

# Regional Airport Business Models: Shannon Group as a Case Study

Noel Hiney, Marina Efthymiou and Edgar Morgenroth  
Dublin City University Business School,  
Glasnevin, Dublin 9, Ireland.

## **Abstract**

*Regional airports, despite their significant economic and social contribution to the communities in which they operate, have low profitability and performance. Scholars have been investigating the connection between ownership models to profitability and performance, without reaching definitive results. Case studies can contribute to a better understanding of how structure and ownership is connected to airport performance, by looking into local specificities. This chapter reviews The Shannon Group, which includes Shannon Airport, and examines its regionally based business model. Shannon Airport's strategic position is also analysed, and future prospects are considered. Finally, the chapter discusses how active stakeholder engagement and increased local economic activity can contribute to improved performance and new air routes.*

## **European Regional Airports**

European lawmakers regard regional aviation as a key contributor to citizens' mobility, providing better access to regions and contributing to the development of business, tourism and related services, thereby improving the spread of economic prosperity across Europe (European Parliament 2012). Various definitions of what constitutes regional airports have been put forward. Airports Council International Europe, a key representative body for Europe's airports, considers an airport as regional if (1) it primarily serves short and medium range routes and (2) it primarily serves point-to-point destinations (Airports Council International 2017). An alternative, and the definition considered in this chapter, is a European Commission definition of 'regional airport', meaning an airport processing up to three million passengers per annum (European Commission 2014).

Many regional airports in Europe feed significant passenger numbers into larger European airports, providing high levels of connectivity. In fact, such airports comprise 90% of all European airports, with 209 air carriers, 14,600 routes and 724 destinations served in 2017 (Airports Council International 2017). Such positioning has ensured that regional airports play a critical role as important regional economic contributors, which have a multiplier effect into local communities. This impact is achieved mostly through the provision of connectivity that provides essential links to trade and tourism activity, both within the regional catchment area and across the country. Efthymiou et al. (2016) argue that large airports provide the highest connectivity levels, but that smaller airports deliver the greatest connectivity growth. From a commercial perspective, local air access helps to stimulate direct inward investment, generating new business and triggering job creation, which in turn leads to further increases in trade. Regional airports have also become pivotal in supporting social and commercial objectives in regions and areas outside EU capitals and other large cities. As larger European airports increasingly experience capacity constraints, the increased airline use of regional

airports, combined with their growth ambitions, have helped them gain additional passenger traffic.

A number of scholars (e.g. Dobruszkes et al, 2017; Graham, 2014; Adler et al, 2013; Baker and Donnet, 2012) have researched regional airports and their performance. Regional airports face increasingly robust competition from hub and other regional airports. Competition and the relatively high fixed costs associated with airport infrastructure have given rise to increasingly challenging trading conditions for the sector, with up to 76% of regional airports estimated to be unprofitable (Airports Council International 2019). Moreover, regional airports, in particular, are more challenged than larger airports, given that adverse external shocks and volatilities can have a much higher impact on their financial performance, due to smaller economies of scale.

While regional airports are recognised as essential to the economic well-being and development of the regions they operate in, Government involvement with regional airports is complicated by the ‘dual dilemma’ of such airports being socially and commercially beneficial to a local hinterland on the one hand, but often uneconomical to operate on the other. The status of a few such airports has changed due to this performance pressure. Some small regional airports have terminated operations due to low activity and profitability (e.g. Galway airport in Ireland). A small number of airports (e.g. Plymouth City airport in the UK) have terminated their operations due to low commercial traffic, but the local community has actively tried to make such airports operational again (FlyPlymouth 2019). This indicates the strong connection of small regional airports to the local community, but also to ownership models.

This chapter outlines the case of Shannon airport, a regional airport in Ireland which reflects some of the issues regional airports are facing. A brief history of Shannon airport is provided and its innovative ownership structure (i.e. airport group incorporating tourism and property entities) is considered. This case study can help other airport operators identify commonalities in aspects of the contribution of airports to regional development.

### **Airport Ownership and Structures**

The connection of airport ownership and structure to performance has been considered by a number of scholars (Pagliari and Graham, 2019; Adler and Liebert, 2014; Gillen, 2011; Ison et al., 2011). The diversification of airport ownership structures was identified by Graham (2014) as one of three key current airport trends, the others being privatisation and commercialisation. Almost 60% of European airports were publicly owned in 2016, down from 78% in 2010 (Airports Council International 2016). Nevertheless, corporatisation of State-owned airports does not necessarily improve performance. Cahill et al (2017) suggest that despite a continuous process of commercialisation in Ireland’s Dublin Airport Authority (DAA), Total Factor Productivity performance declined over 1994-2014 period mainly due to considerable long-term investment in airport infrastructure that could not be expected to generate short-term returns during the period under measurement.

Other airport ownership models include a combination of public and private shareholdings and hybrid structures, where private interests manage the activities of municipally controlled airports on a concession basis. This model is more common in the United States than in Europe. Private sector involvement is more prevalent in larger airports, where analysis shows that around 40% of all airports have some private sector activity, with these airports accounting for 75% of annual passenger numbers (Airports Council International 2016). Some publicly owned airports across Europe have many different municipal shareholders (e.g. local authorities),

while another ownership model involves private or state organisations owning and managing multiple-airport organisations, such as Manchester Airports Group (UK) and Finavia (Finland).

With respect to business organisation, the majority of European airport operators are managed either on a stand-alone basis or as part of a group. They focus on core commercial activities that mostly generate aeronautical and non-aeronautical revenue. Changing airport ownership is associated with commercialisation (e.g. terminal concessions, car parking and real estate developments outside the airport perimeter), different pricing strategies, and the provision of incentives to carriers to operate to these airports (Efthymiou et al., 2016; Graham, 2014). Airports are in favour of dual-till regulation, arguing that concessions and real estate developments do not generally possess natural monopoly characteristics (Frontier Economics, 2014), although they do from a consumer perspective, at least on airside. Airlines, on the other hand, favour the single-till approach which can be more likely to contribute to a reduction in the fees charged for aeronautical services (Efthymiou et al., 2016).

Airport operators and financial investors are increasingly joining forces to deliver airport developments through operational and financial structuring instruments, such as public-private partnerships or the concession management contract arrangements described above. Privately owned and independent airports are perceived as more market-oriented (Halpern and Pagliari 2007), not least because senior management is likely to be locally based and more scrutinised by local stakeholders, possibly leading to a stronger bias for action.

Regional airports have a multitude of different stakeholders whose presence and activities extend deeply into local communities. This interaction between airport and region is acknowledged as fundamentally important, with airport activity essential to local economic performance – the multiplier effect results in increased levels of trade, tourism and travel, thereby supporting and helping to attract inward investment. In addition, airport-airline cooperation can be mutually beneficial especially for airports with high seasonality (extreme peaks during high season and extreme lows outside these periods), notwithstanding the need for such arrangements to comply with State Aid guidelines if they involve State-owned airports (Efthymiou and Papatheodorou, 2018). This multiplier effect might also be expected to be more significant for regional airports with a business structure that incorporates a tourism entity.

### **Aviation Industry in Ireland**

Ireland has a well-established aviation industry from both a business and regulatory perspective, making a significant Gross Domestic Product (GDP) contribution of €4.1 billion per annum, which supports 42,000 direct jobs (Department of Transport, Tourism and Sport, 2017). The aviation sector is core to Irish economic development, given the country's status as a small island nation. Ireland has three state-owned passenger airports: Dublin, Cork and Shannon, together with a small number of mostly privately-owned ones, including Ireland West (Knock), Kerry and Donegal (Figure 1). However, 85.6% of all Irish air travel is to and from Dublin Airport (Figure 2).

*Figure 1: Key Airports Operating on Island of Ireland*



Source: Department of Transport, Tourism and Sport 2019

Figure 2: Total passenger numbers handled by key Irish airports in 2014-2018 (Source: Central Statistics Office, 2019a)

Airport	2014	2015	2016	2017	2018	% change 2017-2018	% change 2014-2018
Dublin	21,694,893	24,962,518	27,778,888	29,454,474	31,319,419	+6.3	44%
Cork	2,138,057	2,065,678	2,226,233	2,301,450	2,387,806	+3.8	12%
Shannon	1,555,225	1,642,888	1,674,567	1,599,390	1,677,661	+4.9	8%
Knock	703,670	684,671	735,869	748,505	775,063	+3.5	10%
Kerry	294,955	303,039	325,670	335,480	365,339	+8.9	24%
Donegal	35,415	36,552	44,156	46,514	46,537	+0.0	31%
Waterford <sup>1</sup>	33,189	34,249	13,511	0	0	-	-100%
<b>Total</b>	<b>26,455,404</b>	<b>29,729,595</b>	<b>32,798,894</b>	<b>34,485,813</b>	<b>36,571,825</b>		

<sup>1</sup> No commercial flights since June 2016 from Waterford airport

This high concentration of traffic represents a significant challenge for Ireland’s regional airports, given the small geographical size of the Irish Republic and the increased ease of access

to Dublin through the relatively recent completion of a motorway network providing significantly enhanced connectivity to Dublin Airport. Over 86% of motorway kilometres existing in Ireland have been completed since 2002 (McCoy et al, 2018). Figure 3 shows access times of less than 2 hours and 30 minutes from most cities to the airport, with the time taken from Cork 2 hours and 45 minutes.

Figure 3: Fastest Travel Time (private motor car) from main Irish Cities to five largest airports

Airport → City ↓	Dublin	Cork	Shannon	Ireland West	Kerry	Waterford*
Dublin	21 min	2 hr 53 min	2 hr 30 min	2 hr 36 min	3 hr 27 min	2 hr 9 min
Cork	2 hr 45 min	15 min	1 hr 41 min	3 hr 10 min	1 hr 31 min	1 hr 51 min
Limerick	2 hr 11 min	1 hr 40 min	26 min	1 hr 54 min	1 hr 23 min	2 hr 15 min
Galway	2 hr 17 min	2 hr 48 min	1 hr 7 min	1 hr 16 min	2hr 32 min	3 hr 22 min
Waterford	1 hr 55 min	1 hr 50 min	2 hr 25 min	3 hr 50 min	3 hr 0 min	9 mins
Sligo	2hr 36 min	3hr 49 min	2hr 12 min	38 min	3 hr 33 min	4 hr 6 min
Athlone	1 hr 20 min	2 hr 49 min	1 hr 27 min	1 hr 22 min	2 hr 49 min	2 hr 36 min
Belfast	1 hr 42 min	4 hr 23 min	4 hr 4 min	3 hr 23 min	5 hr 0 min	3 hr 39 min
Derry	3 hr 3 min	5 hr 44 min	4 hr 23 min	2 hr 48 min	5 hr 48 min	4 hr 59 min
* No current passenger traffic						

Source: Developed by Authors using Google Mapping Data, 23<sup>rd</sup> September 2019

### Shannon Airport

Shannon Airport forms a significant part of Shannon Group, a 100% State-owned Irish organisation whose other companies manage significant interests in tourism and commercial property, mainly within the airport's broad hinterland. Shannon Group has also been responsible for the establishment of Ireland's largest aviation cluster, with 1,600 employees working in over 40 companies there (Shannon IASC 2019).

