differing levels of intensity (Bilotkach and Bush, 2020). It is argued that airport behaviour should be analysed before strict regulation is imposed and then only if the airports has significant influential market power and are likely to abuse or take advantage of it (Bilotkach and Bush, 2020).

2.5 Regulatory Challenges

The European Union continues to face challenges in their attempt to liberalise aviation and support member states. Regulation has not been implemented at the same pace or with equal vigour across all member states. Policies and directives are not always transposed and aligned successfully to existing national policy. Pre-existing agreements render it difficult to implement certain directives and policy is not always encapsulated in legislation but rather provided as a guideline. Currently the EU is adjusting to Britain's exit from the EU and the COVID pandemic has decimated the aviation landscape, threatening the very survival of airlines and airports throughout Europe.

2.5.1 COVID Pandemic

The COVID-19 pandemic is forcing the EU to adapt its regulatory framework to protect the aviation industry. ACI-Europe (2021) predicts that 193 out of 740 airports will struggle while government-imposed restrictions and quarantine requirements remain in place. The airports currently experiencing most pressure are mainly smaller, regional hubs.

European passenger numbers continue to fall with a loss of over 1.72 billion travellers in 2020 (ACI-Europe, 2020). Eurocontrol (2021) state that of the 41 member states Ireland was amongst the worst affected. In 2019, Dublin Airport accommodated flights from close to 50 airlines flying to more than 190 destinations in 42 countries. In April 2020, these numbers had fallen to 22 destinations in 11 countries and 7 airlines (daa, 2021).

In response to COVID-19 the EU adopted several measures to assist the aviation sector including rules concerning renewals and extensions of certain licenses, certificates and authorisations (EU 2020/698). The European Commission re-examined its directives governing State aid measures, and relaxed measures to allow EU member states provide greater assistance to the sector. While the adjusted framework is necessary, the EU continue to ensure decisions made do not impact the competitive environment in the longer term. Albers and Rundshagen (2020) suggest that the provision of government

assistance could distort competition and compromise gains made over the past number of years.

Airports of all sizes across the EU have been forced to adapt to an unprecedented environment. Passenger numbers have fallen and are not expected to recover quickly (ACI-Europe, 2020). Airport revenues are substantially reduced and many businesses within the industry have been forced to scale back operations. Airports have employed different strategies to protect cash flows in a bid to remain solvent. These include furloughing and seeking redundancies, as well as seeking debt repayment holidays.

Europe's top 20 airports have cut expenses by over €3 billion to date and capital expenditure programmes are down €2.6 billion (ACI-Europe, 2021). However while airport revenues fall, fixed costs remain the same.

Additional finance has been raised through capital markets and government backed packages. The EC approved supports put in place by the Irish government to provide compensation for lost earnings and damage to business, as well as finance to cover fixed costs. The Commission made exception on the grounds that the supports were necessary to protect the Irish aviation industry and remedy the negative impact of COVID-19 on the Irish economy.

Many airports are burdened with debt. Without the necessary cash reserves to service debt and cover significant fixed costs airports will not survive. Paderborn airport in Germany recently filed for insolvency after passenger numbers fell 85%, the first in a long line of potential casualties (Eurostat, 2020).

Regulatory implementation has been postponed or delayed throughout the EU as airports scramble to withstand the fall out from the pandemic. Airport business plans have changed from ambitious expansion projects to survival strategies.

Furthermore, the pandemic may force the EU to address longstanding concerns regarding the fitness of the regulatory framework and whether it truly lends itself to a fully liberalised market.

2.5.2 Brexit

Britain exited the EU December 31st 2020. Previous research examined the potential impact of a 'no-deal' Brexit with UK airlines operating outside the EU. Regional airports were identified as vulnerable due to the reduction in air services between the UK and Europe. It was expected that the UK would lose the freedoms gained through the liberalised market (Dobruszkes, 2018). Concerns were raised regarding the potential administrative and bureaucratic delays due to reactivating border controls. The EU and the UK reached a formal Trade and Cooperation Agreement (TCA) in late 2020 designed to preserve the existing regulatory framework for air services and aviation safety while still removing the UK from the single market.

Under the agreement, the rights to fly between the UK and the EU are preserved with no limits on capacity or frequency. UK airlines no longer have access to EU internal routes and EU airlines no longer have access to domestic UK traffic rights. In preparation for Brexit many airlines established necessary subsidiaries in member states to preserve their European rights.

Air traffic to and from the UK is vitally important for Ireland. Ireland's aviation sector is the most heavily dependent on UK traffic of any EU country (Eurostat, 2018). Heathrow is the busiest route for Dublin Airport, serving 1.8 million passengers in 2019 (CSO, 2020).

2.6 Analysis of the Literature

Regulatory Framework

Since its inception, the EU has adopted a gradual cautious approach to deregulation and liberalisation. The process is often slow and has led to litigious friction between the EU, member states and those involved in the provision of services. The lack of uniformity and disparity in implementation has facilitated anti-competitive behaviour, at odds with the EU objective to create a fair and non-discriminatory single market.

Airport Charges

Due to the disparity and lack of uniformity in implementation, along with the issues that capped charges pose for smaller regional airports, the current Airport Charges Directive requires some significant adjustments to deliver a fairer system. EU airports should not be forced to adhere to the directive where they do not have significant market power. On the other hand, analysis suggests that price capping and regulation is entirely suited to larger airports that may otherwise abuse their dominance in a market. Airlines have undoubtedly benefited from the introduction of the ACD, gaining access to primary airports and the charging system has lead to greater transparency. With the introduction of the proposed universal performance measurement system, airports will be in a stronger position to determine the success of the ACD in terms of efficiency. The ACD, while attempting to create a more competitive environment, seems to have come down on the side of airlines, ensuring they are treated equally and fairly and charged the same, irrespective of airport size or airport market strength. Airports, on the other hand, find themselves unable to recoup operational costs through airport charges and are investing significantly in non-aeronautical services to remain profitable.

Costs and pricing

Airports continue to face the rising costs of implementation and compliance. Smaller regional airports can apply for state aid to have these costs covered, to ensure they remain compliant with EU law. However not all airports have access to state finance and so must cover development and operational costs from revenue. It is evident from the body of research that airports cannot rely solely on such revenue from aeronautical services and significant investment must be made in non-aeronautical services, such as retail and other business concessionaries.

Pricing structures must cover costs but larger EU airports must also adhere to EU regulation when setting prices. This can make it more difficult to attract new business. Conversely, smaller airports often must negotiate with dominant airlines and have little power. In the case of Cork airport, airlines offering new routes are exempt from charges for the first 12 months of operation, after which time the airlines may choose to leave.

This is common practice at many smaller regional airports throughout Europe. As more airlines leave the market, or consolidate to gain market share, a dominant number remain, making it difficult for airports to negotiate without conceding to demands that ultimately impact on cost base.

Liberalisation

Liberalisation has delivered on many fronts. Quality of service, improved connectivity and choice, passenger growth, fair practice and aviation safety are some of the benefits evident from research. However, the framework is not fully cohesive and both airlines and airports have exploited the exposed loopholes. This in turn has led to uncompetitive practices, tilting the landscape in favour of one or the other. The lack of cohesion and disparity in implementation has led to open criticism by both airlines and airports and risks undermining the entire process of deregulation and liberalisation.

