

**Can Air Transport Public Service Obligation Subsidies Become
Successful Investments in Peripheral Development? A Multiple
Case Study Exploration of UK Regional Routes.**

DAMIAN DEVLIN

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Abstract

The benefits gained by passengers since the liberalisation of the European air transport market have been considerable and include increased choice, improved service, and reduced fares. However, these benefits do not accrue on routes that lack sufficient demand to create the necessary scale economies and market competition. Air transport public service obligations (PSO) are intended to protect such routes when they become vulnerable to market failures, as airlines concentrate their networks onto profitable routes with high demand. This thesis has aimed to identify the conditions in which PSOs can most substantially contribute to regional development in peripheral regions, which would in turn stimulate greater demand for a PSO service.

New Economic Geography explains the influence of transport costs on a firm's location choices and in creating the core-periphery structure dominating the economic landscape. Contemporary regional development theory emphasises the importance of endogenous strategies, that valorise place-based assets to achieve growth in lagging peripheral economies, over redistributive policies that direct economic activity towards them from leading core centres. However, aviation connectivity remains unevenly distributed and peripheral regions do not benefit from the same quality of access to external markets as core centres. What remained unstudied was the conditions necessary to increase demand for air transport connectivity from within the peripheral regions they serve, which in turn create the market environment for increasingly competitive PSO tenders and the reduction of public subsidy, while also creating the possibility for the marketisation of these routes.

A multiple-case study method was used to compare the circumstances present in regions of the UK benefiting from a PSO service to London– Cornwall, Dundee, and Londonderry. A mixed-method approach, following a three-stage sequential exploratory order, consisting of documentary research, stakeholder interviews, and a questionnaire-based survey, was taken to investigate the circumstances present in each of these regions. Judgment sampling was used to select research participants from three stakeholder groups with the seniority and insights required by this study– Local Government, the Business Community, and Aviation Services Providers.

The findings identify how the current regulatory and policy approach to funding, imposing, and administering PSOs is failing to fulfil the connectivity needs of peripheral passengers. The implications of which are set out in the new contributions the thesis makes to theory. The first contribution is that taking a new and contemporary view of the core parameters of New Economic Geography makes it possible to elucidate the greater contribution to endogenous development to be made by strategically imposed PSOs. The second is a new general systems theory model illustrating the role of PSOs in regional development in maximising the permeability of the boundary around place-based economic activity. A third contribution is a framework of technical and policy conditions necessary to stimulate greater demand for a PSO route, thereby reducing its dependency on public funding.

The study has highlighted the need for a shift in the paradigm of PSO funding amongst policymakers if peripheral regions are to benefit from aviation connectivity that affords them competitive access to external markets, from that

of subsidising an air transport service to an investment in the economic development of the peripheral regions they serve. This thesis provides policymakers with clarity about the strategic objectives for a PSO when imposed as part of an endogenous approach to regional development, which can guide them when making the strategic case in a PSO funding proposal business case. The research was conducted before the effects of Brexit or Covid-19 were fully understood. Though events are likely to add to, not detract from, the relevance and timeliness of these contributions.

Statement of originality

I declare that this thesis has been composed solely by myself and that it has not been submitted, in whole or in part, in any previous application for a degree. Except where stated by reference or acknowledgement, the work presented here is entirely my own.

Damian Devlin (21280889)

London Geller College of Hospitality and Tourism

University of West London

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List of abbreviations

| | |
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| ADS | Air Discount Scheme |
| APD | Air Passenger duty |
| BC | Business Community |
| BCR | Benefit-Cost Ratio |
| BMA | Belfast Metropolitan Area |
| CAA | Civil Aviation Authority |
| CAN | Cornwall Airport Newquay |
| CODA | City of Derry Airport |
| CP | Core-periphery |
| CfF | Centrifugal Forces |
| CpP | Centripetal Forces |
| CSPR | Case Study Peripheral Region |
| DCSD | Derry City and Strabane District |
| DfI | Department for Infrastructure |
| DfT | Department for Transport |
| EAS | Essential Air Service |
| ESTDR | Essential Air Services and Tourism Development Route |
| FCC | Full Cost Carrier |
| FDI | Foreign Direct Investment |
| GDHI | Gross Disposable Household Income |
| GDP | Gross Domestic Product |
| GTC | Generalised Travel Costs |
| GVA | Gross Value Added |
| HAL | Highland and Islands Airports Ltd |
| IMPT. | Importance |
| IS | Industrial Strategy |
| ICAO | International Civil Aviation Organisation |
| IPA | Importance–Performance Analysis |
| LA | Local Authority |
| LCC | Low-Cost Carrier |
| LDC | Low Demand Country |
| LEP | Local Enterprise Partnership |
| MAR | Marshall-Arrow-Romer Externalities |

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| MSs | Member States |
| NEG | New Economic Geography |
| NI | Northern Ireland |
| NIS | National Infrastructure Strategy |
| NISRA | Northern Ireland Statistics and Research Agency |
| NPS | National Policy Statement |
| NTT | New Trade Theory |
| NVQ | National Vocational Qualification |
| OECD | Organisation for Economic Co-operation and Development |
| OJEU | Official Journal of the European Union |
| PERF. | Performance |
| PSO | Public Service Obligation |
| PT | Part-Time Employment |
| ROI | Republic of Ireland |
| RUREMPLO | Rural Employment Project |
| SHG | Stakeholder Group |
| SME | Small and Medium-sized Enterprise |
| SOA | Super Output Areas |
| SSM | Soft Systems Methodology |
| TAG | Transport Analysis Guidance |
| UNWTO | United Nations World Tourism Organisation |
| VFM | Value for Money |
| WEI | Wider Economic Impacts |
| WTO | World Trade Organisation |

PART ONE: INTRODUCTION

Chapter One: Introduction

1.0 Overview

Regional development is a complicated and dynamic concept (ESDP, 1999) that endeavours to ensure that all regions of a nation can benefit from similar levels of social and economic prosperity, by levelling any economic differences there are between leading and lagging regions. A leading region's prosperity is partly a product of its geographic situation and the natural or human endowments it possesses, as well as the social and institutional norms that influence behaviours and attitudes within it (Pike *et al.*, 2007). A further determinant of a region's prosperity is whether its location is a core or periphery one, in which the core is characterised as leading and the periphery as lagging economically. A core is a city or urban centre into which economic activity has become concentrated. The concentration occurs because of the benefits of the agglomeration effect, in which the proximity of firms and workers creates positive externalities that increase a firm's profitability by reducing the costs of inputs, and by improving the productivity of production processes. The periphery is the rural or remote regions surrounding the core and benefits from the agglomeration effect because congestion in cities causes economic benefit to spill over into the surrounding areas. However, the greater the distance from the core, the weaker the spillover benefits are until they become insignificant in the geographically peripheral regions (Gren, 2003).

1.1 Background

Intensifying the agglomeration benefit is embedded within national and supranational institutional policies because it generates levels of national prosperity greater than could be achieved without it (Varis & Littunen, 2012). However, such policies also cause a divergence in prosperity, as core regions benefit to a greater extent than the peripheral region (Baumgartner *et al.*, 2013), because the flow of workers and resources, from the periphery to the core (ESDP, 1999), inhibits growth at the periphery (Veneri & Ruiz, 2013). Additionally, globalization has dismantled the trade barriers that had protected peripheral region economies from the competition (Nuur & Laestadius, 2010), whilst automatization and the doubling of the global labour force have eliminated any remaining labour cost advantages (Stephens & Partidge, 2011) and compounding already low levels of GDP, income, and employment (Davies & Michie, 2011). Peripheral regions have become locked-into attitudes and behaviours established under the historic circumstances, keeping them on a trajectory unsuited to the modern economy.

The approach traditionally taken by governments to regional development was to adopt centrally determined policies that took no account of a particular set of regional circumstances. This is a spatially blind approach and entails the redistribution of the wealth, created by leading regions, to lagging peripheral regions through grants, subsidies, and other forms of state aid. Recently an endogenous approach to regional development has emerged that shifts the emphasis of the public support provided towards local growth-oriented activities, and advocates place-based policies acknowledging that regional differences

exist, and recognising economic growth can be achieved by valorising the unique assets peripheral regions possess. The endogenous approach has influenced the UK government's competitiveness agenda and has encouraged a 'deal' relationship between the central government and local authorities. Place-based strategies prize entrepreneurship (Cooke *et al.*, 2003), valorise and mobilise local assets to be traded externally, and de-lock it from a negative development path (OECD, 2011). They prioritise place over the sector, and investment over subsidy (Ward & Brown, 2009).

Peripheral regions possess an endowment of place-based natural and social assets which can be mobilized to create a local proposition, with a strong competitive advantage over urban cores, in trade and tourism and will appeal to modern technology and knowledge sector firms (Cook & Memedovic, 2003; Crescenzi & Rodriguez-Pose, 2012; Davies & Michie, 2011; Ward & Brown, 2009). (Korent *et al.*, 2015). The role of place-based development strategies is to assist peripheral regions to identify and exploit these opportunities for trade and growth, of which the driving forces are regional specialisation, in high technology and knowledge-intensive sectors, and entrepreneurship. However peripheral regions, when compared to core centres, tend to lack the necessary entrepreneurial capacity and capability (Korent *et al.*, 2015).

Many business owners in peripheral regions became entrepreneurs out of a necessity created by the demise of the agrarian and traditional sectors they had previously depended on (Baumgartner *et al.*, 2013; Varis & Littunen, 2012). Consequently, they lack the skills and knowledge necessary to develop and grow a business (Novelli *et al.*, 2005; Rodriguez *et al.*, 2014), a deficit compounded by

the lack of access to the same level of support and knowledge resources available to their urban counterparts (Young, 2010). Attracting knowledge sector firms to the region is important to peripheral regions, but such firms seek out locations where other firms that are creating, applying, and distributing knowledge, are already located. Ambitious entrepreneurs and knowledge sector firms and workers require access to national and international markets, labour pools and collaborators, but, peripheral locations and inferior transport connectivity make these markets less accessible and increase the time and financial costs of trading from them.

High-quality connectivity, with national or international, core centres greatly improves a region's ability to exploit the opportunities globalization creates (Laird & Mackie, 2016). It increases market reach (Crescenzi, 2012), improves consumer outcomes (UK Gov, 2015), and stimulates inward investment (Banno & Redondi, 2014). All of which positively influences productivity, as businesses benefit from the economies of scale and cheaper supplies, whilst the greater competition to which firms are exposed applies pressure to innovate product design or production processes if they are to remain competitive on global markets (ADES, 2013). Consequently, air transport connectivity has now become an essential component of regional development and achieving sustainable long-term economic growth (ECAC, 2016; Smyth *et al.*, 2012). However, if a peripheral region is to gain the benefits of air transport connectivity and have parity of access to national and global markets, finance and investment, skilled labour, business services and tourists (National Connectivity Task Force, 2015), it must first have access to it and this access is not evenly distributed (York Aviation, 2018).

Inadequate connectivity in the UK has negatively impacted the economies of regions beyond London and the SE of England (Transport Committee, 2015).

Market failure is the principal reason for the uneven access to aviation connectivity in the UK. A lack of demand on routes to peripheral regions, which have small populations and low levels of economic activity, make these so-called 'thin routes' unprofitable for commercial airlines to operate. Before the creation of the single European aviation market in 1992, thin routes were either subsidised directly by governments or cross-subsidised by the national flag-carrying airline (Barrett, 2000). However, the involvement of governments in the aviation market went beyond simply supporting thin routes and protectionist bilateral agreements resulted in a fragmented market that suppressed competition, at the expense of passengers (Reynolds-Feighan, 1995a).

Although an open and freely competitive aviation market has had an immense benefit for passengers, the competitive environment and new profit orientation of airlines left services to peripheral regions vulnerable, as airlines would no longer cross-subsidise loss-making routes and governments could no longer require them to do so. Inevitably, when the provision of air services is left to market forces alone, commercial airlines will not operate unviable thin routes, resulting in social and economic detachment (European Commission, 2008).

The EU anticipated that peripheral regions would require special measures to maintain air connectivity following liberalisation. To close this gap the EU introduced, as part of Council regulation (EEC) No 2408/92 of 2 July 1992 on access for community air carriers to intra-community air routes, the public service

obligation (PSO) mechanism that allows governments to support ‘thin routes’ (EUR-LEX, 1992). A PSO permits member states to regulate competition or compensate airlines for providing scheduled service on unviable routes, which a government considers to be essential for social or economic purposes, and when an air service is the only feasible transport option. In either case, the airline is selected following a tender process and the route must adhere to strict criteria governing the eligibility and proportionality of the service, which balances the connectivity needs of the peripheral region with maintaining a competitive aviation market while protecting the market against distortions by interventions from member states (European Commission, 2008; 2017).

1.2 Research justification

The economic characteristics of agglomerations and urban centres have been comprehensively studied (Rodrigues-Pose & Fitjar, 2013), whereas peripheral regions are characterized as helpless or acquiescent to the economic forces causing their lagging economies and therefore, the range of complex issues that shape sustainable regional development policies have received insufficient attention (Dax & Fischer, 2018; Leick & Lang, 2018). PSO studies have been primarily concerned with matters of the supply side while concentrating on issues such as the causes and impacts on PSO passengers of removing competition on routes (Reynolds-Feighan, 1996) and from the contract tender process (Merkert & O’Fee, 2013b; Williams & Pagliari, 2004), the approach taken by purchasing authorities to the administration and promotion of PSOs (Merkert & O’Fee, 2016); the relative merits of the administration of the PSO mechanism by individual member states of the European Union; the justification for imposing

a PSO (European Union, 2017); and assessing the value for money (VFM) of PSOs in the UK (Gov. UK, 2017b). Insufficient attention has been paid to understanding the conditions necessary to increase demand for air transport connectivity PSOs from within the regions they serve. Moreover, there is an inadequate understanding of what conditions should exist in a peripheral region to enable air transport PSOs to most productively contribute to regional development.

These two gaps in the literature, while seemingly covering different issues, are in fact the same issue from two different perspectives, because the causality flows in both directions. That is to say that economic activity generates connectivity demand and connectivity facilitates economic activity and thus they sustain each other (Mukkala & Tervo, 2013). What remains unstudied are the conditions necessary to increase demand for air transport connectivity from within the peripheral regions they serve and, in doing so, create the market environment for increasingly competitive PSO tenders and the possibility for the reduction of public subsidy (Merkert, 2013) or their imposition by regions that would otherwise consider them unaffordable (Reynolds-Feighan, 1995b).

The thesis makes three contributions to the theory on the relationship between air transport public service obligations and economic development in peripheral regions. The first is to take a new and contemporary view of the two key parameters of new economic geography, namely the economic advantages of place and the transport costs of trading from that place, and to apply it to this relationship. This had not been done before and by doing so has elucidated the greater contribution a PSO could make to the outcomes of place-based

development strategies, from which the demand for air transport connectivity is derived if applied strategically as an integral part of endogenous regional development. The second contribution is a new general systems theory model that demonstrates the crucial importance of a PSO, to place-based development strategies, of reducing the impermeability of the boundary around the activities of place-based regional development to allow the inflow of inputs at the rate necessary to achieve growth. The final contribution to theory is a framework of the technical and policy conditions that are necessary to stimulate greater demand for a PSO route and create the possibility for a reduction on the routes reliance on public funding support. Lastly, the thesis calls for a shift in the paradigm of air transport public service obligation funding by policymakers, from that of subsidising an air transport service to an investment in the economic development of the peripheral regions they serve. It highlights how these new contributions can be used to guide policymakers on a clear strategic case, for the business case of PSO in preparing or assessing a funding proposal when part of a place-based regional development strategy.

What made this study particularly timely at its commencement was the impending prospect of Brexit and the acknowledgement by the UK Chancellor of the Exchequer that an imbalanced UK economy will inhibit the region's ability to exploit the opportunities to trade globally. The solution for this problem, according to Hammond (2016), is a transport network that effectively interconnects the capacities and capabilities of all the regions of the UK. Since when Brexit has become a reality and the need for firms to strike new global trading partnerships is no less pressing. The study remains as timely now as it did then, if not more so, because 'levelling up' the nation's economy has become the central tenet of the

new government's policy agenda. It is ushering in new initiatives like the National Infrastructure Strategy– which promises to redress long-standing inequalities in regional infrastructure investments– and a review of the Treasury's Green Book that calls for greater emphasis to be placed on the strategic case for government spending proposals (HM Treasury, 2020).

The literature on regional development and air transport connectivity has shown that both the decision to implement a PSO on a route and the level of demand for that route are influenced by a range of organizations, circumstances, assets, and externalities, which are bound by a complicated network of relationships. The nature of which, and how they might impact or be impacted by regional development strategies and PSOs, could also differ across peripheral regions. It would be meaningless to scrutinize each element individually, but rather taking a more comprehensive approach to exploring these and their relationships is necessary. This can only be achieved by viewing them through the lens of systems theory, which recognizes reality as an integrated and interacting whole (Checkland, 1997) that creates problematic and messy situations (Checkland & Poulter, 2020) which, if they are to be adequately understood, need to be viewed and surveyed in their entirety and not reduced to individual elements that are viewed in isolation (Von Bertalanffy, 1968). Parallels can be made between the spatial characteristics, organization and interactions of actors and resources in a peripheral region with a system. That is a hierarchical framework in which sub-systems exist within a boundary, set within the context of an environment to which it is either open and able to make the exchanges that enable it to prosper, or it is closed, resulting in the demise of the system (Boulding, 1956).

1.3 Research aim, objectives, and questions

This study aims to explore the technical and policy conditions needed, at either a local or national level, in which air transport public service obligations can most substantially contribute to the regional development of geographically peripheral regions.

Research objectives

To achieve this, the study has four research objectives:

1. To research the literature on regional development and geographical peripheral regions to identify current theory on regional development in geographically peripheral regions.
2. To review the current literature on air transport connectivity and the role of PSOs in investigating how these are used as a strategy for economic development in peripheral regions.
3. To gather data from key stakeholders regarding conditions in which air transport PSOs may be successful in terms of regional development.
4. To propose a framework of measures to guide policymakers in maximising the benefit of air transport PSOs to regional development strategies.

Research questions

The study will also focus on answering the following four research questions:

1. What approach are the local authorities of peripheral regions taking to achieve regional economic development?
2. What influence do place-based conditions have on endogenous development in peripheral regions?

3. In what ways do pecuniary and non-pecuniary costs of transport compound a regions peripherality?
4. How could the imposition of PSOs best support endogenous regional development in peripheral regions?

1.4 Thesis structure

The thesis is organised into four parts. Part one is an introductory chapter, which provides the background and justification to the study and sets out the aim and objectives it is attempting to achieve. Part two is the literature review and consists of three chapters. Chapter two presents the key geographical economic concepts of the formation of the core-periphery structure and the effects of these on peripheral economics, and the shift that has occurred in regional development theory from an exogenous to endogenous approach. Chapter three reviews the impact of the liberalization of the European air transport market on peripheral regions, and the different imposition and administration issues that influence passenger demand for PSO services. Chapter four presents a conceptual framework of the key theoretical constructs identified in the literature and the nature of the relationships between these. Part three consists of the methodology. It outlines the reason for taking a multiple-case study approach, explains the selection of Derry~Londonderry, Cornwall, and Dundee as case study regions, and explains the reasons for using mixed methods and a sequential exploratory order.

The final part, four, includes the presentation of the research findings, the discussion, and the conclusion chapters. Chapter six presents the research

findings from each of the three stages. Firstly, the documentary research is presented as rich pictures for each case study region. Secondly, the technical and policy themes that emerged from the stakeholder interviews are documented, and the eleven important PSO attributes surveyed in stage three are identified. Finally, the assessment by the survey respondents of the relative importance and performance of the attributes is presented. The implication of which is discussed in chapter seven. Chapter eight provides answers to the research questions posed in chapter one. It highlights the new contribution made in the thesis: the advancement of New Economic Geography theory in relation to the strategic role of air transport PSOs in regional development; a general systems model demonstrating the role of PSOs in regional development; and a framework of the technical and policy conditions necessary to maximise demand for PSO services. It also sets out how the contributions in this thesis can be used to guide policymakers in the strategic imposition of PSOs as part of endogenous regional development activities. Lastly, chapter eight reflects on the research journey and makes recommendations for further research to build on the outcomes from this.

PART TWO: LITERATURE REVIEW

Chapter Two: The Economics of Regional Development

1.0 Introduction

This chapter provides a review of the literature on regional economic development of peripheral regions to identify the theory about economic development strategies in these regions. It begins with a review of the New Economic Geography (NEG) theory and the role that the balance between centripetal economic forces, such as Marshallian externalities and the agglomeration effect, and centrifugal forces play in the formation of the core-peripheral (CP) spatial economic structure. It examines the influence of social, economic, and technological changes and globalization has had in reinforcing the CP structure, and the danger that a peripheral region could become locked into a negative path trajectory if it remains dependent on practices and behaviours formed in the past, that are unsuitable for future development.

The chapter then explores the influence that industrial clusters, the knowledge economy, and an endogenous paradigm of regional development has had in influencing a shift in government policy away from 'place-blind' redistribution and subsidy mechanisms, towards a 'place-based' localism agenda of competitiveness and investment. The last section of the chapter ends by reviewing the role that entrepreneurship has in the new localism agenda and the challenges to peripheral regions face in this regard, because of a deficit in enterprise capacity and capability.

2.1 What peripheral regions look like

A striking feature of the spatial structure of contemporary society is how it is organising into either core cities or peripheral regions. That is, densely populated urban centres of concentrated economic and social activity, which are set within large expanses of rural areas and hinterlands with markedly lower population densities. Moreover, the trend globally is towards greater levels of urbanisation, creating ever-larger cities and increasing the number of mega-cities. By 2030 the global population living in cities is forecast to reach 60%, double what it was in 1930 (United Nations, 2015a). The reason why many of the world's cities are situated, where they are now, is because the earliest settlements were located at places that provided an advantage of first geography (Coombes & Overman, 2004). People settled in places where they could take advantage of abundant natural resources because climates were conducive to a particular activity, or a topographic feature created a transport advantage, such as a natural harbour. The locations of later settlements were influenced by emergent technology, such as strategic points along canals or railways (Fujita & Mori, 1995; 2005).

These factors alone however, albeit critical at the time, cannot satisfactorily explain how many of these early settlements have sustained themselves and grown to become dominant economic centres, long after the presence or value of the original locational advantage had been diminished. A challenge for both human geographers and economists has been attempting to understand the forces causing growing numbers of the world's population to migrate away from the peripheral rural regions and to concentrate at these core centres, and to explain how these population movements are affecting the wider economic

system. NEG emerged from the study of this geographical phenomenon by mainstream economists.

Figure 2.1. European core-periphery structure as seen at night



Source: NOAA (2020)

Paul Krugman was the first such economist to appreciate that spatial location affected the nature of economic activity (Krugman, 2011) and developed the earliest mathematical model that would explain the formation of agglomerations (Fujita & Krugman, 2004). In the introduction to the seminal NEG paper, ‘Increasing Returns and Economic Geography’ (Krugman, 1991), Krugman uses an image of Europe at night, in which the night lights are concentrated into relatively small areas within great swathes of darkness, to illustrate the CP spatial structure and how it has come to dominate the European landscape (Figure 1). By 2020 80% of the entire European population will live in the relatively small areas covered by the city lights (European Commission, 2016). NEG seeks to explain why it is that economic activity agglomerates into urban cores and leaves *“the remaining regions playing a peripheral role”* (Krugman, 1991, p. 485).

2.2 The new economic geography theory and peripherality

NEG emerged when mainstream economists attempted to satisfy their need for a general-equilibrium model that explained the formation of the core centres of economic activity, that is agglomerations (Fujita & Krugman, 2004). According to Krugman, NEG theory was the logical step from the New Trade Theory of international trade (NTT) (Nobel Prize Organization, 2008). Traditionally neoclassical economic theory was employed to explain differences in nations economic structures and the different welfare levels between countries. Firms in country 'A' produced and exported the goods that they could produce at lower relative costs than firms in country 'B' were able to. Invariably this was because some form of local factor endowments— natural, labour, or technological— provided a country 'A' with a comparative advantage (Ohlin, 1933; Ricardo, 1821).

The pattern of international trade should be between countries with differences in local factor endowments, their comparative advantages, as their different needs would be complimentary. However, neoclassical economics did not reflect the reality of modern international trade patterns. Countries with very similar economies were trading in very similar goods. It was no longer the case that Great Britain was exporting its surplus wheat to Portugal and importing the wines it could not produce. Instead, Germany and France were each producing and trading automobiles with each other (Krugman, 2009). NTT attempted to illuminate why this was the case.

Prior to NTT, the neoclassical economic convention had sought a single equilibrium solution in which perfect competition and diminishing returns would

ensure the even distribution of economic activity across space (Venables, 2006), effectively seeking a form of backyard capitalism (Fujita *et al.*, 1999). NTT introduced to the modelling the idea of increasing returns and imperfections, and by adding a transport cost it introduced a geographical dimension. NTT was able to mathematically demonstrate that the interaction between scale economies and transport costs provided firms with the incentive to concentrate production into fewer larger plants and, that the location of these plants mattered— that is, firms wanted to benefit from the scale economies of mass production and wanted to be located close to their largest market (Krugman, 1979; 1991).

NTT mathematical modelling now formally supported the ‘home market’ argument first made by Max Corden (Corden, 1970). The next ‘logical step’ was to recognise that these same ideas could also be used to study the geographic concentration of production within a single country. In also allowing for worker mobility, and therefore the mobility of consumer demand, alongside firm mobility, which was already allowed for in NTT modelling, Krugman was able to develop a model that explained the formation of economic agglomerations and developed the CP structure (Fujita & Thisse, 2009).

2.2.1 The core-periphery structure

The cost of transport is one of the “Four T’s” that are the four major costs that can inhibit trade between regions (Spulber, 2007). The others are transaction, tariff and non-tariff, and time costs. Without transport costs, the place would be inconsequential to the location decisions of firms (Ottaviano & Thisse, 2004). However, transport is costly, and it can have the effect of isolating regions from

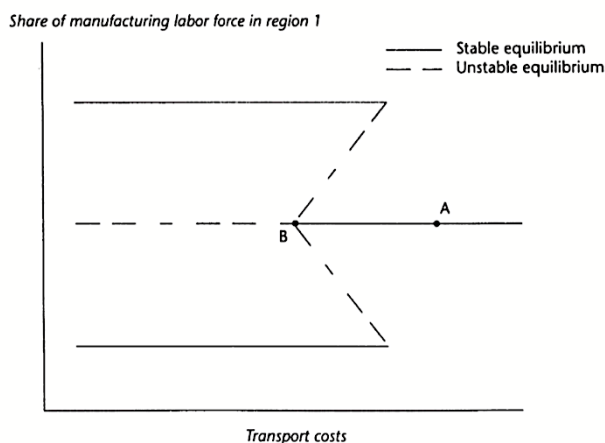
agglomerations and trade opportunities (Lima & Venables, 2001). The core-periphery model illustrates the nature of the relationship, between transport costs and scale economies, that make agglomerations attractive and in turn causes the formation of core-periphery structure (Krugman 1999).

The model consists of two regions. Both regions have an agricultural sector that has constant returns to scale, and a manufacturing sector that has increasing returns to scale. the manufacturing sector includes the production of final goods and intermediary components. Transport costs are high and, therefore, are a barrier to trade occurring between the two regions. Both regions are equally proficient in their production processes and do not have a comparative advantage in manufacturing. An initial reduction in transport costs can cause trade between the two regions in differentiated products but remain too high for regional specialisation to occur.

If one region has a larger manufacturing sector than another and a wider range of intermediary manufacturers means production is cheaper there, a further reduction in transport costs makes it viable for firms to relocate to the more profitable location. A process of circular causation ensues as the greater concentration of manufacturers and strengthening forward and backwards linkages increase productivity improvements causing further relocation of production to that region. This will also lead to an increase in demand, and therefore, the cost of labour in the core, and a reduction in demand for labour, and therefore, the cost of labour in peripheral regions. This is illustrated in figure 2, in what has come to be known as the 'Tomahawk Diagram' (Figure 2). If the cost of transport continues to be reduced, it could become sufficiently low that the lower

labour costs in peripheral regions offset the profitability gains in the core and the cost of distance from it. This provides firms with an incentive to relocate back into the, now, peripheral region.

Figure 2.2. Illustration of Krugman's 'core-periphery' pattern



Source: Krugman (1999)

The Tomahawk diagram was used by Krugman (1999) to illustrate the effect of a reduction in transport costs has on the concentration of manufacturing activity into one location. In this diagram, manufacturing activity is measured as the share of manufacturing labour. High transport costs are represented by point A, at which the two regions are held in a state of equilibria while manufacturers and workers, in each region, have no incentive to relocate to the other. However, with the reduction in transport costs, when the economy reaches point B, a bifurcation occurs and the manufacturing activity, and workers, relocates from one region into the other. The direction of which is determined by the comparative advantage one region has over the other. The region into which the activity and workers locate becomes the 'core' and because firms wish to "*concentrate where the market is large*", which in turn means that "*the market will be large where manufacturers are concentrated*", a process of circular causation ensues, as

these two effects sustain each other and their status as either core or peripheral region becomes embedded (Krugman, 1991 p.486). The region out of which economic activity locates becomes the 'periphery'.

Mainstream economic modelling is aggregated to the level of the entire system and as it is abstract from local real-world conditions and circumstances, the CP model is not able to predict the locations at which agglomeration will occur— that is, the locations that will become either core or peripheral, only the conditions under which it is going to occur (Fujita & Krugman, 2004). Nevertheless, according to Fujita & Thisse (1996), any meaningful modelling of economic geography intended to explain agglomeration formation must sufficiently account for the opposing C_pF and C_f forces that 'push and pull' firms and consumers into the locations of greatest benefit to them (Fujita, 1996 p.340). The firm's location will ultimately be the result of a trade-off between maximising market access and minimising production and transaction costs (Coombes & Overman, 2004; Venables, 1996). Consumers will seek a location in which they can maximise their utility without increasing the household expenditure (Fujita, 1987). The global trend towards urbanization demonstrates how much stronger the C_pFs have been than the C_fFs as firms and people seek the benefits of an agglomeration.

2.2.2 Centripetal forces

The C_pFs that cause the agglomeration effect and the concentration of economic activity in a place are those that pull people, firms and investors towards a given location. Fujita & Thisse (1996) identify external economies as a major

CpF causing the agglomeration effect. Known also as the Marshallian externalities (Marshall, 1920), which Rosenthal & Strange (2004) describe as the micro-foundations that underpin agglomeration economies because they create enable firms to increase profitability through increased productivity and reduced costs. The benefits derived from mass manufacturers of products include:

Input sharing. Low transport costs make it cost-effective for firms to access distant markets and when combined with the production efficiencies, achieved by exploiting scale economies, incentivises individual firms to concentrate production into a small number of larger plants. The concentration of many different firms into an agglomeration creates the scale economies that make specialist downstream providers viable, to which firms upstream in the agglomeration outsource tasks and can benefit further from the production efficiencies the specialist providers create.

Labour market pooling. A thick labour market reduces the risk and cost to workers from job searching so making movement between firms easier, which in turn facilitates better matching between employer's needs and worker's capabilities. It also provides for an elastic labour supply, enabling firms to adjust their employment levels in reaction to fluctuating levels of market demand. Additionally, as workers are also consumers, the concentration of workers becomes a market centre and the proximity of firms to a denser market has associated transport costs benefits.

Knowledge spillovers. The concentration of firms and workers creates conditions attractive to an increasing number of new firm entrants, which could cause market

crowding. However, this increases competition and puts pressure on firms to innovate to differentiate themselves from their competitors. Interaction between highly skilled workers and intensive research and development activity facilitates the innovation that creates product differentiation, process improvements, and the business practices that keep firms competitive (Cohen & Paul, 2008).

The Marshallian externalities drive demand, productivity, and profitability. This creates conditions that attract more firms and investment, a greater number and variety of employment opportunities attract more workers, and a wider variety of consumption choices attracts more consumers, which in turn further improves the economic conditions at the core and the attractiveness of it to yet more firms. This causes the continuous 'snowball' cycle that sustains the growth of the agglomeration as firms, consumers and investors continue to be drawn to it (Baldwin & Martin, 2004).

The economic activities in agglomerations can be divided into those that are production-oriented and those that are creative. The concentration of people is essential to the creativity and quick communication required for rapid product development because distance and time are an impediment to these and are a cost to trade between regions (Spulber, 2007), and further strengthens the appeal of agglomerations (Gillespie *et al.*, 2001; Jacobs, 1969). Though, globalization and reductions in the cost of international trade have led to the spatial fragmentation of the production process (Deardorff, 2003; Jones, 2000) and the separation of production functions from strategic functions (Fujita & Thisse, 2006). By which productions functions are in cheaper regions and strategic function become concentrated into core centres.

2.2.3 Centrifugal forces

The attractiveness of an agglomeration also creates diseconomies, which are a CfF as they cause the dispersion of activity. CfFs are the forces that counter CpFs and oppose the agglomeration effect, as they can disperse economic activity away from the core and into the peripheral regions. CfF includes the lower cost and immobility of the factors of production in peripheral regions (Ottaviano & Puga, 1998), such as the natural endowments that may only be present only in each location, a pool of inexpensive labour, or spatially fixed industrial plant (Venables, 1996). In these circumstances, low transport costs would also act as a dispersion force, as firms seek to reduce the cost of accessing a market at a greater distance in a peripheral location (Fujita & Thisse, 1996). The diseconomies of market crowding in agglomeration, such as high wages and land rents, could lead firms to calculate they can no longer justify these costs against attainable levels of productivity or profitability (Martin, 2008), motivating them to relocate to less congested peripheral locations.

New market entrants might seek to avoid the higher costs altogether and start-up away from the core (Rosenthal & Strange, 2001). Firms locating away from an agglomeration can weaken the industrial base and its capacity to provide the benefits firms expect from a functioning agglomeration, making it a less attractive location (Venables, 1996). CfFs affect workers choices also. Commuting costs and the price index of consumer goods can become too great for workers who also become motivated to seek lower real-term prices away from the core (Mori, 1997). Similarly, social, and other or non-pecuniary forces, such

as noise, air pollution or a stressful environment, can also motivate workers to relocate to the less congested peripheral regions (World Bank, 2009).