### Airport History

One of Europe's most westerly airports, Shannon was established in 1945 and the bilateral Ireland/US Air Services Agreement signed that year stipulated that flights to and from Ireland would route only through Shannon, resulting in its designation as Ireland's transatlantic airport. Shannon's geographical position also meant that until the mid-1950s, many European and North American airlines, who operated aircraft with limited range on transatlantic routes, used the airport as a refuelling gateway between Europe and America. Shannon established the world's first duty-free airport shop and industrial zone during this time (Shannon Airport

2017). The airport developed a partnership with Aeroflot during the 1980s, involving fuel bartering and aircraft painting. This relationship led to the opening of the Soviet Union's first duty-free shop, on a joint-venture basis, in 1988. Shannon Airport established an advisory retail business (Aer Rianta International - ARI) that year which, as part of DAA, is now a major airport retailing and retail consultancy organisation (Shannon Airport, 2017). Following an easing of restrictions in the 1990s, the requirement for traffic on air routes between Ireland and the USA to stop at Shannon in both directions was fully eliminated following the introduction of the EU-US Open Skies Agreement in 2007 (Barrett 2009).

During 2009, the first US Customs and Border Protection pre-clearance site outside North America and the Caribbean opened in Shannon. Due to its Atlantic location, the airport has a high proportion of transatlantic travel relative to other airports of its size, with Aer Lingus, American, Delta, and United operating routes out of Shannon using narrow-body aircraft. Norwegian and Air Canada operated routes from Shannon to the United States and Canada respectively using Boeing 737 Max aircraft, until the grounding of this type in March 2019. The Norwegian routes were subsequently cancelled. Official Airline Guide (OAG) analysis for 2017 (excluding transit traffic) shows that Ryanair provided almost 45% of the seat capacity at Shannon Airport, while Aer Lingus supplied around 38% and the three big US carriers (United, American and Delta) were responsible for 14%. The UK is the largest market served by Shannon, accounting for almost 50% of total traffic. Current passenger numbers, including transit traffic, total c. 1.86 million per annum (Shannon Group 2019).

### **Shannon Airport Ownership**

Always a State-owned entity, Shannon Airport was attached to the Irish Department of Transport before becoming part of Aer Rianta, the Irish State Airport Authority, in 1969. In 2004, the Dublin Airport Authority, DAA, replaced Aer Rianta, retaining responsibility for Cork, Dublin and Shannon Airports, in addition to ancillary companies including ARI.

Future ownership options for Shannon were considered by the Irish Government in 2012, setting in motion events, which led to the formation of Shannon Group in 2014. The then Minister for Transport commissioned a review of ownership options for Cork and Shannon airports, in advance of any decisions regarding separation of State Airports (Department of Transport, Tourism and Sport 2012). An international strategic consultancy organisation undertook this assessment, and its final report expressed concerns about prospects for Shannon, highlighting a significant drop in air traffic and passenger numbers. It suggested that demand levels were not sustainable, that niche investments might not generate required returns, and that the airport, therefore, faced a potential threat to its viability (Booz and Company 2012). The alternative to Shannon remaining part of DAA was the airport's separation from this Authority, addressing issues such as the impact of Shannon-identified DAA debt on future viability. The new corporate entity to be established would incorporate other companies such as Shannon Development, which changed its name to Shannon Commercial Enterprises, a State-owned owner of significant commercial property interests. Shannon Development (originally SFADCO or Shannon Free Airport Development Company) had been established by the Irish Government in 1959, to promote the interests of Shannon Airport by driving regional economic development in the wider Shannon area in partnership with government, private companies, public bodies and the people of the region (Shannon Development 2007).

During the stakeholder engagement process following the publication of these options, it appears that local parties were quite enthusiastic in their support for separation, with Regan

(2018) highlighting the positive local reaction to the establishment of Shannon Group, his paper positioning the change in the context of previous challenges such as the arrival of the jet age and industry cycles, and emphasising Shannon’s innovation DNA, as exemplified by the leadership of Dr. Brendan O’Regan over many years, for example through introduction of the world’s first airport duty-free shop in 1947, and development of a free trade zone in 1959 (O’Connell and O’Carroll 2018).

The decision to grant Shannon Airport full independence from the Dublin Airport Authority (now DAA plc) was taken in principle in May 2012, to take effect on 31st December 2012 (Department of Transport, Tourism and Sport 2012). Shannon Group, the current corporate structure, was formally established in September 2014 with the addition of the Shannon Heritage tourism business to the Group’s existing airport and property interests. An International Aviation Services Centre cluster, Shannon IASC, was also established. ARI, the airport retail and duty-free consultancy that started life in Shannon, was by then an integral part of DAA. It has been reported that the Dublin Airport Authority retained a debt of c. €110 million associated with Shannon Airport activities. This meant that the airport started its new independent life on a debt-free basis (O’Halloran 2018).

Ireland’s Minister for Transport at that time optimistically emphasised the benefits of separation to Shannon Airport and the Shannon Region, in particular (1) a fresh approach to airport development and (2) creation of the aviation services centre to build on a hub of aviation-related business activity. An Aviation Business Development Task Force established at this time suggested that Shannon could, within five years, be a self-sustaining, cost-efficient international airport with 2.5m passengers per year, providing convenient short and long-haul travel options for local businesses and travellers. It also envisaged the airport as a transit hub for passenger and cargo airlines (using its geographic position and US Customs pre-clearance advantages) and the International Aviation Services Centre (IASC) as a vibrant cluster of diverse and aviation-related businesses, providing training, education and employment and opportunities. It contended that IASC could create and sustain 3,000-3,500 new direct jobs (Department of Transport, Tourism and Sport 2014).

### **Shannon Group Structure: Overview**

The wholly State-owned Shannon Group is “a commercial semi-state group focused on delivering economic benefits for the West of Ireland and the wider national economy” (Shannon Group 2017). Shannon Airport Group mission and vision statements focus on the successful development of aviation, tourism and property assets, customer excellence, business growth and playing a pivotal role in the region it serves.

Shannon Group comprises four distinct units:

1. Shannon Airport, a regional airport with routes to the UK, Europe and North America.
2. Shannon Commercial Properties, a company that owns and manages significant property assets, mostly in the Shannon region.
3. Shannon Heritage, a tourism company that owns and manages tourism assets across the Republic of Ireland.
4. Shannon International Aviation Services Centre (IASC), which focuses on the creation of an aerospace and aviation cluster in Shannon.

Shannon Group’s structure is underpinned by a not yet proven hypothesis that synergies are possible for companies within the Group, through the provision of shared leadership and

support for airport, tourist and property businesses and activities within the Shannon Region. In his Shannon-focused review of airport industry clusters, Zhang (2014) contends that this is a new development model supporting regional economic activity, with local enterprises and external forces other key factors. This approach positions Shannon Airport as a key driver and enabler of regional economic development. The other companies within the Group such as Shannon Heritage, Shannon Commercial Properties and IASC can contribute significantly, by playing essential roles in attracting foreign investment, economic and tourism activity to the Shannon Region and contributing to increased airport traffic. These objectives are not dissimilar to Shannon Development's original vision, as described above.

As State-owned organisations, however, individual Shannon Group companies must operate independently and comply with State Aid regulations and requirements. Any asymmetric national regulation or state funding favouring Shannon or another airport might be likely to fall foul of such rules. However, the impact on airport competition arising out of Ireland's privately-owned regional airports receiving EU sanctioned State Aid, in the shape of operating or capital expenditure grants for safety and security matters which Shannon and other State airports cannot avail of due to a Government policy not to provide such aid, should also be noted. Such anomalous arrangements have potentially disadvantaged Shannon and Cork airport performance and prospects. For example, Shannon Airport had to borrow funds to finance a recent runway overlay, while the State provided 75% finance for a similar overlay for the mostly privately-owned Ireland West regional airport (O'Brien 2019)

### **Analysis of Shannon Airport's Strategic Position**

A number of academic tools have been used to describe and analyse Shannon Airport's strategic position. This activity was informed by consideration of key airport characteristics, industry trends, opportunities, challenges and competitive threats. A broad strategic assessment of Shannon Airport was first undertaken by the authors to help assess and interpret its positioning. The following strategic models were deployed:

1. Business Model Canvas
2. Strengths, Weaknesses, Opportunities and Threats Framework
3. Porter's Five Competitive Forces

#### ***Shannon Airport: Business Model Canvas***

Osterwalder and Pigneur's Business Model Canvas (2010) outlines key components of the value model driving a company's business. This model describes how value is generated, transferred and delivered to key stakeholders, with value deduced through three entities listed as customers and partners; core business propositions; and financial performance. A business model canvas can make connections more explicit (Joyce and Paquin 2016) and can identify opportunities for value creation (Johnson et al. 2008). Shannon Airport's Business Model Canvas reflects the airport's two distinct customer sets: passengers (Business to Consumer) and airlines (Business to Business). It suggests a focused business model for Shannon Airport, concentrating on increasing volumes of passenger and, to a lesser extent, cargo services. Strong route development activity and high levels of engagement with various companies under the umbrella of the Shannon Group, together with private and public stakeholders with interests in the Shannon region, all underpin this approach.



Figure 4: Business Model Canvas, Shannon Airport, August 2018 (Source: Osterwalder and Pigneur Business Model Canvas, interpreted and applied to Shannon Airport)

## Business Model Canvas for Shannon Airport \*



<http://www.businessmodelgeneration.com> \* Cost and Revenue Comments Based on Group Financials

The airport's value proposition highlights an excellent and efficient passenger experience, enabled by ease of access, a reasonable number of destinations, speedy processing, US Customs and Border Protection pre-clearance and a positive retail experience. Airlines receive competitive, undisclosed terms to operate to and from this important tourism gateway in uncongested airspace with significant terminal capacity and the longest runway in Ireland, and a potential catchment area of one million people living within 90 minutes of the airport (Anna Aero 2019).

Shannon customer segmentation identifies business and leisure passengers (B2C), and network and low-cost carrier airlines (B2B), operating mainly point-to-point routes to and from the UK, Europe and the United States. Other customers include Maintenance Repair and Overhaul (MRO) companies who rent hangar space at the airport. Key activities supporting Shannon's proposition include a mandate to increase aeronautical and non-aeronautical revenue and stakeholder engagement, which is concentrated on stimulating economic and tourist activity in the Shannon region. Shannon's main resources include its significant airport infrastructure, in particular a terminal with passenger capacity comfortably exceeding current traffic levels. Other Shannon Group company resources, i.e. tourism, commercial property and aviation services, help increase economic growth and prosperity in the region. The airport continues to explore new routes and introduce innovations such as a recently opened autism-friendly sensory room in the airport departures area (Flynn 2017).