State Aid

Plans to eliminate all state aid may extend beyond 2024 to allow the EU to address the fall out from the COVID-19 pandemic. State aid can distort competition and result in loss making airports receiving funding that could be put to better use. There is an increased likelihood that smaller airports, i.e. those with less than 500,000 passengers, may face closure once state aid is no longer permissible. Airports in receipt of state aid will need to increase revenue and improve overall efficiency to survive. The EU suggest that airports should not cover similar catchment areas as it may lead to duplication of capacity. Throughout Europe, the displacement of air services from non-subsidised airports to subsidised airports threatens competition (ACI-Europe, 2020).

In Ireland, airports exist in close proximity to one another, and state owned airports are seeking to cut funding to regional airports believing they do not deliver value for money. State airports, which include Dublin, Cork and Shannon want the Regional Airports Programme (RAP) to be revisited and adapted to meet the objective of the National Aviation Policy (2015) to phase out funding operational expenditure at unviable airports by 2024. Regional airports in Ireland continue to argue that the airports are vital to rural

connectivity but the risk is airlines will use these airports and their PSO routes depriving state owned airports of necessary funding and business.

The EU needs to consider existing capacity, whether airports have overlapping catchment areas and whether there is sufficient demand for services before approving government aid or assistance to airports. This may reduce the risk of funding unnecessary expansions that may displace services from other, often more profitable, airports operating in close proximity. This could lead to a defined, limited number of sustainable, financially viable and geographically dispersed airports throughout the member states and thus contribute to a more efficient and competitive market.

State aid may be necessary for the survival of smaller airports, particularly those deemed critical to national infrastructure and regional development. However the application for state aid should be based on a cross European sustainable business model.

Capacity and Slot Allocations

Capacity is a problem at both ends of the scale. Larger, city based airports are dealing with capacity restriction and operational curfews, a situation that is likely to continue once passenger numbers return to pre-COVID levels. Capacity is often under utilised at smaller airports and reduces overall efficiency thus increasing costs. Capacity utilisation needs to be addressed and airport performance must be tracked to see where suitable viable improvements can be made. The EU slot allocation system could benefit from some reforms to improve airport efficiency and increase overall competition throughout the EU.

Competition

The research shows evidence that liberalisation of the aviation market increased competition. Airports face competition from airports of all sizes throughout the EU. The market is more competitive due to the limited number of airlines, both low cost and full service, in operations throughout the EU. The risk of airline bankruptcies has increased since the pandemic and the decimation of passenger numbers throughout Europe contributes to a very difficult period. While passenger numbers are expected to return to

2019 levels over a 5-year period, this depends entirely on successful vaccination programmes, less travel restrictions and a reduction in quarantine requirements. The EU needs to ensure a robust regulatory framework exists to support the return to air travel. However current research indicates the pace of adoption of common policy is slow in a market that changes quickly and has many stakeholders.

Aviation is an evolving market. Competitors face continuous political, economic, social and technological challenges. Opportunism and agility are key to success and airports must respond accordingly to environmental and industry changes. The aviation market is always evolving and dependent on many external factors such as fuel prices, economic fluctuations, political influences and international security.

2.7 Conclusions

The process of liberalisation has been largely successful but it still has not reached its full objectives and there are key areas of disparity within the system.

Regional and smaller airports are under increasing pressure due to costs of compliance and implementation of regulation and therefore will be challenged even further if state aid is no longer available. This may devastate local economic development or strengthen the position of stronger airports and lead to a more efficient competitive environment.

Airlines have higher bargaining power and airports are forced to seek revenues in other ways. New business models are emerging where non-aeronautical services contribute to overall income.

Both capacity constraint and under utilisation are an on-going problems and ones that could possibly be fixed by the introduction of more suitable universal performance measurement system.

Finally, the speed at which regulation is implemented and the disparity and lack of uniformity in implementation across all member states remains an issue. Objectives are not always met and EU policy is not always aligned to national policy and vice versa. The concept and notion of a liberalised market is to be encouraged but the framework

must be readjusted and strengthened to protect weaker players. A more robust framework would continue to protect passengers while developing a competitive and fair market. Moreover the pandemic has highlighted the need for a more flexible regulatory structure that can adapt quickly to an ever-changing business environment and respond to changing market demands.

3. Methodology

3.1. Introduction

The research was explorative in nature, seeking to determine the impact for Irish airports of operating within the EU's single transport market. Qualitative Research, in the form of semi-structured interviews, was the chosen research method. Data was also drawn from EU and Government reports, academic journals and articles. There is a paucity of research in this area so interviews were necessary to fill critical knowledge gaps and to gain insights as to the kinds of challenges, issues, problems and opportunities being experienced specifically within Irish airports. This chapter explains why this method was used, how the data was collected and subsequently analysed. It also explains some possible limitations within the research.

3.2 Aims and Objectives of Research

The main aim of this study is to examine the role of the EU within the aviation sector and the impact, if any, the European aviation regulatory framework has on the growth and strategic direction of international and regional airports. A secondary aim is to determine whether the risks and opportunities posed by operating within the single European market enhance or inhibit Irish airport operations and whether the implementation of EU regulations and policies have hindered or improved overall performance.

This was achieved by examining key documents and reports, as well as analysing the responses and contributions of key management staff from the three state owned Irish airports (Dublin, Cork and Shannon) to determine if there were common experiences and challenges faced by airport management due to Ireland's involvement in the single air transport market within the EU. The objective of the research is to act as a starting point to further research to determine the best approach for Irish airports going forward. This is of particular interest in light of the current COVID pandemic. The study examines whether airports should continue as public or private entities, the current key challenges and how key challenges might be addressed in the future to protect existing airports, particularly the smaller regionals that serve the communities in which they are based.

3.3 Research Design

A qualitative approach using semi-structured interviews, as well as documentary analysis of relevant industry journals, conference and webinar papers, was deemed the best approach to explore the research topic.

Semi-structured interviews enable the researcher to devise a set of open-ended questions that address the question under investigation. The aim of qualitative research is to uncover insights and opinions, discerning meaning from what is presented (Burnett, 2009). The questions are designed to encourage the interviewee to respond with flexibility and afford the interviewer the opportunity to explore responses and develop the discussion further. According to Burgess (1984), a semi-structured interview is a 'conversation with a purpose'.

The interviewer poses the questions but has the freedom to follow any relevant lines of enquiry that may contribute to the research. Semi-structured interviews provide wider scope to express opinions (Silverman, 2011) and provide a natural flow to conversation. The questions were designed to encourage open and free expression of opinions and views, allowing participants to elaborate further, thus contributing to a more informal discussion. The aim was not to mislead or direct conversation in any particular direction or to influence the answers but to cover the research topics and any relevant topics that emerged by facilitating a deeper discussion through follow-up questions (Rubin & Rubin 2005, Bell 1999).

Research participants were chosen from across the three state owned airports. Dublin Airport accounts for 86% of air traffic in Ireland with Cork accounting for 7% and Shannon 4% (CSO, 2019). The group comprised a small carefully selected sample of eight managers from Dublin, Cork and Shannon airports. The combined experience of the managers is extensive, with each participant operating in a variety of different roles throughout their careers including, but not limited to, finance, marketing, operations, asset care, security, technology and development. Managers were chosen from Irish airports, and not European airports, as the research is focused on the implications of the EU regulatory framework within an Irish context. Knowledge of national aviation policy

was crucial to understanding the impact of transposing EU regulation into national strategy. National transport strategies vary across EU member states and the impacts of liberalisation would vary accordingly. The research therefore has a narrow but determined focus.