Many people and firms are attracted by the CfFs and continue to relocate into cities, at the expense of peripheral regions, and as the UN's forecasts highlight, this is a trend that is likely to continue. The significance of agglomerations has given rise to a discussion about the nature of the structure of economic activity. That is, about the nature of the industrial sectors clustered within them, the industrial clusters, and whether these can positively influence the growth and productivity of an agglomeration.

2.2.4 Gravitational forces of trade

Gravity models of trade are concerned, as the name suggests, with the gravitational force that is exerted by one economy on another. In the classic model of international trade, Tinbergen (1962) used Newton's Universal Law of Gravitation to describe the gravitational effect on bilateral trade flows between two economies. The intensity of flows of people, commuters, consumer goods, and tourists, is positively proportional to the product of their size and inversely proportional to the distance between them (Bergstrand, 1985). The intuitive nature of this, classic, gravity model has resulted in it being widely used to understand and explain such trade flows (Yotov *et al.*, 2016). A criticism of the early gravity models was that they were purely descriptive and lacked a theoretical framework (De Benedictis & Taglioni, 2011). Recent interest in their application has led to the development of robust theoretical foundations and of several other models (e.g., Minford & Xu, 2017; Nijkamo & Ratajczak, 2020; Shahriar *et al.*, 2019), that

now better accommodate more advanced economic concepts of trade (Shepherd, 2016). It is understood, for instance, that distance alone is too simplistic and unsatisfactory a proxy for trade costs (De Benedictis & Taglioni, 2011), as they include a broader range of issues, such as transportation and transaction costs, tariff and non-tariff barriers, legal and regulatory friction, and cross-border political and cultural influences on trading relationships (Overman *et. al.*, 2003).

Gravity models are now very sophisticated (Shahriar *et al.*, 2019) and it has become, therefore, critical that the trade flows to be assessed are well-defined and grounded in the appropriate theoretical framework (De Benedictis & Taglioni, 2011). However, while gravity models are a useful tool for estimating trade flows between economies, they are not able to predict the direction of these flows (Nijkamp & Ratajczak, 2020), the impact that geography has on trade costs, or the effect of trade costs on trade volumes (Overman *et. al.*, 2003). It should also be recognised that the purpose of gravity models is to estimate trade flows specifically and, therefore, are unsuitable to measure other economic flows, such as economic welfare or the movement of people or capital that is caused through market liberalization (Shepherd, 2016), or the location decisions of firms that to set up operations in a country to avoid incurring border-crossing trading costs (Lafourcade & Thisse, 2009). What the gravity model does confirm, however, is that distance continues to matter to trade volumes (Krugman, 2004; Overman *et. al.*, 2003) despite rapid developments in, and adoption of, ICT technology (Nijkamp & Ratajczak, 2020). This means that transport infrastructure improvements will continue to be crucial in improving trade flows and volumes (Krugman, 2004; Lafourcade & Thisse, 2009).

2.3 Industrial clusters

An industrial cluster is an assembly of economic entities in proximity and can occur on any geographical scale. An agglomeration is a cluster because, as described above, firms and workers congregate because of a mutual economic interest to do so. The benefits (*vide supra*) of a cluster are derived from the linkages created between the entities within it. The strength and nature of these linkages will determine the form of a cluster that emerges and, therefore, its value to an economy (Venables, 1996). The economic benefit gained from clustering is an accepted fact. Whether these linkages should be within a cluster that specializes in a specific sector or diversifies across any number of different sectors, to be most economically productive is, however, a point of debate.

2.3.1 Cluster specialisation

If a cluster is the geographic concentration of firms and institutions, the type of cluster will depend on whether these firms and institutions are from a specific sector and undertake similar activity, which is specialisation, or from unrelated and varied sectors, which is diversification. The arguments for specialisation have been made by Marshall (1890), Arrow (1962) and Romer (1990) who between them made the argument for an accumulation of firms from a particular industry, as the similarity of skills and knowledge enables spillovers to occur more easily between firms and workers and thus, the growth of that sector within that city. Their arguments became collectively known as the Marshall-Arrow-Romer externalities (MAR) model following the “Growth in Cities” paper by Glaeser *et al.* (1992).

The clustering of firms from one sector encourages spillovers, which drives growth in that sector. However, innovating firms in the MAR model are vulnerable to the transfer of valuable knowledge, by staff moving freely between firms or it being stolen, causing the firm's an economic loss as their idea are copied by competitors. Therefore, the MAR model favours a local monopoly, as competition prevents firms from benefiting from their own innovation and inhibits their growth, which is detrimental to the growth of the local economy (Glasear *et al.*, 1992).

2.3.2 Cluster diversification

Jacobs (1969) argues that the transfer of knowledge between firms from different sectors is essential for innovation and, therefore, growth and that competition creates the impetus for firms to innovate. The presence in one place of firms and workers from varied and diverse sectors encourages cross-sector collaboration, whether planned or serendipitous. Collaboration creates the conditions in which synergies are achieved and new products are created and commercialized. The greater the volume and variety of firms and sectors in a place, the more able it is to continually create new products and attract new entrants. Accordingly, Jacobs argues that as cities accommodate the greatest range and number of firms and workers, they are particularly important to knowledge creation, innovation, and growth. Glasear *et al.* (1992) concur with Jacobs that at the city level specialisation has a negative effect on the speed of growth, whereas competition has a positive effect. Similarly, diversification has a positive effect on employment because labour flows and spillovers across sectors are found to be more important for job creation than those remaining within a sector.

Porter (1990) argues, as do Marshall (1890), Arrow (1962) and Romer (1990), of the importance of sectoral specialisation in a cluster. Where Porter, and Glaser *et al.*, differ is they argue there is a need for strong competition, as competition and a regional competitive advantage are the driving forces behind cluster development. The intensity of competition, firms face, increases the intensity of innovation for products and processes, which translates into increased productivity and profitability (Porter, 2000). According to Porter, there is clear evidence from around the world that the most competitive industries in different countries are those that are concentrated into clusters within that country (Porter, 1990).

Porter also described a cluster typology, according to the nature of the economic contribution, a cluster makes, to the local economy. Local industries provide goods and services to the local market, conduct limited trade with other regions, and have employment levels proportional to the local population. Resource-dependent industries are located where there is an endowment of natural resource and trades these locally and internationally. Traded industries trade locally and internationally in goods and services that are not resource-dependent. These are more important for a location because, being less dependent on natural resources and more on their firms' innovation capability, they make a more valuable and sustainable contribution to the local economy (Porter, 2003). It is this work by Porter that is most widely associated with industrial clusters and that has been most persuasive with policymakers of the value of investing in developing clusters as a means of regional economic development.

2.3.3 The influence of industrial clusters on policy

Regional, national, and supranational governments and institutions have adopted industrial clusters as key policy tools for promoting regional innovation, competitiveness, and growth (Martin & Sunley, 2010). According to the World Bank:

“cluster initiatives may well be one of the most effective tools in a broader context of policy reform and private sector development initiatives” (World Bank, 2009).

The value that the world bank attributes to industrial clusters is shared by the OECD. It emphasizes the considerable tangible benefits achieved by firms that engage with a cluster. An industrial cluster *“enhances productivity, rate of innovation and competitive performance”* whilst allowing *“small firms to combine advantages of small scale with...benefits of large scale”* and helping SMEs to *“realize the opportunities and meet the challenges associated with globalization”* (OECD, 2000). The EU describes clusters as *“fertile ground for fostering industry transformation and the development of emerging industries”* (Ketels & Protsiv, 2016). Consequently, establishing industrial clusters has become a key objective for policymakers responsible for both urban and regional economic development (European Commission, 2002). In creating conditions in which industrial clusters can develop, authorities are seeking to maximize benefits derived from the agglomeration effect which, as described above, spill into the surrounding rural and remote peripheral regions. This is important to policymakers in achieving

convergence, in the levels of prosperity and opportunity, between the leading core regions and the lagging peripheral regions.

2.4 Economic convergence

Economic convergence is a key policy objective for many national governments and supranational organisations, including the UK Government. The objective of which is to minimise economic and social disparities between leading and lagging regions within a country (European Commission, 2015). The agglomeration effect is recognised as a critical process in achieving this goal. It is recognised that there is a positive correlation between well-managed agglomerations and social and economic development (United Nations, 2015b) which benefits the country as a whole, and not only the population at the agglomeration (Fujita & Thisse, 2003). As an agglomeration grows the economic benefits accrue at a commensurate rate. These benefits spread into the economies of peripheral regions through trickle-down economics, spillovers, and congestion (World Bank, 2009). This creates prosperity gains in the peripheral regions that otherwise could not have been achieved. The result of this process should be a convergence of living standards across all regions, as lagging peripheral regions catch up with the leading cores (World Bank, 2009). There is strong evidence of a relationship between a growing agglomeration and higher GDP per capita, higher labour productivity and faster growth rates than national averages (European Parliament, 2014; OECD, 2006; World Bank, 2009). The World Bank (2009) maintains that “*places near prosperous provinces, counties, and regions have invariably benefited*”. The aggregate national gain from the agglomeration effect has influenced both EU and UK government thinking and

policy (Pike & Tomaney, 2008). However, whether the benefits of agglomeration reach as far as peripheral regions is less clear.

Economic convergence is not inevitable (Kalder, 1970) and recent studies suggest that the growth core regions are experiencing may not, actually, be spilling over to the extent policymakers would have expected. The German Central Bank (Boris & Metiu, 2013) found there to be no evidence of economic convergence in the EU, despite the significant funds directed specifically towards achieving this. Recent reports by the IMF (Franks *et al.*, 2018) and the European Central Bank (2017) make similar conclusions. In the UK, the London economy now accounts for 23% of the entire national GVA (Harari, 2016) and in the 5 years to 2015 London grew at twice the rate of the national average and nearly 4 times the rate of the slowest growing UK region (Harari & Ward, 2017).

Fujita and Thisse (2003) argue that while the economic growth achieved at the core is not at the expense of peripheral regions, they acknowledge that growth does not occur at the same rate in peripheral regions. The populations of peripheral regions are not benefiting to the same extent, from agglomeration created growth, as the populations at the core. Therefore, though the overall wealth of the country may be improving, a gap in prosperity between core and periphery regions is opening. However, they also maintain that any policy interventions designed to direct economic activity away from agglomerations, to spread it more evenly across the regions, will undermine overall economic growth. Ultimately this will have a negative impact on those regions that it is intended to benefit from as it will slow aggregate growth (Fujita & Thisse, 2003). This is consistent with the positions of the World Bank (2009), the EU, and the UK

government regarding uneven rates of economic growth, and therefore levels of prosperity, an unavoidable feature of regional development growth (Gardiner *et al.*, 2011).

2.5 Causes of uneven economic development

Uneven levels of prosperity across a country are the product of the different conditions and circumstances existing in different regions, and it is a feature of many countries (Pike & Tomaney, 2008). Some regions benefit economically from local geological or meteorological conditions that had provided them with an advantage in agricultural or mineral exploitation activities. Other regions achieved prosperity by accumulating highly productive industrial activities (Kaldor, 1970). Even then, some regions will possess the human capital and institutions to exploit and sustain these advantages, whilst others do not and fail to capitalize on potential opportunities. The net result is that some leading areas have become economically and socially prosperous, whilst other areas have lagged (UK Gov., 2016b).

Uneven economic development is a long-standing and widely acknowledged feature of the UK's economic map and is often characterized as the North-South divide, in which the South is a leading region, and the North is lagging. Though before the First World War the North was the UK's trading powerhouse. A natural endowment, of reliable water, cheap coal, semi-skilled labour, and technological innovation in semi-automated manufacturing techniques, enabled it to accumulate the production capacity needed to satisfy high international demand for cheap cotton products. However, disruption to trade

caused by the great war, followed by a fundamental shift in international trading patterns, brought about by resurgent nationalism in export market countries, and the return to the gold standard left Northern goods without a market. When the plants, manufacturing mass consumer goods, were then located in the South, closest to their largest populations, the emergence of the North-South divide had begun (Williamson & Counce, 2015).

An enduring North-South divide illustrates the extent of the challenge in addressing the causes of uneven levels of prosperity. However, nationwide trends and national scale figures can disguise the differences that exist within a country at a regional level and between core centres and peripheral areas (Overman & Puga, 2002). A key determinant of a region's level of welfare is whether it is in the core or out on the periphery. The core-periphery relationship is characterised as the core is a centralised point of economic activity, within which an agglomeration develops and from which economic benefits 'spill-over' into the surrounding regions. However, the greater the distance from the core, the weaker such spill-over of benefits is until it is insignificant at the peripheral regions (Gren, 2003; Partridge & Rickman, 2008).

Peripheral regions, in old industrialized nations, are now contending with challenging conditions caused by the seismic changes in national and global economic structures. Globalization and industrialization have restructured the economies of peripheral regions away from the long-established agrarian and resource extraction industries (Stephens & Partridge, 2011). Labour saving technological advancements in the traditional industries reduced employment levels within them and international competition, from countries with significantly

lower labour costs, eliminated any remaining labour input cost advantage they once had (Kitson *et al.*, 2004; Stephens & Partridge, 2011). The global supply of labour doubled in the 1990s when market liberalization in India and the move towards capitalism by China and Russia added 1.46 billion workers to the global workforce (Freeman, 2007). At the same time technological advances reduced the cost of trading internationally, global supply chains were evolving, and international trade agreements disassembled the regulatory barriers that had previously cushioned peripheral regions from competition from the new industrial nations entering the global market (Nuur & Laestadius, 2010). The effects on peripheral regions of these structural changes have been as much social, as economic.

The changes in economic structures in peripheral regions have caused a change in the demographic shape of their populations. Peripheral regions have experienced high levels of out-migration, particularly amongst their young people. However, it has not been the low skilled and unemployed who left to search for employment, rather it has been the skilled and enterprising seeking career and lifestyle opportunities no longer available in the peripheral regions (Stretton-Beaty, 2018). The effect of such demographic shifts has been to increase the average age and reduce the average education level of the remaining population. The new peripheral region workforce profile, combined with infrastructure limitations, makes it difficult to attract, to the region, the larger firms that can provide high-quality career and employment opportunities (Stephens & Partridge, 2011). Consequently, the level of economic activity in the peripheral regions is weaker, resulting in lower GVA and wages than national averages. It also means less tax revenue is available to local authorities, putting further pressure on local

authorities' budgets which are already contending with higher cost-per-capita for these services due to the highly dispersed nature of the peripheral population (Davies & Michie, 2011).

The nature of the actual impact on the different peripheral regions is shaped by the local mix of geographic diversity, social and cultural norms, and the economic and political institutions present within it. To successfully even out the imbalances in prosperity through economic convergence, requires governments to adopt regional development policies able to take account of all the different combinations of local factors and conditions that will continue to shape the local economy (Pike *et al.*, 2007). To achieve this requires a shift in policy focus away from centrally determined 'place-blind' development strategies to those that take account of the circumstances of individual regions, or places.

2.6 The emergence of a 'place-based' approach to regional development

The study of regional development has largely been focused on the urban cores, as the drivers of national prosperity, and not on peripheral places. Peripheral places, such as rural areas or hinterlands, tend to be viewed as acquiescent contributors of the people and resources that sustain growth at cores, irrespective of the impact this has on those places (Ward & Brown, 2009). The influential 'World Bank Report 2009' emphasized the critical importance to national prosperity of concentrating economic activity into urban cores and that the goal, therefore, of government policies should be to strengthen this process. It regards the populations of lagging regions as being in the "*wrong places*" and

who have not yet relocated to the leading places, the agglomerations (World Bank, 2009, p.24). The report advocates that, where the centripetal forces exerted by an agglomeration are too weak, or when the barriers to mobility are too great to achieve further concentration, a government's intervention should be only with spatially blind policy measures.

2.6.1 Spatially blind regional development

Spatially blind, or place-blind, policies are without regard for the specific context of any region. The world bank advocates that place-blind measures should include connectivity infrastructure investments to improve the mobility of populations to relocate from lagging to leading places, or to provide greater market access for the lagging regions. Should a government determine a spatially targeted intervention is unavoidable, these should be undertaken sparingly and should not be an effort to divert economic activity away from a leading to a lagging region. Instead, interventions should be designed to provide support to the region only in the short run and of a nature that would not cause divergence from the long-run goal of reinforcing agglomerations. Intervention suggestions offered by the World Bank include investing in transport projects that assist local mobility or that encourage agrarian businesses. This guidance, however, seems to fail to take into account that in many industrialized nations, agrarian workers are now reliant on the wider local economy for their employment (Ward & Brown, 2009).

Two further highly influential reports were published in 2009, which had a different perspective to the that of the World Bank: 'An agenda for a reformed cohesion policy' (Barca, 2009) and 'How regions grow' (OECD, 2009). These both

concurred with the World Bank view that, one, redistributive development policies have failed and, two, in recognizing geography as a critical factor that government development policies should consider (Barca, 2009; OECD, 2009). However, these reports placed great emphasis on the importance of the role of place, the people living within them, and therefore, the need for place-based policies. This is because local people, firms and institutions are best placed to understand and address the issues causing their persistent deficits in productivity and social inclusion. Though place-based policies might be initiated by exogenous institutions or objectives, they should be endogenously developed and delivered (Barca *et al.*, 2012).

2.6.2 Place-based regional development

A place-based approach to regional development represents a shift away from the previous approach of top-down strategies, in which decisions were exogenously made and policies were focused on compensation or subsidy. The shift is towards an emphasis on 'growth-orientated' approach and policies that recognizes that regions possess a unique package of local assets that can be valorised and traded (Figure 3). Place-based policies emphasise the place over any sector, and investment over subsidy (OECD, 2011). The role of economic developments strategies is now to provide a peripheral region with the support necessary to develop capacity and capability locally to commercialize the assets they possess (Pugalis & Gray, 2016). As each region has unique sets of tangible or intangible assets, as well as guiding social norms and institutions, creating a heterogeneity of conditions across peripheral regions, no one-centrally prescribed strategy could satisfactorily accommodate them all (Barca, 2009; OECD, 2009).

Crucially, place-based strategies are ‘bottom-up’ programmes that are highly influenced by and tailored specifically to local conditions.

Figure 2.3. Old and new paradigms of regional development

| | Old paradigm | New paradigm |
|-----------------------------|--|--|
| Objectives | Compensating temporarily for location disadvantages of lagging regions | Tapping underutilised potential in all regions for enhancing regional competitiveness |
| Unit of intervention | Administrative units | Functional economic areas |
| Strategies | Sectoral approach | Integrated development projects |
| Tools | Subsidies and state aids | Mix of soft and hard capital (capital stock, labour market, business environment, social capital and networks) |
| Actors | Central government | Different levels of government |

Source: OECD (2009)

A peripheral region will already possess an endowment of different assets that includes tangible features, such as tranquillity, natural attractions, beautiful scenery, historic landmarks, built environments, as well as intangible characteristics, such as a unique history, cultural heritage, or social traditions. Entrepreneurs and enterprising regions can use these packages of assets to create a strong competitive advantage over other regions or urban centres, enabling them to broaden the regions appeal and capture higher rents (Cook & Memedovic, 2003; Ward & Brown, 2009). Local firms can develop and trade products or services that emphasise the provenance or cultural identity of the region, or that exploit features of the land (Lane *et al.*, 2016), which could be packaged and promoted to attract tourists (UNWTO, 2002). External firms and employers might be motivated to relocate to the region by the prospect of an agreeable environment, away from congested and stressful cities, or to live amongst natural surroundings (Davies & Michie, 2011). Such amenities might also appeal to highly mobile high-value professionals (Crescenzi & Rodrigues-

Pose, 2012) or two-career households, needing a central place for their home, while not cutting ties to urban centres and places of employment (Nelson & Nelson, 2011).

The imperative to find a development strategy that delivers for peripheral regions is growing. As Rodriguez-Pose & Fitjar (2013) contend, it is no longer an option for a peripheral region to not have a spatially specific strategy that enables it to exploit the opportunities of globalisation because to passively accept the negative effects of agglomeration as inevitable will only result in further decline. To fail to develop such a strategy would leave the region locked into a development path established in the circumstances of the past and unfit for the challenges of the future, and would only continue a cycle of diminishing prosperity and subsidy dependency.

2.7 Path dependency

Path dependency theory maintains that the development of economic conditions in a region is the product of the cumulative effect of random historical events. The influence of seemingly trivial events is intensified through positive feedback until one potential outcome is selected over all other possibilities and thus, an economic structure is established. The idea of path dependency was raised by Arthur (1994a) and David (1975).

Like Krugman, Arthur (1994) understood the value of incorporating increasing returns and multiple equilibria into economic modelling. He believed conventional economists were reluctant to accept such concepts because of the

difficulty in determining how one equilibrium outcome could be selected from all the competing alternatives. This was aside from a very real and practical problem of computing all the permutations. However, Arthur (1994b) held the view that no particular equilibrium outcome could be pre-selected, as the eventual outcome was that of a process that occurred by itself over time. David agreed and argued that the path towards an equilibrium would “*flow from seemingly negligible differences in remote beginnings*” (David, 1975, p.16). He maintained that it would not be possible to adequately understand modern economic development without also understanding the significance of the influence that history has on it. However, it was not until the influential paper ‘Clio and the Economics of QWERTY’ (David, 1985) that economists and geographers began to accept the idea that a sequence of chance events, rather than a set of deliberate actions, would result in one outcome being selected over all other possibilities.

Both Arthur (1994b) and David (1975; 1985) approach the idea of path dependencies from different perspectives and this is reflected in the nature of the externalities they identify. David’s interest was with the nature of those externalities that influenced the adoption of one technology over another, possibly even an inferior technology. Arthur was concerned with the increasing returns that made shifting from an established path trajectory increasingly costly and difficult. However, they both shared the same foundational principles: one, unintentional or inadvertent events have a long-run effect on the economic structure of a region; two, this structure becomes path dependent if it is ‘locked-in’ through externalities, positive feedback, and increasing returns; and three, once locked-in, an economy will retain its structure until it experiences an external shock. The types of externalities in a region’s economy that lock it into a negative path trajectory

include: a sector mix that has been shaped by an endowment of natural resources or cheap labour, the costs 'sunk' into a heavy industry or a particular infrastructure, the nature of rural community institutions or social traditions, and the impact of local or national government policies and interventions (Martin & Sunley, 2006).

2.7.1 Lock-In

David (2015) maintained that being locked-in to a given path is a positive state, as it provides the optimal conditions for maintaining a Nash Equilibrium. However, the language he used to describe the actual effects is consistent with the wider view of economist that it is in fact a negative state. The danger of being locked-in to a future path is that the eventual outcomes cannot be predicted in advance, once established it cannot be easily altered, and it will not necessarily be the most efficient of all the possible future paths that become available (Arthur, 1989). The current path was the most suitable for the conditions that existed at a given point in time, but without an awareness of the unknown future changes in conditions, including whether a more productive path may become available. An entity that has strategically selected and invested resources in one path will likely be unable or unwilling to change to another, with the result that the original path has become locked-in, even if a new path, more conducive to the new circumstances, becomes available. Once locked-in, the ability of an entity to adapt and respond to changes occurring within its environment are restricted (David, 1975).

According to David (2001), breaking free from the forces that lock an economy into a negative path trajectory can only be achieved through the impetus gained from a greater exogenous force, that is a transformative shock to the system, that will free it to reshape a new economic structure. This process is like the concept of hysteresis, by which economic structures are irreversibly changed by large exogenous shocks, the making of which are outside the control of the region (Baldwin & Krugman, 1986).

2.7.2 Endogenous de-locking

Economic geographers argue that it is possible that the impetus needed to de-lock a region from a negative path trajectory can come from within, and that a region can endogenously shift onto a positive future path. It can do this by harnessing the accumulated skills and experiences gained locally through the previous paths of development (Martin, 2010). Martin & Sunley (2006) propose five approaches that a peripheral region might take to endogenously escape from being locked-in to a negative path trajectory: 1. diversify sectors and practices to ensure constant innovation and evolution of the economic structure; 2. identify opportunities to add new value to existing assets or endowments not already exploited; 3. import emerging technological or sector opportunities; 4. repurpose existing technology, plant or infrastructure for new uses or opportunities; and 5. introduce new practices, technologies, products or services to revitalize the local industrial base.

Each local economy is the product of a complex structure of interactions between different individuals, institutions, or organizations, and each are subject

to interventions from different layers of government that have their own priorities, outlooks, and approaches. It is this heterogeneity, of unique local conditions, that is essential to enabling an economy to escape from a future that has been predetermined by its past (Marin, 2010). This suggests that a negative path dependency does not have to be the inevitable consequence of historical happenstance, however, the strategy for de-locking is not universal, rather it is contingent on the conditions present in a peripheral region.

2.8 UK regional development policy

A spatial imbalance in prosperity is evident in the UK, as it is in many developed countries, and this has concerned successive governments since the early 20th century. Designing regional development strategies to address this is challenging because it is a complex and multifaceted process, and one that requires the participation of a broad range of actors and is set within the context of dynamic environments and differing geographical conditions (ESDP, 1999; Storper, 2011). Development is commonly understood to mean the “*the movement upwards*” of all people (Myrdal, 1974) and the argument for governments to address imbalances is one of social equity, as people should not have to endure inferior job opportunities, quality of life, or of health or public services because of the place where they live. There is also an economic justification of ensuring that all regions are fully utilizing the available productive capacity to maximize the overall wealth of a country (Martin, 2015).

The approach traditionally taken by the UK government to regional development, as has many other industrialized countries, has been through

centrally administered ‘top-down’ policies (Martin, 2015). The earliest being the 1928 ‘Industrial Transference Act’. A ‘take workers to the work’ policy encouraged the unemployed in the lagging regions of northern England, Central Scotland, and South Wales to move to the employment that was available in London and the south of England. The failure of this policy led to the 1934 ‘Special Areas Act’. A ‘take the work to the workers’ policy incentivized firms to set up businesses in the lagging regions to provide employment (Martin *et al.*, 2016). Following the Second World War the idea of even national development was supplemented by that of Spatial Keynesianism (Pike *et al.*, 2017, p.52). Government policies now involved both the redirection of economic activity and the redistribution of wealth towards lagging regions (Barca *et al.*, 2012; Pike *et al.*, 2017). Such policies tended towards either infrastructure provision or state aid. While such redistribution policies could be politically expedient, as the benefits were highly visible and demonstrable in the short term, they were ‘one-size-fits-all’ regional policies and ultimately did not deliver sustained economic development (Pike *et al.*, 2006).

2.8.1 Government policy shifts towards a place-based approach

In the 1990s there was a shift in government development policies towards the idea of regional competitiveness. In 1998, when Britain could no longer compete based on low factor inputs or commoditized goods (Edmonds, 2000), the then Labour government published a white paper setting out a strategy for the UK to achieve competitiveness in the global markets (DTI, 2001). The UK’s ability to compete internationally would depend on

“...making the most of our distinctive assets... those distinctive assets are increasingly knowledge, skills and creativity rather than traditional factors such as land and other natural resources” (Edmonds, 2000 p.7).

The 2001 enterprise white paper (DTI, 2001) embedded the idea of regional competitiveness into a new regional policy that would require regions to promote innovation and enterprise. The government prioritized developing industrial clusters and would become focused on promoting business start-ups and growth amongst manufacturing firms or businesses reliant on intangible assets. The Labour government's development policies were guided by the principles of an endogenous growth strategy and by the example of regions with successful industrial clusters, such as Silicon Valley in the US or Tuttlingen in Germany.

The government took the view that, given the compelling evidence of the link between regions with a concentration of innovative firms and activities and their superior economic growth, policy should be to direct public funds or private investment towards the acquisition of innovative skills, knowledge, and technological advancements (Dolowitz, 2004; Westlake *et al.*, 2012). The government's objective of increasing innovative capacity to improve competitiveness was consistent with policies that have been adopted by many other developed countries (Westlake *et al.*, 2012). According to the EU, competitiveness is essential to the 'social cohesion' of a lagging region (Kitson *et al.*, 2004)

Despite the regional competitiveness agenda, wide regional economic disparities have persisted, and it is widely accepted that these contributed to the economic crisis of 2008, and they if they were to remain, they would hinder future economic stability. A new coalition government made the objective of ‘rebalancing the economy’ central to an economic recovery and a new growth agenda (Martin, 2015; Sharma, 2014). The focus was switched toward incentivizing local growth through ‘bottom-up’ strategies that would be proposed by local communities and businesses and tailored to local circumstances and priorities. The growth principles of decentralization, localism and rebalancing were set out in the 2011 Localism Act (UK Gov., 2011).

In response to the effects of the Coronavirus pandemic, the UK government published a ‘Plan for Growth’ (HM Treasury, 2021) in which it detailed how the country could ‘build back better’ from the economic disruption caused, and the approach it would take to ‘levelling up’, the current government’s label for economic convergence. However, while there has been a change in the language used to describe the process of economic convergence, the endogenous approach and principals of the competitiveness agenda remain unchanged. So too does the scale of the challenge that is confronting the government. The UK is one the most spatially unequal of the worlds developed countries and if levelling up agenda is to be achieved, it will require a long-term and multifaceted endeavour and one in which the role of local authorities will be crucial (Davenport & Zaranko, 2020).

2.8.2 Criticisms of the localism agenda

There are critics of the new endogenous approach to regional development who are concerned that it abandons the principle of equity redistribution (Pugalis & Gray, 2016) and has shifted the emphasis away from supporting lagging regions to contend with their social needs, to one of correcting a regional economic under performance, so that a new transactional relationship has developed as regional authorities promote themselves and negotiate for funding from central government. The risk for peripheral regions is, instead of being recognized as regions contending with a challenging set of social and economic conditions, they are now open to the accusation, that they have failed to effectively deliver on the commitments made to secure funding. Nonetheless, if a peripheral region can valorise local assets and mobilise local resources, it is not necessarily inequitable to enable them to do so, because it is the local community that stands to benefit. In fact, studies have found that policies that institutionalise peripheral regions as 'lagging' create a dependency (Stadel, 2005) on the continual, and likely unsustainable, practice of fiscal intervention that ensues (Baldacchino & Pleijel, 2010) which, in turn, stifles creativity and entrepreneurship (Cooke *et al.*, 2003). Entrepreneurship is essential to the UK government's competitiveness and localism agenda and to which it sees its role as creating the environment in which they can flourish.

2.8.3 UK national infrastructure strategy

A national infrastructure strategy was published in November 2020 as part of the governments levelling up agenda. The strategy is based on the guidance of the National Infrastructure Commission and the recommendations it made in the 2018 infrastructure assessment (NIC, 2018), the intention is also to reverse

under investment in the infrastructure and distribute government infrastructure spending more evenly across the UK (HM Treasury, 2020b, p.6). While it aims to achieve this by facilitating investments into “*rural areas, towns and cities*” (p.8), it does not make specific reference to the outermost and peripheral regions of the country. Investment in transport infrastructure improvements is a key part of the strategy, as is changing the way in which infrastructure investment proposals are assessed and policy decisions are made. The strategy is based on the guidance provided by the National Infrastructure Commission and the recommendations it made in the 2018 infrastructure assessment (NIC, 2018).

The national infrastructure strategy refers to the importance of aviation connectivity to the UK as a trading nation, in providing access for businesses to international markets. Otherwise, the role of aviation in national transport connectivity is not referred to, including whether aviation has a role in connecting peripheral regions, to which road or rail investment schemes are not to be extended, and, if it does not have a role, how the government plans to ensure already peripheral regions do not become further isolated and uncompetitive, as the transport connectivity to non-peripheral regions is improved.

It is not clear from the NIS document if, or what, consideration is given to the transport connectivity needs of UK’s peripheral regions so that, they too, will benefit from the countries levelling up agenda. Or, how these regions are to be connected to the UK’s hub airports if they are also to gain the benefits of access to the world’s third-largest aviation network (HM Treasury, 2020b). The DfT’s Aviation Strategy 2050 consultation paper acknowledges the importance of aviation connectivity to regional development, and it too specifies the importance

of the UK's hub airports (UK Gov., 2018d). In its response to the Transport Select Committees recommendations on the Airports National Policy Statement (NPS), the DfT highlighted the specific role Heathrow Airport has in facilitating this UK's access, and to ensure the UK's regions do benefit it expects that 15% of the additional slots, at an expanded Heathrow, are to be ring-fenced to provide additional domestic connectivity (UK Gov., 2018). However, the proposed Aviation 2050 strategy consultation and preparations for Heathrow's expansion occurred under the previous government and neither has been progressing by the current government. Instead, it is waiting on the final publication of a 'Union Connectivity Review' (DfT, 2020).

In an interim Union connectivity report, the transport connectivity needs of peripheral regions do not have a particularly high prominence (DfT, 2021). The interim report makes a reference to the importance of Newquay Airport to East-West passenger flows, but it does so without considering the quality of these connections. Similarly, it highlights the need for the NW of Ireland to be better connected but specifies connections to Belfast and not London. Where it does identify that NI needs improved air links to England, it does not specify the particular needs of the NW of NI. In addition to which, it notes that these would not necessarily need to be with London Heathrow. It does so without identifying how, therefore, the NW is to gain comparable or competitive access to the world's third-largest aviation network. De-emphasising the importance of London Heathrow airport is consistent with, if not because of, the opposition the current Prime Minister has expressed to the expansion of Heathrow Airport. It is his view that the expansion is now highly unlikely to happen (Parliament UK, 2021), despite the Supreme Court having overturned the Court of Appeals ruling that the

NPS was illegal. The likely effect of failing to expand Heathrow is that it would remain a congested airport and the benefits of the connectivity to global markets it provides (HM Treasury, 2020b) would remain inaccessible to peripheral regions.

2.9 Entrepreneurship

Entrepreneurship is central to many contemporary development strategies as it drives economic growth and job creation and as start-up businesses mature and grow, the value of these contributions increases (Henderson & Weiler, 2010). Innovation is “*the specific tool of the entrepreneur*” (Drucker, 1985, p. 19) and entrepreneurs are a crucial “*link between [innovation] and economic growth*” (Henderson & Weiler 2010, p.23) as they have the capacity to think creatively about existing assets. New jobs and prosperity are created as new ideas become new products and services, which are then commercialized. Terluin (2003) identifies the partnership between entrepreneurs and local government as the main driver of growth in a peripheral region, as they are best able to valorise local assets and to develop and deliver a new type of economic strategy, one that can commercially exploit local assets and deliver local growth.