Shannon's Canvas shows that major partners, including airlines, Shannon Group companies, concessionaires and external stakeholders such as regulators and local representative bodies, are essential to the airport's business model. Municipal bodies can, through policy decisions, play a key supporting role in airport development, promoting 'win-win' policies which support advancement of the airport and the region. Papatheodorou (2019) highlights this triple-win benefit of an effective stakeholder relationship triangle of airport, airline and tourist authority

partners. The relationship with principal customers, especially airlines, is fundamental to a regional airport's success. The impact of any change to an airline's network footprint will be immediately felt by the airport.

Turning to financial performance, Shannon Group's 2018 Annual Report highlights operating profit for the year of €15.7m, an increase of almost €7m on the previous year, with much of this the difference accounted for by the combined impact of investment revaluations and a provision for staff termination payments. This outcome presents a return on equity of just over 10%. Total operating costs came to €77.6m, this increase of 12.3% from the previous year primarily accounted for by the provision for employment termination payments. Separate airport figures were not disclosed. Total revenue increased by 7.7% to €77.8m (Shannon Group 2019).

Airport income streams were not broken down between aeronautical and non-aeronautical revenue prior to the 2018 report. This year's revenue disclosure provides a partial breakdown for 2018 and 2017, which shows specifically declared aviation revenue (Shannon Group 2018a). Aeronautical revenue was almost identical between the two years, reflecting the challenges associated with new route development (the Max grounding occurred following year-end, and did not affect these numbers). It should be noted that a portion of Group retail and commercial revenue may be airport-related, given the fact that total airport revenue as reported was higher in previous years, but such a breakdown is not now available, and a like for like comparison with previous years is not therefore possible.

*Figure 5: Shannon Group Revenue Analysis*

	2017 (€000)	2018 (€000)
<b>Aeronautical and Related Income</b>	<b>18,285</b>	<b>18,289</b>
Retail Revenue	16,120	17,741
Tourism Revenue	10,172	12,036
Commercial Property Revenue	10,038	10,888
<b>Airport Concession and rental Revenue</b>	<b>9,517</b>	<b>9,991</b>
Other Commercial Revenue	8,107	8,892
<b>Total Revenue</b>	<b>72,239</b>	<b>77,937</b>

The absence of any material long-term debt has undoubtedly been of benefit to Shannon Group finances, the modest 2018 non-current ratio reflecting a long-term loan associated with a recent runway overlay investment. Table 3 shows some key financial ratios for the Group. These measures highlight a high but improving cost to income ratio of 83.2% for 2018 and annual staff costs of €58,395 per employee. Both numbers appear high relative to the nature of the Group's businesses. They also provide context for the airport's staff voluntary redundancy programme and airfield re-categorisation from Category 9 to Category 9 flexible, as the number of widebody aircraft using the airport has fallen considerably, which ultimately reduces the permanent need for the highest category of fire service. The revised categorisation seems adequate and acceptable, given Shannon's traffic volumes and aircraft types (Sheridan 2017).

*Figure 6: Key Financial Ratios for Shannon Group (Source: Shannon Group, 2016-2019)*

	2013	2014	2015	2016	2017	2018
Cost/income	99.62%	96.38%	89.87%	89.94%	88.60%	83.17%
Return on Assets (ROA)	0.30%	0.42%	5.13%	4.24%	5.37%	7.22%
Return on Equity (ROE)	0.44%	0.53%	6.30%	5.08%	6.92%	10.08%

Current Assets/Current liabilities	131.03%	178.84%	192.62%	174.74%	140.14%	101.28%
Quick Assets/Current liabilities	94.54%	134.02%	144.44%	135.72%	91.99%	44.81%
Gearing (non-current debt/equity %)	No non-current debt				10.10%	12.2%
Staff Cost per employee in EUR (excl. termination payments)	No data	58,268	56,313	58,395	58,269	

The Business Model Canvas highlights how a change in one variable might affect others. For example, the financial impact (cost and revenue) of the provision of (say) free customer parking using available underutilised land, or subsidised public transport services, could be offset by an improved customer value proposition, higher passenger numbers and, increasing non-aeronautical revenue, achieving a local multiplier effect.

The Business Model Canvas does not, however, provide an extensive insight in the macro and micro forces affecting Shannon Airport, as it is created primarily using an internal company standpoint. Such forces identify Shannon’s landscape and positioning while providing reference points to where future actions may be considered. The *SWOT* and *Five Competitive Forces* models have been used to consider these factors for Shannon Airport.

### Shannon Airport: Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis

The SWOT Analysis examines a company’s Strengths, Weaknesses, Opportunities and Threats. The application of the SWOT analysis to Shannon Airport has highlighted a small number of critical features influencing each quadrant. Main positive factors include unrestricted, cost-effective capacity for expansion and the potential for recent government planning policy announcements to improve growth prospects for the airport, enabled by strong stakeholder engagement. Key challenges identified include low population density, significant domestic airport competition, modest demand for new services and, of course, Brexit. Figure 7 identifies these features for Shannon Airport:

Figure 7: Shannon Airport SWOT Analysis, Developed by Authors

<i>Strengths</i>	<i>Weaknesses</i>
<ul style="list-style-type: none"> <li>• Comprehensive airport infrastructure; 24/7 availability</li> <li>• No delays/congestion - unrestricted capacity airside and landside</li> <li>• Strong passenger experience, especially westwards – ease of access, US CBP pre-clearance and smooth transit to gate</li> </ul>	<ul style="list-style-type: none"> <li>• Challenging route economics. Low (population) density hinterland – impact on outbound passenger demand (expensive for carriers to operate)</li> <li>• Peripheral location, especially for eastbound traffic</li> <li>• Not ideally located for freight business</li> </ul>

<ul style="list-style-type: none"> <li>• Positioned between third and fourth largest Irish cities</li> <li>• A key part of region-based Shannon Group, focused on delivering economic benefits to its hinterland</li> <li>• Unique aviation brand - heritage rooted in innovation and entrepreneurship</li> <li>• Ideal west coast base for inbound tourism (a fundamental proposition) - Wild Atlantic Way gateway status</li> </ul>	<ul style="list-style-type: none"> <li>• Modest Route Network (lack of European hub routes) and low, light frequencies</li> <li>• Cost Base, given the scale of infrastructure, e.g. Staff Costs</li> <li>• Poor public transport connectivity (no rail, few bus services)</li> <li>• Group funding restrictions (airport must be self-financing; no State Aid permitted)</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Favourable public policy approach to balanced economic and tourism development (National Aviation Policy, Ireland 2040, Rural Action Plan for Jobs)</li> <li>• Strongly performing economy, improving business and tourism prospects</li> <li>• Galway now part of Shannon hinterland with new motorway opening</li> <li>• Region-focused stakeholder group to pursue opportunities in a coordinated way</li> <li>• New funding models/partnerships. Development of significant piece of local infrastructure, e.g. Conference Centre, Aviation Museum?</li> <li>• Benefit to Shannon of holistic approach to approach to State Airport Capacity Review</li> <li>• New inbound markets (e.g. Asia)?</li> </ul>	<ul style="list-style-type: none"> <li>• The impact of Brexit on activity and business volumes. The UK a key market (42% of passengers)</li> <li>• No significant change in Government policy favouring Dublin and east of Ireland development (notwithstanding recent initiatives to address this)</li> <li>• Strong competition from Dublin, Cork and other European airports for new airline routes</li> <li>• Loss of major airline customer – two airlines account for a high proportion of total traffic</li> <li>• Route impact of extended Boeing 737 Max grounding</li> <li>• Boeing 757s, heavily used in Shannon, approaching the end of their commercial life</li> <li>• Risk that Group structure might deflect airport focus</li> <li>•</li> </ul>

### **Brexit – A Key Threat**

*<Note to Editors –Reviewer comments noted, and section has been revised. Brexit was highlighted mainly as an example of external threat and it is difficult to be explicit as the nature of the UK’s exit, and its impact on Ireland, aviation, airports and Shannon, is very difficult to predict. Also, situation will be clearer next month, well before publication deadline. Finally, this might be best positioned as a ‘text box’ within the chapter, if not featured elsewhere in the book?>*

While the enduring economic effects of Brexit will take some time to be felt, its potential impact on Irish aviation, including airports and airlines, is likely to be significant in any no-deal scenario. Irish airports are very exposed to UK economy, which is solely responsible for 43% of total European passengers handled by Ireland’s main airports in 2017 (Central Statistics Office 2018). As Brexit is expected to have a negative impact on the UK economy at least in

the short- to medium-term, resulting in higher unemployment and lower average income, passenger numbers are likely to be affected. From a transport and passenger transit perspective, any post-Brexit regulatory delays to aircraft and passengers departing from or arriving into Ireland would put a strain on the country's airport infrastructure. OAG analysis reveals that around 38% of Shannon airport's seat capacity connects to UK airports in the summer of 2018, while the UK alone is responsible for 68% of its European seat capacity.

According to a recent Irish Tourism Industry Confederation Report, receipts from visitors to Ireland from Great Britain have been declining since the fall in Sterling after the UK referendum vote to leave the European Union, with such visitors seeing a 12% reduction in their purchasing power. (ITIC 2019). These developments are likely to affect Shannon Heritage (Tourist Business) performance. In response to this challenge, Tourism Ireland, a national tourist authority, is launching a promotional campaign to increase British tourist spending by 25% over the next three years (Tourism Ireland 2019). A sustained weakening of Sterling relative to the Euro, however, could see a reduction of UK traffic into Shannon, though it may make the UK a more attractive destination for outgoing passengers.

Brexit might also be likely to have an adverse impact on Shannon Commercial Properties and the International Aviation Services Centre, if for example company decisions to invest in the region are cancelled or scaled back due to economic uncertainty. There is, however, also a possibility that Brexit might lead to some displacement of FDI away from the UK (Lawless and Morgenroth, 2016), which might benefit Shannon Commercial Properties.