All interviews were conducted on a one to one basis. This format was the preferred option as the researcher felt that group interviews might result in participants being less forthcoming with their answers. Also within the group environment there was a risk that the responses may be swayed by other opinions within the group. Research questions were open-ended to allow the participant speak openly and freely and produce answers that 'reflect the richness and complexity of the views held by the respondent' (Denscombe, 2017). Some meetings were held face to face and others were conducted online using Google Meet. Online meetings were held due to Level 5 COVID restrictions. All participants adhered to the relevant HSE guidelines at the time of interview.

At the outset of the study the researcher planned to attend a number of conferences and visit other airports within the EU for research purposes. The global COVID pandemic resulted in some conferences moving online, while others were cancelled completely. It was not deemed safe to travel outside of Ireland to visit other airports so the researcher drew on previously documented visits to other EU airports, including airports in Denmark and Belgium. Analysis of relevant conference papers, strategic plans and industry reports contributed to the research and were used to facilitate deeper research on the chosen topic.

3.4 Data Sampling and Collection

3.4.1 Data sample

A purposive sample group of eight managers covering a wide base of responsibility was selected from the three state owned airports in Dublin, Cork and Shannon. All those interviewed have worked in the airport for more than 10 years, some close to 30 years, and have vast combined experience in a variety of different roles and positions.

3.4.2 Data Collection

Participants within the sample group were assigned identifying codes. The codes identify the airport in which they work, the department they currently manage, followed by their placement in the interview process. Therefore, for example, C A M 1 denotes: Cork Airport; Marketing department; first interviewee. The purpose of the codes was to anonymise the data and yet make it possible to for the researcher to recognise each participant. Due to the high commercial and sectoral sensitivity of the material discussed in this thesis, it is not possible to apply labels to specific quotes. They are instead used to assist the researcher in anonymising and organising the research.

The data was initially captured by recording on a mobile device. The recording was later uploaded to a secure drive. Online meetings were video recorded and saved to the same secure drive. The interviews were then transcribed into a Word document. Each interview took an average of four hours to transcribe. Once transcribed the researcher carefully went through the document to ensure the content was accurate.

3.5 Ethical issues

The study obtained ethical approval from the UCC Social Research Ethics Committee and the interviews were conducted between March 2021 and April 2021. An information sheet was given to each participant outlining the purpose of the research and what participation in the study would involve. This enabled all participants to make an informed choice. It was explained that meetings would be face-to-face except in the case where government guidelines/restrictions relating to COVID prevented this. In the cases where face-to-face interviews were not permitted due to the level 5 restrictions preventing inter-county travel, interviews took place online using Google Meet. Each participant was given assurances regarding anonymity and confidentiality. Once the interviews were transcribed and all identifying information removed, all audio and video recordings were deleted leaving only the anonymised transcripts that were stored on a secure drive within the University. At the beginning of each interview, participants were asked to read and sign a consent form.

3.6 Data analysis

A thematic approach was used in the research analysis (Braun and Clarke 2006, Dawson 2019). Audio files were carefully transcribed ensuring all information provided was retained. The researcher took extensive notes and assigned codes to the data throughout the transcription process. The notes were reviewed and decisions made regarding the data. All information relevant to the code was organised into a table in Word. The data, guided by the research objectives and research questions, was categorised into varying themes and subthemes to help isolate the most common themes. The broader themes were then refined into narrower and more specific themes.

Each interviewee was assigned a unique code to ensure the anonymity of all participants while also providing an easy reference when going back and forth while reading and interpreting data. The data was mined and any material deemed irrelevant was discarded. Pertinent findings from the data were compared against current literature to help establish common themes.

3.7 Contribution of the Study

Due to the lack of research surrounding the impact of liberalisation on Irish airports, this body of work could prove useful for further research pertaining to the survival of regional airports and the exploration of potential expansion strategies, particularly in light of recent developments, in Ireland.

3.8 Limitations of the Study

Due to the small sample size the findings cannot be considered comprehensive. Participants were chosen from the three Irish state owned airports and did not include participants from the smaller state funded regional airports. Due to the COVID pandemic and restrictions regarding travel it was not possible to attend a number of conferences that were postponed. These forums provide useful data and insights into current developments within the EU that directly impact airports throughout the EU. In addition, the global

pandemic has completely altered the aviation landscape and propelled some issues into the spotlight. For that reason the research was mostly based on pre-pandemic estimations with regards to passenger growth.

3.9 Conclusion

Chapter three discussed the reasoning behind the chosen research methodology of semi-structured interviews as a means of collecting data. It details the rationale for adopting a qualitative approach to research and why such an approach was considered most effective to this body of research. It outlines the background and experience of the sample group and how interviews were organised and the data collected. It also explains how the data was analysed to extract the most pertinent information. Ethical issues, possible limitations and how the body of work could contribute to future research were also discussed.

4. Research Findings

4.1 Introduction and key themes

Chapter four covers the most significant findings discovered from the research data. The research provided deeper insight into Irish airport operations within the context of adherence to current EU aviation regulation. Analysis of the data produced a number of common themes that were present across the three airports. The themes reflected some of the findings of the existing literature in the research area.

Responses given by participants through the semi-structured interviews were varied but contained common thematic references to findings within current literature. Through careful analysis the primary themes were extracted and then compared to the findings of current literature. There were several cross-overs between the data and the theoretical literature but the research also produced insights that were more specific to Irish airports.

The themes identified and discussed in this chapter, as a result of liberalisation of the air transport market, clearly indicate both the positives and negatives for Irish airports operating in adherence to EU regulation. Themes include passenger growth, improved accessibility, changes in business structure and integration, along with the increasing power of airlines, higher costs, airport charges and state support. The chapter concludes with a summary of the main findings.

4.2 Benefits to Irish Airports of the Single Transport Market

4.2.1 Passenger Growth

The most stated benefit from participants of Ireland's participation in the EU's single aviation market was passenger growth. Each of the state owned airports have seen passenger numbers rise consistently since the market was liberalised. Over the period 2015-2019, passenger numbers at Dublin Airport grew from 25 million to 32 million; Cork Airport rose from 2 million to 2.5 million and Shannon Airport[6] remained steady at 1.6 million. Such growth has led to improved infrastructure and connectivity, particularly

[6] Shannon airport is a fuel stop for many transit flights that are not included in the CSO figures

at Dublin airport. Ireland, as a country on the periphery of Europe, has established good connectivity with Europe. Dublin in particular has seen an increase in US and Middle East destinations.

4.2.2 Improved Accessibility

Participants spoke extensively of the impact to Irish airports following the emergence of low cost carriers and how these airlines broke the monopoly held by Irelands national carrier, Aer Lingus. 'You see increased competition and competition is always good; it has allowed challenges to the national airlines monopoly you could argue that was there and the low cost carriers have certainly gained a foothold to their advantage and to the passengers advantage'. Participants discussed how 'prices fell and passengers had access to lower fares as well as an increase in destinations'. Air travel became a much more 'accessible option' and the improved accessibility led to an increase in passenger numbers. The larger, unified market made it easier for people to travel within Europe, reducing barriers and improving accessibility.

4.2.3 Changes in Business Structure

Some of the group explained how much easier it was for airlines to operate within the new liberalised market. Airlines could establish bases in any country within the EU and were no longer restricted to their home country. This in turn increased competition at Irish airports and meant Irish airports continue to invest heavily in improving infrastructure and service offerings through the 'Capital Investment Programme 2020+' which is 'a €1 billion proposal to add capacity' and improve service offerings for customers.