2.9.1 Necessity and opportunity enterprises

Entrepreneurs in peripheral regions can be categorised as that motivated by either necessity or opportunity. Farm owners, confronted with the realities of the changing nature of economic activity, diversified activity on their land to supplement incomes, becoming entrepreneurs through necessity (McElwee & Bosworth, 2010, RCC, 2008). They are not motivated by growth (Baumgartner,

2013; Varis & Littunen, 2012) and invariably lack the necessary business acumen and strategic skills to develop an enterprise (McElwee & Bosworth, 2010). This skills deficit is compounded by a level of access to business support that is lower than that available to entrepreneurs in core areas (Young, 2010). Their businesses are small and privately owned, which makes capital difficult to access or attract (McAdam *et al.*, 2004; Yoo *et al.*, 2012). There is a high level of risk aversion because of the lack of growth motivation, while a reluctance to invest in process or product development means they forgo the high return opportunities (Baumgartner, 2013; Varis & Littunen, 2012). Consequently, they have a limited value to local economy (Rodrigues *et al.*, 2014).

Opportunity entrepreneurs, however, have identified a business opportunity and being commercially minded and motivated by growth, have greater value to a peripheral economy (Stephens & Partridge, 2011). They locate their business according to an attachment to it, or because they have been influenced by a pecuniary incentive that had intended to deliberately attract them (Audertsch & Keilbach, 2007). They have higher levels of education or formal training, and experience suited to business strategy and entrepreneurship (Greenberg *et al.*, 2018) and will increase local consumption through forward and backward linkages (Stephens & Partridge, 2011). As they trade on external markets, they bring in new finance and their extended networks and higher profiles attracts FDI (RELU, 2013). The presence of opportunity entrepreneurs in a location increases its appeal to new entrepreneurs, which increases the business population density, and the prospects of start-up from within, making the region less vulnerable to the fortunes of one dominant employer or sector (Stephens & Partridge, 2011).

2.9.2 Knowledge intensive enterprises

They can be involved in either traditional sectors, like tourism, which is inextricably linked to a place, or modern sectors, such as knowledge intensive industries, which are highly mobile and not rooted to any one place. Knowledge intensive industries are highly desirable for peripheral region authorities as they generate higher GVA, provide better quality employment, and attract higher levels of investment than traditional businesses (Stephens & Partridge, 2011). However, they are less likely to be influenced by financial incentives (Audretsch & Keilbach, 2007) and instead seek locations that offer the best knowledge and innovation conditions, that is, where there is already a high level of knowledge creation, use and dissemination (Mahroum *et al.*, 2007). The conditions favoured by high-tech industries tend to be present in locations that already have a dense high-tech industry base (Todtling & Trippl, 2005) and where pressure from competition to innovate is greatest (Mahroum *et al.*, 2007). Typically, these are the core agglomerations.

The implication being that peripheral regions will struggle to attract high-tech entrepreneurs and the associated economic benefits, as they lack the necessary density (Doloreux & Dionne, 2008). The 'thinness' of firms, suppliers and customers at peripheral regions and the fact that those present tend to be widely dispersed, reduces considerably the spillover and synergy benefits gained from the collaborative interactions of a critical-mass of firms and institutions (Doloreux & Dionne, 2008). To address the disadvantage new types of regional development strategies have emerged to increase the knowledge and innovation capacity of a region. These strategies emphasize the role of knowledge and

creative industry clusters, building research capability, attracting large or multi-national firms, and facilitating the development of new products and services through spillovers and synergies (Todtling & Trippl, 2005). However, knowledge industries are a relatively low contributor to peripheral economies overall and traditional industries will likely remain the most important sector for most regions. As these have received inadequate support and attention to date, there will likely remain much untapped potential (Varis & Littunen, 2010).

2.10 Tourism

Tourism has become an important tool in regional development strategies because of the economic contribution it makes, the positive spillovers it enables (Eurostat, 2020; UNWTO, 2014), and the direct and positive impact on employment and livelihoods in peripheral regions (Dwyer *et al.*, 2000). It also creates opportunities for SMEs, either directly in tourism sectors or through their supply chain linkages (Meyer, 2004). The stronger the value chain linkages are within a region, the less likelihood there is of tourism spend leakage and, therefore, a reduction in the potential indirect benefits to it (Dwyer *et al.*, 2000; WTTC, 2012). The induced effect is that of the employees, of tourism sectors or its value chain suppliers, who make an economic contribution through their own expenditure on personal goods and services, increased taxes and, the multiplier effect (Oxford Economics, 2013). Growth in the local tourism sector can cause local competition, stimulating innovation and increased investment in skills training of the local population, product development and, in local infrastructure and facilities (Schubert *et al.*, 2011). Though modelling by Papatheodorou (2003) does caution that competition should be balanced with the need for coordination, among tourism providers and promoters, to ensure the growth of tourism in

peripheral regions does not simultaneously result in the destruction of a region's appeal.

2.10.1 Tourism and regional development

Changing tourism consumer trends are creating new opportunities for peripheral regions to exploit the uniqueness of the local natural and built environment, and heritage, cultures, and traditions. Tourists are increasingly seeking individualised, immersive, and authentic experiences. They have moved away from the mass tourism of 'sunlust', towards the discovery of 'wanderlust' which is creating new relevance and opportunities for peripheral regions (Salvatore *et al.*, 2018). Mass tourism is associated with large multinational organisation adopting a Fordist approach to exploiting scale economies and, therefore, it has become denominated by large multinational tourism companies, who offer tourism products and experiences with little variety (Papatheodorou, 2004). Whereas a shift towards allocentric 'wanderlust' tourism is creating opportunities for smaller and specialist 'niche' suppliers in peripheral regions to become part of the local tourism product (Novelli & Benson, 2005). It presents peripheral regions with the opportunity to break from the 'agglomeration shadow' of core tourism resorts, and by emphasising the idiosyncratic character of place they avoid the risk of substitution from homogenised tourism products in core tourism centres (Papatheodorou, 2004).

Tourism dispersal beyond gateway cities has become a key issue for governments and the authorities in gateway cities. It is seen as a way in which over tourism can be managed and to encourage the distribution of tourism

benefits more widely. Koo *et al.* (2012) analysed inbound tourist data to assess what characteristics influenced tourist's dispersal propensity, when on a trip to Australia. Air transport connectivity was found to have a strong influence on dispersing inbound international tourist beyond the gateway city. The study also found there to be a greater propensity to dispersal amongst tourists participating in multiple activities and those on organised tours. The propensity to dispersal becomes greater as the length of stay increases. The time and cost of intermediate trips have been found to be deterrents to tourist dispersing beyond their arrival gateway (Khadaroo & Seetanah, 2007; Prideaux, 2000) and it might be that these become more acceptable as part of a longer trip. Tourism is worth £146bn to the UK economy, or 7.2% of UK GDP. However, the economic benefits from tourism are concentrated into London. Fifty percent of all international trips to the UK are to London (Foley & Rhodes, 2019). Eighty percent of these tourists would not travel beyond London because of their concerns about accessibility (BDRC, 2016).

A further barrier to tourism development that peripheral regions will need to overcome is the different priorities tourists have for short breaks as opposed to a main annual trip. Firstly, value for money is a significantly more important consideration and tourists actively look to maximise the value they can achieve from their available budget. Secondly, a short break is not a substitute for a main annual trip, but rather a break in their normal routine and as such, decisions are more spontaneous, and the nature of the trip will be determined by the time they can make available while minimising disruption to their normal schedule (Visit England, 2014).

2.10.2 Peripheral tourism and air route development

Transport is a vital component of a region's tourism offer, as it provides the vital link between a tourist-generating area and the region. Air transport has been the main mode of travel for international travel, but liberalization of the travel market has made it a viable option for between interregional destinations (Graham *et al.*, 2008). However, peripheral tourism destinations will be disadvantaged in gaining market share and the benefits that can be derived from tourism if tourists are unable to access the region (Halpern, 2008) and the region could, therefore, remain underdeveloped as a tourism destination (Papatheodorou, 2004). Which reduces the prospect of tourism being a meaningful contributor to economic development in a region (Graham & Shaw, 2008). As Papatheodorou & Lie (2006) note, the choice of a destination, once their travel needs and destination choices have been considered, is ultimately a matter of choosing to travel to one destination at the expense of another.

The type of effect accessible air transport can have on the demand for tourism destinations is demonstrated by, first, packaged holidays and charter flights, and secondly, the emergence of low fare airlines. Both of which were brought about by changes in the way the aviation market is regulated. An unexpected consequence of agreement at the 1944 Chicago conference was the emergence of chartered airlines (Papatheodorou, 2002). Charter airlines focused on cheap fares, often as part of a packaged and standardised holiday offer (Papatheodorou & Lie, 2006), which gave rise to the rapid expansion in demand amongst Northern European markets for sunlust destinations, such as those in Spain. The railway had made leisure travel affordable to a larger proportion of the

British population and gave rise to mass tourism at seaside destinations. Charter airlines made it affordable for those tourists to travel to seaside in warmer Southern Europe destinations (Forsyth, 2006).

Full liberalization of the European aviation market then eliminated the legal distinction between traditional scheduled and unscheduled chartered airlines, creating the conditions for the emergence of the low-cost carrier (LCC) business model. Lower fares encouraged passengers to visit new regions in Europe (Papatheodorou & Lei, 2006) that would previously have been considered as secondary (Forsyth, 2006). A now 'hyper-mobile society' will travel by air, in addition to their traditional annual holiday, to take short duration weekend and city breaks (Graham *et al.*, 2008; Graham & Shaw, 2008) and Koo & Papatheodorou (2017) suggest that LCCs, because of the nature of their business model, could provide new opportunities for peripheral regions through tourism. However, as Halpern and Graham (2015) found, airports operators are actively seeking to increase the number of routes available from their airports, and over half of airports they surveyed are focused, to a great extent, on achieving this by developing LCC routes.

As their business model has evolved, LCCs are competing directly with traditional airlines (Dobruszkes, 2013) on higher demand routes to popular tourism destinations and major cities (Dziedzic & Warnock-Smith, 2016). As LCCs seek to maintain levels of demand on their services, and as their services are in demand by airport operators (Halpern & Graham, 2015), their networks have become subject to constant review (Wit & Zuidberg, 2016) and the benefits to a region are now volatile. However, even if the LCCs selection of airports was less

volatile, it is unclear if they, alone, given the nature of their offer, can be a panacea for a region's connectivity challenges (Graham, 2013).

2.11 Summary

Peripheral regions have lost out economically in the tussle between centripetal and centrifugal forces as described by NEG. People, business, and investment seek proximity to each other in core locations, that is agglomerations, as it is advantageous for them to do so. The agglomeration effect places peripheral regions at a disadvantage which, together with advances in technology and the influence of globalization, has caused a gap to open between their economies and those in core centres.

The agglomeration effect benefits a nation because of the prosperity it creates, which is greater than without it, is distributed from the core to peripheral regions through spillover effects. Consequently, the policy agenda of national and supra-national organizations have been to, one, facilitate the agglomeration effect to maximize these benefits and, two, not to attempt to redistribute economic activity evenly across a nation as this constrains aggregate growth. Peripheral regions have become locked into practices, behaviours and social norms established in the circumstances of the past, locking them into a negative path trajectory unsuited to future circumstances. These two factors suggest that the prospect of continued economic decline and diminishing opportunity and prosperity for peripheral regions is inevitable.

The regional development policies of UK governments had been exogenous mechanisms of equity redistribution. An endogenous approach to regional development has emerged that has been influenced by 'cluster' thinking and 'placed-based' paradigm. These concepts have shaped the UK's 'competitiveness' policy agenda and the 'deal' nature of relationships between central government and regions. The two foundations of this new thinking are to encourage entrepreneurship, in the traditional sectors to valorise locally situated assets or repurpose current infrastructure, and to attract modern technology and knowledge intensive sectors to the region.

These both require the necessary conditions and capabilities to be present. Entrepreneurs in traditional sectors require support and access to finance to be able to valorize the endowment of local assets. Knowledge and modern sector firms seek proximity to other knowledge development, dissemination, and application firms. In common is a reliance on high quality connectivity to reduce the time and financial cost burden of trading from a peripheral location and in accessing resources and trade, tourism, labour, and financial markets. The next chapter provides a review of the literature on the role of transport in general and the effectiveness of PSOs, in enabling peripheral regions to overcome the disadvantage of distance from core regions.

Chapter Three: Air Transport Connectivity and PSOs

3.0 Introduction

This chapter offers a review of the literature concerned with air transport connectivity and the role of public service obligations (PSO) within that, with a view to understanding the way in which they are used in support of economic development strategies. The review starts with an examination of the European Union's (EU) route to liberalization of the European air transport market, the effect of this on market conditions in peripheral regions and the need this creates for PSOs, within the context of the EU's antipathy to state aid for fear of the distortive effect this can have on the single aviation market. It reviews the debate within the literature about the administration of PSOs and whether the EU's objectives are better served by doing so at a federal or individual state level. Following which it assesses how the PSO mechanism has been adopted across the EU and how the UK Government's position on them has evolved.

The review then considers the literature that is available on the technical aspects of PSO including the economic arguments for them, factors that influence the efficiency of PSO programmes, and how the contracting of PSOs can negatively impact the costs of and demand for PSO services. It becomes apparent by the end of the review that while the body of work on PSOs focused on the supply side issues are not extensive, there is extensive examination of demand-side factors.

3.1 EU air transport market liberalization and the need for PSOs

The European Commission (EC) considers high-quality transport connectivity to be fundamental to achieving the EU's goal of economic, social, and territorial cohesion and solidarity. It takes this view because it recognizes both the strong relationship between transport connectivity, market integration, and balanced economic growth (European Commission, 2011a) and because transport connectivity facilitates access to the global economy for all regions of Europe (European Commission, 2011b). Transport has been a foundation to the process of European integration since the treaty of Rome in 1957 (European Commission, 2014), which sought to achieve economic growth through trade by creating a common market between member states that was based on the free movement of goods, people, services, and capital (EUR-Lex, 2018). An aim of the common market was to achieve balanced trade and fair competition by eliminating trade barriers. A 'Common Transport Policy' was one of just three policies –the other two being 'The Common Agricultural' and 'The Common Trade' policies– to be established by the treaty, to facilitate the free movement of goods, people, and services.

During the period between the Treaty of Rome and the Single European Act (SEA) in 1986, member states relinquished very little control over their national transport policy, about which the European Court of Justice ruled in 1985 that the EC had failed to act (Steer Davies Gleave, 2009). The SEA was to bring 'new momentum' to achieving the single European market goal by modernizing the EU governance mechanism. It also prepared the ground for the 1992 Maastricht Treaty (1992) (EUR-Lex, 2018b). The Maastricht Treaty conferred on

the EU's responsibility to create trans-European networks (TEN) that would link member states (MSs) and national networks to ensure the proper operation of the single market. Three TENs would cover telecommunications, energy, and the transport (TEN-T) network infrastructures. After the Maastricht Treaty was the 'Future development of the common transport policy' communication which highlighted that further actions were needed to ensure fairer competition within the single market (European Commission, 1993). This paper included an acknowledgment of the potential impacts of market failure to peripheral regions communities:

"The transport service industry is essential for the integration of the community...The problems of more peripheral regions show that geographic disadvantages may be exacerbated by insufficient transport resulting in a lack of competitiveness and difficult market contacts of the economies concerned." (European Commission, 1993, para. 34).

The TEN-T requirement has since been aligned to the objectives of 'Europe 2020' growth strategy and the 2011 white paper 'A Roadmap to a Single European Transport Area' (European Commission, 2011b). This emphasizes the objective of the TEN-T to ensure the:

"accessibility and connectivity of all regions of the union, including remote, outermost, insular, peripheral and mountainous regions, as well as sparsely populated areas" (European Commission, 2011b regulation No1315/2013, article 4)

Achieving this objective, however, has been a long and complicated process because of the fragmented nature of the European aviation market and the protectionist instincts of European governments prior to the Maastricht Treaty.

3.2 The background to EU air transport market liberalization

It seems inconceivable given how ubiquitous air travel is today, but in 1957 aviation was not covered by the provisions of the Treaty of Rome, other than Article 84 that retained the right to determine a need in the future. Meaning that MSs were free to intervene in and, therefore, distort the aviation market. This was not corrected till liberalization of the market was completed in 1992. Prior to when the aviation sector was highly regulated and governed through bi-lateral agreements between MSs. The market was dominated by national flag-carrier airlines and agreements between MSs amounted to protectionist mechanisms that restricted competition. MSs justified a highly regulated environment as ensuring appropriate safety levels and protecting services. In reality, it was motivated by national political or economic priorities (Reynolds-Feighan, 1996) and the need to protect MS's flag carrier (Barret, 2000). The result was an inefficient European transport system and a distorted air transport market (Button, 2001). However, what it did was to ensure that relatively high levels of air services to peripheral regions were maintained (Reynolds-Feighan, 1996).

It was not until 1987 that the commission began to address these anticompetitive practices that were inhibiting growth in the European aviation market, with the introduction of the first of the three 'packages' of regulations that would culminate in the markets complete liberalization. These packages

established a common set of licensing criteria for all EU based airlines (Reynolds-Feighan, 1999). The first and second packages, in 1987 & 1989, limited a member state's right to object to new fares, provided intra-European airlines a degree of seat capacity sharing, and removed restrictions on passenger and cargo movements between MSs. The final package in 1992 removed all remaining restrictions on competition and harmonized operating license regulations across Europe. It replaced the concept of national ownership with that of 'community air carrier'. The third package also introduced the PSO provision that is intended to maintain services to regions that would be impacted by the market failures caused by opening services to normal competitive market forces (Reynolds-Feighan, 1999).

The benefits gained by passengers by liberalizing the air transport market and opening it to normal competitive market forces have been considerable and include increased choices, higher service levels, and reduced airfares (Reynolds-Feighan, 1996). However, these benefits are only achieved when routes have the necessary passenger demand to create scale economies and market competition (Calzada & Fageda, 2014), which routes to peripheral regions do not have. This is because they are sparsely populated and have low levels of economic activity. Therefore, rather than gaining the benefits of liberalization, communities in peripheral regions are at risk of reduced choice, reduced service quality, and increased fares (Brathen & Eriksen, 2018), or the loss of the services altogether (Brathen, 2011). Before market liberalization, these services were maintained because national airlines would indirectly subsidise them from profitable routes. Governments would be required to provide these subsidies directly, if these services were to be protected and prevent the communities from becoming

isolated, following liberalization (Reynolds-Feighan, 1995b). However, protecting the single market is of fundamental importance to the EU and it is wary of MS interventions that might distort fair and open competition.

3.3 State aid controls

Any form of state subsidy provided to the aviation sector is state aid and it is subject to the same scrutiny as any other form of subvention. Under normal circumstances, the activities of an airport or airline are normal economic activity and would not justify state aid. However, state aid targeted at regional aviation initiatives, intended to improve accessibility or economic development, could be permissible as they are “*promoting social and territorial cohesion*” (EUR-Lex 2012b, para. 1). When an airline provides a service to a region where the market has failed, placing it at a social or economic disadvantage to other regions, the activity of an airline is defined as services of general economic interest (SGEI), which are eligible to receive state aid. A PSO route is an example of a vital SGEI (EUR-Lex, 2012a).

3.4 Public service obligations

Providing state aid directly to airlines or allowing them to cross-subsidise thin routes is a long-established practice by MS. A review of state aid schemes in the European aviation sector in 1992 established that it was common for MS to provide aid directly to national airlines to maintain services on thin internal routes. The review was conducted because the EC was concerned that the effects of liberalization would increase the subsidies MS provided their national airlines

which, it feared, could jeopardize the *“dynamic and efficient air transport industry the European consumer has been looking for”* (European Commission, 1992, p.6). The review concluded, however, that such state aid was not necessarily inconsistent with the Treaty of Rome, so long as it was used for regional development and was not to provide a market advantage for one EU airline at the expense of another (Reynolds-Feighan, 1996). This principle was subsequently adopted by the EC in ‘regulation 2408/92 article 4, the imposition of PSOs’. Which has since been updated in ‘the ‘Common Rules for the Operation of Air Services in the Community (1008/2008)’, in articles 16 (general principles), 17 (public tender procedure) and, 18 (examination) (European Union, 2008).

As is the case with SGEI aid, there are no standards governing how a MS should organize and finance a PSO. Unlike SGEI, however, a body of case law does not exist that can guide the interpretation and application regulations. Consequently, the EC published interpretative guidelines for the imposition of PSOs in 2017 (European Commission, 2017). It did so to provide *“transparency, consistency and clarity”* (European Commission, 2017, para.10) on the correct imposition of PSOs. The intention was that, in sharing assessments of prior applications, it could assist MS with little experience of PSO applications to comply with the regulations. Accordingly, the purpose of a PSO is to:

“set fixed standards of continuity, regularity, pricing, or minimum capacity to ensure access to isolated or developing regions . . . as the market itself will not deliver an acceptable level of air service to these regions” (European Commission, 2017, para.10).

Given there are, what the 'Aviation Strategy for Europe' describes as "*different needs of EU citizens and business, to high-quality air transport services*" then member states "*may consider PSOs as an instrument to ensure service to and from the under-served regions, i.e., to ensure connectivity where needed*" (EUR-Lex, 2015).

A PSO is only intended to maintain adequate services on routes, to peripheral and development regions or on thin regional routes that are vital for social or economic development and that would not otherwise be commercially viable for airlines to provide (EUR-Lex, 1992). Therefore, the level of service the PSO provides must be proportionate to the economic need of the region. Meaning there are limited circumstances in which a PSO could be imposed on a route (European Commission, 2017), which were clarified in the 2017 interpretive guideline.

3.5 PSO regulation interpretive guidance

It is for individual MS to determine the need for and impose a PSO on a route. The EC does not have the power to make this determination or to direct a member state to do so. Whether or not the EU should have this authority is covered later in this survey of the literature. As the regulation currently exists the sole role of the EU is to ensure that a PSO is imposed in accordance with the regulations. The criteria the regulation requires a MS to comply with can be categorized as: route eligibility, justification and necessity, and acceptable service criteria.

3.5.1 Route eligibility

The route eligibility criteria are concerned with avoiding market distortions. The imposition of a PSO is restricted to routes not already sufficiently served by alternative transport modes and when an air transport is the only viable mode. A PSO service can only be imposed on scheduled services, as charter or air taxi services are not eligible. It can only be imposed on domestic or intra-EU routes and should be defined by specified origination and destination airports and not broadly by a city or region. A route that facilitated onward connectivity could form part of the PSO justification, but it would not be sufficient justification by itself. Similarly, stop-overs are permissible, but each individual route segment requires justification. Several routes could not be tendered and contracted as one bundle as each route requires its own justification and an authority must tender each separately.

3.5.2 Justification and necessity

The guidelines make clear that a PSO is a short-term provision intended only to correct a market failure and should involve minimal market intervention. If any airline is prepared to operate a route on unregulated and normal commercial terms, then other operators should not be restricted from operating the route. Only in the absence of such an operator can an authority contract an airline to operate a service on the route, with or without a subsidy. When a subsidy is part of the contract terms, the amount can only be that required to cover net costs to ensure services on an otherwise financially unviable route. It should not be used to create an advantage for one airline, or a beneficiary airport, at the expense of others.

The EC assesses the justification for the imposition of a PSO against four criteria: one, the PSO should be proportionate to the developments needs of the region and should not impose restrictions that surpass this need; two, other transport modes are unable to meet the needs of the region; three, an increase in fares is matched by a decrease in demand, indicating that a fare ceiling is necessary; and four, an aggregate of the existing air service in the region, including indirect services and adequate services from nearby airports, provides adequate connectivity and indicates there is not a market failure.

The EU requires a MS, that is imposing a new or modifying an existing PSO, to ensure all interested parties are informed, including other MS on the route, nearby airports and regions, and airlines already serving the route. It must also advise the European Commission for Transport and Mobility, who will publish the information on the website of the Directorate General for Mobility and Transport (DG-MOVE). A PSO can then be imposed for up to four years before it must be reviewed, though the process of review should be ongoing as, once the market failure, that made the PSO necessary, is resolved the imposition should be removed.

3.5.3 Acceptable service criteria

Service requirements for a PSO are specified by the MS, or a delegated regional authority, and fixed by a contract. The types of service criteria a MS can set include the aircraft capacity, frequency of flights, or the scheduling pattern. It could be that a tender sets out departure and return times that enable business passengers to conduct a day's business without the need for an overnight stay.

The criteria may be concerned with the type of aircraft to be deployed on the route and whether it is helicopter or airplane, or a turboprop or jet engine. The criteria may also define operational or technical requirements such as the take-off weight capability, landing systems equipment, or languages spoken by the crew. The authority might also set criteria for the commercial operation of the route, covering features such as an online booking, inline ticketing facility, setting maximum or category specific fares, and fare exclusion like meals and luggage. The range and nature of these criteria will reflect the purchasing authority's understanding of the needs of the community. As will be discussed later, the complexity of the mix of criteria can have unintended consequences for the tender process and required level of subsidy.

3.5.4 The process of imposing a PSO

The process for imposing a PSO is set out in Chapter Three of EC regulation No1008/2008 on the common rules for the operation of air services in the community (European Commission, 2008). An EU MS must first communicate its intention to impose a PSO by posting information about it in the EU Official Journal of the European Union (OJEU). This should include details about both airports involved, the commencement date, and how further details about the route can be obtained by other member states. The MS must also consult with other affected countries if the route is international. The awarding of a contract to an airline, to operate a PSO service, can only be done through an open and transparent public tender process.

The invitation to tender must be posted on the OJEU and in the MS's national journal, at least two months before the deadline date for tender

submissions. It will include all necessary route information and proposed contract terms. Once an airline has been selected, based on the adequacy of the service and compliance with the route justification criteria, the commission is then informed. The imposition process must be open to examination by the commission, which can request the MS justification for the imposition on a route, which will include analysis of the benefiting region's economy, the proportionality of the service, and an assessment of why current alternative transport modes are not an adequate substitution (European Commission, 2008).

On the 1st of January 2021, the EU regulations were transferred into UK law and amended only as was necessary to accord with UK law and institutions (CAA, 2021). The limited amendments made to the EC regulation are that it is now the Secretary of State for Transport that can impose a PSO within the UK and Gibraltar and that the DfT must instead publish PSO information about a proposed PSO and the tender process in the London, Edinburgh and Belfast Gazettes. Other than some terminology changes, the principal obligations of the EU regulations remain the same (CAA, 2020).

In the UK it had been, and remains, the responsibility for the devolved governments and regional authorities to justify a proposed PSO imposition against the EU's criteria, and for making the funding case. The merits of each PSO proposal are assessed by the Secretary of State for Transport, who makes the judgment about its eligibility. It is no longer necessary for the DfT, as it had done before Brexit, to liaise with the European commission about these judgments. It is then for the devolved governments or regional authorities to manage the tender process and to select the preferred airline provider. If

necessary, it would then submit a separate bid to the DfT for funding support. However, the DfT does expect there would be a high level of funding support for a PSO from the local authority (UK Gov., 2013).

3.6 The imposition of PSOs in the UK

There are 176 PSOs imposed across the EU, of which France accounts for 23 percent and of which the five countries with the most PSOs imposed to account for 74 percent (Table 1). In contrast, 15 member states have not imposed any PSOs.

Table 3.1. Member states with PSOs imposed

| Active PSOs in the EU | | | |
|------------------------------------|----|---------------------------------------|---|
| Countries with PSOs imposed | | Countries without PSOs imposed | |
| France | 35 | Austria | 0 |
| Greece | 28 | Belgium | 0 |
| United Kingdom | 22 | Bulgaria | 0 |
| Portugal | 20 | Denmark | 0 |
| Spain | 20 | Germany | 0 |
| Italy | 11 | Hungary | 0 |
| Sweden | 11 | Latvia | 0 |
| Croatia | 10 | Luxembourg | 0 |
| Estonia | 3 | Malta | 0 |
| Ireland | 3 | Netherlands | 0 |
| Finland | 2 | Poland | 0 |
| Cyprus | 1 | Romania | 0 |
| Czech Republic | 1 | Slovakia | 0 |

| | | | |
|-----------|---|----------|---|
| Lithuania | 1 | Slovenia | 0 |
|-----------|---|----------|---|

Source: European Union (2020)

There are 22 PSO routes in the UK – 18 of which are a network of routes that serve the Scottish Highlands and Islands, one of the remotest and least populated regions in Europe. This network includes seven of Europe’s thinnest PSO routes and one that is just 2.7 km long. While the Department for Transport (DfT) remains responsible for ensuring compliance with the EU PSO regulations, responsibility for local transport policy and funding is a devolved matter that, through Transport for Scotland, lies with the Scottish government. Transport for Scotland retains responsibility for funding and administering Scottish intraregional services, currently three routes to Glasgow International Airport from Barra, Campbeltown and Tiree, and local authorities are responsible for providing interregional services, currently 15 routes within the Orkney Islands, Argyll and Bute, Western Isles and Shetland Island council regions.

An additional air discount scheme is operated by the Scottish government under regulation (EC) No 651/2014 (European Union, 2014), which declares certain categories of state aid compatible with the internal market, including social aid for transport for residents of remote regions. The air discount scheme provides residents in eligible remote regions with a 50 percent discount on airfares, the high cost of which would otherwise be a barrier to travel, to Aberdeen, Edinburgh, Glasgow, and Inverness airports (Transport Scotland, 2019). Since 2007, the Welsh government has supported a PSO between Cardiff airport in the south with Anglesey airport – a civil enclave within RAF Valley – in the north of Wales (National Assembly for Wales, 2015). Following a review of the performance of

the PSO by the Welsh Assembly, this PSO service was renewed in 2019 for two years (Slade, 2019).

The remaining three PSOs in the UK are those on routes to London from Dundee in Scotland, Derry~Londonderry in Northern Ireland, and Newquay in the southwest of England (European Commission Mobility and Transport, 2018).

3.6.1 The imposition of PSOs by the UK government

The DfT has published its own guidance on the UK government's policy approach to imposing PSOs for the protection of regional air services to London. These were first published in 2005 (UK Gov., 2005) and updated in 2013 to take account of the amended EU PSO regulations in 2008, the 2013 aviation policy framework and the creation of a £20-million regional air connectivity fund announced in the 2013 government spending review (UK Gov., 2013). Consistent with its free market instincts, this guidance affirmed its commitment to protecting regional services while also limiting government intervention in the air transport market. It has also been consistent in the view that the imposition of a PSO would not be appropriate for new routes into London. Instead, devolved and regional authorities could apply for start-up aid, through a route development fund, to launch routes with the potential to become commercially viable after three years. The government had, however, recognised that aviation connectivity was more than simply 'a luxury from remote regions' but rather essential to their local economies (McLoughlin, 2013).

In June 2013, the government announced an infrastructure investment strategy, and this included a £20-million fund to support regional air connectivity to London (Osborne and Alexander, 2013). This fund was to be used to protect those regional services to London that were increasingly at risk, as they were becoming commercially unviable for airlines (UK Gov., 2013). In 2015, the regional air connectivity fund was increased to £56 million, specifically to provide start-up aid to encourage airlines and airports to launch new routes to boost 'connectivity, increase trade and support jobs in the regions' (UK Gov., 2015). The regional air connectivity fund was first used to protect the route between Dundee Airport and London Stansted from June 2014, and again later that year to protect the route between Cornwall Airport and London Gatwick. It has most recently been used in May 2017 to support a PSO to protect the route between Derry~Londonderry and London.

3.6.2 Preparing a business case for PSOs in the UK

All spending proposals involving central government funds, including PSOs, require a formal business case (BC) to be prepared. In the case of a PSO this would be prepared by the LA seeking the PSO and needing the government support to fund it. However, even if the LA could afford to impose the PSO without the funding support of the government, it would still need the government's regulatory approval. The BC is used by government ministers, with authority delegated by the Treasury to make spending decisions, to guide their judgment on matters that include the affordability of a proposed scheme, whether it is consistent with wider ministry and government objectives and policies and whether it represents value for money. Guidelines for the preparation of a

business case are set out in the HM Treasury's 'Green book: the central government guidance on appraisal and evaluation' (HM Treasury, 2018).

A BC consists of five components that evaluate different aspects of a PSO funding proposal: one, whether there is a case for government intervention– which is, the strategic case; two, whether it represents value for taxpayer money– which is, the economic case; three, whether it will be commercially viable– which is, the commercial case; four, whether it is affordable– which is, the financial case; and five, whether it can be delivered– which is, the management case. The approach to preparing a business case, in a transport context, and the modelling tools used, in evaluating the economic case, are set out in Department for Transport's (DfT) 'Transport Analysis Guidelines', or 'TAG' (UK Gov., 2017c).

A key element in the justification for a PSO funding proposal is whether the PSO represents value for money (VFM) and this is evaluated as part of the economic case. The DfT defines VFM as the use of public funds in a way that ensures public value is maximised at a national level (UK Gov., 2017b). A PSO is considered to perform well in VFM terms if it can demonstrate that the benefit derived from funding is additional, and that it does not simply relocate existing economic activity from one region to another.

The UK government's objective is to ensure that a PSO is a cost-effective way to ensure that transport links with a peripheral region are maintained. The best practice for assessing a PSO funding proposal requires a cost-benefit analysis (CBA) be completed of the scheme's impacts, positive and negative, so that a cost-benefit ratio can be identified for the full life of the PSO. The CBA assigns a monetary value to the costs and benefits of a proposed PSO by using

market prices where these are available. When a market value is not available, such as for the consumer benefit, a value is derived using mathematical modelling based on the Consumer Surplus Theory. In addition to consumer benefit, the CBA modelling for PSO proposals also monetises environmental impacts, including greenhouse gases, and impacts on the public accounts, such as the effect on tax revenue from changing traveller behaviours (UK Gov., 2017c).