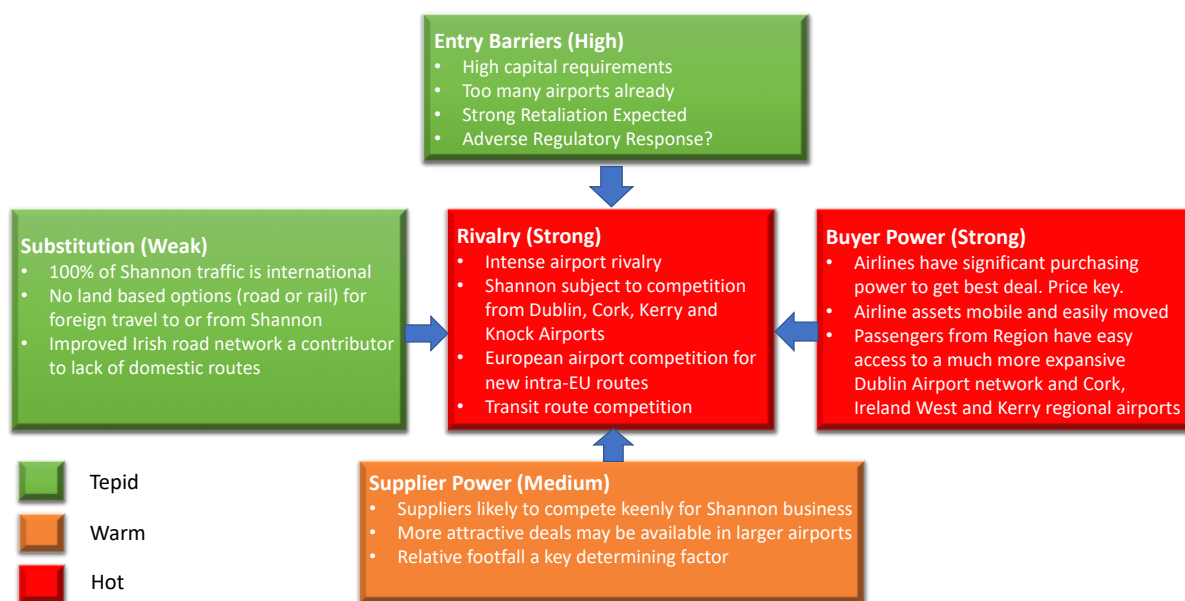
The impact of Brexit on the broad activities of Shannon Airport and other Irish airports will ultimately be determined whether the UK leaves the EU with a Withdrawal Agreement, the nature of that agreement and the nature of the future relationship that will have to be negotiated once the UK is no longer a member of the EU. This arrangement will also define the future positioning of the UK's aviation system within EU Single European Aviation Area and Open Skies agreements.

### **Shannon Airport: Five Competitive Forces Analysis**

Michael Porter's Five Forces model (1979) specifically considers and assesses competitive threats facing an organisation. Like the Business Model Canvas, Porter's model is a static one, representing a snapshot of the business at a given time, but not necessarily conveying industry volatility and rate of change. The model considers a company's performance under complex microeconomic conditions, capitalising on five explanatory or causal variables, described as *forces* (Grundy 2006). Understanding the nature of these forces is essential so that the airport can prepare its response and develop/implement specific strategies to effectively deal with the issues it faces. Figure 2 shows that two forces have a potential adverse impact on Shannon Airport's business prospects. Firstly, the power of buyers, both airlines and passengers and secondly, an exceptionally high level of competition from other airports, particularly Dublin.

*Figure 8: Shannon Airport's Five Forces (Porter) analysis (Developed by authors)*

## Shannon Airport - Five Competitive Forces



*Threat of New Entrants (Low threat):* There may already be too many airports in Ireland, evidenced by the closure of Galway airport to passenger traffic in 2013. Galway is c. 1.5 hours by car from both Shannon and Knock, while Dublin is 2.5 hours away from the city. Significant capital costs would be experienced by any prospective airport entrant given the vast infrastructure that would be required, with revenue not assured. A strong response could be expected from regulators and incumbents. Therefore, any new airport entrant is very unlikely.

*Threat of Substitutes (Low threat):* In the past roads would have represented a significant substitute threat for domestic Shannon routes, and this is what happened some years ago. Today, 100% of air traffic into and out of Shannon is international. There are no domestic or Northern Ireland routes perhaps because of the much-improved roads infrastructure, meaning that an air or sea journey is essential for international passengers travelling to and from the region. Therefore, other transport modes such as high-speed rail or road present no substitution risk regarding such travel, although improving virtual video conference capabilities may do so for some business customers, over time.

*Bargaining Power – Buyers (High threat):* Wilkinson (2013) defines bargaining power as leverage that can be exerted on a company by customers to get the best deal possible, e.g. better slots, superior service, lower price. Airlines have significant bargaining power when dealing with Shannon Airport. Their assets (aircraft) are mobile and can be based at whichever airport offers the most favourable deal, meaning that they can extract the best possible arrangement and still transfer their business elsewhere when the contract expires (Woulfe 2010). The incessantly commercial focus influencing this approach applies to all airlines using Shannon. Passengers equally have other airport options including Cork, Kerry, Ireland West (Knock) and Dublin Airports, which have become more accessible by the much-improved motorway infrastructure. Even though airlines choose the airports to service, passengers chose the airline to fly with, and the airport to fly from. With price and convenience key differentiators, passengers have plenty of bargaining power.

*Bargaining power – Suppliers (Medium threat):* Companies supplying service, plant and equipment to Shannon strive to win such contracts through a variety of means including price,

value-added services and discounts. However, contractors would be expected to compete more aggressively for business with more extensive facilities such as Dublin or other international airports whose scale significantly outweighs Shannon. Such contractors would be more focused on supplying 100 new information display screens in Dublin for example, than 10 in Shannon. Dublin would benefit from higher discounts and expanded agreements. Nonetheless, most suppliers will be interested in securing such contracts, irrespective of airport size.

*Industry Rivalry (High threat):* Competition amongst airports is intense, not just from Dublin and Cork for routes and passengers, but other European airports who are pitching to airlines for new routes. For example, Kerry airport has 14 weekly services to Dublin on Aer Lingus Regional, which allows passengers to connect onwards, posing a high threat to Shannon. Ireland West (Knock) offered 71 weekly flights during summer 2018, of which 59 flights were UK bound. Many airports also bid for transit routes, which use airport facilities and services en-route to a final destination. Development of the Irish motorway network has significantly improved passenger access nationally to a much broader range of destinations in Dublin Airport at the expense of regional airports, including Shannon. This has led to a reduction in routes, such as the Cork and Shannon PSO services to Dublin, and connectivity at such regional airports (Vega and Reynolds-Feighan 2016). Furthermore, intermodal passenger transport can contribute to the better airport accessibility and destination competitiveness (Efthymiou and Papatheodorou, 2015). Ireland's national bus service promotes seamless connectivity from all parts of Ireland to Dublin Airport (Bus Eireann 2019), increasing competition from the country's dominant airport.

### **Peer Airport Comparison: Glasgow-Prestwick Airport**

Across Europe there are several regional airports which previously enjoyed a busier and more prominent aviation role. Shannon is one of these, and another is Glasgow-Prestwick Airport, hereafter called Prestwick, which until 1990 was a designated transatlantic airport for flights to and from Scotland, just as Shannon was for similar Irish flights until these stopovers were abolished (The Herald Scotland 1990). Prestwick and Shannon share many characteristics, for example comprehensive infrastructure with significant capacity, airport supporting businesses, underused airspace and 24/7 availability.

Figure 9 below compares key features of Shannon and Prestwick Airports. Prestwick is currently Scotland's fifth busiest airport in terms of passenger traffic, Ryanair being the only airline operating scheduled services there. There are several dedicated charter services, while the airport operates a sizeable cargo business and supports military operations, with the UK Ministry of Defence and US, Canadian and Kuwaiti Air Forces all using the facility. Shannon has no military operations or base; however, the airport is regularly used for refuelling purposes by the US military, not without controversy (Lannon 2019). Like Shannon, Prestwick has a significant commercial property portfolio of over 204,000m<sup>2</sup> and an aviation cluster. The region boasts a heavy engineering presence and supports MRO operations. The airport faces major competition from Glasgow and Edinburgh Airports (also Manchester and Newcastle at peak times) and the rail network, which will become a more prominent competitive presence when high-speed services from southern England to Scotland are put in place. Given the proximity of Glasgow City, two million residents live within 60 minutes of the airport, vs 620,000 in Shannon. Unlike Shannon, Prestwick also has a dedicated Rail terminal. (Anna Aero 2019).

Other key current challenges include attracting airport investment, securing agreements with additional airlines and developing new opportunities, such as competing for for UK Spaceport



and Heathrow Logistics ‘airport of choice’ status. Prestwick was privatised in 1992 and underwent series of ownership changes before being re-nationalised by the Scottish Government in 2013. The airport is currently for sale, with a process to find a buyer stipulating that any purchaser must be capable of operating an airport and commit to maintaining and developing airport/aviation services (BBC News 2019).

Figure 9: Shannon Group and Glasgow-Prestwick: Key Characteristics

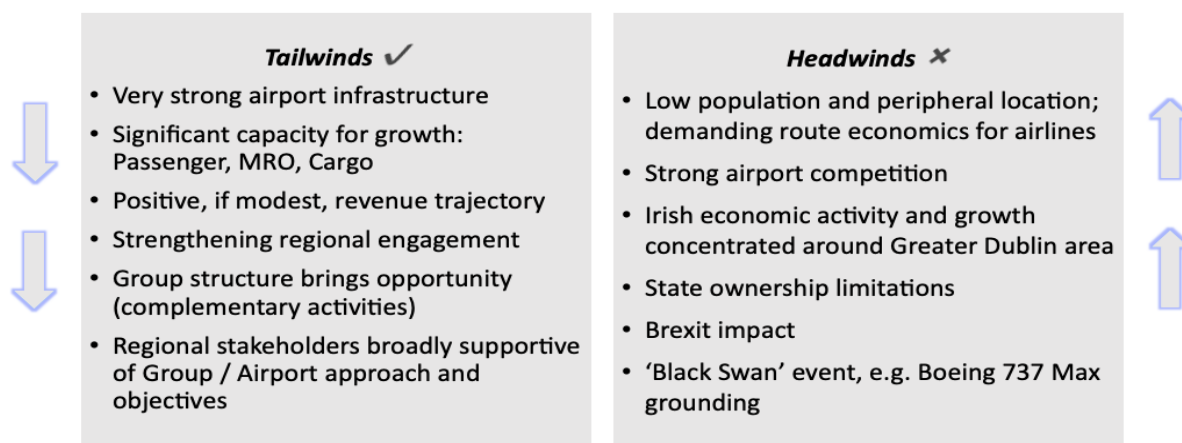
	<b>Shannon</b>	<b>Glasgow Prestwick</b>
<b>Date Opened</b>	1945	1934
<b>Ownership</b>	Publicly Owned, Corporatised (Part of Shannon Group)	Publicly Owned, Corporatised (Previously in Private Ownership; Currently for sale)
<b>Operations</b>	24/7; Good Weather Record	24/7; Good Weather Record
<b>Business Mix</b>	Passenger (Europe and North Atlantic), Cargo, Private, Diversion	Cargo, Passenger (Europe), Military, Private, Diversion
<b>Public Transport Access</b>	Bus	Rail, Bus
<b>Population within 60 minutes</b>	620,000	2m
<b>Size</b>	809.4 hectares	356.1 hectares
<b>Direct Employment (Airport) 2018</b>	260 employees	320 employees
<b>Number of Passengers</b>	1.7m	0.702m
<b>Volume of Cargo (2018)</b>	13,592 Tonnes	11,800 Tonnes
<b>Number of Movements (2018)</b>	25,556	25,700
<b>Terminal Capacity</b>	4.5m	2.5m
<b>Active Runway(s)</b>	One: 3,199m	Two: 2,986m and 1,905m
<b>Commercial Property</b>	241,500 square metres	204,400 square metres
<b>Other Facilities</b>	US Customs and Border Preclearance, Hangar Rental for MROs, Airline Flight Training.	Hangar Rental for MROs, Airline Flight Training. Vying for UK Spaceport and Heathrow Logistics ‘airport of choice’ status
<b>Airport Revenue</b>	N/D	€18.2m

Source: Compiled by authors using information obtained from Shannon Group Annual Report, 2018; Glasgow-Prestwick Annual Report 2017/8; Airport Websites and Department of Transport Statistics, June 2017. Note: Differing year-ends.