Management at Dublin Airport explained how some services were outsourced to improve efficiency and changes in the business structure led to more streamlined, cost effective operations. The daa was established as a commercial semi-state airport company responsible for the operation and management of Dublin and Cork airport. The change in business structure, as a direct result of the liberalisation of the market, has focused

management to diversify and pursue new financial investment opportunities to fund operational expenditure requirements.

4.2.4 Economic Development

All participants mentioned economic development as a consequence of passenger growth and an increase in air traffic. This was true for all three state airports. Increases in employment, arrival and development of new business and the growth in tourism were cited as the key economic benefits. Each participant spoke of the important role regional airports play in regional development and cohesion. Airports were seen as a necessary lifeline for some communities, without which these communities would struggle to attract investment or tourism. Most participants however were in favour of reducing the number of airports currently operating in Ireland but were mindful that such closure would not be without impact and could lead to further isolation of rural communities. It was also acknowledged that some regional airports were operating merely as 'political opportunities' and were clearly 'not sustainable going forward'.

4.2.5 Integration and Information Sharing across the EU

One participant, having worked with the national carrier, Aer Lingus, for many years mentioned that prior to the liberalisation of the market 'slot allocations were a massive issue and created huge problems. Airlines could not get their hands on slots that were allocated to national carriers'. He believed these issues had diminished 'because of the increased cooperation on the European level'.

Another participant spoke of the 'much higher level of integration because of information sharing'. He explained that management from the smaller regional airports in the EU 'meet regularly to discuss and share ideas on things like safety, snow and ice response, emergency response and potential revenue opportunities'. He explained that such sharing is invaluable to airport development and helps brings growth and identify potential areas of opportunity.

Some other participants spoke of specific improvement in areas such as air traffic management (ATM) systems and the continued push from within the EU to further integrate ATM systems and create more efficient and effective airports all working towards the same strategic objectives.

4.3 Negative Implications for Irish Airports

4.3.1 Increased Power of Airlines

Many of the participants mentioned the increased power of airlines and their ability to switch easily from airport to airport. This was most evident when speaking with management of the smaller regional airports. Powerful airlines, such as Ryanair, Europe's largest airline group, were mentioned throughout the interviews, and the ability of such airlines to exert pressure on airports to reduce costs.

> Ryanair is the parent company of Buzz, Lauda, Malta Air & Ryanair. Carrying 149m guests p.a. (pre Covid-19) on more than 2,500 daily flights from over 80 bases, the Group connects over 225 destinations in 37 countries on a fleet of 450 aircraft, with a further 210 Boeing 737s on order, which will enable the Ryanair Group to lower fares and grow traffic to 200m p.a. over the next 5 years. Ryanair has a team of over 16,000 highly skilled aviation professionals delivering Europe's No.1 on-time performance, and an industry leading 35-year safety record. Ryanair is Europe's greenest cleanest airline group and customers switching to fly Ryanair can reduce their CO_2 emissions by up to 50% compared to the other Big 4 European major airlines. (Ryanair Corporate Website, 2021)

4.3.2 Loss of Duty Free

The loss of duty free [7] throughout the EU was seen by a four of the participants to be a negative consequence of the single European market. 'High profit Duty Free' was a key source of revenue particularly for smaller regional airports that subsequently struggled to

[7] The EU abolished duty free in 1999 at which point all duty free sales for travel between member states at airports, ferry ports and on flights and ferries ended. In 1995 tax-free shopping generated in excess of €4bn across the EU.

find ways of 'plugging the gap'. One participant said 'Duty Free was a key source of revenue for Irish airports. Not only that but it also inadvertently encouraged travel. People travelled to get their duty free'. Some participants saw Brexit as a potential opportunity for Duty Free shopping to return between Ireland and the UK and therefore a possible renewal of a previously lucrative revenue stream. One person remarked 'Discussions are well under way with regards to the return of Duty Free shopping between ourselves and the UK. This would mark a welcome return to what has always been a strong revenue stream for Irish airports'.

4.3.3 Airport Charges

The EU Airport Charges Directive is in operation at Dublin Airport. According to participants, the cap on pricing has directly impacted the smaller regional airports ability to compete on price. Management felt that 'if Dublin could set their own prices a little higher, relative to the services offered, regional airports would be able to drop their prices and be significantly more competitive, enough to maybe entice airlines back'.

4.3.4 State support distorting Competition

One participant mentioned that smaller regional airports 'benefit more from government supports, somewhat unfairly at times given their size and passenger figures'. Such support makes it hard to compete and state aid was seen as 'a complete waste of money propping up airports that contribute little and are not sustainable in the long term'. Another participant said it was grossly unfair 'that smaller less profitable airports received government support and funding for unsustainable routes and are operating in close proximity to bigger airports with better services'.

4.3.5 Increased Costs

EU regulation was considered by all participants as necessary but 'can be overly restrictive and costly to implement'. Most participants highlighted the cost of security at airports and explained security systems are the largest operational expense at Irish airports. EU standards require enhanced security requirements that mean 'significant

continuous financial investment'. 'Security has reason to slow the process of passenger handling down; it also introduces significant capital costs to airports, particularly smaller regional airports'. Another participant also noted that 'airport security costs are difficult to absorb. Complicated and time-consuming security processes reduce dwell times and this impacts on food and beverage and retail revenues'.

4.3.6 Diminishing Market

Airports are in direct competition with other EU airports and are fighting hard in a diminishing market. The number of airlines currently operating throughout the EU is reducing, with seven airlines ceasing operations since April 2020, leaving a few dominant players in the market. According to one participant this is 'forcing airports to adopt more aggressive strategies to attract and retain new business'.

4.4 Viability of Irish Airports

All of the participants indicated that airports were 'critical to national infrastructure' and contributed significantly to 'surrounding economic development'. Irish Airports are considered 'vital for connectivity to Europe, the US and the Far East'.

While the airports were considered necessary for continued international investment in Ireland, participants agreed that Ireland currently has too many airports in operation and some of the smaller airports are 'surplus to requirement'. Over half of those interviewed considered the airports in Sligo, Knock, Galway and Waterford as unnecessary as they overlapped with the catchment areas of the larger, more commercially viable airports of Shannon and Cork. Participants stated that Irish airports are situated 'too close together, sometime within an hours drive of one another'. One participant said 'there was a time when these airports contributed significantly to domestic travel but with the improvements in the road network and the continued expansion and development of roads in Ireland, they serve little purpose now. If anything they detract business from the larger airports'. Two participants highlighted that Irish airports are critical in terms of 'connectivity, business growth and tourism development', with a further participant stating 'if the European strategy is one that wants to support improvement then

consideration must be given to the need for an excess number of airports. European funding should only be provided in cases where airports can successfully display the potential positive contribution of a business to the national and European transport strategies'.

All participants agreed that Dublin Airport brings most traffic into and out of Ireland but is currently has capacity constraints and therefore should be supported by smaller regional airports. Smaller airports 'with viable catchment areas and established business models' are 'essential to local regional development'. They also 'provide necessary infrastructure to cope with emergency and overflow situations'. One participant stated they would have 'grave concerns if airport infrastructure could not facilitate traffic from Dublin in the event of an emergency'. The participant went further to explain that regional airports are vital to ensure 'continued access', stating that 'we do need the resilience that if something happened in Dublin planes can land somewhere and flights can continue to their destination without significant disruption'.