Normally any WEI caused by a new transport scheme would also be included in the modelling for the economic case. WEI are created when a reduction in the cost of transport– the generalised travel costs (GTC)– is transmitted back into the local economy through corresponding changes in behaviours that improve productivity. The impacts of which on the economy are induced investment and labour supply or agglomeration benefits (UK Gov., 2013). However, the DfT's position is that when monetised these would likely have a minimal influence on the VFM category for a PSO proposal and are not therefore included in the VFM model. This position is based on the outcome of a study, it commissioned, into the wider economic benefits gained from targeted government interventions in regional air connectivity (Laird & Mackie, 2018).

The CBA and the economic case are an important part of the BC, but they are only one part of what is a multi-criteria evaluation, of a funding proposal, used to prepare a business case. The BC also includes those impacts to which a monetary value cannot be assigned but must still be considered. The decision-making process follows three set stages, each stage building on the previous one, to ensure that the evidence presented is relevant and robust and that the final selection is the most appropriate solution consistent with DfT priorities (UK

Government, 2013b). Stage one is a strategic outline, which makes the case for a spending proposal. Stage two is an outline business case that examines all the available options and selects a preferred one. Finally, stage three makes the full business case for the preferred proposal, which the minister uses to judge its merits and whether it should receive government funding. Because PSO funding tends to be relatively small scale, compared to a typical DfT scheme, the third stage is generally enough by itself and is completed following the PSO tender process.

The DfT acknowledges that the current approach, to assessing proposed PSO routes, does not sufficiently take account of the nonmonetized impacts of the PSO, both the benefits gained and the unintended drawbacks. In a consultation document for a 'Future Aviation Strategy' it has proposed a new two-stage assessment that allows proposals to be transparently assessed on a case-by-case basis (Figure 4). Stage one would evaluate whether an envisaged PSO is compliant with the criteria of EU regulation No 1008/2008. When compliance is established, stage two would evaluate three aspects of each proposal: Regulatory— the degree of peripherality, viability of alternative airport, and subsidy per passenger; Strategic benefits— the contribution made to rebalancing the UK economy, the positive connectivity gains compared to the counterfactual, and taking account of all transport connectivity provision, the positive long-haul connectivity gain and defining the scope of the development region it serves; Induced distortionary effects— how it effects current routes from the origin and destination airports, effects on long-haul routes from the destination airport, and distortionary effect on surface transport markets. The DfT's assessment is that such an approach in the future would allow for a more 'nuanced' understanding

to be gained from the merits of a PSO proposal in the context of the circumstances and environment in which it will operate (UK Gov., 2018d).

Figure 3.1. DfT proposed PSO assessment criteria: stage two

| Regulatory Considerations | Strategic Benefits | Distortionary (undesirable) effects that the PSO might induce |
|--|--|--|
| Assessment of subsidy required per passenger (either direct or indirect) | Strategic fit (how does the PSO help to rebalance the UK economy) | Degree of impact on existing air route(s) from the origin airport (either to foreign hubs or other domestic airports) |
| Degree of peripherality (<3, <4, <5 hours) | Does it improve domestic connectivity to the region, relative to connectivity today by any other mode of transport | Degree of impact on existing air route(s) from a nearby airport to the same destination airport (for example Liverpool and Manchester) |
| Peripherality to alternative airport in the same region | Does it improve long haul connections for the region, either directly from regional airport or through a hub airport | Degree of impact on other route(s) from the destination airport (long haul) |
| | How much of the surrounding area is designated as a 'development region' | Distortion of existing market for rail and other surface public transport connectivity |
| | | Distortion of existing market for road connectivity |

Source: DfT (2018d)

The position of the DfT currently is, that there is not the evidence to make a case for expanding the scope of the governments support for PSOs beyond the current measures. The long-term UK aviation strategy, Aviation 2050, sets out DfT's views on how the sustained long-term growth of the sector can be achieved (UK Gov., 2018d). According to the aviation strategy consultation paper, the best way to strengthen the UK's domestic connectivity and international connectivity and to geographically rebalance the UK economy is to ensure that UK regions have access to the key international markets necessary to grow their local economies. The DfT recognises the part that PSOs have in enabling this access and has stated that it will continue to support existing services to London that are in danger of being lost. It does envisage, however, that the greater share of financial assistance for PSO routes should shift towards the local authorities, though the proportion of funding provided by central government is decreasing.

The DfT is considering whether to review its interpretation of the EU PSO regulations and whether they could be imposed on routes to airports serving other main cities, such as Manchester, particularly if these routes facilitate greater onward connectivity. However, beyond this, it remains the DfT's position, that there is a limited case for expanding the scope of government support for domestic air connectivity beyond current measures, except in instances when capacity constraints at hub airports mean that domestic routes are squeezed out by more commercially viable, often-long-haul services. In such circumstances, the DfT's preferred approach is to explore solutions that do not require funding, such as ring-fencing slots for domestic connectivity, to avoid the particularly distortionary effects of PSOs on the aviation market (UK Gov., 2018d). Whether the current government intends to progress the aviation strategy further remains unclear. It had announced its intention to review regional aviation connectivity in the UK at the beginning of 2020 (UK Gov., 2020a). However, because of the Covid-19 pandemic, the review has not been completed

3.6.3 HM treasury Green Book review outcomes

In the 2020 budget the UK government outlined how it would deliver on its commitment to 'levelling-up' and redress the differences in economic and social circumstances that exist between regions and communities across the UK, by boosting productivity and growth and reversing a long term underinvestment in national infrastructures. Fuller details of which are set out in the governments 'Plan for Growth' (HM Treasury, 2021) and National Infrastructure Strategy (HM Treasury, 2020b). To ensure that government investment in infrastructure projects could be distributed across the UK, the HM Treasury undertook a review

of its Green Book (HM Treasury, 2020). The Green Book sets out the ways in which spending proposals must be appraised, which might potentially have undermined this intention if the approach to appraisals was inherently biased towards more prosperous or highly populated regions.

The review concluded that whilst the methods themselves were not problematic, the way in which they were being used by project sponsors and appraisers is, which if unchecked, could undermine the levelling up agenda. It identified that the approach to BCs had become overly reliant on the economic case and the monetisable elements of the CBA and that the appraisal process had “*become something of a black box*” (HM Treasury, 2020, p.4). This created a situation in which local governments feel unable to engage with the process and instead delegate it to expert consultants. Compounding the fundamental problem with current practices, which is that insufficient attention is paid to the strategic case for a spending proposal, BCs are failing to clearly define the strategic rationale for and the objective of a proposal, or to describe the full range of social and economic benefits that is expected to be gained.

The review also identified that, in prioritising additionality, appraisers are focused on assessing the CBA at a UK level and are, therefore, failing to properly consider the impacts at a local level and on sub-UK objectives. The review found that local authorities were unclear whether local impacts could even be considered as part of the BC. Consequently, the Green Book is being amended to make it clearer that the appraisal process should not be treated as a decision-making algorithm and the CBA should not subject proposals to arbitrary VFM thresholds. Rather, the CBA should be recognised as being one element of a

multi-faceted BC that should be balanced in the way it furnishes decision makers with the full range of data about a schemes economic and social costs and benefits, and how a proposal aligns with the government's strategic objectives. It has, therefore, changed the guidance to placed-based assessments that make the local CBR, employment, and household income impacts the principal frame of reference of spending proposal and for the national impacts to be presented separately (HM Treasury, 2020).

The DfT will take into account the Green Book review and the National Infrastructure Strategy as part of the review it is conducting of the approach it takes to assessments and evidence modelling. The review had originally been initiated by the DfT in 2019 to ensure the department was able to respond effectively respond to emerging issues, such as uncertainty about future travel behaviours and the UK's commitment to Net Zero transport carbon emissions (DfT, 2019).

3.6.4 Wider economic gains from UK PSOs

The DfTs position that there are only marginal wider economic impact (WEI) gains from PSOs is based on a paper, prepared for them, by Laird & Mackie (2018) on ways in which government intervention in regional air connectivity might be improved. The paper does make the point that any benefits gained by peripheral region, from a PSO, are likely to have been displaced from other areas, unless, that is, the local economic growth had previously been constrained by inadequate transport connectivity. However transport improvements alone will not stimulate growth without other investments being made, within the region, to

improve local economic conditions, including access to an “*appropriately skilled workfare*” (Laird & Mackie, 2018, p.4). If the movement of new activity into the peripheral region causes sector specialisation to occur or is accompanied by other types of inward investment resulting in productivity gains, then the gains would be additional. That is, the productivity gains in the periphery location would be greater than the level of losses at the core centre. Likewise, if the benefits from employment created in the periphery is greater than the cost of jobs losses in the core, then the employment gains are also additional. According to Laird & Mackie (2018), it is likely that if movement in economic activity was to occur it would be from core to periphery, rather than from periphery to periphery, as costs and capacity constraints are more likely to be present in a core centre than peripheral region. Movement between peripheral regions, where conditions are similar, would likely to be a zero-sum gain.

As PSOs supported by the government in the UK are on routes to London, and any PSO that is imposed for economic reasons are likely to be to a core region, the movement of activity enabled by PSOs will likely be from core to periphery. The paper also makes the point that there is a long lag between the time when any improvements to a transport system occur and when economic benefits begin to accrue. They estimate that the growth in a trading relationship to be between two and five years, while long term structural changes would take up to fifteen years. Laid & Mackie (2018) also make the point that a PSO is the mechanism that would be most effective in satisfying the needs of business users, because it can provide the connectivity certainty they require.

3.6.5 Brexit and the future use of PSOs in the UK

The 'EU (Withdrawal) Act 2018' passed by the UK parliament transfers all EU law into UK law as retained EU law (UK Gov., 2018b). This includes EU aviation regulations, the specific technicalities of which are addressed in a separate statutory instrument, 'The Operation of Air Services (Amendments etc.) (EU Exit) Regulation 2018 No. 1392' (UK Gov., 2018c). Other than making the minor technical adjustments necessary to ensure the regulations continue to function correctly when transferred into UK law, such as changing references to 'community air carriers' to 'UK air carriers' or the details of how PSOs are to be communicated, there are no changes to the definition or functioning of PSOs.

3.7 EU versus member states debate about the administration of PSOs

There are a wide range of different perspectives and priorities across EU MS, which has given rise to a debate in the academic literature about whether the PSO mechanism is one that should be administered and funded centrally by the EC or at MS level, and what the advantages and disadvantages of either would be. This debate is born out of an absence of guidelines within the regulations that specify a criterion for the designation, operation, and funding of PSO routes. As the regulation currently stands, any assessment of need is for the UK or the MS to make. The probability that each would have different interpretations of the PSO regulation was highlighted by Reynolds-Feighan (1995a) in the first published appraisal of the Third Package provision for PSOs, since when significant

heterogeneity has materialized in the way MSs are administering PSOs to the point, it is argued, that is counterproductive (Brathen & Eriksen, 2018).

3.7.1 EU administration

The concern, with having multiple interpretations, is that it will cause inconsistent impositions and create unevenness in the provision of PSO services across the EU (Reynolds-Feighans, 1999). Reynolds-Feighans (1999) contends that a system like the EAS in the US, which is centrally funded and administered by the Federal Government, would ensure that the process of imposing PSOs would be transparent and would adhere to one EU wide criterion. It would enable a better match between funds and needs, and the need for a PSO would not be determined according to MS's capacity to fund it (Reynolds-Feighan, 1995b), or vulnerable to budget cuts during economic downturns (Merkert & Williams, 2013).

Williams and Pagliari (2004) contend that so long as PSOs remain subject to the decisions of individual member states, each with differing political priorities or attitudes towards market intervention, a balanced and equitable access to mobility for all EU citizens in peripheral regions will not be possible. Their study found that by 2003 wide variations had already developed in the way MS were imposing PSOs and how they were administered. The UK tends to avoid market intervention and had made only limited use of PSOs. This was despite occasions of orchestrated lobbying of the Scottish and UK governments by Highland and Island regions. Whereas France has made widespread use of PSOs and on many routes with passenger numbers that could, arguably, sustain a commercial service (Williams & Pagliari, 2004).

The level of detail when specifying the service criteria tends to vary according to the market intervention instincts of a country. Certain MSs, such as France and Ireland, had very specific PSO criteria, specifying requirements from fares to timetabling. Service level criteria detail the number of hours passengers can spend at a destination in the same day, or that services should be scheduled to depart and return within specified time slots (Merkert & O'Fee, 2012; Williams & Pagliari, 2004). Other specified criteria have included flight frequencies, seating capacities, aircraft size, aircraft type, airport slot allocations and timetabling standards, whereas countries that avoided market interventions, including the UK, specified very loose if any criteria (UK Gov., 2013). Similar variety exists in the approaches to setting fares on PSO routes. While a majority of PSOs contracts set a maximum fare level, MS also fund fare discounts for certain passenger categories, subsidise discounts for residents, or require daily promotions on a percentage of available seat capacity. The governments of Portugal and Spain have provided discounts directly to the residents to apply against airfares, rather than subsidizing the airlines operations (Fageda *et al.*, 2016).

3.7.2 Member state administration

PSO in some countries are administered at a sub-national level and this can lead to variations in the administration of PSO between regions within the country. In France, Germany, and Italy the responsibility was delegated to regional authorities, while in the UK the responsibility is with either the English regional authorities, or the devolved governments. The administration of PSOs, at different levels of government within a state, might then also explain the differences in combinations of PSO conditions that exist within MSs (Brathen &

Halpern, 2012), meaning the quality and cost of the PSO service available to residents, of a peripheral region in Europe, may be dependent on both the MS and the region in which they live. However, despite the concerns Williams & Pagliari (2004) have about the problems caused by the variety of interpretation and application of PSO regulations across MS, they nevertheless note that the different conditions that exist across Europe makes the local administration of the PSO mechanism a necessity.

Merkert and O'Fee (2013) suggest that differences in geographical conditions, across the European continent, make the varied and imbalanced designation of PSO routes in Europe unavoidable. The challenges that would be faced in attempting to create one centrally administered system, able to effectively accommodate the complete range of geographical and social condition permutations across Europe, is illustrated in a study of US EASs (Grubestic & Wei, 2012). It highlights the difficulty making eligibility decisions when having to consider just the geographic conditions of the route to an airport. The length of time of a journey to an airport along high-quality roads and across flat terrain and in good weather would be much quicker than a journey of the same distance in a different region on poor quality roads, over mountainous terrain, and in poor weather conditions. An already difficult task is further complicated by the fact that local conditions do not remain static.

Lian (2010) describes how improvements to the Norwegian road network in the past decade have reduced the journey times to larger airports and how this has changed the preferences and behaviour of regional air passengers. Passengers now drive longer distances to larger airports to access cheaper fares

and more convenient flights. The improved road network has caused passengers to bypass the smaller regional airports providing a PSO service to connect to the same larger airports now accessible by road. These changes in behaviour have become so significant that Mathisen & Solvoll (2012) argue that the catchment area of larger airports should be increased and the number of regional airports on the PSO network reduced. Concentrating passengers would improve the commerciality of the PSO routes and thus reduce the level of PSO subsidy. A centrally administered PSO programme would, therefore, need the capacity to contend with limitless geographic conditions and be able to keep up to date with a constantly evolving geographical and social circumstances.

3.7.3 Differing member states economic & political priorities

Economic structures and political conditions also differ within MS and these too need to be understood, as they influence the nature of PSOs requirements. Halpern & Pagliari (2007) demonstrated the benefit of understanding local conditions. They undertook a review of how the market orientation of a local airport differed if it was independently operated or as part of a wider system of airports. They demonstrated that independent airports had a higher level of market orientation, attributed to key airport personnel and decision makers being locally based, able to make decisions quickly, and having a better understanding and focus on local priorities. This was primarily because they came under greater scrutiny from the local community. Understanding and responding to market conditions is essential as airline route and airport choices are increasingly influenced by market forces and not by public service (Halpern & Pagliari, 2007). Wittman *et al.* (2016) identified the importance of PSO services to regional

airports, as a high proportion of those that had a PSO service were reliant on it for over 90% of the airport's direct connectivity. This typifies the symbiotic relationship that exists between the PSO services to peripheral regions and the regional airports, while also illustrating how the residents, of a peripheral region, and the airport, that serves it, have been equally impacted by the commercialization of routes post liberalization.

Airports must respond to this challenge and those with a higher degree of market orientation are better performers (Halpern & Pagliari, 2008). PSO passengers will become an increasingly important source of revenue to the airport, while there is also the expectation that airlines, and airports, should be more focused on maximizing demand for these routes and reducing the cost of operating them (RPS, 2017). Those with a greater focus on the needs of the market will be better able contend with these challenges. Papatheodorou & Koura (2012) highlight that PSO airlines themselves would benefit from a greater market orientation. They identified wide variations in the relationship between passenger's circumstances, travel needs and travel patterns. They argue that to drive demand on Greek PSO services, the airlines must better match their service with passenger needs. This can only be achieved with a more detailed understanding of their market and the unique characteristics of the different consumer segments.

Devising a PSO service to accommodate the needs of the local community, whether social or economic, while satisfying the necessity for cost constraints and incorporating political and economic demands, is a complicated task and requires a pragmatic approach to decision making (Brathen & Eriksen, 2018). Merkert &

O'Fee (2016) suggest, that it is the pressure of scrutiny from the local community that forces local authorities to work with service providers to innovate and develop a service best matched to local needs and circumstances.

The literature has shown no conclusion to the debate about whether the balanced and equitable provision of PSO services is best achieved through a central EU or local MS administered programme. Arguably, as far as the peripheral communities themselves are concerned, it is a matter of which of these is best placed to understand their specific mobility needs or priorities and is in the best position to design a service, that will most sustainably satisfy them. It does seem, that the EC is better equipped to perform a role of monitoring the imposition of PSOs and for protecting the free market against anti-competitive interventions by MSs, than it is for understanding the nuanced and highly localized circumstances of every peripheral location across Europe. However, it does introduce the risk of inequitable access to air transport connectivity and the benefits derived from it. Arguably it is the MS, regional governments and communities that are best placed to understand, evaluate, and ultimately determine the need and justify the financial support for a PSO service, whether for social or economic reasons.

3.8 The justifications for PSO routes

A sophisticated transport network is essential in facilitating economic development and achieving convergence, and MSs have invested large sums in building transport infrastructure. However, air transport most effectively reduces the disadvantage of distance as it is the fastest transport mode (Graham, 1998).

Peripheral communities rely on regional aviation to connect them with cities or other important centres, but also with the social and economic opportunities created by globalization. In addition to being the fastest transport mode to connect distant regions (ACI, 2016), an air service is often the only way to connect isolated regions or islands to economic centres, and very often these services are only available because of PSOs (Wittman *et al.*, 2016). As detailed above the significant majority of European PSO routes require publicly funded subsidies and this raises the question of whether these can be justified.

Wittman *et al.* (2016) studied the value for money that the EAS and PSO programmes represented in achieving connectivity and in doing so also highlighted the scale of funding necessary to maintain these programmes. Using data available for 2010 they calculated that the U.S committed \$156million, while 11 European countries committed \$747million to these programmes. Together the EAS and PSO routes accounted for 2.5% of the overall total movements and on average each movement benefited from an \$1,800 subsidy. However, what Wittman *et al.* (2016) demonstrated, was that to consider the value of connectivity simply on a per movement or per seat perspective, would mean that insufficient value is attributed to the range of needs a PSO service satisfies and the different priorities between countries. These they describe as being on a continuum ranging from lifeline-focused to connectivity-focused PSOs. They proposed a 'connectivity-per-dollar metric' (Wittman *et al.*, 2016 p.122) should be used to compare the value for money of competing tender bids. Brathen & Halpern (2012) argue that the funding necessary to subsidise PSO services to peripheral regions can be offset by the economic benefits gained by that region because of it.

3.8.1 An economic argument for PSOs

In creating connectivity, a PSO service provides a peripheral region with access to the national and international markets that more densely populated regions with secure routes have. Air transport connectivity enables peripheral regions to benefit from the productivity improvements associated with greater connectivity and provides access to global markets, including trade, tourism, investment, and labour (Cooper & Smith, 2005). Access to markets enables growth and more convenient access to markets and encourages faster growth (Rasker *et al.*, 2009). Ozacan (2014b) demonstrated the close relationship between connectivity and economic growth for communities benefiting from EAS subsidies in the USA. The per capita growth over a ten-year period was compared between communities that retained EAS funding and those that lost funding for eligibility reasons. Communities that retained EAS funding grew GDP by 28.5% between 1999 and 2011, compared to 17.5% for those regions that did not. They also calculate that a 1% increase in passenger numbers on EAS route generated 0.12% per capita growth, suggesting that even a marginal increase in passenger numbers can create significant economic gains.

In addition to attracting FDI and tourism visitors, high quality connectivity can make a remote region attractive to high value individuals and high-quality employers. An advantage a remote region has, over congested urban regions, is the attractive environment and high-quality recreation that it offers, particularly to professional and knowledge workers. However, these amenities are not sufficient by themselves, as such firms and workers still require the high-quality access to markets that only air transport can provide (Rasker *et al.*, 2009). Air transport

connectivity is important in retaining people, at a peripheral location, as it overcomes some of the social issues associated with remoteness. Consistent with this, residents in the region of Molde airport in Norway ranked the quality of nature and recreation, in the region, as the most important factor influencing their quality of life, followed by the connectivity provided by the local airport (Batevik *et al.*, 2002).

A separate study of Norwegian connectivity found, that the residents of a remote region in the West of the country, which offered limited connectivity options, relied on, and valued more highly air transport services from the local airport than those residents at regional centres, who had better overall levels of transport connectivity. While the populations of both regions took, on average, a higher number of trips by air annually than the national average, those in the remote region took markedly more domestic and markedly fewer international trips. As per Rasker *et al.* (2009) and Batevik *et al.* (2002) access to a local airport was an important factor in residents choosing to remain or relocate to the area (Brathen & Halpern, 2011). These studies illustrate the ways in which connectivity is of practical importance to peripheral regions and why authorities would be inclined to support them where the market fails. Yet these subsidies might also be undermining one of the forces responsible for improving passenger outcomes, namely market competition.

3.8.2 The ‘two-way’ road problem

Improving transport connectivity is regarded widely to be an important factor in facilitating economic growth within a region, and particularly to its regeneration. However, the relationship between improving transport access and

economic development is complicated and context specific (Laird and Mackie, 2018). One such complication is the 'two-way road problem', where one region, situated along an improved route, benefits at the cost of another (SACTRA, 1999).

Although economic growth, in peripheral regions, can be constrained by the lack of high-quality transport connectivity, there is also a risk that if connectivity were to be improved the trade barrier of costly access to the local market is removed. To the same degree that a peripheral region gains access to external markets, it also becomes exposed to competition from more productive and competitive external rivals (Eddington, 2006). Improved connectivity can also cause de-agglomeration to occur because a moderate reduction in transport costs makes it more profitable for a firm to amalgamate production into one site, which site will likely be located where it has access to the largest local market and has the additional benefit of now having viable access to its peripheral market. However, if the connectivity improvements reduce the cost of transport sufficiently, to make the cost of market access less significant, relative to other costs, then the firm can now locate to wherever is most profitable. Industries, to which proximity benefits are significant to their productivity gains, are likely to remain located in an agglomeration, irrespective of connectivity improvements. Whereas those sectors that are less dependent on proximity for profitability have the option to relocate to peripheral regions with lower costs or fewer capacity constraints (Venables *et al.*, 2014).

There are also negative social impacts that can be attributed directly to improvements in transport connectivity. They can cause the loss of community services within peripheral regions as local authorities use reduced travel times to

concentrate services into fewer locations. They can also result in increased home ownership costs, as it becomes viable for professionals to commute from the region into core economic and employment centres, or by making the region more attractive to second homeowners (SACTRA, 1999). However, in 1997 the then 'Department of the Environment, Transport, and the Regions' noted that the economic circumstances, within peripheral regions, and, the already low levels of employment limited the extent to which they could suffer further if the region were exposed to greater competition (DETR, 1997).

3.9 Possible consumer impacts from PSO caused monopolies

The objective of liberalizing the European aviation market was to improve passenger outcomes by introducing competitive forces. However, a criticism of the PSO mechanism is, that it can worsen passenger outcomes because they prevent competition on a route. Inhibited competition occurs in two different ways. Firstly, the mechanisms of the tender process can deter competition for PSO contracts, and secondly, the regulation of competition, on PSO routes, removes the forces that create the passenger benefits. Reynolds-Feighan (1995) raised such concerns when comparing the EU's PSO regulation to the USA's EAS programme, which had been able to maintain competition, on EAS routes, by allowing for new or replacement airlines on a route. The effect of which was to regulate fares and minimize the need for federal subsidies. Reynolds-Feighan's concern was that by removing the possibility for competition on a route, the benefits that should be gained from liberalization would not be on PSO services (Reynolds-Feighan, 1996).

The imposition of a PSO on a route does create a monopoly, but it is not clear, from the literature, that this has negatively impacted passengers. As Merkert & O'Fee highlight, without the imposition of a PSO it is unlikely that such routes would otherwise be possible (Merkert & O'Fee, 2016). It is also not necessarily the case that the absence of another airline means a PSO operator does not face competition for passenger demand, as the air service could be substituted by different modes of transport (Calzada & Fageda, 2014). Research in Norway has identified that, even with its challenging terrain, improving road conditions is resulting in passengers replacing a PSO leg of a journey by driving to a better-connected hub airport (Lian & Ronnevik, 2011; Mathisen & Solvoll, 2012). Similarly, in the Greek Aegean Island transfer market there are high levels of passenger commitment to ferries, despite a comparably good air service network. High-speed sea vessels mean ferry services are becoming faster and journey times shorter, which is ensuring they can continue to compete with air services (Rigas, 2009).

Faster rail services are also inducing a modal switch away from air (Bergantino *et al.*, 2015), despite the European HSR rail networks not yet having been fully integrated and many rail journeys requiring a combination of conventional and high-speed rail segments (Givoni & Dobruszkes, 2013). These examples suggest that passengers are willing to switch transport mode when there is a viable alternative, the extent of which could increase as technology and network improvements reduce the door-to-door journey times of previously slower alternative modes to air.

There is also evidence that when competition exists between airlines, on a route, the removal of a PSO service can result in an increase in fares. Francesco & Pagliari (2012) explored the likely outcomes of removing a Sardinian PSO service and highlighted the potential for negative outcomes for residents. Sardinia has a high level of seasonal tourism and an unregulated service on the route would mirror the tourism demand. The commercial imperative for the operator would be to maximize revenues during the peak season and then to reduce capacity in the shoulder periods. Doing so would not be prevented by any frequency specifications of a PSO and could mean reduced service frequency during off season periods, or the possible loss of a daily return service. Normal unregulated fare setting practices would mean cheaper fares were available for early bookers, while later bookers would experience steep increases. This would most likely benefit leisure travellers, able to book flights earlier, and would be at the cost of the residents who book flights as and when their need arises. Furthermore, there is already competition to the PSO operators from an LCC. A comparison of the fares available from both airlines show that the LCC only offers lower fares than the PSO during peak demand periods.

Lian (2010) demonstrated how PSOs have protected Norwegian passengers from bearing the cost, to airlines, of promotional fares on competitive routes. The practice, by network operators, is to increase prices on legs on which they do not face competition from LCCs, to compensate for losses on those legs where they do. However, the stipulations of the PSO ensure that fares remain the same for the entire period of a PSO, despite being provided by a monopoly network operator. What the study could not address was, how the PSO fares would differ if there was competition on the route and if it is inevitable that the

outcomes would be positive for consumers. Arguably this is a moot question because, as Merket & O'Fee noted above, a PSO implies there is insufficient demand to sustain a viable commercial route.

Lian (2010) and Francesco & Pagliari (2012) illustrate the potential for unintended consequences of a regulated PSO route. One of the important benefits of a PSO route is the connectivity it facilitates to hub airports and connections with a greater number of onward flights. Due to higher levels of competition at hub airports airlines based there adopt more sophisticated fare strategies, including promotional fares. Promotional fares, on a given airline, are available to all connecting passengers on it, except when the connecting flight is a PSO service on the same airline. Lian & Ronnevik (2011) highlighted that when the PSO and onward legs are booked together, the promotional fare is not made available. Meaning the benefit of a PSO fare is off-set by promotional fare restrictions and the overall ticket price becomes more expensive than it would otherwise be. While it is possible to split the ticket and benefit from the promotional fares, this is inconvenient and inflexible, which is particularly discouraging for time sensitive business travellers (Lian & Ronnevik, 2011).

3.10 Preventing market distortion by PSOs

Authorities have attempted to avoid their direct involvement in the markets by providing subsidies directly to the residents they are attempting to support, as Scottish, Portuguese and Spanish governments have done on 'PSO' type routes. The Spanish government funded a 75% discount on airfares for travel within Spain to all EU citizens living on the Balearic or Canary Islands and Ceuta or Melilla (Government of Spain, 2018). However, studies have shown that an effort such

as this to maintain market competition is in fact distorting—*“If the objective of the policy is the protection of peripheral resident passengers without damaging the interest of non-resident passengers, this is an undesirable equilibrium”* (Valido *et al.*, 2014, p.397)— because the response of airlines operating routes, where resident’s benefit from a discount scheme is to increase fares by a similar value. Hence the consequence is an increase in fares for non-residents travellers to the regions as they do not benefit from the discounts to off-set the fare increase.

Further studies of the Spanish market were conducted by Calzada & Fagedas (2012) and Fageda & Flores-Fillol (2012) describe how discounts, provided to residents, increased demand for the available services. However, because of capacity constraints, within the Spanish airport system, airlines were unable to respond by increasing capacity to match demand, constrained supply, relative to demand, has enabled airlines to increase fares by an amount similar to the discount. Whilst these fare increases are off-set for outbound residents by the government funded fare discount, they are not for inbound passengers. Consequently, the beneficiaries are airlines that have gained through increased demand, revenues, and scale economies. The island residents are not negatively impacted directly by increased fares, but they are indirectly because of the barriers to tourism and trade that inflated fares have created. Restricting competition on a route, whether it is done for protectionist reasons, will ultimately have a detrimental effect on the development of the region which that route serves (Halpern & Niskala, 2008).

3.11 Barriers to entering PSO contract tenders

It is in the interest of local authorities to maximize competition between airlines during a PSO tender process (Markert & O’Fee, 2013). The absence of

competitor bids strengthens the negotiating position of the airline and weakens that of the local authority, resulting in higher levels of public funds being used to subsidise the service (Williams & Pagliari, 2004) as it grants too dominant a position to the airlines that do participate. The lack of competition can be attributed to barriers to entry that potential operators face (Williams & Pagliari, 2004).

There have been several studies to examine different types of issues, with the tender process, that create barriers to airlines participating in a PSO contract tender. Merkert & O'Fee (2013b) surveyed airline managers about issues that prevented them bidding for PSO contracts. Barriers began with the way in which tender opportunities are communicated, using the EU MOVE portal. Managers were not confident this was kept sufficiently up to date and believed that it was not an effective substitute for being notified directly. An ineffective communication system created delays to what was already regarded as too tight a period to complete a tender process. This prevented airlines from conducting robust route surveys, restricted the time available to plan for the supply of an aircraft type most suited to the economics of the route, or was insufficient time to adequately prepare for operations should a bid be successful.

A reluctance on the part of authorities to provide essential route data further complicates these challenges. Airline managers believe this type of information should already be in the public domain. All of which caused the managers to believe that the tender process favoured an incumbent airline. The size of an airline and the resources it has available were also found to influence if an airline would bid for a contract. Airlines, of the size that would tender for PSO contracts on small volume routes, are likely to be smaller organizations and are unlikely to

have large reserves of personnel that can be dedicated to preparing tender bids. The cost sunk bidding for a contract, operating new routes or opening new bases, and of the risks associated with TUPE responsibilities discourage airlines from bidding for PSO contracts (Williams & Pagliari, 2004).

Merkert & O'Fee (2016) found that despite a perception, amongst airlines, that tenders were written by authorities with a winner in mind trust was not identified as an issue preventing airlines from bidding. A high level of trust between airlines and purchasing authorities was identified by Merkert & Hensher (2013) when they examined the relative levels of trust between the purchasing authorities of transport services and bus or airline providers in Australia. A benefit of high levels of trust is a reduction in resources needed to negotiate and maintain contracts. Merkert & Hensher suggest that the levels of trust may be due to the average length of air service contracts being half that of bus contracts meaning emerging issues are regularly renegotiated in new contracts. Whereas longer contracts mean the response to issues that emerge during the life of the contract, such as reforecasting sales due to a changing economic environment, takes longer. Though contracts, with the greater flexibility to accommodate changes to costs, that are beyond the control of an airline would make PSO routes more attractive financially (Merkert & O'Fee, 2013b).

The need for budget certainty for the duration of a contract, however, is a common priority for purchasing authorities and the primary reason for only offering contracts with costs fixed for duration of the PSO. The lack of flexibility creates a problem for airlines, as costs become increasingly volatile, they are difficult to accurately forecast and consequently, airlines make conservative cost provisions

in their tender responses to avoid becoming financially exposed during the contract term. The result being subsidy levels potentially higher than they would have been if contracts contained a provision to respond to fluctuations in operating cost (Merkert & Hensher, 2013).

PSO contracts were particularly specific in areas concerned with setting minimum service requirements, such as: on-time performance, compliance, safety, payments, and performance reporting. The issue where contracts are least specific, or often do not even include a provision, is that of demand generation. As Merkert & O'Fee (2013) identified, this reflects the greater priority authorities attach to price and performance certainty. However, highly specified contracts remove the scope airlines need to be enterprising with route development (Merkert & Williams, 2013). Airline managers believed that incentives to grow demand could have a positive effect on services and levels of demand.

As airlines are aware that authorities prioritise contract costs, they are disinclined to include a sufficient marketing budget in a tender proposal in the belief that the higher cost would disadvantage their bid. Only 4.5% of the PSO routes, operated by airlines which the managers represented, benefited from any collaborative marketing activity. This was not just because the contract did not include an expectation of it, but because the airlines were dis-incentivized to take it upon themselves to promote the route. Any revenue benefits airlines gained, through promotional activity and expenditure aimed at increasing demand, could be lost through an equivalent reduction in the subsidy they received. Which is why Merkert & O'Fee (2013) argue that if purchasing authorities fail to take ownership

for the success of the route then the airlines are also unlikely to do so and, therefore, the route is likely to remain a publicly subsidized service.