## Shannon Airport: Strategic Summary and Current Performance



Figure 10: Shannon Airport - Headwinds and Tailwinds



Shannon’s performance since 2014 has shown a modest increase in passenger numbers and profitability. Shannon has operational costs similar to those of bigger airports, given its comprehensive infrastructure. For example, current terminal capacity is 4.5m p.p.a., while passenger numbers are c.1.7m p.p.a. Increasing these numbers (and revenue) to match this scale is a challenge, however. It will certainly be difficult to increase numbers to a targeted 2.5m by 2020, with strong competition from other airports who may offer non-stop flights to a wide range of destinations one key reason for this challenge. For example, according to OAG data, Dublin currently connects 167 cities as opposed to Shannon’s 27 (Summer 2018 Schedules). Ireland West (23 routes) and Kerry (six routes) Airports provide further competition for Shannon.

In recent Annual Report updates, Shannon Group’s Chairman, Rose Hynes, linked Group developments with the success of the Region. She highlighted its €150m-plus investment plan to 2022 (with €85m invested since 2014), the economic contribution of the Group to its hinterland and the key role that Shannon Group will play in enabling achievement of the Government’s National Planning Framework 2040, in particular the move to a more balanced national economy and society (Shannon Group 2018a). Cost challenges for the Group were also alluded to. Steps, as described above, have recently been taken to reduce operational and staff costs to bring them closer to those of similarly sized airports.

The National Planning Framework (NPF) policy was explicitly highlighted by the Chairman as important to Shannon Group, with stakeholder engagement being vital. The NPF is the government’s regional development strategy and aims to grow the scale of second tier cities like Limerick significantly (Government of Ireland, 2018). In this context it is noteworthy that the Mid-West region in which Shannon Airport is located has recorded relatively poor economic performance with above average unemployment and below average economic

growth. In the 2017 report, the Group's then CEO, Mathew Thomas, highlighted 16 companies who cited Shannon Airport connectivity when announcing new or expanded operations. US connectivity - six airlines and eight destinations - was emphasised as a big plus, and transatlantic activity accounts for a more substantial proportion of total traffic than in most other airports (Shannon Group 2018a). However, the recent grounding of the Boeing 737 Max aircraft has led to the initial suspension of three such transatlantic routes, and the subsequent cancelling of two Norwegian services (Hamilton 2019).

The CEO also spoke of significant competition for new airline business and highlighted the airport's reliance on customer loyalty and advocacy in retaining routes, which airlines always keep under review. Other relevant areas covered included further development of the aviation cluster and the importance of, and appreciation for, a strong relationship with local stakeholders. In their paper specifically on Shannon Networking (Andreosso-O'Callaghan and Lenihan 2008), the authors support such an approach, suggesting that within such industrial areas or innovation hubs a networking advantage can arise, because proximity brings cost efficiency and knowledge-exchange benefits to organisations.

Shannon Group is now well established, and is positioning Shannon Airport, and its sister companies collectively, as a vital economic engine for the region. Nonetheless, recent growth has come off a moderate base, and the airport faces the constant dual challenge, all too familiar to regional airports, of increasing passenger numbers and reducing costs.

The strategic models applied to Shannon Airport have highlighted company strengths and opportunities and show the significant headwinds which the airport faces. Key recurring themes include a focus on growth and costs, opportunities arising out of national policy developments, intense competition and the challenge of operating in a peripheral, low population density location. There are no silver bullets, and local stakeholder engagement is critical.

Shannon's airport and commercial property infrastructure assets are the Group's biggest attractions. The relationship between Shannon Group and other key regional parties is also vitally important. While it may be argued that the airport's current footprint is too large and costly to maintain and that elements of it should be right-sized, there is a danger that any such action would reduce the infrastructure advantage Shannon currently highlights when seeking new business opportunities.

### **Economic Impact Assessment – Shannon Airport / Group**

A recently published company-commissioned report by W2 Consulting assessed the economic impact of Shannon Group (Shannon Group 2018b). The economic impact report's overall methodology included an analysis of each individual Shannon group company. An Input-Output Model was used to produce employment, remuneration, valued-added and economic output multipliers. This information was analysed and used to quantify the economic impact of each Shannon Group company with respect to Employment, Tax Revenue and Gross Value Added (GVA), a measure broadly equivalent to Gross Domestic Product. Direct, Indirect, Induced and Catalytic economic impacts were also estimated.

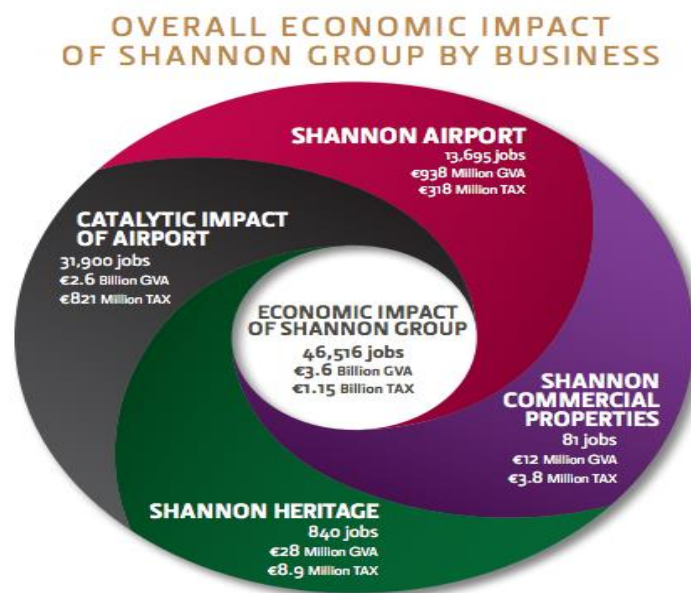
For Shannon Airport, 119 companies associated with Shannon Airport and Airport activities were identified by the independent consultants and invited to participate in the research stage of this study, which was conducted between December 2016 and September 2017. Data collected and information gathered, relating to the 2016 calendar year, included nature of

business, employment levels, annual payroll, expenditure on goods and services and a profile of respondent company employment attributable to (Shannon) airport activity. Other information incorporated into the study included Shannon Group operations and planning information, data from the Central Statistics Office, Tourism and Employment Development Authorities, Employer Representative Bodies, several regional (mid-west) bodies, and aviation sources providing detail on global trends and the outlook for air transport.

Of the 119 companies approached, a response rate of 60% was achieved, implying a 95% confidence level. Responses were representative of the main sectors and business types associated with Shannon Airport. Various alternative sources were consulted to establish data for companies who were identified but did not participate. Further such data was inferred by applying industry averages from those companies that took part in the research. Responses received accounted for 72% of overall direct employment associated with airport activities. This analysis has calculated that the airport’s economic impact is just under €1bn GVA and is responsible for 13,695 jobs in the region (the airport employs 260 staff directly).

Overall, the report contends that Shannon Group overall generates €3.6 billion in GVA in total each year, supporting over 46,500 jobs which contribute €1.15 billion in tax revenue to the Exchequer, with the Airport the most significant contributor, its direct and catalytic impact accounting for two thirds of this total (Shannon Group 2018b).

Figure 11: Overall Economic Impact of Shannon Group (Source: Shannon Group 2018b)



The Table below provides a high-level comparison of the estimated economic impact of Ireland’s main airports. Dublin airport’s economic impact is the highest in the list as expected. Shannon airport is a substantial supporter of the region, providing employment and spillover effects to the region, whereas Kerry airport, the smallest airport reviewed, has the lowest economic impact and employment in Ireland.

Figure 12: Key Irish Airport Economic Impact Assessments (2017)

	<b>UK Market (% of Total passengers)</b>	<b>Economic Impact / Gross Value Added</b>	<b>Employment</b>	<b>Connectivity</b>	<b>Information Source</b>
<b>Shannon</b>	UK 46%	€938m	13,695	30 scheduled destinations served by eight airlines	Shannon Group Annual Report (2018) and Economic Impact Report (2017)
<b>Dublin</b>	UK 34%	€8.3bn	117,300	176 scheduled destinations served by 41 airlines	DAA Annual Report 2017 DAA/InterVISTAS Report 2017
<b>Cork</b>	UK 57%	€727m	10,710	39 scheduled destinations served by nine airlines	DAA Annual Report 2017 DAA/InterVISTAS Report 2017
<b>Knock</b>	UK 85%	€150m	1,400	15 scheduled destinations served by three airlines	Ireland West Annual Review 2017 (Total employment number estimated by L & R)
<b>Kerry</b>	UK 57%	€70m	640	Seven scheduled destinations served by two airlines	L & R, based on a similar methodology applied to similar sized airports
<b>TOTAL</b>		€10.2bn	143,745	267 scheduled routes (all airports)	See above

Source: Oireachtas Library and Research Service (2018)

### **Importance of Regional and National Planning Policies to Aviation**

*Ireland 2040* is a Government-led strategic national planning and development framework for Ireland between now and 2040 (National Planning Framework 2017). It seeks the development of sustained, long-term and regionally balanced physical and social infrastructure. This regional focus is vital. The Greater Dublin Area accounts for 40% of the national population and 49% of economic output. All roads, literally, lead to Dublin. Ireland 2040 seeks to protect the role of Dublin. However, the framework also highlights how Ireland's regional cities such as Cork, Limerick and Galway can benefit from economic activity and employment in their regions and recommends development of adequate infrastructure including motorway, airport and port connectivity.

A number of other current planning initiatives, for example the *Action Plan for Rural Development*, aim to promote a more balanced regional build-up through promotion and development of an Atlantic Economic Corridor to generate jobs and investment along Ireland's Western seaboard, along which Shannon Airport is located (Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs 2017).

Ireland's National Aviation Policy, launched in late 2015 (Department of Transport, Tourism and Sport 2015), focused on three key areas:

- (1) Enhancing Ireland's connectivity and being responsive to the needs of business, tourism and consumers.
- (2) Fostering the growth of aviation enterprise to support growth creation, further helping to position Ireland as a recognised global aviation leader.
- (3) Maximising the contribution of aviation to Ireland's economic growth and development.

Irish State-owned Airports, including Shannon, are perceived as delivering significant strategic transport infrastructure and essential services that positively contribute in supporting State economic and social activities. They operate commercially, but their Government-directed mandate requires that decisions take account of the broader national interest. Ongoing viability depends on their ability to attract inward services and passengers.