When questioned participants stated a minimum of 3 airports and a maximum of 4 would be sufficient to cover the island of Ireland's commercial activity. One participant stated 'The west coast is overridden with small airports with no viable commercial future, because none of them has a significant hinterland'.

'The other regional airports, like Waterford, Sligo, you know, particularly in a post COVID environment, it's going to be difficult for those airports to forge any kind of headway and get any kind of commercial traction'.

All participants agreed that, going forward, the viability of each Irish airport should be investigated to determine 'what is sustainable and what's not sustainable', especially those airports in receipt of funding.

Such an investigation 'should take into account what potential growth it [an airport] has in regard to business, tourism, whatever would drive the business, to see is it worthwhile and can it get approval for infrastructure spend on the basis that it would be of critical importance to an area and can deliver a sustainable model'.

4.5 EU Consideration

Participants gave their views on whether the EU gives due consideration to Ireland's status as an island nation, on the periphery of mainland Europe, when developing aviation policy.

Most participants did not believe that Ireland had the same power as larger EU member states such as France and Germany, to influence the development of EU aviation policy

One participant stated that 'there is opportunity when EU legislation is being developed for airport management to feed into established forums'. However it is their experience 'by the time they are invited to make a contribution decisions have already been made and it is hard to change those opinions'.

Another participant stated that 'Ireland have a number of very strong advocates within the European forum' and 'Ireland are in a position, as a valued member state, to state their opinion and use their vote when deciding legislation'.

It was suggested that 'the EU do not give consideration to Irish operations as a single entity but rather look across the whole sector in Europe. There seems to be a greater focus on the larger airports in Europe'.

It was also noted that 'the EU may not be aware of maybe the nuances of national transport strategies. The onus is on local representatives to make the EU aware of national transport strategies, making sure that at European level, national level interest is appropriately represented'.

Some of the participants felt that 'regulation is often designed with mainland Europe in mind. The fact that Ireland is an island nation, operating on the periphery of Europe, is not always reflected in EU policy. Our requirements may not be the same as our European counterparts and I'm not sure we are viewed as anything other than an extension to the UK. Brexit has left us without our main ally in Europe'.

Another respondent acknowledged that 'the European Commission operate with Europe as their target and European strategies as their target and I believe that the national

strategies feed into those. It all depends of course on our representatives in place within the EU Parliament and the representation they make on our behalf'.

The importance of strategic alignment was highlighted by six of the participants, with one stating 'the national strategy has to tie in with the European policy. Ireland must formulate national strategies to fit in with what the European commission wants'.

4.6 Fitness for Purpose

All participants spoke of the importance of regulation within the aviation sector, particularly in the areas of safety and competition. The need for strict regulation and adherence was agreed by all but some participants questioned whether the current EU regulatory framework was fit for purpose and highlighted areas of concern. None of the participants wanted to withdraw from the single market, recognising the immense benefits gained by Irish airports over the past number of years. However, aspects of current EU regulation were deemed 'cause for concern' and 'have come to the surface in light of COVID'. The participants noted that some of the rules are 'too rigid' and make it 'difficult to adapt current processes so we can at least try and readjust our business to survive'.

Another participant, while acknowledging the importance of and necessity for regulation stated that 'some regulations are just superficial. Some things are already regulated and it doesn't make any difference'. Two other participants concurred with this view stating that 'Irish aviation standards exceed those of the EU' and while 'Irish airports draw from EU recommendations and guidelines they often supercede requirements, particularly when it comes to safety and environmental requirements. The regulations simply tell us what we already know and are already doing, and doing well'.

Uniformity of standards was considered by five of the participants as crucial to the single market. 'It's one thing to have rules but if everybody acts in different ways, picking and choosing what works best for them, then its kind of pointless, not to mention costly'. The disparity in implementation of regulation across the EU was a contentious issue for most of the participants.

One person affirmed that ‘EU regulation standardises how an airport is operating, ensuring that there is a standard across the board for all airports’ and ‘from a safety perspective, it ensures that every airport within the EU acts in line with the standard regulations’. Safety and security are paramount to airport operations but some of the participants did not think that every European airport operated to the same level. Costs were seen as a barrier to proper implementation with one participant asserting that the ‘cost to implement the standard can be challenging for airports’ and ‘airports cannot sufficiently absorb the costs when attempting to comply with all the required EU laws and directives. Airport management have to make sound business decisions without compromising safety and this can be an onerous task when the finance to do so is simply not available’.

While participants agreed that regulation was necessary and understood that liberalisation of the EU’s aviation market was designed to create an open and competitive environment, some felt that ‘parochial favouritism and preferential treatment takes place’ and there was clear ‘evidence of anti-competitive behaviour throughout the industry’.

Another key issue highlighted was the lack of regard for airport size or power when deciding legislation. One participant stated ‘there's a lot of things imposed on airports in a blanket way’ and another confirmed this view by stating that ‘the one-size-fits-all approach is not necessarily suited to the Irish aviation sector considering that outside of Dublin all remaining airports are small and barely covering operational costs as it is’.

EU policies surrounding state aid were openly questioned, with most participants arguing that ‘state aid makes it hard to compete’ and ‘regulation regarding who has access to state funding should be re-examined as a matter of priority both at national and European level’.

One aspect of EU regulation that was welcomed by all participants was the EU’s drive to transition to a low carbon economy. National and EU strategies ‘are aligned and there are clear targets through the energy efficiency programmes’. Another respondent highlighted that ‘Ireland’s National Energy Efficiency strategy is aligned to European recommendations and directives and requires all Irish airports to submit reduction plans,

up to 2030. The national strategy has clearly set targets not just for airports, but for the whole country and Irish airports are tied into public sector targets, incorporating EU recommendations, that are quite aggressive'.

4.7 Coping with Increased Competition

It was evident from the data that participants believed the liberalisation of the aviation market increased competition throughout Europe but also at a national level amongst Irish airports. According to the participants Irish airport management have responded to the increased competition 'through growth incentive schemes, improved marketing and agreed combined strategies within the daa'.

According to the participants Irish airports focus on a number of methods to remain competitive. These include 'keeping costs competitive and having a good safety and security record', 'improving the passenger experience' and 'marketing the island of Ireland as a destination, either from a holiday point of view, or from a business point of view, the fact that it is the last stop before you go to the Americas'. It was agreed by all participants that the Irish government 'is playing its part by promoting tourism into the country, and encouraging the airlines to look at Ireland as a possibility for developing new routes'.

The data indicates that Ireland is well positioned to market the country as a tourist and business destination but an increase in passenger numbers and routes is problematic. One contributor affirmed that 'Dublin is competing with some of the larger European airports, and is very well positioned to continue to attract more airlines. The problem, of course, that they're going to have is, while they address the issue of competition, capacity is and will continue to be a problem'.

When discussing the issue of capacity constraint as an impediment to competition one participant said 'It is not possible to just keep building runways to facilitate traffic flows'.

Irish airports have sought to 'diversify and raise revenue through non-aeronautical activities such as car parks and tenancies' and the daa group are also 'working as an

international consultancy company, providing advice to other airports and businesses and operating and running other commercial ventures where possible'.