3.12 Cost inflating PSO contract criteria

The level of subsidy required for each PSO is determined by a range of conditions, not all of which can be directly influenced by the purchasing authority. For instance, the choice of aircraft type on a given route could be limited by an airport's facilities or dictated by the length of the route, though it may not necessary be the most cost-effective aircraft for the level of demand. However, several of the conditions are caused by the purchasing authorities' expectations of the service, such as frequency, capacity, airfares, fare restrictions, and timetabling. Pita *et al.* (2014) suggest that the criteria an authority sets for a PSO service may have the unintended consequence of causing operational inefficiencies, which will either increase passenger fares or the level of public subsidy. The more these restrict an airline's ability to create operational efficiencies, the greater the subsidy requirement will be, a further consequence of highly prescriptive criteria that limit the number of airlines able or willing to compete for a contract (Williams & Pagliari, 2004).

Services that purchasing authorities are increasingly requiring, and that are adding to a contract's complexity, are that PSO airlines match the unbundled fares common now in the aviation sector or have interline booking arrangements with an airline at a connecting airport. These facilities require a level of sophistication from an airlines IT and bookings systems that they may not possess, or are unable to invest in or arrange within the available timeframe. Airlines may also make the

calculation that investment is not worthwhile, particularly if required for a pre-tender and exposes them to a high level of risk with an uncertain return (Merkert & O'Fee, 2013b). According to Merkert & Williams (2013) and Santana (2009) the heterogeneity of the PSO conditions and contracts raises questions about the impact these could have on the technical efficiency and operational performance of airlines that operate PSO routes.

3.13 PSO operator performance

Santana (2009) studied the cost structures of 11 EU airlines operating PSO routes and six US airlines operating EAS services to understand whether participating in these programmes affected their operational efficiency. The study revealed that airlines on a PSO routes had a higher cost burden than those operating EAS routes. However, the study was unable to establish if this was caused by the requirements of the PSO mechanism or whether it was because the performance of EU airlines was less efficient than their US counterparts. This study, which has not been repeated since 2009, did not compare the economic performance of individual airlines within the programme, while the data used was from the period 1992 to 2002. Since when airlines and purchasing authorities will have gained more experience in contracting and operating PSO services.

A more recent study of the technical performance of PSO airlines was by Merkert & Williams (2013), as in their view purchasing authorities do need to understand those factors that impact airline performance if they are to maximize the value of PSO subsidy. They reviewed the technical efficiency of 18 airlines that operated PSO services between 2007 and 2009. Their assessment was that

the airlines were technically efficient operators, though they did make four observations. One, longer PSO routes were less efficient to operate than shorter routes, which is the opposite to the aviation norm of longer routes resulting in lower unit costs. Longer routes require larger aircraft as these have necessary range, meaning capacity is greater than demand for the route would warrant.

A high proportion of PSO routes are also seasonal and achieve low load factors during shoulder periods. Two, airlines with a larger number of PSO contracts are more efficient, suggesting there is some benefit from scale economies or the learning effect. Three, though airlines with a larger number of commercial routes than PSO routes were more efficient, it was not to a degree that suggested PSO subsidies negatively affected the efficiency performance of PSO operators. Finally, efficient operators were most efficient in the early stages of the contract and not, as had been expected, towards the end when they would benefit from the learning effect and would be preparing for a contract re-tender. This reflects the lack of incentive airlines have to outperform contract expectations.

3.14 PSO route demand development

The studies reviewed above encompass several PSO related issues. However, the researchers were primarily concerned with identifying improvements in the efficiency of different aspects of the PSO mechanism, to minimize the cost and maximize taxpayer value. Merket & Williams (2010 p.1) describe PSOs as “*sensible and necessary*” but reflect that they must still be “*efficiently organized*”. Pita *et al.* (2014) provide a definition of an efficiently

organized PSO. Namely, one that balances operating costs, service levels and, demand satisfaction with the level of public subsidy required. The definition does not include, however, the need to increase demand or reduce public support. An increase in demand for a PSO service could lead to a reduction in the need for public support over time.

The airlines have a key role in demand generation and this should be encouraged and not penalized, when they are successful, through subsidy reductions. If a local authority took a long-term view on route development, they would better appreciate the benefits of the increased economic activity they enable. A better strategy might be to allow airlines to benefit in the short-term and re-assess the subsidy contribution when the PSO is re-tendered, based on a new level of demand for, and benefit derived from the service. Yet as Merkert & O'Fee discovered (2013), purchasing authorities expected to maintain or increase spending on existing PSO routes and do not expect any of these routes to become commercially viable. This would suggest that governments, local and national, persist in regarding PSO funds as an ongoing cost to be incurred. This is typified by purchasing authorities prioritizing budgetary certainty, when contracting PSOs, and avoids the flexibility that enables innovation merely because it creates the possibility of budget uncertainty (Merkert & O'Fee, 2013b).

Merkert & O'Fee (2016) raise the point that, if purchasing authorities are unconcerned with developing demand for a PSO route, it is unsurprising that operators would not be either, particularly if there is no incentive for them to do so. In fact, many purchasing authorities reduce subsidy payment by an amount equivalent to value of the growth achieved, effectively penalizing them for being

successful (Markert & O'Fee, 2013b). At the same time purchasing authorities are reluctant to explore, for themselves, the additional commercial opportunities that could reduce the subsidy level, such as cargo transport, which is a basic component of the aviation market (Markert & O'Fee, 2013). Yet publicly supported regional airports are increasingly commercially focused because they recognize the competing demands for the public funds that subsidise their operations (Malina *et al.*, 2012). Koo *et al.* (2016) advises airport operators of the need to focus not just on performance management but also on developing the capability to respond to the threats and opportunities that an unstable sector creates. Arguably the same advice would benefit purchasing authorities, many of whom fund both airports and PSO services, that must manage the effects of changes in the whole aviation sector as well as responding to changes in the wider economy.

It seems that cargo transportation is overlooked as a means to increase the productivity of a PSO flight and, therefore, to reduce the level of public subsidy necessary. The 2008 EU regulation do indicate that a scheduled air service can include services that can transport cargo (European Commission, 2008), and the 2017 EU interpretive guidelines specify that even a scheduled service solely for transport cargo is permissible under the regulations (European Commission, 2017). According to York Aviation (York Aviation, 2015), the importance to the UK economy of cargo air transportation is undervalued. 40% of all UK imports and exports by value, just 1% by volume, are transported by air (York Aviation, 2015; Steer, 2018).

Heathrow is the UK's largest cargo port (Cebr, 2020), with 60% of the UK's cargo passing through it as belly-hold cargo (Steer, 2018). However, despite the

importance of air transportation to economic activity across the EU or in the UK, very little evidence that consideration is given to the opportunity that PSO's present for cargo transportation or regional development. All of the information gathered by the EU about the imposition of PSOs is concerned with passenger traffic—seats provided, aircraft capacity, load factor, passenger fares—while none is concerned with cargo transportation. (European Commission Mobility and Transport, 2020). Neither does cargo feature in the UK Government's guidance on PSO routes (UK Gov., 2013), the DfT's Aviation 2050 (UK Gov., 2018d), or PSO tender notices (Europa Ted, 2019a; 2019b).

3.15 Summary

In discharging a responsibility to the residents, of peripheral regions, to ensure that they do not become socially or economically isolated, UK national and regional governments are increasingly using the PSO mechanism to maintain air transport services on thin and commercially unviable routes. Peripheral regions are reliant on high quality connectivity to reduce the time and financial burden of distance from core locations and air transport most effectively provides connectivity of the necessary quality. The benefits to the economy of a peripheral region from air transport connectivity—further to the direct, indirect, and induced benefits—are access to national and international trade and tourism markets, clients, and skills; inward investment; and productivity improvements. Therefore, the imposition of a PSO is a means, albeit a compensatory and redistributive one, by which governments can compensate airlines to ensure air transport services are maintained on an economically unviable routes and that does not distort the single market or contravene EU state aid regulations. Doing so ensures that,

while the residents in peripheral regions may not benefit as fully from the positive outcomes of market liberalization as those in core regions do, they do ensure they are not negatively impacted by it.

There is no evidence in the literature to indicate that the imposition of a PSO or the technical performance of airlines operating PSO services has a negative effect on passenger outcomes. In contrast to this there is evidence to suggest that the highly specified and inflexible nature of PSO contracting, intended to increase service quality and provide budgeting certainty, can have a negative effect on passenger and budgetary outcomes, because they increase the level of risk that PSO airlines are exposed to, restrict participation in PSO tenders and inflate costs. Furthermore, in proportionally reducing subsidies when airlines have outperformed revenue expectation, airlines are disincentivized from actively growing demand for the route. All of which suggests, and the literature review confirms, that once a route has a PSO imposed upon it the need for public subsidy will be indefinite.

The concepts and theories in chapters two and three, on regional economic development and the role of public service obligation in enhancing peripheral region's connectivity, have been used to construct a conceptual framework. The conceptual framework, which will be used to guide the primary research required, is described in the next chapter.

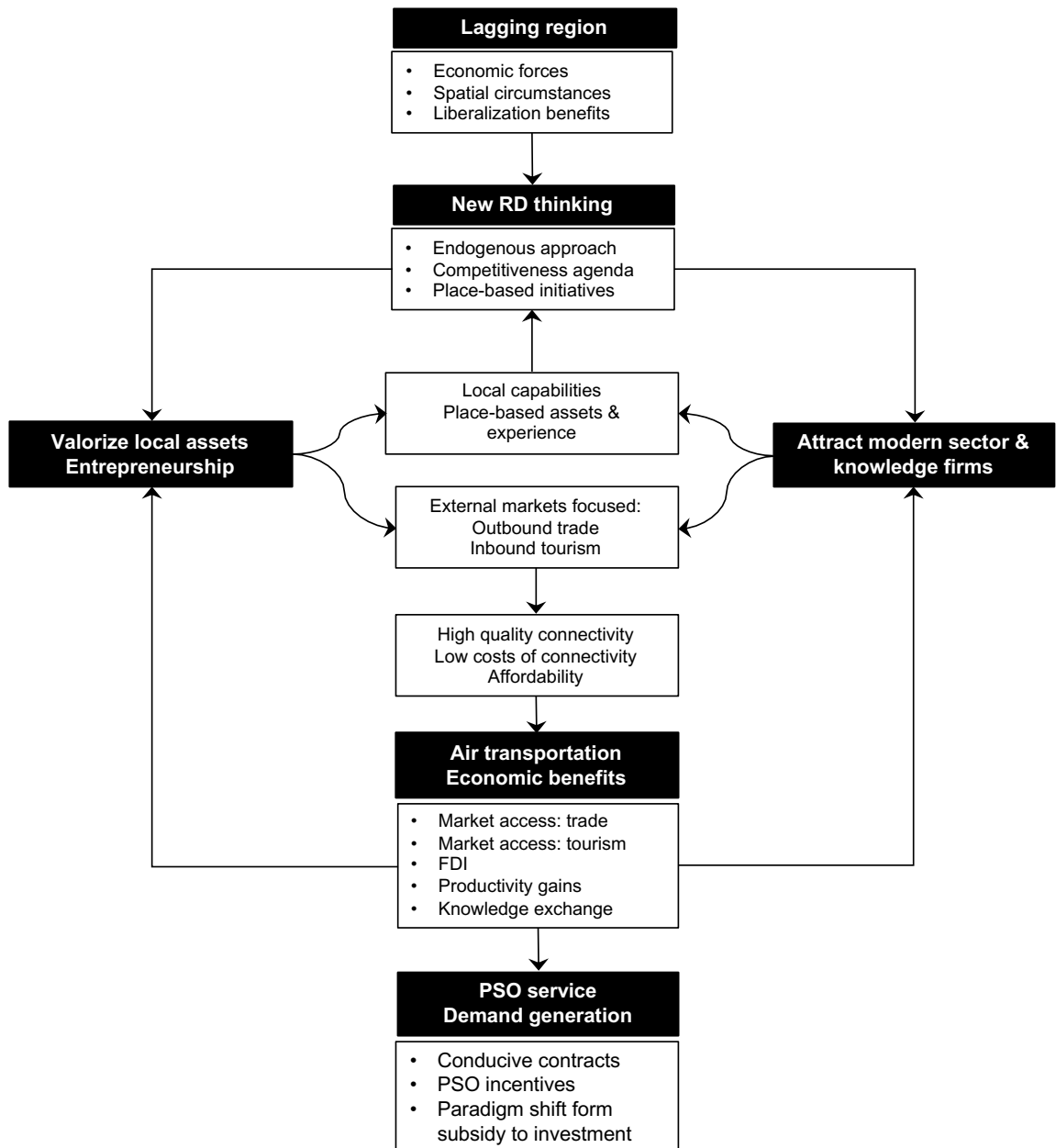
PART THREE: METHODOLOGY

Chapter Four: Methodology

4.0 Introduction

The review of the literature on regional development in Chapter Two, and the role of air transport connectivity in Chapter Three, has shown that a wide range of institutions, organizations, externalities, and circumstances influence whether and how a PSO is to be imposed on a route. It has also helped to identify the key theoretical constructs that are important to this study. In particular, the contemporary endogenous approach to regional development and the crucial role that air transport and PSOs have in ensuring access to external markets and inputs necessary to achieve economic growth. The literature has also shown that these actors and factors are all bound together in a complicated network of relationships, each of which can be impacted by the actions of others within this network. These key theoretical constructs and the complexity of the relationships between them have been brought together and represented in a textual and diagrammatic conceptual framework (Figure 5).

Figure 4.1. Conceptual framework diagram



The approach taken in examining these constructs is presented in this chapter, which first sets out the philosophical stance that underpins the research design. It then outlines the reasons for taking a multiple-case study approach and an explanation of the mixed methods that have been used, and why they follow a three-stage sequential exploratory order. The conceptual framework (Figure 5) underpinned the design and structure of each of the three stages of the primary research and was used as a tool to guide data collection and analysis. It ensured

that the study remained focused and that the data collected was relevant to the research objectives and aim. Finally, the approach taken to managing the ethical considerations of the research is explained.

4.1 Research philosophy

According to Alfred Schultz (1954) the primary responsibility of a social science researcher is to “*obtain organized knowledge about social reality*” (Schultz, 1954, p.261). He describes social reality as the totality of the everyday personal, and therefore subjective, experiences an individual has of their encounters with natural objects or social society occurring in an intersubjective world (Sarantakos, 2013). To do so satisfactorily and effectively the researcher must first address their ontological and epistemological stance, as these will underpin the approach taken to their research programme (Saunders *et al.*, 2016).

The ontological stance taken in this research is that of subjectivism as it holds that a person’s encounters with the world are not of a given reality. Instead, people continually and subconsciously create their own reality, based on their own interpretations of these encounters, which are influenced by their own worldview and life experiences prior to an encounter. While the prevailing conditions at a given peripheral region, like the location relative to a major city or the provision of transport connectivity, will be the same for all within it, the way in which different individuals interpret the same conditions will be influenced by their own circumstances, attitudes, and motivations. The epistemological stance taken in this study is one of Interpretivism because interpretivists believe that the way in which people behave within the realities, they have created for themselves,

depends on how they make sense of their own situation or interpret their environment (Schoonenboom & Johnson , 2013). The priorities and behaviours of individuals in peripheral regions will be the consequence of the reality they have constructed for themselves, through their interaction with the world as it is to them. An understanding of this can only be achieved through a careful description and interpretation of these interactions (Neuman, 2014).

A subjective ontology and an interpretivist epistemology imply that qualitative methods should be used, as these allow realities to be captured and contextualized through written descriptions (Neuman, 2014). However, if the outcomes of the study are to make a practicable contribution, the validity and values of the conditions that are identified must also be tested and measured, and this requires the use of quantitative methods also (Creswel & Plano, 2017; Creswell *et al.*, 2010). Meaning a methodology that borrows a mix of methods from both qualitative and quantitative approaches will be adopted (Schoonenboom & Johnson, 2017).

4.2 Research strategy: multiple-case study

A multiple case study of regions benefiting from a PSO service is the approach that is taken in this study. A case study enables an understanding, to be gained, of complex situations, as it will facilitate a thorough exploration of the drivers of economic performance, the priorities of local actors, and the role of transport connectivity at that region and in the context of its set of circumstances. These circumstances include the regions: geographic location, endowment of natural and human assets, social and economic history, sectoral mix, capacity

and capability of local institutions, legacy of previous development approaches, and its preparedness to support entrepreneurship and modern technology and knowledge-intensive businesses. The case study is an exploratory one because of the need to explore and gain an understanding of the implications and impacts of these circumstances within the region. It would be insufficient to limit the study to describing these and inappropriate to explain what is not sufficiently well understood, which excludes descriptive and explanatory types of case study (Yin, 2017). Furthermore, as the mix and, therefore, the influence of these circumstances will be different within the different regions, benefiting from a PSO service, a number of case studies were undertaken.

There are a number of other features of the case study approach that made it appropriate for this research: one, the study was concerned with the 'what' and 'why' of decisions of authorities that influence the economic environment of the region and make decisions about transport provision, and the needs and behaviours of the firms that create prosperity and opportunity; two, it was interested in understanding normal behaviours of these groups as closely as possible and it would not benefit from amending these in any way; three, the contextual conditions of the regions are important to the study; and four, the boundaries of the study were unclear at the outset (Yin, 2012).

4.2.1 Case-study regions

The purpose of conducting multiple case studies is to explore the similarities or differences that might exist between them and to compare these with expected outcomes (Yin, 2017). Therefore, careful consideration was given to the choice of

case studies to ensure meaningful comparison. A case-study region was defined as the catchment area of an airport that is served by a PSO route operating between it and London, and for which the imposition was justified as being necessary for economic purposes. London is important as it is the UK agglomeration into which economic activity is most rapidly concentrated and it has the greatest level of domestic and international aviation connectivity. The regions that satisfy these criteria are those served by Cornwall Airport Newquay, City of Derry Airport, and Dundee Airport. Other possible case study regions were considered and rejected. It had been the intention to include the region served by Carlisle Lake District Airport as a case study region, as the imposition of a PSO on the route between it and London Southend Airport had recently been announced. The route would have shared the same characteristics as the CSPRs studied. It was a route that would serve London, it was to be imposed for economic development purposes, and it had the agreement and the funding support of the UK government. However, the launch date for the service was deferred a number of times, until it was eventually postponed indefinitely.

The PSO between Cardiff Airport and Anglesey Airport was also considered, as this would have meant the study would have included all three of the devolved nations. However, though the PSO was supported by the Welsh Government, it did not have funding support from the UK government, and the route did not serve London. Other possible case study regions included the PSO routes, funded by the Scottish government, that served the Highlands and Islands of Scotland. These were rejected because of the very short distances and low seat capacities on the routes, and because they had been justified as a social need. Studying the potential for a PSO route between Cornwall Newquay Airport

and St Mary's Airport on the Isles of Scilly was also considered, as the matter had been raised, by Lord Berkeley, in the House of Lords (UK Parliament, 2012). However, as this was not an operating route, and the government had made it clear that there was little prospect that it would support such a PSO, this route potential was also rejected. Although these routes were not included in the thesis, studying the performance of, or potential for, PSOs on them could still benefit from the findings of this thesis, or the research approach taken could be used as a template for case studies of these, and other similar, routes. The PSOs were restricted to those within the UK for both the practicable reasons of language and accessibility, as well as to ensure that each region is subject to the same policy, economic, and market conditions.

4.3 Research design: mixed methods

A mixed method approach allowed this study to combine qualitative methods, necessary to discover the conditions that positively influence the contribution of a PSO service, with quantitative methods, to test their validity and value (Schoonenboom & Johnson, 2017). In effect this study was guided by its exploratory and confirmatory research needs more so than qualitative or quantitative philosophies (Onwuegbuzie, 2003). A sequential exploratory order was followed because the positive conditions that were to be quantitatively tested needed first be discovered through qualitative investigation (Creswell & Plano, 2017). The qualitative stages used a phenomenological approach as phenomenology is expressly concerned with "*the way in which things or experiences show themselves*" (Sanders, 1982 p.354) and enables the

experiences of the research participant to be explored within their normal environment (Schoonenboom & Johnson, 2017).

An advantageous feature of the case study approach is that it allowed for a range of data sources to be studied, meaning different facets of the regions could be explored (Patton, 2002). The study took advantage of this benefit and was divided into three stages, in the sequential exploratory order described above: stage one was documentary research, stage two consisted of interviews with key PSO stakeholders, and stage three was a fully structured questionnaire-based survey with the whole interviewee participant cohort.

4.4 Data collection techniques and analysis

4.4.1 Stage one

Documentary research

It was likely that a large volume of contextual data already existed in documents produced by a variety of institutions and organizations. The purpose of the documentary research was to identify and analyse data, pertaining to the region's economic development and transport connectivity to economic centres or markets, contained within documents produced by local and national governments, business organizations and associations, and aviation service providers. The sources of data consulted included national and local administrative records, sources of national economic and aviation statistics, PSO tender and contract documents, trade data and tourism satellite accounts,

strategic development plans, business registers, business association publications, and online materials.

Documentary research was used to gain an understanding of the context in which behaviours and choices occurred in each of the case study regions. It was used to identify the key stakeholders, their world views or priorities and the nature of the relationships between them, as well as significant sectors, assets, policies, and development strategies. Then the performance of local sectors and development strategies were assessed, as was the utilization of the PSO service and how it had been justified and operationalized. The data gathered allowed for the development of a rich picture for each of the case studies, based on Checkland's (1997) Soft Systems Methodology (SSM).

Data analysis

A soft systems approach was taken to analysing the data gathered through the documentary research. As, has been discussed above, regional economic development and the role of air transport within it, is a dynamic process that is the product of the interactions of many elements (ESDP, 1999). An understanding of the role and contribution of these different elements could only be gained by viewing them through the lens of systems theory, which recognizes reality as an integrated and interacting whole (Checkland, 1997) and if it is to be adequately understood it needs to be viewed and surveyed in its entirety, and not reduced to its individual elements (Von Bertalanffy, 1968). Parallels can be made between the spatial characteristics, organization and interactions of actors and resources in a peripheral region with a system. They each exist within a hierarchical framework, in which sub-systems exist within a boundary, set within the context

of an environment and it is either open, and able to make the exchanges that enable it to prosper, or it is closed, resulting in the demise of the system (Boulding, 1956).

Hard systems thinking, such as that described by Boulding, makes a positivist assumption that set systems exist in the world and that when problems occur these are well defined, and an ideal solution can be found through technical systems. However, this is a rigid approach and, in pursuing unambiguous solutions, it does not take account of the complex problems that exist in the human world. The need existed for an approach that allowed managers to deal with problematic situation, which in the real world are complex and ill defined, with a systematic approach and this gave rise to the soft systems methodology.

Soft systems methodology

Adopting the soft systems approach accommodated the need to discover the complex and varied issues that existed within the case study regions. The system-ness of SSM is that complex real-world problems are tackled through a systematic approach to learning and organizing. It is an action-orientated approach to improving problematic situations. SSM has two main characteristics. Firstly, real-world complexity is a product of the fact that problematic situations are never static, and that different people perceive the same situation differently because of their different world views, which also may not be fixed over time. Secondly, within a problematic situation, there are people who will be working 'purposefully' towards improving it (Checkland & Poulter, 2020).

The first stage of the SSM approach is to learn about the nature and extent of the problematic situation. Which includes uncovering: cultural characteristic, power and political dynamics, and individual world views (Checkland & Poulter, 2020). This is achieved and represented by creating an informal “rich picture” graphic, as this requires holistic thinking– as opposed to taking a narrow reductionist view– and can be used to understand and illustrate the multiple interacting relationships within the case studies (Checkland, 2000). A rich picture should also include a representation of the key structures, processes, and issues or concerns that are present. As a rich picture is not a record, only sufficient information should be included to capture and illustrate the problematic situation. A supplementary narrative could be used to provide the further detail or explanation required (Monk & Howard, 1998).

Rich picture analysis

The use of SSM rich pictures was very useful, as they could capture and elucidate the complex nature and structure of relationships between many different elements and how these are conditioned by local circumstances and different world views. It was also helpful in filtering out unnecessary and distracting information. The starting point was to capture, on a blank page, the full range of the world views, groups, organisations, circumstances, reports, strategies, and infrastructure that had an impact or influence on regional economic development and transport planning at each of the case studies. Then the structure and nature of the relationships connecting these elements were drawn.

The process was iterative and each finished picture allowed the refinement of the clustering, arrangement and structure of the elements and the relationships

to be further examined, understood, and reorganised to best represent the nature of the dynamics involved. As the name suggests the findings are presented in a 'picture' in which drawings are used to represent the different elements and relationships and reflect the characteristics of these. The final picture is accompanied by a narrative that provides an explanation for the context of the picture and further detail for some of the elements.

4.4.2 Stage two

Stakeholder interviews

It was essential to this study to gather the perspectives and insights of the stakeholders, with direct or indirect influence on economic or transport connectivity policy, to understand from them: the types of economic challenges or opportunities that exist within the region, which of these are created by location, and to what degree and how do these influence their needs and decisions. Equally valuable was their views on the role that transport connectivity plays in overcoming these challenges and the contribution that the PSO service makes to this.

Semi-structured interviews

Interviews were used to explore these issues with stakeholder participants. Semi-structured interviews were chosen because these provided the scope to explore the new or interesting points that emerged during the interviews, whilst providing a structure that ensured the focus remained on the key points to being investigated. A fully structured interview would have prevented interesting points, that emerged, from being explored further and could have inhibited the

interviewee from introducing insights and perspectives they believed to be valuable. The structure for the interview was provided by a clearly defined interview guide, containing a list of questions and the types of subjects that might emerge through the interviews that could be explored further (Table 2) (Altinay *et al.*, 2015).

Careful consideration was given to the preparation of the interview guides, which were directed by the conceptual framework that has been presented in chapter four. The questions on the interview guide were designed to allow for a full exploration of the issues at the centre of the conceptual framework, and to gain a deeper understanding of these. Namely, one, what influence do the local conditions and capabilities have on the region's capacity to achieve endogenous growth, and two, how fully is the PSO service able to support place-based strategies (Table 2).

Table 4.1. Interview guide progression

| Conceptual framework | Purpose of the question | Interview guide questions |
|--|---|--|
| Organisational capacity to achieve endogenous growth | How and to what extent do local stakeholders believe a region's ability to deliver endogenous growth is affected by location, transport connectivity and business conditions. | What are the reasons for remaining located/ relocating in [region] or have you had reason to consider relocating |
| | | What challenges or issues does your business face from being located in [region]? |
| | | What is the geographical market for your [product/service]? |

| | | |
|---|--|---|
| | | Do you have ambitions further afield than [region]? |
| | The measures that need to be taken to remove barriers to market access and productivity improvements. | Does [region] have an effective strategy and adequate resources to assist your business overcome these challenges [described] or to achieve your ambitions? |
| | | What challenges does your business face that are created by the local business environment? |
| | | What further support does your business need from the local authorities to achieve greater levels of growth? |
| PSO capability to support endogenous growth | How a deficit in the required PSO service quality effects: a) transport mode choices b) business performance and ambitions | Is air transport connectivity to London important to your business and for what reasons? |
| | | How fully does the PSO service from [region] to London overcome the challenges described or satisfy the needs of your business? |
| | | How would your business strategy be different had the air transport PSO service to London not been introduced? |
| | Changes necessary to the PSO provision to positively influence the use of air transport. | How would your business be impacted if the current air transport PSO service to London was discontinued? |

| | | |
|--|--|---|
| | Changes necessary in attitude towards PSOs to positively influence the marketization of the route. | How should the Council and the business community respond if the PSO subsidy was not renewed and the air transport service to London was put at risk? |
| | | What changes to PSO service would need to occur to have a positive transformative effect on your business? |

The interviews themselves were designed to take no longer than one hour, as any longer might have discouraged participation, whilst providing sufficient time to complete the interview guide and explore the topics that emerged during them. This proved to be sufficient time to complete the interviews and in a manner that was relaxed and allowed for the full and willing participation of the interviewees. With the permission of the participants, the interviews were voice recorded for transcription using NVivo software.

Interview sampling strategy

Three different groups of stakeholders were identified who had a role, influence, or interest in local economic development, and transport policies or strategies. These are: one, local government administrators with economic development or transport responsibilities; two, senior employees of air service providers; and three, local business owners, senior employees, or industry association representatives. A judgmental sampling technique was used to select interview participants, for each of the stakeholder groups, who would have the quality of insights and perspectives required by this study (Sarantakos, 2013). In

addition, the business stakeholder interviewees were purposively selected from firms that are essential to an endogenous approach to growth. The interviewees were either entrepreneurs or business leaders with firms that were either started in or have substantially relocated to the region. The firms were from technology or knowledge-based sectors or innovative product or service developers, that were currently trading in or had plans to expand into external markets.

To gain a broad range of responses the targeted number of interviews was five per stakeholder group, per case study region. In total thirty-five interviews were completed across the three case study regions. The purposive sampling technique employed, and the practical approach taken to eliciting participation, as well as the pragmatic need to make progress, meant that the final sample was determined by those cases that were motivated to participate in the research. Consequently, the actual complexion of the sample varied per case study region according to the background of the interviewees who participated. Consequently, the final sample was underrepresented in participants from the business sector that have a narrower or inward focus, and in tourism and aviation cases specifically. It also meant that cases were located entirely within the case study regions and did not include representatives from businesses or investors who had considered, or might have reason to in the future, locate or invest in the regions.

Securing the participation of suitably qualified interviewees was an extremely difficult and frustrating process as they were, because of the busy nature of their roles and their seniority, individuals who had many competing demands on their time. Nevertheless, persistence paid off and those who did eventually participate were interested and engaged in the process, answered

questions openly and willingly, and had very valuable insights and perspectives as users or administrators of the PSO service.

To ensure anonymity for the participants of the interviews, their names have been replaced by a code. The code identifies which stakeholder group the participant belongs to, the region they were from, and an individual number. The stakeholder group is denoted by an initialism (LA for local authorities, SP for service provider, and BC for business community), the region by the letter (X, Y, or Z) and the individual by a number. For example, BC-Y-3 is third interviewee, is from region Y, and is business community stakeholder group (See appendix 1).

Interview data analysis

A Framework analysis approach (Ritchie & Spencer, 2002) was used to analyse data collected during the stakeholder interviews. The objective was to identify a framework of the positive conditions that need to exist within a region to maximize the contribution of the PSO, according to the research participants. Framework analysis is a set of techniques that were developed and refined by the 'Social Research Institute in the UK'. It consists of five sequential and interconnected steps: *familiarization*— the researcher familiarizes themselves with the range and diversity of the data and compiles lists of key ideas and recurring points; *identification*— of the key issues, concepts or themes which are then used to create a thematic framework; *indexing*— involves the systematic coding of the data while in textual form; *charting*— of the data into a matrix according to the conceptual framework, which is presented in chapter four (Figure 6); and *mapping*— through which key characteristics were identified, and themes grouped as associations between these became apparent, which allowed for the interpretation the data set as a whole. This process required the researcher to

search for the underlying structures and relationships within the data, rather than to simply seek a “*multiplicity of reoccurring data*” (Ritchie & Spencer, 2002). With permission the interviews were digitally recorded, and Nvivo qualitative data analysis tool was used to assist with this task (See appendix 2). The NVivo software was particularly useful for transcribing the interviews and for identifying and highlighting all of the important bits of data held within them. It was particularly helpful for arranging and organising the data into the thematic groups and ensuring this was done with structure and discipline. The process of charting and mapping the data was mainly completed using pen and paper, and whiteboards because of the need for many different iterations. It is likely that this too could be more efficiently completed using the NVivo software, with more practice using it and after gaining greater familiarity with its full range of functionality.

The process of indexing, charting, and mapping the data collected during the interviews enabled the key themes and important issues contained within the interview data, that related in some way to the conceptual framework, to be identified. Reviewing and analysing the interview responses in this way allowed for the important themes within it to be identified and, to see how these related to each other and to the conceptual framework. In the conceptual framework, developed from the review of the literature and the interview guide developed using this, the key constructs, relating to regional development and air transport connectivity and PSOs, were treated distinctly. That there is a relationship between these two areas was understood, but by approaching the analysis in this way allowed for how they intersected to be seen. The outcomes of this are presented and discussed in the following chapters. As an example, however, a peripheral location can create challenges in business development as clients

have a negative preconception about a firm's capabilities. Reasons for this ranged from clients doubting it was possible for highly capable firms to be located in peripheral regions, to concerns that they may be unable to provide the necessary ongoing support in a timely way. The role of connectivity and the PSO intersected with this in a practical way as the PSO service was used by businesses to demonstrate to prospective clients that the region is well connected and they, the client, would not be disadvantaged by choosing to work with them. This is an economic benefit derived even without actually travelling on the PSO.

In broad terms, the underlying characteristics of the themes were either concerned with wider environmental themes relating to the local conditions and policy decisions, or with the approach to administration and operation of the current PSOs in the UK.

4.4.3 Stage three

Questionnaire

On completing research stages one and two a range of issues relating to the PSO and what conditions were needed for it to make a greater contribution to the economic growth of a region had been identified. These could be categorized as either policy-related or technical. Technical in that they are attributes of the PSO services that are a product of policy decisions and form part of the service that passengers encounter, and they became the basis of the third stage of the field study. The objective of stage three was to test the validity and value of these attributes, by using a fully structured questionnaire-based survey on a wider sample of the population. This was a combination of those individuals who had

participated in the interviews and those who were interested, in participating in one but had been unable.

The survey intended to enable the evaluation of which attributes the stakeholders agreed are important, and to what degree, and whether this is matched by the performance of the service. Therefore, the questionnaire surveyed the participants about the same list of attributes, from these two different perspectives. The first asked them to assess how important the attributes were to them. The second was to ask them to assess how satisfied they were with them (Appendix). These were measured using a 5-point Likert scale that ranged, for importance, from extremely important to unimportant, and for performance, from extremely satisfactory to unsatisfactory (DeVaus, 2002).