Airports are regarded as key tourism and business gateways, and continued development to this end is supported. The policy document highlighted the extensive airport coverage (Cork, Donegal, Dublin, Ireland West and Kerry) for a small island nation with a population of 4.9 million inhabitants. It acknowledged that this presented airport operator challenges regarding traffic and performance, given the cyclical vulnerability to economic/political shocks as well as emission targets. An abundance of airports leads to duplication of unused or inefficiently used infrastructure (European Commission 2014). Indeed, smaller Irish airports have experienced significant difficulty in attracting passenger routes in recent times, and some of them have ceased airline operations.

The National Aviation Policy also committed to a review of airport capacity, given recent passenger increases in Dublin. However, this work is focusing on capacity constraints in Dublin, rather than taking a national, holistic perspective, which approach might have given rise to a more balanced approach to managing future Irish Airports capacity (Department of Transport, Tourism and Sport 2019b).

The Irish Government contends that State ownership of the three largest Irish airports enables fulfilment of its commercial mandate, facilitating trade, tourism and inward investment with consideration of the broader national interest, in a manner not guaranteed if the airports were privately owned. Key national aviation policy commitments do, however, include a review of future ownership options regarding the State-owned airports. While current policy is that Dublin, Cork and Shannon airports will remain in public ownership, the Government will formally review this approach in 2019, and every five years subsequently.

### **Policy Impacts: Shannon Airport**

Recent Irish policy initiatives, such as *Ireland 2040* (National Planning Framework), as described above, have highlighted the potential benefit of regional economic policies to the Shannon region in general, and Shannon Group/Airport in particular, with the airport seen as having a pivotal role to play.

The nature of Irish regional policy and planning frameworks is fundamental to the development of Shannon and environs, and its tourism gateway status is a second essential factor. The potentially positive impact of Irish economic policies could facilitate development of a western business cluster in Ireland, along the lines of the tourism cluster that forms the Wild Atlantic Way. A planned new motorway linking Cork and Limerick, Ireland's second and third largest cities, should also benefit Shannon. Furthermore, two other major economic pillars for the region's development - Foynes Port and the University of Limerick – are located very close to Shannon Airport. These factors, combined with emerging capacity issues in the greater Dublin area, give rise to a potential increase in regional demand for local industrial space and activity, potentially benefiting the business of Shannon Airport and the other Group companies.

### **Stakeholder Engagement**

One of the most acclaimed authors on stakeholder theory, R. Edward Freeman, suggested the following stakeholder definition in 1984: "Stakeholders are groups and individuals that have a valid interest in the activities and outcomes of a firm, and on whom the firm relies to achieve its objectives." (Freeman et al 2004). Stakeholder engagement is described by Jeffery (2009) as a "process whereby parties who can affect, or may be affected by, the activities of an organisation and the achievement of its goals, should have an opportunity to contribute to the development of activities and decisions that may affect them".

The positive, enabling role of stakeholder engagement in aviation is supported by Amaeshi and Crane (2006) and Murphy and Efthymiou (2017), who identify it as a complementary mechanism to market and regulatory activities associated with airport companies. Shannon Group stakeholder activity comprises engagement with local representative groups, including local authorities in Limerick and Clare, airlines, national development agencies, chambers of commerce in Counties Limerick and Clare, tourism bodies and the Department of Transport, Tourism and Sport. Such stakeholder engagement is essential. For example, Ireland's Industrial Development Agency (IDA) continually emphasises the importance of Shannon Airport and the Group's commercial property business when marketing Shannon and Ireland's mid-west region to companies considering inward investment. These capabilities are important selling points when such investment opportunities are being pursued. Mobilisation around the Ireland 2040 National Planning Framework is another key stakeholder opportunity for the region.

Figure 13 highlights a broad range of regional airport stakeholders, underpinning the importance of an effective engagement approach in this area.

*Figure 13: Key Shannon Airport Stakeholders*

## Key Regional Airport Stakeholders



Source: Developed by authors

### Shannon Airport: Current Focus

Shannon Airport's emphasis on passenger growth and route development is strongly focused on inbound tourism and business-friendly routes. Of course, airlines now seek to make money from day one on new routes. Irrespective of specific introductory agreements, sustained customer demand is key. If a route fails, it is hard to win it back. This gives rise to a major challenge for peripheral airports such as Shannon, as airlines are much more likely to be interested in routes with significant population levels at both ends, something which is not one of the airport's selling points. Approximately 60% of the Irish population lives within one hour of Dublin, while for Shannon the number is closer to 16%. It is likely, given Ireland's much-improved motorway network, that a significant number of passengers travel from Shannon's hinterland to take a flight from Dublin Airport. It is now quite easy to do a day or overnight trip to the West of Ireland from Dublin, meaning that even if flying into Dublin, tourists can also travel to the West. In its report, *Tourism in The West: An Engine for Growth and Jobs* (Irish Tourist Industry Confederation 2015), it was estimated that over 50% of such tourists arrive into Ireland via Dublin and then travel to the west of Ireland. Even though the reverse is also true, this trend benefits the airport with the highest levels of connectivity. Indeed, Ireland's national bus company proudly advertises the fact that it provides 300 daily services to Dublin Airport from all parts of the country, including Limerick, Shannon's closest main city (Bus Eireann 2019).

Shannon has good westward connectivity to North America, as evidenced by the number of transatlantic carriers using the airport for much of the year. This is likely to remain the case for as long as US travel operators perceive the West of Ireland as a separate tourist market. However, Shannon is not as strong an attraction for routes to the UK and, especially, Europe. Ireland is one hour behind most of Western Europe. The airport's location also means that Shannon is at least an hour away from mainland Europe in the air. Airline economics for such routes are especially challenging. Even free deals are not attractive to carriers if the seats cannot

be filled. Competition for new routes will also come from the UK and mainland European airports who regularly compete to take up new airline capacity.

Given the challenging nature of airline economics for peripheral airports, as described above, Shannon's future is more likely to involve a greater use of regional jets or turboprops (60-100 seats) on UK and European routes, which will primarily be point-to-point focused, and maximum range Boeing and Airbus narrow-bodies for transatlantic routes which is already the case, with all such connections currently operated by Boeing 757 and 737 types. It can be expected that Aer Lingus will use some of its A321neo LR aircraft, when delivered, to replace the Boeing 757s which currently operate the airline's Shannon routes on a contract basis. However, it appears that any new Aer Lingus transatlantic routes, whether launched, recently announced or contemplated, will fly out of Dublin, notwithstanding emerging capacity constraints there. This approach is consistent with the increasing use by Aer Lingus of Dublin Airport as a mini hub for North American air traffic, connecting European passengers with US destinations (and vice versa). Additionally, the use of Boeing 757s by US transatlantic operators on Shannon routes could represent a risk when these aircraft come to the end of their working life, if these carriers do not have adequate alternative aircraft available for use on routes such as Shannon in the short-term. Finally, the current grounding of Boeing 737 Max has had a disproportionate effect on Shannon, with the airport's interim CEO estimating an annualised loss of 120,000 passengers (c.7% of total 2018 numbers) arising from the suspension of three transatlantic Shannon routes using this type (Ryan 2019).

These competitive factors represent a significant challenge to passenger growth at Shannon. However, given its current capacity, runway length and US CBP facility, Shannon has distinct advantages and has the potential to expand the number of transatlantic flights particularly with low-cost long-haul carriers and US carriers. It could even develop itself into an attractive location for airlines targeting North American traffic opportunities (in the same manner that Ryanair is feeding traffic to Air Europa at Madrid, which connects passengers onwards to Latin America). Shannon has also launched a stand-alone website 'FlyShannon.ie', which enables visitors to book any flight from Shannon, including the option to reserve a hotel room, hire a car and arrange airport parking. This focus on non-aeronautical activity has also highlighted an opportunity for Shannon's duty-free businesses to focus on superior heritage-related products and several premium retail and hospitality outlets have recently opened.

## **Concluding Remarks**

European regional airports will continue to experience challenging times in increasingly volatile industry and economic conditions, and competition will remain intense. Given the critical role such airports play on the one hand, and the business challenges they face on the other, their financial standing and the nature and extent of external and state support, will continue to weigh heavily on performance and viability. Notwithstanding high current levels of public ownership of regional airports, it is likely that many airports and governments will become more open to risk sharing models, perhaps involving greater privatisation and various hybrid partnership arrangements.

Economic and aviation-related government policies have the potential to significantly influence regional airport development, particularly in lower population-density regions where stimulation of activity, for example through investment and incentives, is seen politically as necessary or desirable. There is broad agreement that neither companies nor airlines will establish operations in a specific location due to region-friendly policy positions that have no



commercial basis. Such approaches could fall foul of State Aid rules and might not deliver sustainable benefits locally.

It is too early to assess the success of the Shannon Group business model. Passenger numbers have steadily increased since separation from the Dublin Airport Authority. From an airport point of view, however, Shannon faces the cost and growth challenges all such airports experience. The Group is peripherally located and faces intense competition, highlighted by the fact that c. 85% of Irish airport passenger growth into and out of the country from 2012 to 2017 has been through Dublin Airport (Central Statistics Office 2018). Furthermore, the impact of one-off events such as the Max grounding and the need to invest significantly in upgraded security screening equipment without State support, as provided to other Irish airports (Hamilton 2018), will have a disproportionately adverse effect on airports such as Shannon.

Airport sustainability may be enhanced through group synergies, a key success factor when assessing the Shannon Group, where a cluster of vertically integrated airport assets can coalesce to improve the Group's financial performance. A similar corporate structure, i.e. one including an airport and commercial property component, is in place at Prestwick Airport, suggesting that variations of the Shannon Group model are potentially applicable elsewhere in Europe, given the similarity of regional airport characteristics.

Local stakeholder engagement is also critical for European regional airports. These airports should be closely aligned with business groups, tourist bodies, local government agencies and other networks. Airlines are likely to react positively to the presence of such a united local front when considering the launch of new routes. Such a united coalition can also help parties maximise the potential from local business and tourism opportunities, benefiting airport passenger traffic. Strong local stakeholder relationships may result in, or happen as a result of, airport groups taking a more active role, including ownership, of related local infrastructure, as has happened in the case of Shannon Group. One risk to success is any potential dilution of focus from an airport's core business due to additional management requirements associated with a broader group company remit. It can be argued, however, that this broader focus is essential to support airport sustainability and growth.

As European aviation grows and hub airports reach capacity, there will be an opportunity for regional airports, particularly well-located ones with low costs and significant capacity. Shannon's strong transatlantic position, supported by the presence of US Customs and Border Pre-clearance (CBP), provides a unique differentiator relative to other regional airports, while its location on the western edge of Europe is more likely to be able to sustain routes to the Eastern corridor of North America using narrow-body aircraft types. Notwithstanding current issues, the launch into service of next generation Airbus and Boeing narrow-bodies points to new opportunities for Shannon, as the operating economics for such aircraft are substantially better than those of wide-body aircraft, making them suitable for a higher number of point to point routes.