Each of the state owned airports are 'trying to reduce their cost base and pass those reduced costs on to airlines'. Since the liberalisation of the market, and in line with the increased level of competition due to deregulation, the business structure of Irish airports has changed dramatically. The three main Irish airports have remained under state control with one participant stating 'the benefit of remaining under state control is that it *[the airport]* is a state asset and the state have some say in the connectivity and proposed connections, ensuring the business of remaining connected with the world. The shareholder considers what is in the best national interest as opposed to seeking out profit'.

However it was also suggested that 'private ownership maybe can raise money in a different way' and 'private business can bring clarity and focus'. Some participants argued that 'state airports are hampered by all the state ownership rules, state aid rules, public sector procurement. Dealing with ministers and departments and being answerable to the Minister for Transport and trying to get and spend money can be difficult and governments change. Whoever is on top in a political sense, at a given time, can probably get more than their fair share of whatever cake is there to be portioned'.

Another stated that 'privatising, which is popular across Europe, is not necessarily the optimal solution. I think the risk of privatising airports fully in Ireland, of course, is that those airports can open and close based on financial returns with little regard for anything else. You know, you have the risk that someone comes in, buys an airport, and then decides that no, it's not making money, so they turn it into a housing development. National interest would be best protected through continued state ownership in that regard'.

Reference to the impact of the global pandemic dominated much of the conversation with group participants. 'The COVID pandemic provides a clear example why state control is extremely critical for the survival of airports because any funding now is all about just

airports getting through this very difficult period and state subsidy is the only possible way, in my mind, that airports can get through at this point in time'.

However three participants argued that state subsidised programmes, making specific reference to the Irish Regional Airports Programme 2021-2025, are drawing resources and finances from critical airports. The idea that 'you are scattering the resources over too many bases, none of which is actually going to reach critical mass and provide the necessary returns' was a prevalent theme throughout the interviews.

It was proposed that 'airports in receipt of state funding use that funding to attract business away from more profitable, commercially viable airports'. All participants however noted that in the current COVID environment 'all Irish airports currently require state funding in order to deal with the exceptional financial losses experienced'.

Participants were keen to highlight that state subsidies cannot remain in place in the long term as such a business model 'threatens the very progression of the liberalised market'. Prior to the pandemic the EU proposed the complete elimination of state subsidies by 2024. That deadline has now been extended indefinitely. One participant noted that 'the EU have suggested that in future all airports in receipt of funding must present a plan to show how they intend to pay for themselves going forward so that they don't come to just rely on state aid to remain operational'. This was considered a positive move by each participant.

4.8 Recent Challenges

While the impact of Brexit has been somewhat overshadowed by the COVID pandemic, participants expressed concern surrounding the 'possible reduction in incoming and outgoing traffic to the UK'. One participant expressed concern that 'Ireland may not be represented as well at European level' and another discussed the possible 'delays through customs and delays in commuting or moving goods'. It was acknowledged that the EU and Ireland have 'been working sufficiently well in the background to prepare for Brexit and what they consider to be worst case and best case scenario'. The major positive expressed by all participants was the possibility of the return of duty free on UK

routes, which was considered by each contributor as ‘a serious revenue earner for Irish airports back in the day and a potential earner going forward’.

The COVID pandemic was clearly highlighted as the biggest challenge facing the EU and Irish airports. Participants were aware of the dramatic fall in passenger numbers and spoke about the ‘severe cost cutting measure and continued job losses’ taking place across all Irish airports. One participant said ‘the pandemic will threaten the long-term viability of numerous airports, including Cork and Shannon. Dublin are currently in a stronger position and may be more likely to survive, but the regional airports are understandably worried. The landscape changes from day to day’.

One participant stated that ‘smaller Irish airports are going to be even more dependent on state aid. Cork will be looking for support, national and EU support, to help maintain their operations, if that is even possible’.

The interviewees recognised that airlines were equally as vulnerable as airports and if they collapse, the airports will be directly impacted. ‘We’re all hoping and praying that Aer Lingus doesn't collapse, even Ryanair will have taken a massive hit. The impact of potential closure would be devastating’. Another stated ‘Airlines are in serious trouble. And it's hard to know how many airlines will survive the COVID pandemic having aircraft on the ground for such a long period. And again, if the airlines run into that type of difficulty, that's going to have a knock on effect on airports’.

One participant indicated ‘a slow recovery and increased fares’ and ‘the huge strain on airports and capital programmes’ stating that ‘airports may not reopen without significant investment from the EU or local government to maintain them’.

On the other hand, some of the participants saw the pandemic as ‘an opportunity to reset, to seek new opportunities and to get the cost base right and get revenues back up and running’. The participants suggested that the EU have a unique situation to examine the current regulatory framework and determine whether it is reaching its objectives. One participant said ‘COVID may help to finally isolate the better performing airports and reduce the amount of airports being propped up in the country’. It was stated that the

pandemic is ‘going to test the systems that are in place in all airports throughout the EU and I'm not really sure that all airports are going to survive. The EU have responded but the previous framework is being severely tested and while the EC have loosened previous restrictions in their attempt to keep the single market alive, I wonder if the single market plan can withstand all the changes’.

4.9 Response Mechanisms

Participants were asked how Irish airports were currently responding to the challenges posed by their participation in the single aviation market especially in view of Brexit and the COVID pandemic. All the participants agreed that each of the state owned airports were in survival mode. With passenger numbers down 95% and traffic at Cork Airport down to 1%, protecting the current business was considered paramount to those interviewed. One participant stated ‘it is just about survival now and then patiently rebuilding the route network over time. But it will take time.’ It was clear from the data that Irish airports continuously monitor their cost base and seek to maintain good infrastructure, ‘managing costs, keeping overheads down and passenger costs low’.

Post-COVID, participants suggest that Irish airports need to ‘grow revenues and return traffic to optimum levels as quickly as possible’. It was acknowledged that there will be ‘undoubtedly a degree of pent up demand in the post COVID environment so sustaining and building upon that, creating sustainable and viable airports for people to work in and for business to thrive is essential’.

Management at all airports are keenly aware of the need to focus on commercial viability. A participant spoke about the need for ‘suitable comparatives’ amongst airports to help ‘monitor performance and set appropriate targets’. It was also suggested that there must ‘be a higher degree of accountability, particularly for airports relying heavily on state aid’.

It was suggested that airport management ‘continuously examine new ways of generating revenue particularly through non-aeronautical services’. One manager spoke of how they

had examined their land bank to explore the possibility of using the land to 'generate energy or electricity for the airport and therefore reduce costs further'.

Six of the participants interviewed spoke of the cost pressure of remaining compliant with EU regulation, particularly in upgrading and maintaining security systems. One manager stated 'huge investment is made in new systems that have a very short lifecycle and offer very little return on investment'. Some of the managers impressed the need for improved assessments of Irish airports to enable compliance but on a relative scale to what the airports could afford. One manager suggested 'some sort of graded systems where larger airports have larger systems; smaller airports have smaller ones that are more cost effective'. There is a need for the 'EU to abandon the 'one size fits all' blanket approach' when it comes to compliance and implementation of regulation.

4.10 Findings Summary

The data clearly indicates that Irish airports have gained from Ireland's participation in the EU single aviation market. Passenger growth, access to new routes, new business development and increased tourism, have led to key infrastructural development of Irelands three state airports, with Dublin airport operating as a key hub airport within Europe. Dublin, Cork and Shannon have, in the past, invested heavily in their capital investment programme and positively positioned themselves to cater for passenger growth as predicted through Irish socio-economic patterns. The regulatory framework within the EU has provided structure to this development and brought consistency while standardising operations. However, Irish airports, and indeed their European counterparts, continue to face challenges. Capacity restrictions, increasing costs, airline power and a distorted competitive environment are making it difficult for smaller regional airports, such as Cork and Shannon, to operate profitably. It would seem from the research that participants question whether the EU suitably addresses the unique requirements of Irish airports operating from an island on the periphery of Europe.