The second aspect assessed was an attempt to categorise the attributes according to the relationship between the importance attached and the assessment of performance. This was done through analysis of the responses using Martila and James's (1977) Importance Performance Gap analysis method. Which is explained in greater detail below. An important benefit of a fully structured questionnaire survey is that respondents are better able to express their views when they can respond to statements that reflect these (Payne & Payne, 2004). Therefore, careful consideration was being given to the way in which the conditions were presented when designing the questionnaire.

The survey consisted of 22 questions, which are set out below. These were tested through a pilot sample of six people and only two minor changes were necessary. One was to not refer to 'attributes' which, though it is a common term

in the literature, was confusing the participants. Instead, they were referred to as features. The second was to only refer to 'PSO' and not 'air transport PSO', as it was easier to read. Participants were familiar with the meaning of PSO because it was explained in the original correspondence inviting their participation. The statements are intended to test the relationship between a dependant variable, which is the level of demand for a PSO service, and a set of independent variables, which are those conditions, identified through the qualitative research, that exert an influence on the level of demand for the service.

Survey questions

On a scale of 1 to 5 (with 5 being extremely important & 1 being unimportant) please answer the following question: How **important** are the following features of a PSO service?

1. It departs from the airport to which it takes the shortest time to travel.
2. It arrives at an airport that is most convenient for London.
3. It arrives at an airport that is most convenient for catching onward flights, to other UK or international airports.
4. The frequency of flights can fulfil most air travel needs.
5. The flight departure and return times make it simple to minimise the time spent on a trip.
6. The cost of fares does not restrict air travel to only the most critical trips.
7. We are made aware of ticket deals and fare promotions.
8. Suitable flights will be available for trips planned at short notice.
9. The service makes traveling to this region as convenient as it would be to any other region, whose businesses we compete with.

10. It will reassure clients, investors, or partners, that our location does not negatively affect our capabilities.
11. It will provide confidence in the long-term future of air services to and from this region.

On a scale of 1 to 5 (with 5 being extremely satisfactory 1 being unsatisfactory) please answer the following question: How well does the current PSO service **satisfy** the following requirements?

12. The PSO departs from the airport which takes the shortest time to travel to.
13. The PSO service arrives at an airport that is most convenient for London.
14. The PSO service arrives at an airport that is most convenient for catching onward flights, to other UK or international airports.
15. The frequency of the PSO flights can fulfil most air travel needs.
16. The PSO flight departure and return times make it simple to minimise the time spent on a trip.
17. The cost of PSO fares does not restrict air travel to only the most critical trips.
18. We are made aware of PSO ticket deals and fare promotions.
19. Suitable PSO flights will be available for trips planned at short notice.
20. The PSO service makes traveling to this region as convenient as it would be to any other region, whose businesses we are in competition with.
21. The PSO service will reassure clients, investors, or partners, that our location does not negatively affect our capabilities.
22. The PSO service will provide confidence in the long-term future of air services to and from this region.

Stage three sampling strategy

The objective of stage three was to assess the importance and performance of each of the attributes, that have been identified by the stakeholders that participated in the interviews, and the strength of agreement that exists across different groups. The research population for stage three comprises the same stakeholder groups identified for the stage two interviews and, those who had been willing to participate in an interview but had been unable because of scheduling reasons. As with stage two the sample purposively selected those individuals that agreed to participate in the research interviews. This provided the possibility for sixty participants and though this is not a statistically representative sample of the population, the sample characteristics will be typical of it. This sampling strategy should allow an indicative understanding to be achieved of the importance to different groups of the conditions within the framework.

The survey sample consisted of those cases that had participated in the stage two interviews and those who had agreed to but were prevented by pressures of time. As contact had already been made in stage two, the media to which they had responded and subsequently corresponded, which was either LinkedIn or email, was used to distribute a link to the survey, to be completed online at [Jisc.ac.uk](https://jisc.ac.uk). As was the case for stage two in securing participation in interviews, it was difficult to encourage the sample to complete the survey. Initially, the period for completing the survey was November and December 2019 (Table 3). However, only thirteen surveys were completed during this time, and the number did not increase despite three rounds of reminders throughout and December and a first extension into January 2020.

The approach used to distribute the survey was used to avoid antagonising the participants, who were all senior and busy individuals. However, because of the insufficient number of completed surveys, it was necessary to re-evaluate this approach, and the decision was made to contact them by phone. The period for completing the survey was also increased till the End of March 2020. The changes had a positive impact, as it proved to be more convenient for the participants themselves, as they answered the phone when it was convenient for them to do so. Many asked for the link to be resent and they would complete it then, while they were waiting to board a flight or were travelling, or they were pleased for the distraction or asked to be called back at a time when they knew they would be able to complete it. This resulted in an increase from 13 to 36 completed surveys (See appendix 3).

The purpose of the questionnaire was to assess the extent to which the participants was in agreement about the importance of the service attributes. The size of the sample population, who had agreed to participate, was 60. The number of 36 participants provides a reasonably high level of confidence in the significance of the responses as, to achieve a 5% margin of error, or confidence interval, required a sample size of 44 (Durberry, 2017).

Table 4.2. The sequence of Brexit and Heathrow events during the primary research

| Date | Research | Brexit | Heathrow |
|-------------|------------------------|---------------|----------------------------------|
| 2/2018 | Interviews commence | | |
| 6/2018 | | | NPS passes vote in parliament |
| 2/2019 | Interviews end | | |

| | | | |
|---------|-----------------------------|--|---|
| 3/2019 | | Original EU withdrawal date | |
| 3/2019 | | 1 st extension to Article 50 agreed | |
| 4/2019 | | 2 nd extension to Article 50 agreed | |
| 5/2019 | | | Divisional court rejects legal challenge to the NPS |
| 6/2019 | Boris Johnson elected as PM | | |
| 9/2019 | Survey piloted | | |
| 10/2019 | | 3 rd extension to Article 50 agreed | |
| 11/2019 | Survey commences | | |
| 1/2020 | Survey extended | | |
| 1/2020 | | Brexit transition period commences | |
| 2/2020 | | | Court of Appeal upholds legal challenge to NPS |
| 2/2020 | | | Government not to appeal court decision |
| 3/2020 | Survey ends | | |

| | | | |
|---------|--|---|--|
| 12/2020 | | Transition period ends. UK leaves EU single market, customs union, and EU laws cease to apply | |
| 12/2020 | | | Court of Appeal NPS ruling overturned by Supreme Court |

The environment during the primary research period

The significant environmental factors present during the period of the primary research were Brexit and the proposed third runway at Heathrow Airport. During this period it remained unclear what the final arrangements for Brexit would be and what the implications would be for businesses that traded in the EU, or regions that benefited from EU funding. However, this uncertainty remained constant throughout the research, as the final Brexit arrangements were not known until the very last days of the transition period, which came after the primary research had been concluded (Table 3). During the research period, the government at the time was supporter of Heathrow's expansion. The Parliament had subsequently voted in favour of it, and a legal challenge to the government's Airports National Policy Statement (NPS) was rejected by the Divisional Court. The ruling by the Court of Appeal that the NPS was not legal did not occur until the primary research had concluded. Meaning that the data

collected during the primary research would not have been affected by significant changes in either of these environmental conditions.

Questionnaire data analysis

The data collected through the surveys was analysed in two steps once it had been sorted and organised. The first stage was a descriptive statistical analysis of the data was to summarize it, to make it easier to visualize and see the patterns within it. Of particular interest was the level of importance the participants attached to the attributes surveyed, how the performance of these was assessed and, what level of agreement there was amongst all participants, and within the stakeholder groups. To this end the mean average, ranges and frequency of responses were calculated. The second stage was to use importance-performance gap analysis to attempt to categorise responses according to the nature of the relationship between the level of Importance and the satisfaction with Performance. Importance-Performance Gap analysis (Martila & James, 1977) was used to perform this task. The IBM SPSS Statistics software package is the tool that will be used to conduct this analysis.

Importance-Performance gap analysis

Since the seminal paper by Martilla and James (1977), Importance-performance analysis (IPA) has been used by a range of industrial sectors to develop management strategies— including tourism, transport, education, banking, healthcare, and public administration (Chou *et al.*, 2011; Sever, 2014) and in transport research (See Abenoza *et al.*, 2017; Lierop *et al.*, 2017; Thompson & Schofield, 2007; Ha *et al.*, 2019). IPA is a tool that enables issues with service provision to be categorised, by locating measurements of importance

and performance of service on a two-dimensional graph. There are three stages involved in IPA analysis. First, the specific attributes to be assessed need to be identified and specified. This is typically done by adopting attributes that have been used in similar studies already published, or by identifying a specific set, relevant to a particular study, through qualitative methods. As described above, the attributes assessed in this study were identified through the stakeholder interviews. The second stage is to survey a cohort about the importance they attach to this set of attributes and how satisfied they are with its performance. This was done by way of the Likert survey already described. The third stage is the calculation of the importance and performance scores, for each attribute, which is then used to plot it on the IPA graph.

Importance-Performance analysis chart

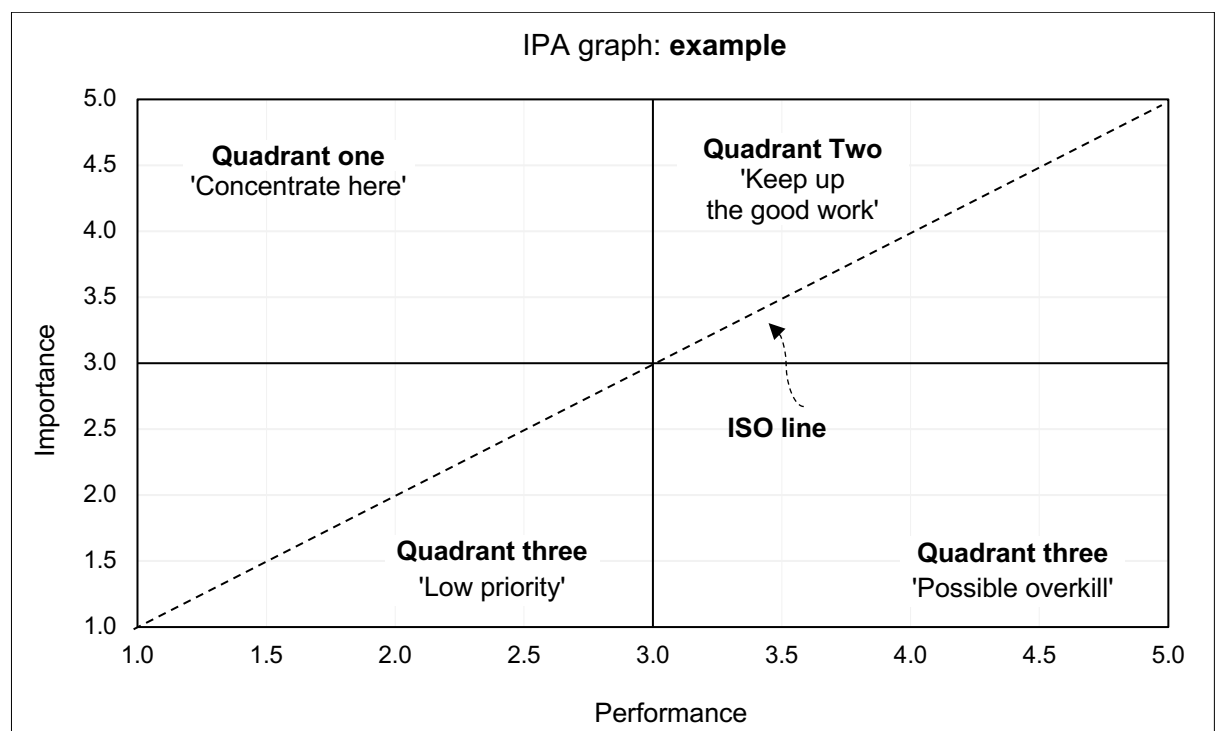
The IPA graph is formed by a two-dimensional graph that is divided into four quadrants by placing crosshairs onto it. The horizontal x-axis is used to plot Performance. The vertical y-axis is used to plot importance. The vertical crosshair represents the cut-off point between high and low performance. The horizontal crosshair represents the cut-off between high and low importance. The approach taken to the placement of the crosshairs on the chart, and whether they should be scale or data-centred, is a matter of debate in the literature (Oh, 2001). Scale-centred crosshairs use the mean of the survey scale used, while data-centred crosshairs use the mean values of the survey responses (see Azzopardi & Nash, 2013). Martilla and James (1977) emphasis that the decision about the placement of the crosshairs is a matter of judgment by the researcher, as the intention of the analysis is to assess the relative measurement of the importance and performance scores.

A concern raised with the data-centred approach is the tendency towards high importance-high performance as it is argued importance is, in fact, a product of performance, and the misinterpretation of attributes relatively close to each other (Oh, 2001). The risk of miscalculation is that they could lead to the resource being incorrectly diverted from one attribute to another. A commonly used adaptation to the original model is a 45-degree line, known as the ISO line, to represent the point at which importance is greater than performance. Attributes that fall below this line would be considered as sustainable and attributes above it would require improvement (Bacon, 2003; Boley *et al.*, 2017). However, as noted McLeay *et al.* (2017), the benefit of this in making judgements about priorities is limited when there is a clear gap between importance and performance.

According to Martilla and James (1977), ultimately the purpose of IPA is to guide decisions makers in their judgments about the relative merits of different options available to them. Therefore, a scale-centred approach was taken to setting the crosshairs in this study, as the findings are intended as a guide that informs judgments and decisions. An ISO line has been used in the graphs to serve as an additional reference point. The points along the x and y-axis where the crosshairs were set as the mean average of the Likert scale, used in the survey, for importance and performance. The value for these was used to calibrate the crosshairs that formed quadrants on the chart. An average for all responses to each of the eleven attributes was also calculated and these provided the location for the attribute to be plotted onto the chart (Figure 6).

The values for importance and performance are the coordinates that plot the attributes location on the grid. The attribute is then classified by the quadrant in which it has been positioned. Quadrant One, 'keep up the good work', represents attributes that are assessed as of high importance and that have also a high level of satisfaction with performance. Attributes located in quadrant 2, 'possible overkill', are of less importance but have a high level of satisfaction with performance. Quadrant three attributes, 'low priority', are attributes assessed as having a low level of satisfaction with performance and are of low importance. Quadrant four, 'concentrate here', indicates the attributes that are of high importance but are assessed to have a low level of satisfaction with performance.

Figure 4.2. The composition of an Importance Performance Analysis graph



4.5 Ethics

The nature of the subject of study is a publicly occurring social phenomenon and studying it was unlikely to harm the well-being of participants

and, therefore, research method design was considered appropriate for the purpose (Saunders *et al.*, 2016). Though the researcher remained sensitive throughout to the possibility that unexpected harmful consequences might occur. The researcher was aware of the potential for the research to cover topics that participants might consider to be commercially or politically sensitive in nature. Therefore, a concerted effort was made to protect participants from anxiety or embarrassment at every stage.

This was achieved in three ways: one, the researcher reassured participants of the seriousness of the research and their participation in it, through diligent communication and professional conduct; two, the researcher reassured participants, that the sensitive nature of insights and experiences shared is recognized and fully understood; and three, would ensure anonymity and confidentiality, by following appropriate data storage security and access protocols and replacing names and identifying detail with reference codes (Sarantakos, 2013).

Participants were advised of the purpose of the research and why they had been selected for an interview, that their participation was entirely voluntary, that they could withdraw at any point and for any reason, and that the research was being conducted with the full awareness and consent of the Universities Ethics committee (Veal, 2011). For the avoidance of misunderstanding this, the security and anonymity arrangements and details of the university ethics committee and the supervisory team were shared with the participants before commencing the research and requesting that they provide their informed consent prior (Veal, 2011). The research strategy and the approach to be taken towards ethics was

submitted to the University of West London's ethics committee for approval which it received (See appendix 4).

PART FOUR: RESEARCH FINDINGS & DISCUSSION

Chapter Five: Research Findings

5.0 Introduction

In this chapter, data collected during the three stages of research are analysed and the findings presented. Stage one was documentary research, the purpose, of which, was to analyse material already published and investigated, firstly, the nature of the challenges facing the CSPRs and the policy approach that has been adopted to overcome these, and secondly, those factors with a bearing on the current PSO. Stage one identified that a primary economic concern for the LAs is a lack of high-quality employment opportunities, and therefore, the relatively low levels of income and quality of life for local populations. The analysis identified that LAs are taking an endogenous approach to regional development, based on externally traded technology and knowledge intensive sectors. It has also highlighted how the CSPRs' peripherality is compounded by thin overland transport networks that are vulnerable to disruption, offer limited travel options, and in which the PSO service is the only air transport option to London. However, because of the approach taken to funding PSOs in the UK, there are regional variations in their cost to the populations of each CSPR and, in the quality of service from which each region benefits.

Stage two was stakeholder interviews to gain an understanding of how they believe they are impacted by their peripheral location, and hence, what value the PSO has for them. The first set of themes is concerned with broad environmental factors relating to local conditions and policy issues. That is, the reputational risk

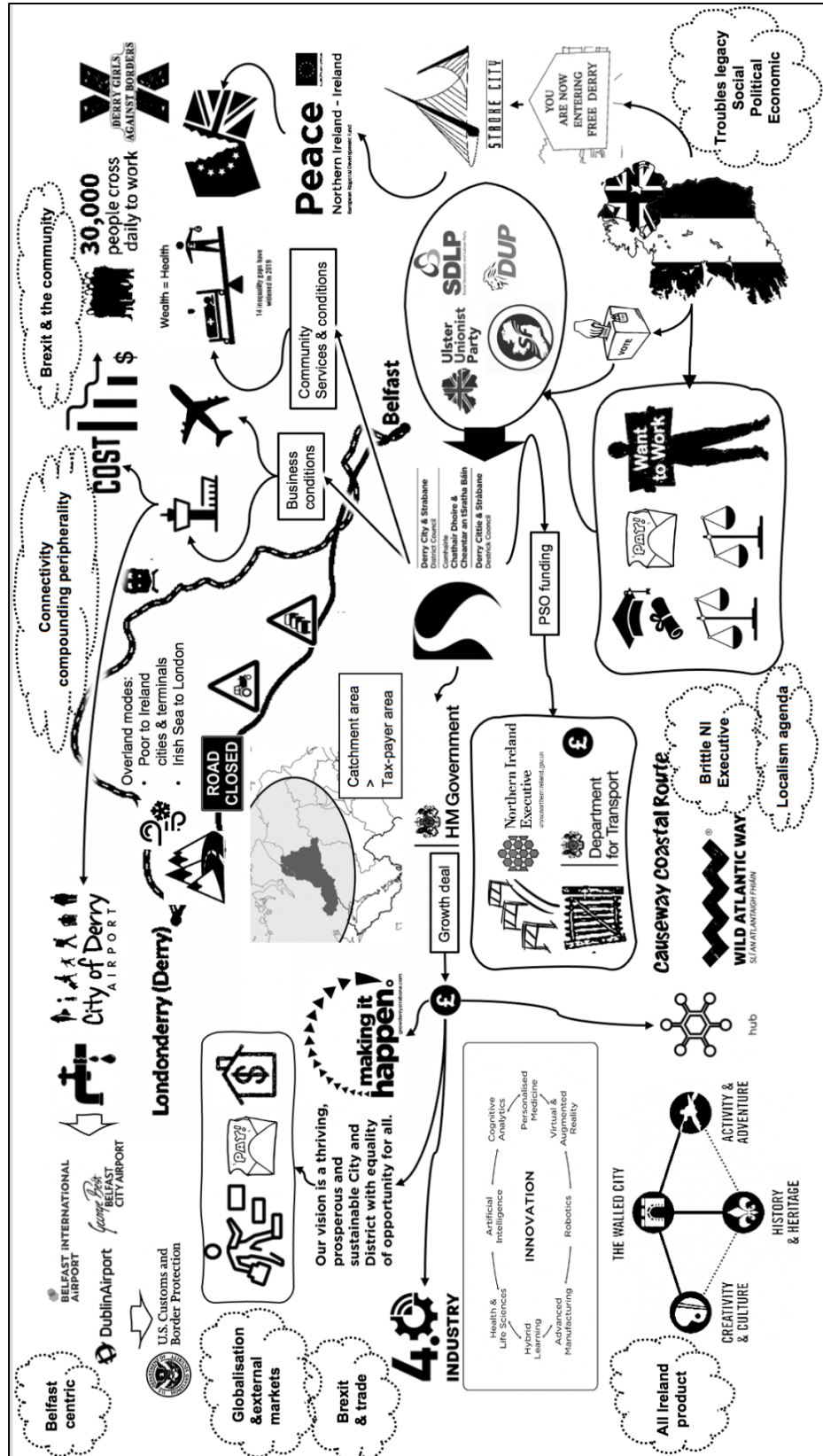
caused by peripheral location and mitigated by the PSO, a business environment with which the main concern is recruitment, and a policy approach that constrains the effectiveness of the service. A second set of themes is specifically concerned with technical issues and include the failure to promote the route effectively, failings with the quality of the PSO service, and causes of constraints for or leakages of demand for the service. The final theme concerns how business passenger demand is prioritised at the expense of tourism. The attributes, that emerged as being of importance to the participants, formed the basis of questionnaire surveys used in stage three.

Stage three was a Likert survey distributed to all interview participants, the purpose being, one, to assess the level of importance of the service attributes to the participants overall, and two, measure the degree to which the performance matched importance. The survey findings confirm, that the stakeholders do attach a high level of importance to these attributes and, that a wide gap exists between their assessment of importance and performance. The Importance-Performance analysis enabled the attributes to be organised into groups according to the priority with which they require the attention of policy and decision-makers, if the PSO is to fulfill more satisfactorily the passenger requirements. The chapter follows the same structure as that of the research and starts by first presenting the findings of the documentary research, which consists of a Rich Picture analysis, based on Soft Systems Methodology (Checkland, 1997) and an accompanying narrative of the key issues identified. After which the thematic findings of the stakeholder interviews are presented, and, finally, the outcomes from the Likert survey responses.

5.1 Stage one: documentary analysis

5.1.1 Derry~Londonderry rich picture

Figure 5.1. DSCD rich picture



5.1.2 Derry~Londonderry rich picture narrative

The city of Derry~Londonderry has been so called since it was granted a royal charter by King James I in 1613. A new settlement was built in 1603, during the 'plantation of Ulster' by the British, on a monastic site by the River Foyle. Derry is the anglicized name for 'Daire', which then became Derry~Londonderry because of the role of the City of London in organising commerce and administration, and which funded the city wall constructed to protect a loyalist British population from the surrounding rural Irish nationalists. There were sporadic nationalist attacks on the city and the annual loyalist parades, that commemorate the ending of the 1689 'Siege of Derry', continue to be a cause of tension between the two communities. The city's name is also contentious, because of sectarian connotations. In 1984 the nationalist Sinn Féin party changed the City's council name to Derry City, also reflecting the extent to which industrialization had changed the city's political complexion. However, an attempt in 2007 to rename the city itself failed and it remains formally Londonderry, though it has become commonplace to refer to it as Derry~Londonderry.

Derry~Londonderry is located on the Foyle river in the Northwest of Ireland at the western periphery of the United Kingdom (Figure 8). This location made it an important port for transatlantic passenger and cargo traffic, until 1939 when the passenger service ended. Until then the ports, ship building, and other maritime servicing industries had been a source of prosperity for Derry~Londonderry (Brennan & Walsh, 2008). Shirt-making then became a booming industry, following the city's early adoption of sewing machine technology and the adoption of the factory system of production. By the 1920s Derry~Londonderry had become the main UK producer of shirts and these were

exported throughout the British Empire. Until competition from cheaper Asian produces caused the industries demise in the 70s, together with the city's fortunes (Hume, 2002).

Figure 5.2. Derry~Londonderry's location within the UK



Source: ONS (2018)

Sectarianism has historically been a characteristic of politics in Northern Ireland and the politically weak nationalist population had been unable to influence NI government policies. Either because it lacked adequate policies on economic activity or it deliberately directed investment towards loyalist regions, the government in NI oversaw an economy in which nationalist areas, such as the North-West, stagnate, while loyalist areas prospered. Infrastructure projects in the mid-1960s, that should have dispersed economic activity beyond Belfast, remained in the predominantly loyalist North-East regions of NI regions. They were not, as many people had expected, located in Derry~Londonderry, which is NI's second city (McCann, 2011; US Congress, 1972). Conditions of discrimination and depravation in the nationalist regions created the tensions that

ultimately led to civil unrest and the sectarian troubles that blighted NI until the Belfast agreement in 1998. Since then much progress has been made in the peace process, but Derry~Londonderry has not recovered from de-industrialisation in the 70s and the socio-economic effects of subsequent underinvestment (Hancock, 1998).

Population characteristics

NI has a population of 1.885 million, making it the least populated country of the UK. 37% of whom live in the Belfast Metropolitan Area (BMA) consisting of Belfast and Outer Belfast (Table 4). Derry City and Strabane District councils (aka Derry~Londonderry) were merged into one council region in 2015 and, is part of the NUTs 3 region the 'North of Northern Ireland'. Derry~Londonderry is recognised as Northern Ireland's second city, though it and the region's other settlements are significantly less densely populated than those in BMA (Table 5).

Table 5.1. Comparison of settlement sizes in Belfast and the North of NI region

| North of Northern Ireland ¹ Derry City and Strabane District ² Causeway Coast and Glens | | | Belfast Metropolitan Area ³ Outer Belfast | | |
|--|------------------|-------------------------------|--|------------------|-------------------------------|
| Local authority district | Population 000's | Population density per sq. km | Local authority district | Population 000's | Population density per sq. km |
| Derry City ¹ | 110 | 290.4 | Belfast | 288 | 2,615.3 |
| Strabane ¹ | 40 | 47 | Carrickfergus ³ | 40 | 484.1 |
| Ballymoneys ² | 32 | 77.1 | Castlereagh ³ | 70 | 817.1 |
| Coleraine ² | 60 | 123.7 | Lisburn ³ | 128 | 287.2 |

| | | | | | |
|-----------------------|----|------|---------------------------|----|-------|
| Limavady ² | 35 | 59.2 | Newtownabbey ³ | 87 | 578.1 |
| Moyle ² | 17 | 35.1 | North Down ³ | 81 | 996.1 |

Source: NISRA (2019)

Table 2.2. Comparison of settlement sizes in NI and Derry~Londonderry

| Two largest settlements Derry city & Strabane district | | Largest settlements Northern Ireland | |
|--|---------|--|----------|
| Derry~Londonderry | 83, 163 | Belfast City | 280, 183 |
| Coleraine | 24, 634 | Derry~Londonderry | 83, 163 |
| Strabane | 13, 172 | Newtownabbey | 65, 646 |
| Limavady | 12, 032 | Craigavon | 64, 323 |
| Ballymoney | 10, 402 | Castlereagh | 55, 857 |
| Portstewart | 8, 003 | Lisburn City | 45, 370 |
| Portrush | 6, 454 | Ballymena | 29, 5512 |

Source: NISRA (2019) & ONS (2020)

Derry~Londonderry's population, which has grown 4.7% since 2001, is an aging population. Since 2001 the pre-working age (<15) and young working age (16-39) population has decreased by 4.8% and 5.4%, whereas the older working age (40 – 64) and retired (>65) have increased by 5.8% and 4.6%. It is projected that by 2026 the working age population will decrease by 4.5% and the retired population will increase by 24.8%.

Employment characteristics

The Derry~Londonderry region faces what the LA describes as the twin employment challenges of high economic inactivity and low employment rates. Economic inactivity in the region is 34.1%, compared to 27.2% in NI and 21.7%

in the UK. The unemployment level is 4.3%, compared with 2.6% for NI and 3.8% for the UK. The employment rate, of 61.6%, is also the lowest in NI, which is 70.0% overall and 77.7% in the highest region (Table 6). Business unit data illustrates how NI has a Belfast-centric economy and the volume of high-value businesses and high-quality employers are concentrated in the city. There are six times as many businesses employing more than 100 people in Belfast than in Derry~Londonderry.

There are twice as many businesses in Belfast generating turnover greater than £100k per annum than in Derry~Londonderry and, almost four times as many with turnover exceeding £1m. The non-financial services sector accounts for 38.4% of the NI economy and GVA has increased by 49% since 2018 (NISRA, 2020). However, knowledge-intensive employers in 'Information and Communication', 'Financial and Insurance services', 'Professional and Scientific', and 'Business administration and Support services' sectors account for just 14% of all businesses in Derry~Londonderry, compared to 34% Belfast. Two of the three largest employers in Derry~Londonderry are the public sector– 'Human Health and Social Care' and 'Education'– which employ 30.3% of the local population. The second largest local employer is 'Retail and Wholesale', of which 58% of jobs in this sector are part time. The ratio of part-time employment in Derry~Londonderry is 12% more than it is for NI (Table 6).

Table 5.3. Derry~Londonderry employment and educational attainment indicators

| | Derry~ Londonderry | NI | UK |
|-------------------------|-------------------------------|-----------|-----------|
| Unemployment rate | 4.7% | 2.5% | 3.9% |
| Economically inactive | 37% | 27% | 20% |
| Part time employment | 36% | 24% | 33% |
| NVQ4 and above | 22% | 26% | 37% |
| No formal qualification | 28% | 21% | 8% |

Source: NISRA (2020) & NOMIS: ONS (2019)

The quality of employment in the Derry~Londonderry is reflected in earnings. Weekly gross pay is £378, which is 22% less than Belfast, 42% less than NI, and 55% less than the UK. Likewise, GDHI is almost £1,000 less per person in Derry~Londonderry than Belfast, £2,000 less than NI, and £9,000 less than the UK (Table 7). The region has the second highest number of super output areas (SOAs) in NI within the top tenth of the most deprived in NI (Figure 9) (McFadden *et al.*, 2018).

Table 5.4. Derry~Londonderry earnings and income indicators

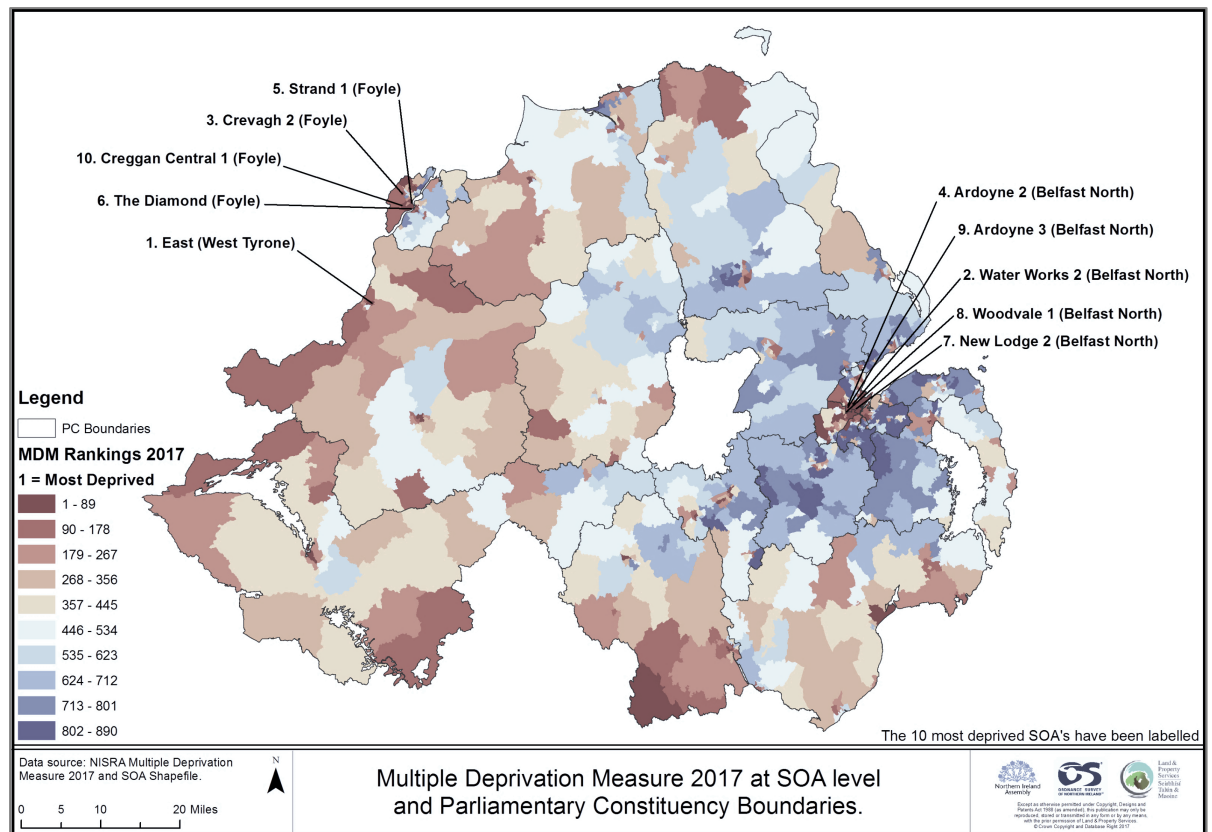
| | Derry~ Londonderry | Belfast | NI | UK |
|---------------------|-------------------------------|----------------|-----------|-----------|
| Weekly pay gross | £378 | £463 | £535 | £585 |
| GVA per head | £16,898 | £49,338 | £21,237 | £27,430 |
| GDHI per head | £14,666 | £15,590 | £16,556 | £23,374 |

Source: NISRA (2020) & NOMIS: ONS (2019)

A well-educated workforce is a prerequisite to shifting employment from secondary sector jobs towards a modern and knowledge intensive economy. One

legacy of the troubles is a particularly difficult set of educational and, therefore, employment challenges. Half the populations of many city wards are without any formal qualifications and labour mobility continues to be inhibited by sectarianism, which discourages people from working in areas of the city with which they do not identify (Oxford Economics, 2010). The NI executive and the local council is clear that pursuing an economy of equal opportunity, but of a divided community is economically and socially unsustainable (DRD, 2008).