It is difficult to envisage any short-term change in Shannon Airport's ownership status. The question as to whether Shannon would be best placed as a state airport or a private commercial entity remains an open one. However, any privatisation of Shannon would be likely to be politically difficult. During a 2016 address to a tourism conference in the airport's hinterland, Shannon Group's Chief Executive Officer, Mathew Thomas, spoke about combining the best characteristics of public sector ownership, e.g. long-term vision and cautious risk profile, with private sector thinking, e.g. efficiency, creativity and agility. These words suggest that at some future stage, the Group might consider hybrid investment models tied to specific initiatives

targeting business growth (Thomas 2016). Shannon as a Group is likely to be more attractive to potential long-term investors than Shannon as an Airport. Though it appears that the State has no current intention of selling down its shareholding, this position might possibly change if such a transaction was regarded as beneficial to the region as a whole. Such benefits could come through investments in a major new tourism asset or through further development of the aviation services cluster. Public-private partnership models could also be considered regarding the development of a specific piece of infrastructure, for example a major conference centre on grounds owned by Shannon Group.

This chapter has sought to use the example of the Shannon Group to highlight the challenges and opportunities affecting regional airports, and to describe how such airports might become part of a locally based corporate entity. Shannon Group's vision and mission statements are focused on increasing airport passenger numbers by attracting more visitors and businesses to the area and delivering economic benefits to the west of Ireland. Its structure represents a strong focus on innovation and entrepreneurship, combined with a broad and more integrated regional positioning for Shannon Airport.

Consideration of similar models for other European regional airports has potential attractions, including improved performance and alignment with national and EU regional economic and airport objectives. The authors hope that these early observations from the Shannon Group experience will help readers better understand this topic.

## References

- Adler, N., Ülkü, T. and Yazhensky, E., 2013. Small regional airport sustainability: Lessons from benchmarking. *Journal of Air Transport Management*, 33, pp.22-31.
- Adler, N. and Liebert, V., 2014. Joint impact of competition, ownership form and economic regulation on airport performance and pricing. *Transportation Research Part A: Policy and Practice*, 64, pp.92-109.
- Airports Council International 2017. *European Regional Airports - Connecting people, places and products. Regional Airports' Forum*. [Online], April 2012. Available from: <https://www.aci-europe.org/component/downloads/downloads/5337.html> [Accessed 4 June 2019].
- Airports Council International 2016. *The Ownership of Europe's Airports 2016*. [Online], 8 March. Available from: <https://www.aci-europe.org/component/downloads/downloads/5095.html> [Accessed 14 June 2018].
- Airports Council International 2017. *Regional Airports' Forum*. [Online], June. Available from: <https://www.aci-europe.org/policy/position-papers.html?view=group&group=1&id=18> [Accessed 14 June 2018].
- Airports Council International 2019. Fast Facts. [Online]. Available from: <https://www.aci-europe.org/policy/fast-facts.html> [Accessed 20 June 2019].
- Amaeshi, K.M. and Crane, A. 2006. Stakeholder engagement: A mechanism for sustainable aviation. *Corporate Social Responsibility and Environmental Management*, 13(5), pp.245-260.
- Andreosso-O'Callaghan, B. and Lenihan, H. 2008. Networking: A Question of Firm Characteristics? The Case of the Shannon Region in Ireland. *Entrepreneurship and Regional Development*, 20(6), pp.561-580.
- Anna Aero 2019. Glasgow Prestwick Airport (PIK/EGPK). Available from: <http://www.therouteshop.com/profiles/prestwick-airport/> [Accessed 1 August 2019].
- Anna Aero 2019. *Shannon Airport (SNN/EINN): Other major reasons to serve this airport*. The Route Shop. [Online]. Available from: <http://www.therouteshop.com/profiles/shannon-airport/> [Accessed 1 July 2019].
- Baker, D. and Donnet, T., 2012. Regional and remote airports under stress in Australia. *Research in Transportation Business & Management*, 4, pp.37-43.
- Barrett, S. 2009. EU/US Open Skies – Competition and change in the world aviation market: The implications for the Irish aviation market. *Journal of Air Transport Management*. Volume 15, Issue 2, March 2009, Pages 78-82.
- BBC News. 2019. Publicly owned Prestwick Airport put up for sale. Available from: <https://www.bbc.com/news/uk-scotland-scotland-business-48627212> [Accessed 13 August 2019].
- Booz and Company 2012. *Options for the Future Ownership and Operation of Cork and Shannon Airports*. [Online]. Available from: [https://www.ennischamber.ie%2Fwp-content%2Fuploads%2F2012%2F03%2FOPTIONS\\_FOR\\_THE\\_FUTURE\\_OWNERSHIP\\_AND\\_OPERATION\\_OF\\_CORK\\_AND\\_SHANNON\\_AIRPORTS-0.pdf&usg=AFQjCNESvhM3reSFtMg8KXXT-mx89kf9Zg&sig2=EW7yx-bclsmjb8gOZ78RNw&bvm=bv.142059868,d.d24](https://www.ennischamber.ie%2Fwp-content%2Fuploads%2F2012%2F03%2FOPTIONS_FOR_THE_FUTURE_OWNERSHIP_AND_OPERATION_OF_CORK_AND_SHANNON_AIRPORTS-0.pdf&usg=AFQjCNESvhM3reSFtMg8KXXT-mx89kf9Zg&sig2=EW7yx-bclsmjb8gOZ78RNw&bvm=bv.142059868,d.d24) [Accessed 4 December 2016].
- Bus Eireann. 2019. *Get to the airport ready to fly*. Available from: <https://youtu.be/4VqbaU62ibi> [Accessed 1 July 2019].
- Cahill, C., Palcic, D., Reeves, E. 2017. Commercialisation and airport performance: The case of Ireland's DAA. *Journal of Air Transport Management*, 59, pp. 155-163

- Central Statistics Office 2018. Aviation Statistics; Quarter 4 and Year 2017. [Online], 19<sup>th</sup> April. Available from: <https://www.cso.ie/en/releasesandpublications/er/as/aviationstatisticsquarter4andyear2017/> [Accessed 6 August 2019].
- DaSilva, C.M. and Trkman, P. 2014. Business model: What it is and what it is not. *Long Range Planning*, 47(6), pp.379-389.
- Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs 2017. *Realising our Rural Potential: Action Plan for Rural Development*. [Online], 23 January. Available from: <http://www.ahrrga.gov.ie/realising-our-rural-potential-government-launches-the-action-plan-for-rural-development/> [Accessed 10 June 2018].
- Department of Transport, Tourism and Sport 2012. *Options for The Future Ownership and Operation of Cork and Shannon Airports*. [Online], 29 February. Available from: <http://www.dttas.ie/aviation/publications/english/feb-2012-options-future-ownership-and-operation-cork-and-shannon> [Accessed 20 August 2018].
- Department of Transport, Tourism and Sport 2014. *Minister Donohoe hails new era as Shannon Airport Authority and Shannon Development transferred to Shannon Group*. [Online], 5 September. Available from: <http://www.dttas.ie/press-releases/2014/minister-donohoe-hails-new-era-shannon-airport-authority-and-shannon-development> [Accessed 23 August 2018].
- Department of Transport, Tourism and Sport 2015. *A National Aviation Policy for Ireland*. August 2015. [Online], 20 August. Available from: <http://www.dttas.ie/aviation/english/national-aviation-policy-ireland> [Accessed 15 June 2017].
- Department of Transport, Tourism and Sport 2017. *Address by Minister for Transport, Tourism and Sport, Shane Ross T.D. at the National Civil Aviation Development Forum*. [Online], 20 February. Available from: <http://www.dttas.ie/speeches/2017/address-minister-transport-tourism-and-sport-shane-ross-td-national-civil-aviation> [Accessed 16 May 2017]
- Department of Transport, Tourism and Sport. 2019a. Regional Airports Public Consultation Programme. [Online]. Available from: <https://www.gov.ie/en/consultation/a901a5-regional-airports-porgramme-public-consultation/> [Accessed 12 September 2019].
- Department of Transport, Tourism and Sport. 2019b. Independent Review of Capacity Needs of Ireland's State Airports. [Online]. Available from: <https://www.gov.ie/en/publication/177d5f-independent-review-of-capacity-needs-of-irelands-state-airports/> [Accessed 3 August 2019].
- Dobruszkes, F., Givoni, M. and Vowles, T., 2017. Hello major airports, goodbye regional airports? Recent changes in European and US low-cost airline airport choice. *Journal of Air Transport Management*, 59, pp.50-62.
- Drysdale, J. 2017. *Boeing and Datalex partner with IASC and DCU to support high-flying aviation start-ups at Shannon*. [Online], 20 June. Available from: <https://www.linkedin.com/pulse/propeller-shannon-john-drysdale> [Accessed 24 June 2017].
- Efthymiou, M. and Papatheodorou, A. 2015. *Intermodal passenger transport and destination competitiveness in Greece, Anatolia* International Journal of Tourism and Hospitality Research 26 (3): 459-471.
- Efthymiou, M. and Papatheodorou, A., 2018. Evolving airline and airport business models. *The Routledge Companion to Air Transport Management*, pp.122-135.

- Efthymiou, M., Arvanitis, P. & Papatheodorou, A. (2016) Institutional Changes and Dynamics in the European Aviation Sector: Implications for Tourism. In Pappas N. & Bregoli, I. (eds) *Global Dynamics in Travel, Tourism and Hospitality*. Hershey Pennsylvania: IGI Global, pp 41-57.
- European Commission 2014. *Guidelines on State Aid to Airports and Airlines*. [Online], 4 April. Available from: [http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52014XC0404\(01\)](http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52014XC0404(01)) [Accessed 15 July 2018].
- Flynn, P. 2017. *Shannon airport opens sensory room for passengers with autism*. The Irish Times. [Online], 29 March. Available from: <https://www.irishtimes.com/business/transport-and-tourism/shannon-airport-opens-sensory-room-for-passengers-with-autism-1.3029221> [Accessed 24 May 2017].
- FlyPlymouth 2019. It's Time to get Plymouth's Airport Flying Again. [Online]. Available from: <http://www.flyplymouth.com/> [Accessed 25 August 2019].
- Freeman, R.E., Wicks, A.C. and Parmar, B., 2004. Stakeholder theory and "the corporate objective revisited". *Organization science*, 15(3), pp.364-369.
- Frontier Economics, 2014. *Setting airport regulated charges: the choice between single till and dual till*. London: Frontier Economics.
- Gillen, D., 2011. The evolution of airport ownership and governance. *Journal of Air Transport Management*, 17(1), pp.3-13.
- Glasgow Prestwick Airport, 2019. TS Prestwick Accounts. Available from: <https://www.glasgowprestwick.com/wp-content/uploads/2018/12/TS-Holdco-Ltd-Accounts-Apr-17-Mar-18.pdf> [Accessed 23 August 2019].
- Google Maps. 2019. Directions and Route Planner. Available from <https://www.google.com/maps/dir/> [Accessed 16 September 2019].
- Government of Ireland (2018) *Ireland 2040: National Planning Framework*. Dublin: Department of Housing, Planning and Local Government.
- Graham, A. 2014. *Managing Airports 4th Edition: An International Perspective*. Routledge.
- Grundy, T., 2006. Rethinking and reinventing Michael Porter's five forces model. *Strategic Change*, 15(5), pp.213-229.
- Halpern, N. and Pagliari, R. 2007. Governance structures and the market orientation of airports in Europe's peripheral areas. *Journal of Air Transport Management*, 13(6), pp.376-382.
- Hamilton, P. 2018. *Shannon Airport chief criticises lack of Government support*. Irish Times [Online]. Available from: <https://www.irishtimes.com/business/transport-and-tourism/shannon-airport-chief-criticises-lack-of-government-support-1.3711328> [Accessed 1 June 2019].
- Hamilton, P. 2019. *Will Norwegian's Irish exit lead to higher transatlantic airfares?* Irish Times [Online]. Available from: <https://www.irishtimes.com/business/transport-and-tourism/will-norwegian-s-irish-exit-lead-to-higher-transatlantic-airfares-1.3986002> [Accessed 1 September 2019].
- Ireland West Airport 2019. *Where can I fly?* [Online]. Available from: <https://irelandwestairport.com/> [Accessed 31 October 2019].
- Irish Tourist Industry Confederation 2015. *Tourism in The West: An Engine for Growth and Jobs*. [Online], November. Available from: <http://www.itic.ie/wp-content/uploads/2015/11/Tourism-in-the-West-Full-Report-Nov-2015.pdf> [Accessed 20 June 2017].