Questions are also raised as to whether the number of airports currently operating in Ireland is sustainable and if Ireland needs to rationalise its air transport network. The

research also incorporates the increased challenges posed as a result of the COVID pandemic.

One key finding from the research is the threat posed to small regional airports due to what appears to be the increasing power of low cost airlines. Such strong market power could herald the return to monopolistic control of a few airlines, particularly as more airlines struggle to survive the global pandemic. It is predicted that more airlines face bankruptcy across Europe and stronger airlines will move to capture coveted slot allocations. Mergers and acquisitions across the EU may become more prevalent as businesses struggle to survive.

The research also indicates that the adoption of EU regulations without due consideration for market power and airport size is currently heaping costs onto struggling airports. The need for a more flexible regulatory framework, designed to support smaller regional airports, seems warranted but requires further research to determine how airports might be sufficiently assessed and how a multi-stranded strategy designed to meet exact needs might work.

The removal of state funding as a means of supporting airports to cover their operational and development costs will be increasingly difficult to achieve in light of the COVID pandemic. Airlines and airports are currently relying heavily on government support to survive. The EU will need to extend access to state aid support and perhaps include airports with higher passenger numbers.

Finally, common policies surrounding energy efficiency and green initiatives must continue to be implemented and aligned to existing national strategies. This is essential to airports, particularly Irish airports, as air travel is critical to the island of Ireland.

5. Conclusion and recommendations

5.1 Conclusion

Liberalisation of the air transport market has contributed positively to the development of Irish airports. Passenger growth year on year, increased traffic and improved connectivity, have enhanced tourism and business development in Ireland. The single market has transformed airports from mere providers of infrastructure to commercially viable businesses in their own right. However, operating in adherence to the EU regulatory framework has also presented a number of challenges to management, particularly at the smaller regional airports. Notwithstanding the devastating impact of COVID, Irish airports were already struggling to cover infrastructural development and operational costs. The dramatic fall in passenger numbers and cessation of flights due to travel restrictions has only contributed further.

One of the key issues highlighted in the research is the current imbalance between airlines and airports. The freedom of airlines to come and go at the shortest possible notice creates a challenging business environment for Irish airports. The number of airlines operating throughout the EU continues to fall leaving a few dominant players with strong bargaining power. These airlines run almost as monopolies and exert increasing pressure on the smaller non-hub airports.

The strategic objectives for many airports throughout the EU have changed considerably in line with the fall in business due to the COVID pandemic. Irish airports are adjusting to survive. Focus is squarely placed on cutting costs in the hope of an upturn in the not too distant future. As the EU scrambles to construct a supportive framework, they must however also ensure that they do not undermine or undo previous work by the European Commission in developing the single air transport market.

Ireland must continue to ensure they stay connected and work closely within Europe to develop policy and initiatives that work to the advantage of Irish airports. This is even more important as the UK, a strong ally always to Irish business, have exited the single market.

Airline power must be closely monitored, especially if smaller regional airports such as Cork and Shannon are to survive. These airports contribute to local regional development and are important support infrastructure to Dublin airport. Additionally, the economic viability of existing airport infrastructure must be closely examined. Issues surrounding the provision of state aid and the possible distortion of the competitive environment must be considered. In the case of Ireland and other EU member states, governments should not be permitted to continuously prop up failing airports at the expense of commercially viable airports. However closing small regional airports will have far reaching economic, social and political consequences and the loss of these small airports will increase inequality between regions.

European airports have committed to net zero carbon emissions by 2050, an ambitious target in view of the fact that Ireland is an island and without the strong public transport infrastructure of other European countries. Innovative concepts such as zero emissions planes and the conversion to biofuels are welcome ideas but are not, as yet, close to fruition. The 'green market' will continue to seek greener alternatives to flying and this is likely to reduce demand but for Ireland, as an island country without the same alternatives as mainland Europe, flying is an integral part of economic development and therefore a suitable balance must be sought.

Furthermore, the research indicates that the number of airports operating in Ireland is currently too high. Other islands in the EU operate fewer airports with many adopting a strategy of privatisation, thus removing airports from government ownership. There is, for example, only one airport serving the Maltese Islands, Malta International Airport. The airport was fully privatised in July 2002 when the Maltese government sold 40 percent equity to Mediterranean Link Consortium Ltd. (MLC), with a further 40 percent to the general public. Vienna airport, the principal shareholder of MLC, provide operating management and the airport experienced continuous growth up to 2019 achieving passenger numbers of 7.3 million within a catchment area of 1.1 million. The number of worldwide connections from the airport also increased while the retail and

property portfolio contributed 30 percent of airport revenues (Malta International Airport, 2021).

The island of Cyprus operates two international airports, Larnaka and Pafos. Both airports operate under the private consortium of Hermes Airports Ltd. under a 25-year build-operate-transfer concessions agreement. The consortium of 9 Cypriot and international shareholders, of which Irish owned Aer Rianta International holds an 11 percent share, assumed operation and management in 2006 and opened new terminals in Pafos and Larnaka in 2008 and 2009 respectively. Passenger numbers for both airports exceeded 11 million in 2019 (Hermes Airports, 2021).

Greece operates its main international airport in Athens and in 2017 the government agreed to hand over control of its 14 regional airports, which included 3 mainland and 11 island, to German airport operators Fraport. The government received €1.2 billion and Fraport took over the operations, maintenance and development of the regional airports for the next 40 years with plans to invest €1 billion over that time period (Stamouli 2017).

Given the size of Ireland, the State needs to consider the capacity that currently exists in the aviation landscape and how that may be better utilised or rationalised to meet demand. Rather than continuously funding capacity expansions that may not have sufficient demand and displacing services from other more commercially viable airports, the government need to examine current strategy. A possible immediate improvement might entail extending the Regional Airports Programme to include all airports with less than three million passengers annually, thus incorporating Cork and Shannon, and creating a fairer competitive environment. There is a limitation in terms of research specifically in the context of conducting any form of substantial comparative analysis of regional airports as access to information about other airports, particularly privatised airports, is highly sensitive and often publicly unavailable.

Finally, additional research could also be considered to determine to what extent state aid contributes to the aviation industry, to what degree it distorts competition and possibly

used to explore more sustainable and profitable models of business. This would mean assessing and determining the number of airports required, their geographical distribution and whether funding should be provided for airports in areas where larger, more sustainably viable airports are located and can be reached in reasonable time. The research could also examine the possibility of better performance assessment models that could be used by other airports throughout Europe, providing a better platform for comparative analysis within the EU.

At the close of this research, the EU estimated that nearly 200 airports are facing insolvency in the coming months. The 'at risk' airports have been identified as largely regional airports, similar to Cork and Shannon. Larger airport hubs, such as Dublin, while under pressure having taken on huge debt to counter the fallout from the pandemic, are predicted to stand a better chance of survival.

5.2 Recommendations

Due to the small number of those interviewed, and the fact they were drawn from the three state owned Irish airports, indicates the findings cannot be considered comprehensive and a much larger group, drawn from all Irish airports, would perhaps yield more definitive results. However the research could prove useful to those wishing to examine the impact of aviation regulation and legislation across the EU and whether the regulatory framework supports the development and operation of regional and smaller airports throughout Europe.