Figure 5.3. NI constituency multiple deprivation rankings



Source: NISRA, multiple deprivation measures, (2017)

5.1.3 Regional development approach

The first Derry~Londonderry regeneration plan, published in 2010, highlighted how the city's economy lagged those of NI and the UK. It argued that the city needed to take the initiative upon itself to make a step-change to the

region's performance. As the community divisions, that existed, would only be overcome through sustained growth in the economy and improved prospects for employment and quality of life for everybody (Devenney & McNulty, 2010). This principal was later absorbed into a new 'Inclusive Strategic Growth Plan 2017 – 2032', following the merger of Derry City and Strabane District councils, that reaffirmed its place as the capital of the NW of NI and set the ambition for sustained prosperity for the whole community. It identified entrepreneurship, enterprise, and regional competitiveness, alongside education and skills, the arts and, culture as the drivers of 'economic wellbeing' (DCSD Strategic Growth Partnership, 2017). According to the plan, economic wellbeing is achieved when a community prospers because of a competitive and sustainable economy, the region is a cultural destination of choice, and it has a workforce that is highly skilled and well educated.

The strategy set out how economic wellbeing would be achieved by, one, creating a competitive advantage in key industrial clusters (Table 8), two, encouraging entrepreneurship through mentoring and start-up programmes, and three, leveraging global connections to encourage FDI in these key sectors and to build the necessary supporting facilities and infrastructure. 'Future Proof North West' is a network established in Derry~Londonderry to engage the Irish Diaspora, which is estimated to be 70 million worldwide and 36 million in the USA alone (DFA, 2017), to promote international investment into the North-West of Ireland.

Table 5.5. Derry~Londonderry development strategy, key industrial sectors

| Sectors | Supporting facilities |
|---------------------------------|----------------------------------|
| Life sciences & health sciences | Cognitive analytics research lab |

| | |
|------------------------|---|
| Digital industries | Clinical translation research innovation centre |
| Creative industries | Intelligent systems research centre |
| Advanced manufacturing | School of creative arts & technologies at Ulster University |
| Culture and tourism | Multi-media incubator |
| | Textile design incubator |
| | North-west centre for advanced manufacturing |

Source: DCSD council (2018)

In 2018, when the NI was without a functioning executive, the UK government invited Derry~Londonderry to present a city deal proposal. The proposal outlined an economic transformation achieved by exploiting the opportunities of the '4th Industrial Revolution' (DCSD, 2018). Government funding would be used to scale-up local research and innovation assets and, install the digital infrastructure and facilities necessary to attract firms and investment in the key sectors, that had already been identified in the development plan. A central feature of a proposed regeneration was a multi-purpose 'Central River Regeneration Project' which would provide 'landmark buildings' and a 'signature creative tourism experience' along the Foyle river, as well as being a business, civic, and commercial district in which private and public groups and organisations could mix and collaborate (DCSD, 2018).

To ensure opportunities for all, the council proposed a pathway to employment comprised of an apprenticeship and skills hub, a youth investment hub, a work force development fund; an employability programme for the long term unemployed and an intervention programme to prevent long term unemployment; and a skills academy that would align education to the needs of

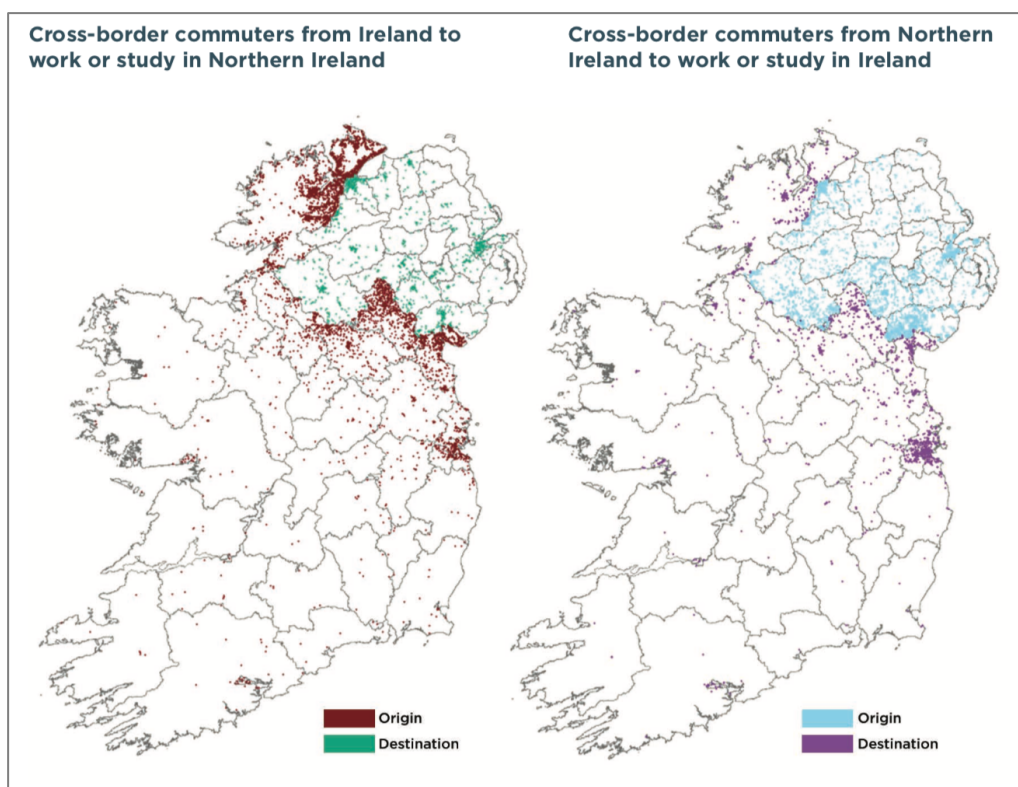
key sector employers, in consultation with a future skills advisory panel. All of which will be underpinned by a bid to become a UNESCO Learning city & region. In 2019 a funding commitment of £105 million was confirmed by the UK government, £50 million, of which, is a City Region Deal, to be directed towards economic regeneration projects, and to unlock additional partner funding opportunities, and £55million is for an Inclusive Future Fund, to fund projects aimed at overcoming long-term issues of deprivation, improving the employment prospects of young people, and improving the quality of the place (UK Gov., 2019).

Impacts of Brexit

Derry~Londonderry is the only city in the United Kingdom to border with the Republic of Ireland (ROI), and therefore, the EU. A Brexit study published by Ulster University (Magennis *et al.*, 2017) identified the largest direction of cross-border travel is from NI into ROI along the Belfast Dublin corridor. However, in the North-West region, it is the reverse, from the ROI into NI, because of a large proportion of the Derry~Londonderry population that live in the ROI (Figure 10). Seamless cross-border trade in goods and services after Brexit is crucial to the Derry~Londonderry economy, as 34% of local trade is with the ROI, compared to 25% for NI overall. However, the report also observed that this was in a context where, regardless of Brexit, too few local firms are exporters and that the region is overly reliant on the ROI for this limited export trade. If exports are to increase, local firms need to become more innovative in developing goods and services that can be successfully traded beyond the local market.

Derry~Londonderry borders the county of Donegal in the ROI. The councils of these two regions cooperate to promote economic growth through initiatives like 'Ireland Northwest: Gateway to Growth', according to which, the immediate priority for the north west of Ireland is that the free movement of people, goods, and services across the border must be able to continue. Any opportunities from Brexit will remain unclear until the details of what Brexit will ultimately entail are resolved (Kelpie & Neely, 2017).

Figure 5.4. Direction of cross-border commuting on the island of Ireland



Source: Magennis *et al.* (2017)

The NI Protocol

On the 24th December 2020 the UK and EU finalised a 'Trade and Cooperation Agreement' that came into provisional effect, as it has yet to receive the European Parliament's consent, on 1st January 1st 2021. Alongside this agreement sits a 'Northern Ireland protocol, the purpose of which is to avoid the

need for a 'hard' border on the Island of Ireland while protecting the integrity of the EU's single market. In addition to the protocol there was a renewed commitment to the Common Travel Area, allowing free movement between the UK, Ireland, the Channel Islands, and the Isle of Man.

As Northern Ireland remains part of the UK customs territory it will be included within future free trade agreements and tariff arrangements made by the UK government (UK Gov, 2020). Goods entering Northern Ireland, from the UK or other third countries, will be subject to the same arrangements unless they are at 'risk' of subsequently being moved into the EU, in which case they will be subject to an EU tariff. Northern Ireland will also have to adhere to certain EU rules of the single market and maintain certain standards as Great Britain diverges. A Joint Committee, between the UK and EU, has been established to oversee the implementation and application of the withdrawal agreement and a specialised committee was established for issues on the implementation of the NI protocol (UK Gov. 2019b). The agreement between the UK and EU is in its infancy and several items contained within the protocol are yet to be resolved.

Tourism strategy

Tourism has been identified as an additional opportunity for economic growth. 53% of visitors to the Derry~Londonderry region are VFRs. Leisure visitors account for only 36% of all visitors to the region and 61% of these are day visitors. This is 11% less than the NI average for day visitors. Three quarters of all visitors originate in the UK, 45% from NI and 28% from GB (Tourism NI, 2018). The neighbouring County Donegal, in the ROI, hosts five times more visitors from Europe and three times more from North America than Derry~Londonderry. As

80% of current leisure visitors also visit the ROI– 52% of whom arrive through Dublin airport, 23% through the Belfast airports, and just 5% through City of Derry Airport– Derry~Londonderry council believes the region is well-positioned to become an important part on an itinerary of a visit to the Island of Ireland.

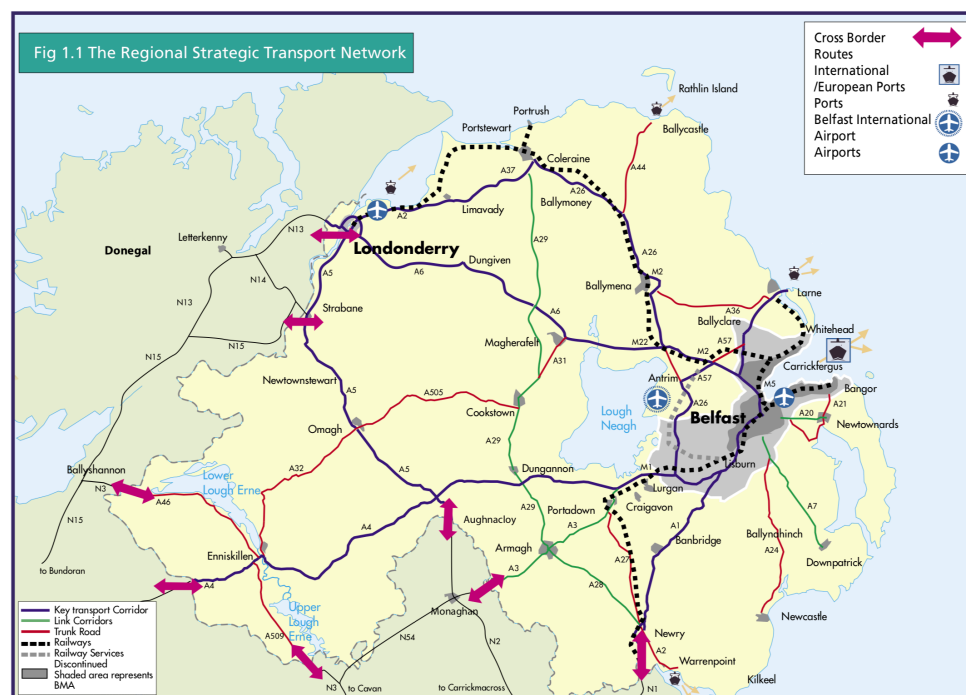
It assesses its location, between the Wild Atlantic Way and the Causeway Coast Route, can enable it to become a hub from which tourists can explore these routes, as well as the range of local tourism attractions. The city sits at the mouth of the Foyle estuary and at the foot of the Sperrin mountains and, therefore, offers a wide range of countryside and rural activities. It is the only complete walled city on the island and has a long and varied history, from the troubles and conflict to an industrial and maritime heritage. It has a rich tradition of creativity and culture, being the UK City of Culture in 2013. The city council has identified that these assets can help drive an increase in both the volume and quality of tourism to the region, by increasing demand from new segments and the number and length of overnight stays (DCSD, 2018b).

5.1.4 Transport conditions

The population of the Derry~Londonderry council region is 151 thousand, while the wider North of Northern Ireland is 295 thousand (NISRA, 2019). The size of population situated within a 60 to 90-minute drive of the City of Derry Airport is 434 thousand (York Aviation, 2018). While the distance between Derry~Londonderry City and Belfast International Airport is just 70 miles by road, journey times are long and unreliable because of a poor-quality transport infrastructure connecting them (Figure 11). The main road link is mostly single

carriageway, there are several severe bottlenecks, it carries a high volume of local and agricultural traffic and, as the route crosses the Sperrin Mountains, it is frequently subjected to weather disruption (TransportNI, 2016). Although there is ongoing investment in upgrading the road link to Belfast, significant sections of it will remain as single carriage, including the spur road to Belfast international airport (DRD, 2015). The rail service does not provide a faster alternative as the service is infrequent, requires interchanges with bus services, and follows a circuitous route. The shortest scheduled journey from central Derry~Londonderry to Belfast international airport is 127 minutes, and to Belfast city airport is 164 minutes (Translink, 2019).

Figure 5.5. NI's strategic transport network



Source: Transport NI (2016)

Aviation circumstances

The City of Derry Airport opened as RAF Eglinton in 1941 and was purchased by the then Derry city council in 1977. The council's intention was to

develop it as key transport infrastructure for the North-West and it has benefited from state aid to improve the airfield and terminal facilities (European Commission, 2019). In 2010 the council separated the ownership from the operation of the airport and incorporated it as City of Derry Airport Operations. City of Derry Airport has been operated under contract by Regional and City Airports Management. The council retains 100% ownership of the airport and, therefore, continues to subsidize its operations annually (Table 9).

Table 5.6. Financial support provided to CODA by DCSD council

| Year | Airport subvention | Year | Airport subvention |
|-------------|---------------------------|-------------|---------------------------|
| 2013 | 2,152,000 | 2016 | 2,145,000 |
| 2014 | 2,145,000 | 2017 | 2,409,000 |
| 2015 | 2,514,000 | 2018 | 2,405,000 |

Source: DCSD council (2018c)

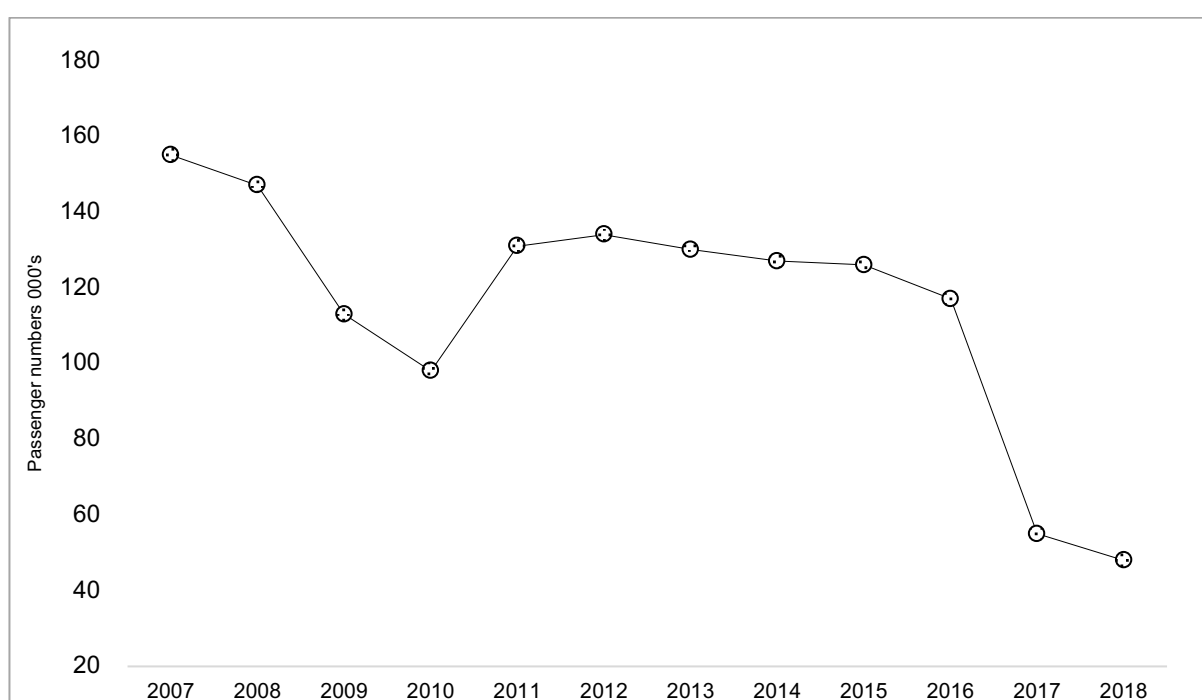
The airport's terminal passengers peaked at 439 thousand in 2008, since when they have declined annually, reaching 186 thousand in 2018 (Civil Aviation Authority, 2019). Passenger numbers on the London route also decline during this period, from a high of 155 thousand in 2007, to 98 thousand in 2010. Passenger numbers on the London route did recover in 2011, but not to the level of 2007 and they again began to decline annually from the following year (Figure 12). In 2016 Ryanair advised of its intention to discontinue the City of Derry Airport-London service from April 2017– citing unfavourable exchange rates, UK airport departure tax, and the consolidation of London traffic on its Belfast routes. In 2004 a local resident's group raised concerns about the future viability of the airport, as proposals for airport development were overly dependent on a growth in services provided by Ryanair (Parliament UK, 2005). Since Ryanair ceased the

London route the terminal passenger numbers have not shown signs of recovery (Table 12).

PSO imposition

As Derry~Londonderry council was unable to attract an airline to replace Ryanair on a commercial basis, it applied to the DfT to support a PSO. Without a PSO the region and airport would be without a direct air service to London, with the road improvements, enabling easier access to the alternative Belfast airports, still many years from completion.

Figure 5.6. Annual passenger numbers on the CODA-London PSO route



Source: adapted from Civil Aviation Authority (2019)

A £4.3 million support package was agreed with the DfT in 2017 to fund the PSO for two years, to which Derry~Londonderry would contribute 12%, with the remaining 88% coming from the DfT's regional air connectivity fund (UK Gov., 2017d). In May 2017, following a one-month break in the service, BMI Regional

began operating the route. The funding provided for two daily rotations on weekdays and Sundays, and one rotation on Saturday. In February 2019 BMI went into administration and stopped all operations immediately, including the London PSO (Companies House, 2019). As EC regulation 1008/2008 permits, Derry~Londonderry council undertook an emergency tender to secure a replacement airline. This left the region without a service to London for ten days until the 27th of February, when the service could resume following the appointment of Loganair on a seven-month contract.

In April 2019 Derry~Londonderry city council tendered for a new operator to continue the service for another 16 months, with the possibility of extending this for a further 24 months (Europa Ted, 2019a). In Sept 2019 the council confirmed that Loganair had been appointed to continue to operate the service. The cost of the renewed PSO is £3.148 million which maintains the same number of daily rotations, though the London airport was to switch from that at Stansted to Southend (Europa Ted, 2019b). Unlike the Cornwall Airport to London route, the City of Derry Airport passenger numbers have not yet picked up following the imposition of the PSO.

Figure 5.7. Cornwall rich picture



5.1.6 Cornwall rich picture narrative

Cornwall is a peninsular region and the most westerly county in England. Its coastline, the longest of all English counties (Cornwall Council, 2017), extends into the Atlantic Ocean, bordering the Celtic sea, the English Channel, and the only land border is with Devon county (Figure 14). Cornwall unitary authority was formed in 2009, following a merger of the former district councils, though it would still prefer to be known as a Duchy, or a region in its own right. Important to the Cornish identity are its differences to the rest of England, seeing itself as a small Celtic state, with its own Celtic language, “Kernewek”, and closer in culture to Wales and Ireland than to Saxon England. Thirteen percent of the Cornish population self-identify with a Cornish national identity (Deacon, 2013) and in 2014 the UK Government formally recognized the distinct identity of the Cornish people and granted it minority status within the UK (UK Gov, 2014b).

Figure 5.8. Cornwall's location in the UK



Source: ONS (2018)

Mining had been important to the Cornish economy for centuries and, at its peak, in the mid 18th century, there were 340 operating mines (Buckley, 1992) employing 30% of the working male population (Cornwall Heritage Trust, 2017). Cornwall benefited from abundant mineral endowments and was the world's largest producer and exporter of tin, copper, arsenic, granite, slate, and China clay (Cornwall Heritage Trust, 2017). One resource it did not possess was the coal, needed to fire steam powered mining machinery, which it imported from Wales. The need to reduce the cost of coal imports drove the innovations in mining technology for which Cornwall became famous (Cornwall Council, 2018b).

Cornish mining technology and skills were exported across the world as new deposits of diamonds, gold, and minerals were found (Cornish Mining, 2018). However, the discovery of new deposits of the minerals that Cornwall had mined led to the demise of mining in the region, and by the 1950s only two mines were still operating (Buckley, 1992). The Cornish economy has continued to be reliant on the land since, with agriculture and tourism remaining the region's largest industrial sectors (PFA, 2018). However, evidence of Cornwall's mining history is still evident today. It became a UNESCO World Heritage site in 2006 and it is now an important tourism asset (UNESCO, 2006), which is in addition to an extensive inventory of other natural and man-made landscape assets.

Population characteristics

Cornwall is the second highest populated unitary authority in the UK, with a population of 555,057. It is also the largest by area and, therefore, has the fifth lowest population density, of 157 residents per sq. km, (ONS, 2018). The county's largest settlement, St Austell, has a population of just 28,420 and the rest of the

urban population is spread across 34 settlements, the smallest of which is 1,482 residents (Table 10). The region already has a retired population which is 6.3% higher than the national and is projected to grow from 25.2% in 2020 to 28.7 in 2030, and by 2040 it will reach 31.2%. During which time the working age population will have decreased from 58.7% to 53.8% (ONS, 2018).

Table 5.7. Population sizes of the largest and smallest settlements in Cornwall

| Five largest towns | | Five smallest towns | |
|---------------------------|--------|----------------------------|-------|
| Newquay | 21,110 | Lostwithiel | 3,030 |
| Truro | 21,555 | Fowey | 2,905 |
| Camborne | 21,987 | Porthleven | 2,660 |
| Falmouth | 22,744 | Millbrook | 2,356 |
| St Austell | 28,420 | Tywardreath & Par | 1,482 |

Source: Cornwall Council (2018)

Employment characteristics

Cornwall has a well-educated population as 34% have gained a qualification of at least an NVQ level four, just 3% less than the UK. Just 5% are without any qualifications, also 3% less than the UK. It also has a level of economic activity that is the same as the UK, and an unemployment rate of 3.1%, which is 0.9% below the UK level. However, the proportion of employment that is part-time is 40.7%, which is 8.3% greater than for the UK. The Cornwall local enterprise region has the second-highest proportion of part-time employment (NOMIS, 2017b), and 82% of the 13,000 additional jobs created in Cornwall, since 2008, have been part-time (NOMIS, 2018b) (Table 11).

The distribution of business units by employment size in Cornwall is very similar to that of the UK overall. However, there are large variations in the types of sectors. The largest three sectors are 'accommodation and food service', 'health and social care', and 'retail'. Accommodation accounts for 17.7% of employers in Cornwall, which is 8.7% more than for the UK. Together these three sectors account for 49.8% of all employers. Whereas just 12.9% of employers are in the 'information and technology', 'finance and insurance', professional and scientific', and 'Business administration' sectors, which is 12.6% less than for the UK overall.

Table 5.8. Cornwall's employment and educational attainment indicators

| | Cornwall | UK |
|-------------------------|-----------------|-----------|
| Unemployment rate | 3.1% | 4.0% |
| Economically inactive | 22% | 22% |
| Part-time employment | 40% | 33% |
| NVQ4 and above | 34% | 37% |
| No formal qualification | 5% | 8% |

Source: NOMIS: ONS (2020)

Table 5.9. Cornwall's earnings and income indicators

| | Cornwall | England | UK |
|-----------------------------|-----------------|----------------|-----------|
| Weekly Pay ^{gross} | £491 | £591 | £585 |
| GVA ^{per head} | £18,485 | £27,949 | £27,430 |
| GDHI ^{per head} | £18,568 | £21,609 | £21,109 |

Source: NOMIS:ONS (2020)

These employment statistics are reflected in the Social Mobility Commission's ranking of Cornwall among the lowest 5% of regions in England for

social mobility (Social Mobility Commission, 2017). The annual GVA per person in Cornwall is £18,485, which is 65% that of the UK GVA, and just 36% of that for London (£46,482) (ONS, 2017). Although Cornwall's unemployment rate, 3.1%, and levels of economically inactive, 76.7%, are lower than the UK's, gross weekly pay in is £94 less than the national average and, GDHI is £2,541 less than the national average (Table 12). These differences in employment prospects are despite the Cornish population having a similar educational level as the UK overall.

5.1.7 Regional development approach

The Cornwall and Isle of Scilly (CIOS) local enterprise partnership (LEP) is the agency responsible for driving economic development in the region. Cornwall was amongst the first regions to respond to the Government's invitation, in 2010, to create new public-private partnerships, that would act independently of government to provide strategic leadership in setting local economic priorities. In 2015 the council and UK government agreed on a devolution deal that transferred powers and accountability to the CIOS LEP to accelerate the delivery of a regional development plan (Cornwall Council, 2015). Vision 2030 (CIOS LEP, 2017) is the region's economic development strategy, and it identified three outcomes for business, people, and place: one, thriving businesses that excel; two, inclusive growth that improves workforce skills; and three, improved infrastructure and economic distinctiveness.

The strategy highlighted the need to create inclusive growth to address the challenge of low-income levels and an increasing productivity gap with the UK.

The region's traditional sectors of tourism, mining, and agriculture would receive support to improve their levels of productivity and innovation and, link these with knowledge-intensive industries to create a new capacity to compete internationally (Table 13). These sectors are known as the '10 opportunities' and include creative, space, energy, agri-food, tourism, marine, mining, aerospace, eHealth, and the region's location itself.

Table 5.10. Cornwall's development strategy key industrial sectors

| Cornwall's '10 opportunities' | |
|--------------------------------------|-----------|
| Creative | Mining |
| Space | Aerospace |
| Energy | eHealth |
| Agri-food | Tourism |
| Marine | Place |

Source: CIOs LEP (2017)

The LEP strategy has been supported by three rounds of government 'Growth Deal' funding, totaling £97.23 million, in addition to a £40 million investment fund backed by the British Business Bank. Direct support to local business is provided by the LEP and through the council's Cornwall Development Company, which manages the region's enterprise zones, grant funding, and business and skills' support programmes. The Cornwall Trade and Investment programme promotes Cornwall as a high-quality destination to 'live and work' and manages inward investment.

Prior to the UK governments growth deals, Cornwall had been in receipt of EU objective one and convergence funding, in 2000, 2007 and, 2014, which has

amounted to £1,581 million Euro and has been the highest per capita recipient in the UK (Institute for Government, 2012). This has funded a CIOSS growth programme that has supported a wide range of social and economic projects, most notably the Eden Project, upgrading the main access trunk road, conversion of the RAF airport to CAN and, providing the region with superfast broadband infrastructure. A 'shared prosperity fund' is proposed by the UK government to replace EU funding post-Brexit (Brien, 2020) and although details had not been finalised, Cornwall Council had indicated to the government that it calculates the fund should be worth £600 millions between 2020 and 2030 (Cornwall Council, 2020).

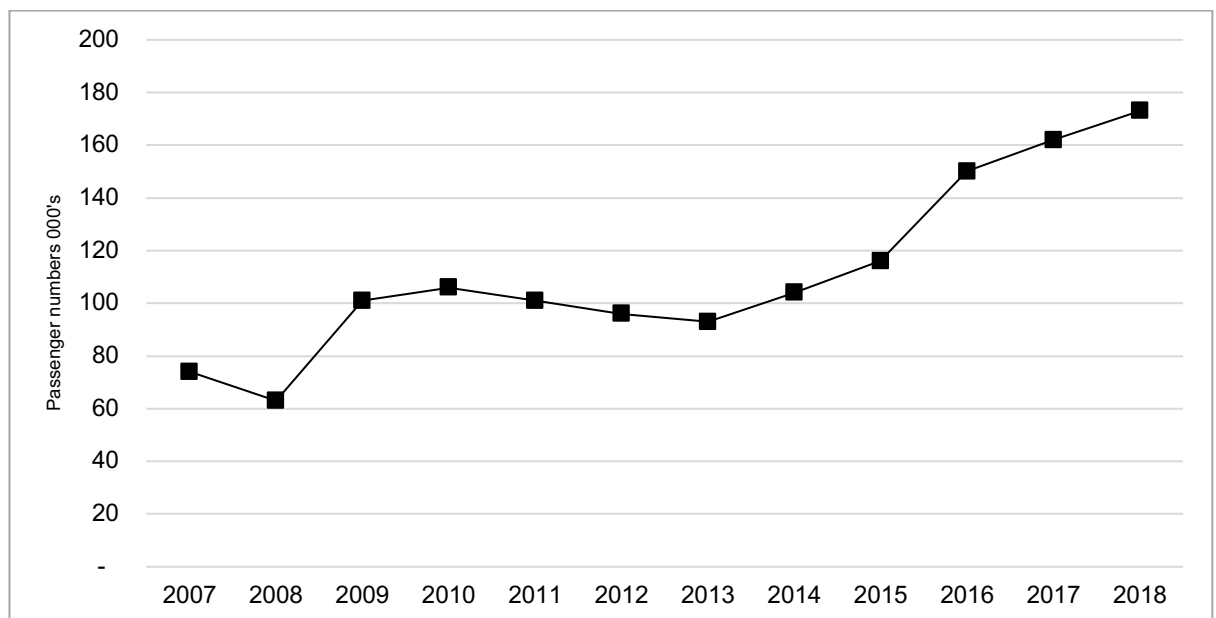
5.1.8 Transport conditions

Cornwall is the most westerly region of England and one of the farthest from London. It is situated on a narrow peninsular that extends into the Atlantic Ocean and is connected to London and the rest of the UK by a thin transport system. The county is served by one trunk road and one mainline railway line, which are both vulnerable to disruption caused by severe weather events (Highways England, 2017; Network Rail, 2014; 2019). Cornwall Airport is the only airport serving the region since the closure of Plymouth City Airport in 2010. The closest alternative airport is now Exeter Airport, further East in Devon. The journey time by road to Exeter airport, from St Austell, Cornwall's largest settlement, Truro, the county capital, and Falmouth, the second largest settlement, is from 90 to 119 minutes, between 69 and 63 minutes more than the journey time would be to Cornwall Airport. Journey times by rail to the nearest rail station are between

114 and 174 minutes (GWR, 2019), plus a further 21 minutes transfer to the airport.

Cornwall council took ownership of the airfield in 2006 – Cornwall Airport had formerly been a Royal Air Force airfield with only limited commercial activity. In 2007 Cornwall council requested that state aid be permitted to allow the conversion of the airfield from military to commercial use (European Commission, 2009) and in 2008 it was granted a CAA license. The original 2008 airport master plan forecast that by 2015 the terminal passenger numbers would exceed 1 million (Aerohub, 2009). In fact, the 431 thousand terminal passengers handled in 2008 remained the highest annual number passing through the airport for the next ten years.

Figure 4.9. Annual passenger numbers on CAN-London PSO route



Source: adapted from Civil Aviation Authority (2019)

In the subsequent four years, terminal passenger numbers fell by 62%, reaching 166 thousand in 2012 (Civil Aviation Authority, 2019). During this same period passenger numbers on the London route also declined from 106 thousand

in 2010 to 93 thousand in 2013 (Figure 15). In 2013 Flybe, the route operator, announced its intention to end the service in March 2014. In the media, Flybe attributed this to a 102% increase in airport charges at Gatwick during the previous five years, which had made the route unsustainable (ITV News, 2013). Though the airline's managing director also questioned whether commercial services from small regional airports could remain viable without government support (BBC News, 2013).

PSO imposition

After efforts by Cornwall Airport to secure a replacement airline to maintain the service had been unsuccessful, Cornwall council applied to the DfT for support in imposing a PSO on the route. Flybe agreed to extend the service until October 2014, and it was later awarded the PSO contract by Cornwall council following a tender process. The funding package to support the PSO was £2.8million over four years– 88% provided by the DfT's regional air connectivity fund and the remaining 12% provided by Cornwall council (UK Gov., 2014c). The Council's support of the PSO is in addition to the annual subsidy the council was already providing Cornwall Airport, which amounted to £8.4 million over the four years of the first PSO (Table 14).

The PSO funding secured a service to Gatwick airport of three weekday rotations and two on Saturday and Sunday, reducing to one on a Saturday on a winter schedule. Passenger numbers on the route have since increased annually, with an 11% increase in the first year of the PSO service, and reaching 173 thousand in 2018, almost double what they were in 2013. However, Cornwall Airport remains critically reliant on one airline, Flybe, which carries 71% of its

passengers, and on one route, the PSO route to London, which accounts for 36% of all passengers (Cornwall Airport Ltd, 2018).

Table 5.11. Financial support provided to CAN by Cornwall council

| Year | Airport subvention | Year | Airport subvention |
|-------------|---------------------------|-------------|---------------------------|
| 2013 | 3,071, 952 | 2016 | 1,793,283 |
| 2014 | 2,808,694 | 2017 | 1,362,938 |
| 2015 | 2,399,703 | 2018 | 1,334,000 |

Source: Cornwall Airport Ltd (2018)

In 2018 the DFT committed to supporting a renewed PSO service, which initially would continue to fly to Gatwick airport. It would then switch to London Heathrow airport in spring 2019 when it would also increase to four rotations a day. The switch to Heathrow airport was made available with the use of remedy slots that had become available at Heathrow through the acquisition of British Midlands by the International Consolidated Airlines Group in 2012 (European Commission, 2012).