- Irish Tourist Industry Confederation 2019. *Tourism, A Competitiveness Report*. [Online]. Available from: <https://www.itic.ie/wp-content/uploads/2019/08/Tourism-competitiveness-ITIC-report-Aug2019.pdf> [Accessed 2 September 2019].
- Ison, S., Francis, G., Humphreys, I. and Page, R., 2011. UK regional airport commercialisation and privatisation: 25 years on. *Journal of Transport Geography*, 19(6), pp.1341-1349.
- Jeffery, N. 2009. *Stakeholder engagement: A road map to meaningful engagement*. Cranfield CERES.
- Johnson, M. Christensen, C., and Kagermann, H., 2008. Reinventing your business model. *Harvard Business Review*, 86 (12), pp. 50-59.
- Joyce, A. and Paquin, R.L., 2016. The triple layered business model canvas: A tool to design more sustainable business models. *Journal of Cleaner Production*, 135, pp.1474-1486.
- Kerry Airport 2019. *Direct Flights from Kerry Airport* [Online]. Available from: <https://kerryairport.ie/website/flight-info/destinations/> [Accessed 30 October 2019].
- Lannon 2019. *A question of neutrality and Shannon Airport*. RTE Brainstorm. Available from: <https://www.rte.ie/brainstorm/2019/0115/1023314-a-question-of-neutrality-and-shannon-airport/> [Accessed 30 October 2019].
- Lawless, M., and E. Morgenroth. 2016. "Opportunities and Risks for Foreign Direct Investment" in Bergin, A., Morgenroth, E., and K. McQuinn (eds.) *Ireland's Economic Outlook: Perspectives and Policy Challenges*. ESRI Forecasting Series EO1.
- Lei, Z and Papatheodorou, A. 2010. Measuring the effect of low-cost carriers on regional airports` commercial revenue, *Research in Transportation Economics*, 26 (1), 37–43.
- McCoy, D., Lyons, S., Morgenroth, E., Palcic, D., and L. Allen, (2018) "The impact of local infrastructure on new business establishments" *Journal of Regional Science*, Vol. 58(3), pp. 509-534.
- Murphy, G., & Efthymiou, M. (2017). Aviation safety regulation in the multi-stakeholder environment of an airport. *Journal of Air Transport Studies*, 8(2), 1-26.
- National Planning Framework 2017. *What is the National Planning Framework?* [Online]. Available from: <http://npf.ie/about/> [Accessed 5 June 2017].
- O'Brien, T. 2013. *Government Scraps Spatial Strategy*. The Irish Times. [Online], 12 February. Available from: <https://www.irishtimes.com/news/government-scraps-spatial-strategy-1.1254981> [Accessed 4 July 2018].
- O'Brien, T. 2019. *Knock airport to attract 1m passengers with upgraded runway*. The Irish Times. [Online]. Available from: <https://www.irishtimes.com/news/ireland/irish-news/knock-airport-to-attract-1m-passengers-with-upgraded-runway-1.4025008> [Accessed 20 September 2019].
- O'Connell, B and O'Carroll, C. 2018. *Brendan O'Regan: Irish Visionary, Innovator, Peacemaker*. Irish Academic Press.
- O'Halloran, B. 2018. *Shannon Group falls short of targets set five years ago*. The Irish Times. [Online]. 17 February. Available from: <https://www.irishtimes.com/business/transport-and-tourism/shannon-group-falls-short-of-targets-set-five-years-ago-1.3394947> [Accessed 4 July 2018].
- Official Journal of the European Union 2014. *Guidelines on State aid to airports and airlines*. 2014/C 99/03.
- Oireachtas Library and Research Service. 2018. *Ireland's Main Airports: An Economic Profile (2017)*. [Online]. Available from:



[https://data.oireachtas.ie/ie/oireachtas/libraryResearch/2018/2018-07-05\\_ireland-s-main-airports-an-economic-profile\\_en.pdf](https://data.oireachtas.ie/ie/oireachtas/libraryResearch/2018/2018-07-05_ireland-s-main-airports-an-economic-profile_en.pdf) [Accessed 3 July 2019].

- Osterwalder, A. and Pigneur, Y. 2010. *Business model generation: a handbook for visionaries, game changers, and challengers*. John Wiley & Sons.
- Pagliari, R. and Graham, A., 2019. An exploratory analysis of the effects of ownership change on airport competition. *Transport Policy*, 78, pp.76-85.
- Papatheodorou, A., Vlasi, E., Gaki, D., Papadopoulou-Kelidou, L., Efthymiou, M., Pappas, D., Paraschi P. 2019. 'The Airline – Airport –Destination Authority Relationship: The Case of Greece' Kozak, N. and Kozak, M. (eds). *Tourist Destination Management-Instruments, Products, and Case Studies*. Switzerland: Springer. [https://doi.org/10.1007/978-3-030-16981-7\\_3](https://doi.org/10.1007/978-3-030-16981-7_3)
- Porter, M.E. 1979. How competitive forces shape strategy. *Harvard Business Review*. [Online], March. Available from: <https://hbr.org/1979/03/how-competitive-forces-shape-strategy> [Accessed 14 June 2017].
- PwC Capital Projects and Infrastructure 2017. *Connectivity and growth: The Brexit Issue*. [Online], March. Available from: <https://www.pwc.com/gx/en/capital-projects-infrastructure/pdf/pwc-connectivity-and-growth-the-brexit-issue-2016.pdf> [Accessed 6 June 2017].
- Regan, P. 2017. Flying on course: Public-sector innovation at Shannon airport. *International Journal of Entrepreneurship and Innovation*. 18(2), pp. 128-135
- Ryan, O. 2019. 'Looming Crisis' at Shannon as Passenger Numbers Fall and Norwegian Exit. *The Clare Champion* [Online]. Available from: <https://clarechampion.ie/looming-crisis-at-shannon-as-passenger-numbers-fall-and-norwegian-exit/> [Accessed 1 August 2019].
- Shannon Airport 2017. *History of Shannon Airport*. [Online]. Available from: <http://www.shannonairport.ie/gns/about-us/history-of-shannon-airport.aspx> [Accessed 2 June 2017].
- Shannon Development 2007. *Shannon Development – A brief profile*. [Online]. Available from: <https://web.archive.org/web/20071129223104/http://www.shannondevelopment.ie/AboutUs/AbriefprofileofShannonDevelopment/> [Accessed 30 October 2019].
- Shannon Group 2017. *Shannon group plc annual report, 2016*. [Online]. Available from: <https://www.shannongroup.ie/shannon-group-plc-annual-report-2016/> [Accessed 20 June 2016].
- Shannon Group 2018a. *Shannon group plc annual report, 2017*. [Online]. Available from: <https://www.shannongroup.ie/shannon-group-annual-report-2017/> [Accessed 20 August 2018].
- Shannon Group 2018b. *Shannon Group Economic Impact Report*. [Online]. 25 April. Available from: <https://www.shannongroup.ie/shannon-group-economic-impact-report/> [Accessed 21 August 2018].
- Shannon Group 2019. *Shannon group plc annual report, 2018*. [Online]. Available from: <https://www.shannongroup.ie/wp-content/uploads/SNN-Group-Annual-Report-2018-V5-Onscreen-FINAL-English.pdf> [Accessed 20 June 2019].
- Shannon IASC 2019. *Why Set up Business in Shannon?* [Online]. Available from: <https://www.iasc.aero/> [Accessed 10<sup>th</sup> September 2019].
- Sheridan, A. 2017. *Plans for Shannon Airport a 'bombshell' say staff*. *The Limerick Leader* [Online]. 30 March. Available from: <http://www.limerickleader.ie/news/home/242602/measures-at-shannon-airport-are-to-reduce-costs.html> [Accessed 30 April 2018].

- Thomas, M. 2016. *A new model for Airport Development*. Annual Tourism Policy Workshop. [Online], 17 November. Available from: <https://tourismpolicyworkshop.files.wordpress.com/2014/10/a-new-model-for-airport-development.pdf> [Accessed 24 June 2018].
- Tourism Ireland. 2019. *Mid-year review of overseas tourism 2019*. [Online]. Available from: <https://www.tourismireland.com/Press-Releases/2019/July/Mid-year-review-of-overseas-tourism-2019>. [Accessed 15 August 2019].
- Thurlby, B. 1998. Competitive forces are also subject to change. *Management decision*, 36(1), pp.19-24.
- Vega, A. and Reynolds-Feighan, A., 2012. Evaluating network centrality measures in air transport accessibility analysis: a case study for Ireland. *UCD School of Economics Working Paper Series, University College Dublin*.
- Wilkinson, J. 2013. *Buyer Bargaining Power* [Online], 23 July. Available from <https://strategiccco.com/buyer-bargaining-power-one-of-porters-five-forces/> [Accessed 24 June 2017].
- Woulfe, J. 2010. *O'Leary claims Shannon 'dying on its feet' as Ryanair cuts flights by 21%*. The Irish Examiner. [Online], 9 September. Available from: <http://www.irishexaminer.com/business/oleary-claims-shannon-dying-on-its-feet-as-ryanair-cuts-flights-by-21-130266.html> [Accessed 14 June 2017].
- Zhang, M.L. 2014. Analysis on herter- organizing of airport industry cluster based on the system dynamics. *Applied Mechanics and Materials*, 556-562, pp. 6610-6615