It is clear that continued investment is required to support and maintain airport infrastructure in Ireland. From an Irish perspective, and in line with EU Aviation strategic objectives, it is imperative that current capacity is more closely examined to determine whether there is a need to invest in new development or make best use of existing capacity.

The source of investment needs to be examined further and the best possible business model must be implemented.

The need for improved integrated operations across the EU to address issues such as sustainability, air traffic management and security, remain imperative. For the EU to satisfy current objectives and develop a competitive and fair environment, market power of airlines and airports must be continually assessed to ensure that one does not emerge as such as strong competitor that competition is instead stifled.

Greater pricing flexibility is necessary, particularly for smaller regional airports, so they can compete. An examination of current pricing regulation is required to determine how smaller regional airports could position themselves better in the market.

There is a need to consider further the challenges of smaller airports and to develop more robust performance management systems with suitable performance indicators that facilitate better comparative analysis of airports. The need to recognise smaller airports and offer higher support is required within the current EU framework.

The continued assessment and integration of air traffic management systems throughout Europe's is important to overcome problems with capacity and congestion and is critical to meet increased demand for flights

The availability of competitive airport services, including runways, passenger terminals and ground handling, is critical for the continued success of the single market. However it may not be enough and therefore airports must look at alternatives to generating new sources of income. The building of airport 'cities', better use of infrastructure and land are certainly areas that require deeper investigation.

Europe must address the unintended consequences of liberalisation and address the loopholes that have enabled certain suppliers to grow in market strength and exert inordinate pressure on smaller entities on the value and supply chain. Abusive business models, subsidy-hunting, and regulatory 'forum shopping' must be eradicated. A level playing field with third country airlines is a precondition for the industry to survive. Europe and EU Member States must learn from third country governments and invest in quality airport infrastructure to guarantee a high level of service for passengers.

Fair competition is a particular challenge when airlines from foreign countries are subject to completely different regulatory, legal and social frameworks. As a truly global industry, it is therefore crucial for the EU Commission to continue dialogue with 3rd countries. This must include launching initiatives to foster fair competition and regulatory convergence at bilateral and global level.

Regretfully, certain third countries do not have effective competition rules in place, and have been reluctant to accept or even discuss 'fair competition' clauses in air transport agreements with EU Member States. As long as those clauses are not applied, and as long as foreign airlines do not abide by transparent financial and accountancy principles to ensure they are not state-supported, the traffic rights to the EU should be limited.

Crucially, EU Members States have an important role to play to ensure a level playing field. They should ensure that strategic elements of their economy (e.g. airport infrastructure, airline ownership and market access) are not traded away when negotiating air transport agreements and cross-sector trading partnerships with foreign companies and governments. Such negotiations should be used to enhance Europe's airlines ability to compete internationally, rather than considering air transport as a bargaining chip to achieve other commercial or political interests.

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Appendices

Appendix A Interview Questions

1. In your view have Irish Airports benefited or been disadvantaged by participation in a single European air transport market? Can you explain how?

2. In your opinion what have been some of the more significant changes for Irish airports over the past twenty years?

3. With regard to liberalisation in the air transport market and operating within the single European aviation market, in your view, what are the most pressing and current challenges faced by airport management? Can you explain how such issues are being addressed?

4. Does the regulatory framework of the EU impact positively or negatively on airport operations? Can you explain how?

5. In your opinion, does the EU give due consideration to Irish operations when formulating aviation policies, initiatives or directives?

6. Do you think the European Commission are sensitive to or operate without regard for national transport strategies?

7. What is your opinion on the contribution of airports to national infrastructure?

8. In your view what is the ideal minimum and maximum number of airports required within Ireland? Can you explain your choices?

9. In your opinion, how have Irish Airports addressed the issue of increased competition from other airports within the EU?

10. Do you think the single European air transport market has led to better integration or division amongst European airports? Can you explain the key influencing factors?

11. European airports run as both independent business entities or remain under state control. In your view what are the benefits of either or both models?

12. How do you think European and national strategy can best support Ireland's transition to a low carbon economy, having regard to policy on climate action and sustainability?

13. What are your views on the Regional Airports Programme 2021-2025 and the Irish airports currently being supported?

14. In your opinion what are the current and key impacts of Brexit for Irish Airports?

15. In your opinion what are the main implications of the COVID Pandemic for Irish airports?

16. Going forward, where, in your opinion, should airport management focus their attention to maintain viability?

17. For Irish airports, what in your opinion are the key issues that need to be addressed at European level? At National level? How might such issues be suitably addressed?

Appendix B Information sheet for research participants



Information Sheet

Thank you for considering participating in this research project. The purpose of this document is to explain to you what the work is about and what your participation would involve, so as to enable you to make an informed choice.

The purpose of this study is to research the impact of EU regulation on Irish airports. Should you choose to participate, you will be asked to take part in a one-to-one interview. This interview will be audio-recorded, and is expected to take 30-40 minutes to complete.

Interviews will be prearranged and all interviews will be recorded for the purpose of transcribing afterwards. Should Government Guidelines/Restrictions mean it is no longer possible to conduct face-to-face meetings, I will conduct the interview online using Google Meet. A secure link will be forwarded to you prior to the arranged date and time. These meetings will be recorded and saved to Google Drive for the purposes of transcribing after. In the event of a security breach or interruption to a virtual call the meeting will end immediately and rescheduled for another time.

All of the information you provide will be kept confidential and anonymous, and will be available only to the researcher and my supervisor. The only exception is where information is disclosed which indicates that there is a serious risk to you or to others. Once the interview is completed, the recording will immediately be transferred to an encrypted laptop and wiped from the recording device. The interview will then be transcribed by the researcher, and all identifying information will be removed. Once this is done, the audio- recording will also be deleted and only the anonymised transcript will remain. This will be stored on the University College Cork OneDrive system. The data will be stored for ten years. The information you provide may contribute to research publications and/or conference presentations.



Participation in this study is completely voluntary. There is no obligation to participate, and should you choose to do so you can refuse to answer specific questions, or decide to withdraw from the interview. Once the interview has been concluded, you can choose to withdraw your details at any time in the subsequent two weeks.

We do not anticipate any negative outcomes from participating in this study and should you wish to do so, you can choose not to answer questions or to bring the interview to an end at any time.

This study has obtained ethical approval from the UCC Social Research Ethics Committee.

If you have any queries about this research, you can contact me at bill.daly2019@gmail.com or my research supervisor maryc.murphy@ucc.ie.

If you agree to take part in this study, please sign the consent form overleaf.

Appendix C Consent Form

Consent Form



I.....agree to participate in Bill Daly's research study. The purpose and nature of the study has been explained to me in writing. I am participating voluntarily. I give permission for my interview with Bill Daly to be audio-recorded.

I understand that I can withdraw from the study, without repercussions, at any time, whether before it starts or while I am participating.

I understand that I can withdraw permission to use the data within two weeks of the interview, in which case the material will be deleted.

I understand that anonymity will be ensured in the write-up by disguising my identity.

I understand that disguised extracts from my interview may be quoted in the thesis and any subsequent publications if I give permission below:

(Please tick one box:)

I agree to quotation/publication of extracts from my interview ☐

I do not agree to quotation/publication of extracts from my interview ☐

Signed: ..... Date: .....

PRINT NAME: .....