Figure 5.10. Dundee rich picture



5.1.10 Dundee rich picture narrative

Dundee is a seaport city on the northern bank of the 'Firth of Tay', a North Sea inlet on the east coast of Scotland (Figure 17). The first harbour was built in the 16th century and became an important trading port with the British empire, home to the largest British Whaling fleet, and a thriving ship-building industry (Jackson & Kinnear, 1991). The serendipitous discovery that whale oil, of which it had an abundance, softened jute so that it could be spun and woven, coupled with the textile production skills gained from sail cloth manufacturing, ready supplies of raw material from the Indian trading routes, and a cheap workforce in the city's hinterlands led to Dundee becoming the world's largest producer of jute. Dundee became known as 'Juteopolis' and 150 factories employed 50,000 people. Jute is one of the three 'Js' for which Dundee became famous, Jute, Jam, and Journalism (Domenico & Domenico, 2007).

Figure 5.11. Dundee's location in the UK



Source: ONS (2018)

A trader at Dundee's docks bought a consignment of storm-damaged Seville oranges, which were cooked into a jam by his confectioner wife. Demand for the resultant product, orange marmalade, was so great that a factory was opened in 1797 and 'Keiller's Dundee' marmalade was exported throughout the British empire (Mathew, 2008). The 'Beano', 'Rover', and 'Jackie' are titles of familiar magazines produced by newspaper and magazine publisher DC Thomas which, founded in 1905, remains one of the city's largest employers. While the importance of Journalism to the city continues, Jute and Jam, and the harbour, have waned. India began to produce cheaper jute itself and trade bypassed the harbour in favour of Edinburgh, which also brought about the demise of ship building. The Keiller's brand was consumed by the Cross and Blackwell company and, having lost market share to other jam producers, the brand was eventually retired (Tomlinson, 2014).

In the 1940's, manufacturers like Timex and NCR opened factories in Dundee to take advantage of the cheap labour that was available since employment at the docks had declined. However, poor labour relations led to their closure in the late 80s and brought about the end of the industrial era in Dundee (Domenico & Domenico, 2007). Dundee has recently begun to pursue a development strategy focused on knowledge intensive industries, based around its two universities. Dundee university has been the catalyst for Biomedical research and product development and Abertay University has become a leader in computer arts and computer games design. Dundee was awarded UNESCO City of Design status in 2014 because of the globally significant design contributions it has made in a range of fields, such as Aspirin, the adhesive stamp, and the Grand Theft Auto computer game (Dundee City Council, 2013; 2014).

Population characteristics

Dundee is the fourth-largest city in Scotland, with a population of 143 thousand, behind Glasgow (579 thousand), Edinburgh (457 thousand) and Aberdeen (205 thousand). The wider 'Tay Cities Region', of which it is a part, has a population of 486 thousand (NR Scotland, 2020). The Tay Cities region was formed in 2018 and is a collaboration between Angus, North East Fife, and Perth and Kinross Councils to secure and implement a City Region Deal. Since 1998 the size of Dundee's population has remained stable, contracting by only 0.2%, whereas the total Scottish population increased by 7.6%. While Dundee's population size is projected to remain unchanged, there will be changes to its age profile.

The working age population is forecast to decrease from 66.2% to 62.3% by 2037. Due to the two universities the largest group is the 23 to 34 years of age, who are 17% of the population, whereas they are 13% of Scotland's population (NR Scotland, 2020). However, this causes significant seasonal variations in the population profile and a challenge for the city is to retain a higher proportion of these students after they graduate (Dundee City Council, 2017).

Employment characteristics

The level of educational attainment in Dundee is similar to that for Scotland and slightly higher than for the UK. 45% of the population has gained at least an NVQ level four, which is the same as for Scotland and 5% higher than for the UK, though 11% less than for Edinburgh. The proportion without any formal qualification is 8%, which is the same as for the UK and 2% less than for Scotland, though it is 2% more than Edinburgh. Despite a well-educated population,

Dundee's 67% employment level is the second-lowest in Scotland. The unemployment rate is 5.8%, which is 2.5% higher than it is for Scotland overall (Table 15).

Table 5.12. Dundee's employment and educational attainment indicators

| | Dundee | Scotland | UK |
|-------------------------|---------------|-----------------|-----------|
| Unemployment rate | 5.8% | 3.3% | 3.9% |
| Economically inactive | 31% | 22% | 20% |
| Gross weekly wage | £543 | £577 | £585 |
| NVQ4 and above | 45% | 45% | 40% |
| No formal qualification | 8% | 10% | 8% |

Source: NOMIS (2020)

The share of larger-sized businesses, by the value of turnover, is slightly higher in Dundee than it is for Scotland and the UK. Businesses with turnover up to £100 thousand accounts for 33% of all units, compared to 38% in Scotland and 39% in the UK. Whereas businesses with turnover between £100 thousand and £1 million account for 56%, compared to 53% for Scotland and 52% in the UK. The proportion of businesses with turnover greater than £1 million is 11%, compared to 9% in Scotland and the UK. This pattern is reflected in business units by employment size, in that it has a smaller proportion of micro-businesses, and a higher proportion of small, medium, and large (Table 16).

Table 5.13. Comparison of businesses by size in Dundee and Scotland

| | Micro (0-9) | Small (10-49) | Medium (50-249) | Large (250+) |
|----------|-----------------------|-------------------------|---------------------------|------------------------|
| Dundee | 83.5% | 13.6% | 2.3% | 0.6% |
| Scotland | 88.0% | 10.0% | 1.6% | 0.4% |
| UK | 89.5% | 8.6% | 1.5% | 0.4% |

Source: ONS (2020)

Although Dundee compares favourably for the number and size of firms in absolute terms, it has the third lowest ratio of businesses per head of the population in GB (Centre for Cities, 2019). It is also underrepresented in firms in knowledge intensive sectors. The total number of firms in the ‘Information and Communication’, ‘Financial and Insurance services’, ‘Professional and Scientific’, and ‘Business administration and Support services’ sectors account for 28% of businesses in Dundee. This is 6% less than they are in Scotland overall, and 9% less than in the UK. It is also 18% less than Edinburgh, where firms in these sectors account for 46% of all business units. Dundee does have a higher number of ‘Information and Communication’ businesses than for Scotland overall, reflecting the importance of DC Thomson to employment in the city. Otherwise, 8% fewer are employed in knowledge intensive sectors than are in Scotland overall, and 16% fewer than in Edinburgh. Furthermore, a third of Dundee’s working age population are employed in ‘Education’ or ‘Health and Social Services’, whereas it is a quarter in Edinburgh (ONS, 2020).

These employment conditions are reflected in workers earnings. GVA per head is £25,176, which is similar to Scotland, but £2,254 less than the UK. Though, it is £20,000 less than Edinburgh. Weekly gross pay in the city is £545, which is 6% less than for Scotland, 8% less than in the UK, and 14% less than in

Edinburgh. GDHI in Dundee, which is £18,103, is lower than the Scottish and UK averages and £5,271 less than Edinburgh City (Table 17). Consequently, Dundee has the fifth highest share of the UK's most deprived SOAs (SIMD, 2020).

Table 5.14. Dundee's earnings and income indicators

| | Dundee | Scotland | Edinburgh | UK |
|---------------------|---------------|-----------------|------------------|-----------|
| Weekly Pay Gross | £543 | £577 | £617 | £585 |
| GVA per head | £25,176 | £25,685 | £45,269 | £27,430 |
| GDHI per head | £18,103 | £19,752 | £21,109 | £23,374 |

Source: NOMIS (2020) & ONS (2020)

5.1.11 Regional development approach

The 'City Plan 2017 – 2026' (Dundee City Council, 2017) is to create a sustainable economy that provides jobs and attracts talent, reduces social exclusion, and increases community cohesion, and that Dundee becomes a place that is attractive to live in and visit. It prioritises addressing economic challenges and improving the quality of local employment opportunities through innovation, internationalisation, and connectivity. To achieve this the LA will prioritise attracting investments that will create high quality jobs, recognise the importance of SMEs in creating high quality employment, and equip the population with the skills required for the new employment opportunities. It has set out a comprehensive approach to upskilling and reskilling the population for these future jobs and directing dedicated support towards the long-term unemployed (Dundee City Council, 2017).

To improve the quality of place, the regeneration of 240 hectares of the old harbour district, stretching along 8KMs of the river and reconnecting it with the city centre, began in 2000. An initial investment of £73 million, from the Scottish Government's Cities growth fund, in infrastructure preparations has unlocked a further £1 billion in public and private investment. The area is developing into a destination for business, visitors, and tourists and in 2018 the V&A Dundee opened. It is the only V&A and design museum in the UK outside of London. Dundee is seeking further regeneration through culture and in 2015 it published a ten-year cultural strategy. The aim of which is to leverage the local creative 'eco-system' to create employment opportunities in the creative and cultural sectors, as well as being a way to strengthen community cohesion and improve the quality of life (Dundee City of Design, 2015).

Alongside the Cultural strategy sits a dedicated 'creative industries strategy'. It highlights the need for greater collaboration within the sector itself and with the city's educational institutions, to facilitate an exchange of ideas, practices, and resources, improve the sector's business practices, and create the types of opportunities that will encourage young people and postgraduates to remain. Also highlighted is the need to attract visitors and investors by developing the city's cultural tourism offer and raising its external profile as a creative technology hub (Dundee Creates, 2017). Dundee still has progress to make in this regard, as it has not yet been recognised by the Creative Industries Federation of creative clusters in the UK (Creative Industries Foundation, 2018). The strength of its creative eco-system is not yet reflected in the number of creative start-up businesses. Though, the city's objective of increasing the number of SMEs or spin outs from the local universities, in all sectors, is not being achieved either (Dundee

City Council, 2019). Creative industries are one of six key sectors to be identified as regional sectoral strength. As part of the Tay Cities region, Dundee's economic strategy is aligned with the Tay Cities economic strategy (Tay Cities, 2019), which has a primary objective of transforming the region into an international, innovative, and knowledge-based economy by 2037 (Table 18).

Table 5.15. Dundee's development strategy key industrial sectors

| | |
|--|---|
| Oil and gas decommissioning | Health & care |
| High-value food and drink | Engineering & advanced manufacturing |
| BioMedical innovation | Eco-innovation: renewable energy & technology |
| Creative industries and digital innovation | World-class tourism offer |

Source: Dundee council (2019)

Tourism strategy

The overreliance on domestic day visitors, the seasonality of the local tourism offer, and sectoral productivity rates lower than those achieved by tourism in Scotland overall have been identified as underlying weaknesses of the tourism sector in the Tay Cities region. In 2018 91% of visitors were day visitors who spent £170 million in the region. The remaining 9% of overnight visitors spent £433 million (Tay Cities, 2019). The Tay Cities tourism strategy emphasises the value of the international and domestic short break visitor segments and highlights the need to develop the tourism product in a way that will appeal to them, will encourage longer average stays, and could create an extension to the traditional seasonal. It notes that these segments are seeking genuine connections with local people and culture and identifies three types of such experiences in which it has strengths: one, a vibrant contemporary culture, because of the breadth of the

creative sector and a rich cultural heritage; two, a field to fork food and drink story; and three, a wide variety of outdoor adventures that benefit physical and mental wellbeing. In addition to these experiences, the region has a strong golf tourism sector, with courses, including the St Andrews 'home of golf', that host the globally significant Ryder Cup, Open, and Solheim Cup tournaments. The strategy assesses that, with the tourism assets the region possesses, it could increase overnight tourism by 3% annually, which would be worth an additional £550 million by 2024 (Tay Cities, 2019b).

5.1.12 Transport conditions

Dundee and the Tay Cities region are well situated on Scotland's strategic road and rail networks, providing it connectivity with all seven of Scotland's city regions, as well as the international airports at Aberdeen, Edinburgh, and Glasgow. However, the journey time to Aberdeen and Glasgow airports is over two hours, as it is to Edinburgh airport for large areas of the region (York Aviation, 2018). Capacity constraints and congestion at key points on the local transport network are cited as reasons why the transport network is described as sub-optimal (TACTRAN, 2015; Tay Cities, 2019). Dundee is also well served with overland connections to London, but the distance between the two cities means these journeys inevitably take a long time. The distance between the two by road is 480 miles and the direct rail service from Dundee takes five hours and 44 minutes (LNER, 2019).

Dundee airport began as a grass airstrip in 1963, on land reclaimed from the Firth of Tay. In 1977 the then Tayside regional council determined the region needed a publicly subsidised airport. It replaced the 500 meters grass strip with a

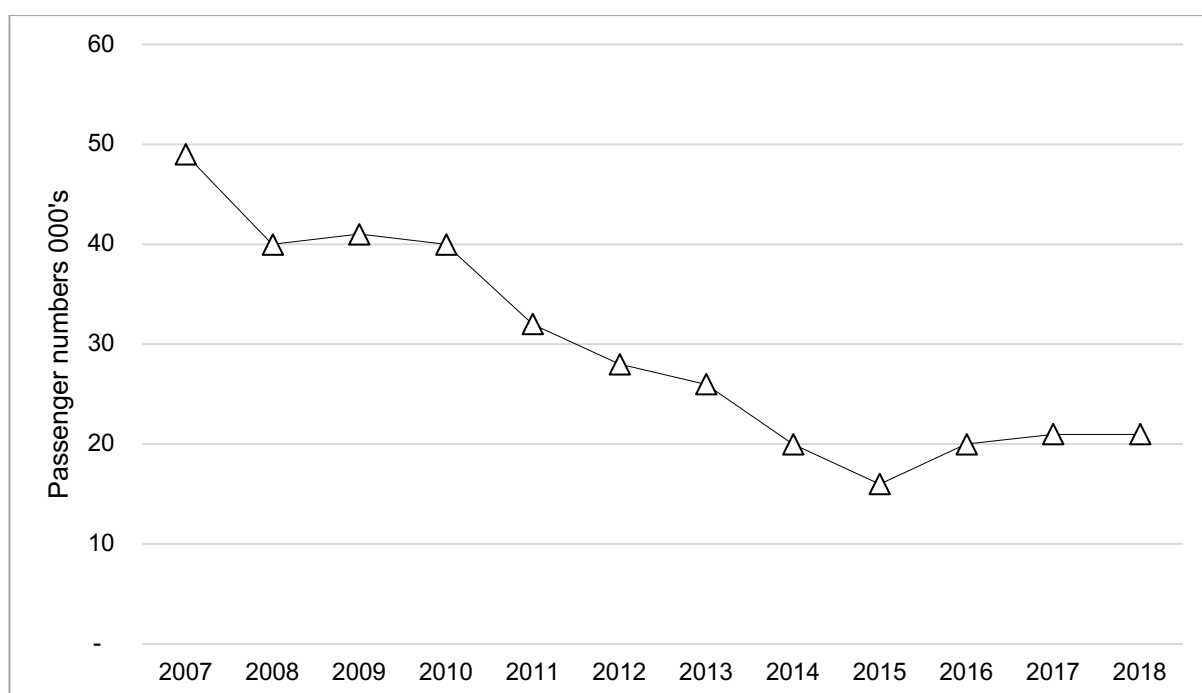
900 meters asphalt runway, which was quickly extended to 1,100 meters and again to 1,400 meters in 1995. The current length of the runway restricts the airports use to the small jet and turbo prop aircraft used by regional operators and prevents the types of jets typically used by low-cost carriers (Transport Scotland, 2014). The airport's proximity to the banks of the Tay means that the runway cannot be extended any further without significant investment in land reclamation, for which there is little prospect, as the investment needed has been estimated to be between £40 and £50 million (TACTRAN, 2014). In 1996 Dundee city council took on the responsibility for the airport, following a reorganisation of local government.

Since 2004 the airport has been loss-making and requires significant subsidies to continue operations. The financial burden became too great for the council in 2007, and the airport was offered to Highlands and Islands Airports Ltd (HIAL). Since then it has continued to require financial support annually, which is now paid by the Scottish government via HIAL, and to which Dundee council has not been required to contribute (Companies House, 2019b). HIAL is a private limited company wholly owned by the Scottish government and responsible for operating 11 small regional airports across Scotland. It pays Dundee city council a peppercorn rent for the use of the airport and the council retains ownership of the airport land (TACTRAN, 2014).

The Dundee to London route commenced in 1999 and it is currently the only commercial service that operates from Dundee airport. The route was launched by Suckling Airway and then from 2007 was operated by the Air France subsidiary CityJet, serving London City airport. The peak year for this service was

2006, when it handled 50 thousand passengers, after which there was a steady annual decline and by 2013 passenger numbers had almost halved to 26 thousand (Figure 18). CityJet announced in 2013 that as the route was no longer viable it would be discontinued in 2014. As HIAL and Dundee city council were unable to secure a replacement airline, the region was at risk of losing its only air route to London. Dundee city council and subsequently the Tay Cities partnership maintain that the airport is essential to achieving the region's economic potential through business and tourism growth (Tay Cities, 2018).

Figure 5.12. Annual passenger numbers on the Dundee-London route



Source: adapted from Civil Aviation Authority (2019)

PSO imposition

The Dundee PSO was the first to be funded from the government's new 'regional connectivity fund' and the first to serve a route to London. It was awarded to Loganair and commenced in July 2014 with the route switching from London City airport to Stansted airport. The initial funding package for the PSO was

£3.247 million over two years, 88% of which came from the DfT regional air connectivity fund and the remaining 12% from Dundee city council (UK Gov., 2014d). The funding secured two rotations on weekdays and one evening rotation on a Sunday, but none on a Saturday. In 2017, the PSO funding was extended for a further two years at a cost of £3.7 million, to which the Scottish government contributed £1.4 million (38%) and Dundee council contributed £400 thousand (12%). The remaining 50% was provided by the DfT (UK Gov., 2017e). In the year following the imposition of the PSO, passenger numbers on the route grew slightly, since when they have remained at around 20 thousand a year.

A tender process to renew the PSO commenced in April 2019 for an additional two years of funding, with a review of the service mid-way through. London city airport had lobbied for the PSO to use it as a destination, as it believed future passenger numbers could reach similar levels to when the Dundee service last flew from it (London City Airport, 2019).

5.1.13 Rich pictures comparison

Poor employment prospects for the CSPR's populations (Table 19) and how that affects earnings and incomes (Table 20) have been identified by each of the LAs as their most significant challenge. While the challenge is the same, there are some differences in their nature in each of the regions. *Cornwall* has the lowest unemployment rates and economic inactivity outperforms the UK average. The challenge it faces is the quality of this employment. Recent job creation has been predominantly part-time jobs. It has the highest share of PT employment of the CSPRs, and is higher than that of the UK. Gross wages in Cornwall are higher

than in Derry~Londonderry, but 20% lower than Dundee and 23% lower than the UK. *Dundee* has the highest levels of educational attainment, higher than the UK average. It has the highest GDHI income, equal to that of Scotland and the UK. However, it also has higher levels of unemployment and economic inactivity than the Scotland and UK averages. These are only marginally lower than Derry~Londonderry, which has the most challenging employment conditions of the CSPRs. *Derry~Londonderry* has the lowest levels of educational attainment, employment, earnings, and income levels of all the CSPRs, and it is also amongst the worst-performing regions in the UK for employment and earnings. NI is the most deprived region in the UK– with 37% of the most deprived 5% of regions in the UK– and Derry~Londonderry is one of the most deprived regions in NI, with 27% of NI's 100 most deprived areas.

Table 5.16. All CSPR's employment and educational attainment indicators

| | Derry~ Londonderry | Cornwall | Dundee | UK |
|-------------------------|-------------------------------|-----------------|---------------|-----------|
| Unemployment rate | 4.7% | 3.1% | 5.8% | 3.9% |
| Economically inactive | 37% | 22% | 31% | 20% |
| NVQ4 and above | 22% | 34% | 45% | 37% |
| No formal qualification | 28% | 5% | 8% | 8% |

Source: NOMIS (2020)

Table 5.17. All CSPR's earnings and income indicators

| | Derry~ Londonderry | Cornwall | Dundee | UK |
|---------------------|-------------------------------|-----------------|---------------|-----------|
| Weekly pay gross | £378 | £491 | £543 | £585 |
| GVA per head | £16,898 | £18,485 | £25,176 | £27,430 |
| GDHI per head | £14,666 | £18,568 | £18,103 | £23,374 |

Source: NOMIS (2020)

Improving levels and quality of employment is the clear priority outcome for the CSPR's development strategies and has been a major influencer of the type of economies they are now. The technology and knowledge intensive sectors that are key to these strategies are chosen because the regions already possess levels of experience and assets in them, and because these sectors are assessed by the LAs as offering the best high-quality employment prospects. *Cornwall* is seeking to transform the capabilities of its economy to one able to exploit the international opportunities presented by the digital technology and to add value to traditional sectors, such as mining and agriculture. It has also acknowledged a need to ensure the region's economy will provide the types of careers opportunities that will attract younger workers to return or relocate to the region. *Derry~Londonderry* is focused on the opportunities created by the 4th industrial revolution. Amongst its priorities is to ensure the benefits of growth are evenly distributed as means to further heal a divided community, but also to improve the city regions competitiveness and its international image. *Dundee* has stated its ambition to be an internationally focused economy that will be knowledge led. In addition to expanding its creative eco system and repurposing its offshore drilling

experience to offshore energy and oil decommissioning. Table 21 illustrates the similarities of the high value, knowledge intensive character and traded nature of the sectors key to the CSPR's future economies, while reflecting the different place-based assets and competencies in the regions.

Table 5.18. Comparison of similarities in future key industrial sectors

| Derry~ Londonderry | Cornwall | Dundee & <i>Tay Cities Region</i> |
|--------------------------------|-----------------|--|
| Artificial intelligence | Creative | Food & drink |
| Cognitive analytics | Space | High value engineering & manufacturing |
| Personalized medicine | Energy | |
| Virtual & augmented reality | Agri-food | Energy: renewable, offshore wind, oil decommissioning |
| Robotics | Marine | |
| Advanced manufacturing | Mining | Digital & creative |
| Hybrid learning | Aerospace | Biomedical, life &, meditech |
| Health & life sciences | eHealth | Construction |
| Culture & tourism | Tourism | Tourism & culture |

Source: DCSD council (2019); CIOs LEP (2018); Tay Cities Region (2019).

Tourism

Increasing tourism exports is also identified by each region as a potential driver of economic growth. The regions are improving the quality of the tourism offer in order to appeal to high quality and longer-stay allocentric tourists and shift their tourism economies away from high volumes of low-value day visitors. They are also seeking to increase the length of their tourism seasons and to position themselves as all-year destinations. The regions have each identified that they are well-endowed with high-quality tourism assets, such as the richness and uniqueness of their local culture, heritage and historic and natural environments (See table 22), which they are packaging so as to appeal to the inbound international and domestic short break tourist.

Table 5.19. Tourism product similarities

| Derry~ Londonderry | Cornwall | Dundee & <i>Tay Cities Region</i> |
|---|---|--|
| A hub for exploring. | Exciting & diverse natural appeal | Food culturalists |
| Where the Wild Atlantic Way & Causeway Coastal Route meet | | Curious travellers |
| The historic walled city | Long coastline & wild, iconic moors. | Outdoor adventurers |
| History & heritage | | UNESCO city of design |
| Creativity & culture | Vibrant culture | Tay river waterfront development |
| Activity & adventure | World heritage sites & renowned attractions. Eden Project & Tate St Ives | V&A museum |

Source: DCSD council (2019); CLOS LEP (2018); Tay Cities Region (2019).

Cornwall is promoting its heritage as a Duchy with a unique identity and Celtic characteristics, alongside a wide range of natural and man-made landscapes. These include the UK's longest coastline, a dramatic maritime history, and the UNESCO mining heritage. Alongside which it also promotes its modernity, by highlighting attractions such as the Eden Project. The *Derry~Londonderry* tourism authority acknowledges that it has an underdeveloped tourism economy, with low visitor numbers and insufficient visitor attractions and accommodation. It also lacks all-weather attractions, such as the Eden Project in Cornwall or V&A in Dundee. It does, however, have its own unique tourism asset in the history and artifacts of 'the troubles'. The city region is also situated between two internationally renowned tourism routes, which includes internationally recognised sites such as the Giants Causeway. *Dundee* has invested heavily on constructing tourism assets, such as the harbour quarter the V&A museum. It is also promoting its creative heritage by becoming a UNESCO City of Creativity. These developments are intended to supplement the region's traditional heritage and contemporary culture, its food and drink offer, its natural environment and opportunities for outdoor pursuits, and an internationally famous golf offer. However, the CSRs have each recognised that they will increasingly face competition from other remote regions, such as each other, that are also recognising their tourism potential and are valorising their own unique basket of assets.

The nature of the development strategies now being pursued by the CSRs, in both industry and tourism, makes each region equally dependant on high-quality connections to external markets for trade, labour, finance, and other

inputs. However, their locations make accessing these markets or accessing the regions themselves, costly. Costs that are multiplied by thin interregional transportation infrastructures, that offer severely limited alternative travel options, and which are vulnerable to disruption. All of which serve to isolate the regions further. The PSO routes are now the only air services connecting the regions with London. The collapse of the BMI, which operated the City Of Derry Airport route, and Flybe, which operated the Cornwall Airport route, highlight how the regions' developmental activities continue to be negatively impacted by air transport market failures.

5.1.14 A PSO funding comparison

The economic circumstances at each CSPR are equally challenging, for which they are pursuing similar development strategies. Their accessibility challenges are also very similar in that peripherality is compounded by thin transport infrastructures, that are vulnerable to disruption, and which provide minimal connectivity options. The PSO is equally crucial to each CSPR to provide high-quality connectivity access to external markets for trade and other inputs. It appears, however, that despite the similarity in economic and connectivity circumstances, differences exist in the quality of PSO service from each CSPR benefits, the level of support the regions receive from the central government, and the cost burden to local taxpayers.

The cause of these differences could be attributed to the circumstances at each CSPR. Firstly, Derry~Londonderry and Cornwall councils are the owners of the local airport and are responsible for providing the operating subsidies required

annually. Whereas Dundee airport is owned by the Scottish government which provides the airport subsidy, not the Dundee council (See appendix 5). Secondly, each region's airport faces different levels of competition from competitor airports. The leakage of demand for routes, including the PSO, affects the commercial performance of the local airports differently and, therefore, the level of subvention they each require. It does appear that there is an association between the increased level of funding Cornwall could afford, when the PSO contract was renewed, and the reduction in the level of subvention required by Cornwall airport. Whereas the decline in City of Derry passenger numbers has prevented it from improving its financial performance and, consequently, to reduce the subvention required from the LA. As the PSO service is the only regular scheduled service from City of Derry Airport, it is unlikely that Derry~Londonderry council would be able to reduce its dependency on central government funding support for the PSO (See appendix 6). Finally, differences in population sizes and boundaries mean there are differences to the cost of funding local taxpayer for aviation services (See appendix 7). Cornwall's population is almost four times larger than Derry~Londonderry's, and the council region and airport catchment area populations are the same. Meaning that the taxpayer and airport beneficiaries are the same populations. Whereas the population of the City of Derry Airport is four and a half times larger than the Derry~Londonderry council region population that is subsidising the airport and the PSO.

The regions are each reliant on the central government for funding support as the PSO would not otherwise be affordable. However, in addition to the impacts of each PSO from the local factors, there are also differences in the level of funding the central government provides for each region's PSO, and in the

number of years for which the funding is committed by it. The consequence of all these factors is that the greatest cost burden is placed on the Derry~Londonderry population, which is also contending with the most challenging economic, employment, and deprivation conditions, while also requiring them to subsidise the airport and the PSO service for the benefit of the wider population within the airport catchment area.

5.2 Stakeholder interviews

Stakeholder interviews were conducted to explore the two key issues identified through the literature review. Interviews were conducted with stakeholders from each of the case study regions (Table 23).

Table 5.20. Details of interview stakeholders

| | Stakeholder group | Region | Sector | Comment |
|----------|--------------------------|------------------|-------------------------------------|-------------------|
| 1 | Business community | Northern Ireland | ICT, creative, or another knowledge | CTO |
| 2 | Business community | Northern Ireland | ICT, creative, or another knowledge | CEO |
| 3 | Business community | Cornwall | Innovative goods or manu-services | Owner (Partner) |
| 4 | Local authority | Northern Ireland | Tourism, leisure, or hospitality | Managing director |
| 5 | Business community | Cornwall | Innovative goods or manu-services | Owner |

| | | | | |
|-----------|---------------------------|------------------|-------------------------------------|----------------------|
| 6 | Local authority | Dundee | | Councillor |
| 7 | Local authority | Cornwall | | Director |
| 8 | Business community | Cornwall | Agency | CEO |
| 9 | Business community | Northern Ireland | ICT, creative, or another knowledge | CEO & Owner |
| 10 | Business community | Northern Ireland | ICT, creative, or another knowledge | CEO & Owner |
| 11 | Business community | Dundee | ICT, creative, or another knowledge | CEO & Owner |
| 12 | Business community | Northern Ireland | ICT, creative, or another knowledge | CEO & Owner |
| 13 | Local authority | Dundee | Tourism, leisure, or hospitality | Regional director |
| 14 | Business community | Dundee | Tourism, leisure, or hospitality | COO |
| 15 | Business community | Dundee | Agency | CEO |
| 16 | Aviation service provider | | | Chairman |
| 17 | Local authority | Dundee | | Partnership director |
| 18 | Local authority | Cornwall | | CEO |
| 19 | Local authority | Northern Ireland | | Director |

| | | | | |
|-----------|---------------------------|------------------|-------------------------------------|--------------------|
| 20 | Business community | Northern Ireland | Agency | Regional director |
| 21 | Local authority | Dundee | | Head of Department |
| 22 | Local authority | Northern Ireland | | Councillor |
| 23 | Business community | Cornwall | ICT, creative, or another knowledge | Owner (Partner) |
| 24 | Aviation service provider | | | Contract director |
| 25 | Local authority | Northern Ireland | | Head of Department |
| 26 | Business community | Dundee | Innovative goods or manu-services | Owner |
| 27 | Business community | Northern Ireland | Innovative goods or manu-services | Owner |
| 28 | Business community | Cornwall | ICT, creative, or another knowledge | Founding director |
| 29 | Business community | Dundee | Innovative goods or manu-services | Company director |
| 30 | Local authority | Dundee | Tourism, leisure, or hospitality | Head of department |
| 31 | Local authority | Dundee | | Director |
| 32 | Business community | Cornwall | Tourism, leisure, or hospitality | Owner |

| | | | | |
|-----------|---------------------------------|--|--|-----------|
| 33 | Aviation service provider | | | Retracted |
| 34 | Aviation service provider | | | Retracted |
| 35 | Local authority | | | Retracted |

The first issue explored in the interviews was whether these stakeholders believed the CSPRs possess the conditions and capabilities necessary to achieve endogenous growth and whether they felt the location was affecting their businesses performance. The second was to understand if they believed the PSO was able to support their businesses in the way they required it to. The data collected, during the interviews, were analysed using Framework Analysis approach, developed by Ritchie and Spencer (2002). In determining which of the issues and themes that emerged were directly pertinent to the study, the analysis was guided by the conceptual framework (see figure 5), in which the key theoretical constructs, identified through the literature research, are presented.

Thematic findings from this analysis of the data collected through the interviews, are presented in this section of the chapter. The first set of themes are concerned with broad environmental factors relating to local conditions and policy issues. These are the reputational risk caused by peripheral location and mitigated by the PSO, a business environment whose main concern is recruitment, and policy approach that constrains the effectiveness of the service. The second set of themes are specifically concerned with technical issues and

include the failure to promote the route effectively, failings with the quality of the PSO service, and causes of constraints for or leakages of demand for the service. A final theme is concerned with the way in which business passenger demand is prioritised at the expense of tourism.

5.2.1 Policy and environment themes

Theme One: Locational reputation and PSO renewal caused risks

There was wide agreement amongst business interviewees that the primary issue they must contend with, that is due to their peripheral location, is the way in which it hinders their business development efforts (BC-Z-7, BC-Y-9, BC-X-17, BC-X-25, BC-Y-27, LA-Y-29, BC-Z-32). They described having to contend with a perception amongst potential clients, based solely on their peripheral location and not on any evidence of their prior performance, that they lack the necessary capabilities to satisfy their requirements or could provide the same level of ongoing support as firms from less peripheral regions:

“The main thing we have to overcome in our clients is getting them into the headspace that Cornwall actually is really easy to get to and we’re not all chewing hay and driving around in tractors... They sort of think that Cornwall is you know the middle of nowhere Hicksville... Who are they trying to sell to big brands like Jeep and Tesco?”

It is a recurring thing. We take that apart by virtue of the work that we’ve done around the country and their projects and the clients that we’ve worked with.”

(BC-Z-32)

In such instances, the PSO service was used to reassure potential clients that it was not so unusual for a sophisticated firm to be located in a peripheral place, as it was not as isolated as they perceive it to be (BC-Y-22, BC-Z-30, BC-Z-31).

There was similarly wide agreement, across the CSPRs, that if the PSO service was discontinued it would send a damaging message about the region being a serious business destination (LA-Y-1, LA-Z-6, BC-Z-7, BC-X-8, BC-A-11, LA-X-15, SP-Y-16, LA-Y-19, BC-Y-27, BC-Z-30, BC-Z-32). The damage to Derry~Londonderry if the London service was lost, which is typical of the sentiment expressed by the interviewees, was described as:

"It wouldn't be a signal of intent. Our strategic growth plan speaks about... additional GVA, a region on the rise, additional economic prosperity, tackling economic inactivity. You have that message on one side and that [discontinuing the air service to London] on the other. So, it would have jarred.

The London route is a bit of a bell weather, a beacon for wider stuff. That broader narrative around the region. We're trying to change that narrative of being a region on the ask to a region on the, look at the opportunity we can give government if you invest" (LA-Y-19).

The perspective of BC-X-8 is that access to international cities through a gateway airport is fundamental to Dundee's aspiration to be an international city. To lose such access, in the view of LA-X-15, would be like *"dropping the city down a division"*. According to BC-Z-7 and BC-Z-30 the fear, that this could be a reality,

is caused by a constant speculation within the community and the local press about the futures of the PSO service and the local airport.

The concerns about what the effects of losing the PSO could be, are, according to the insights from LA-Y-10 and LA-X-24, seemingly well-founded. The infrastructure and transport conditions in the CSPRs mean they are less likely to satisfy the location specifications of organisations looking to relocate parts of their business. While those organisations that would be prepared to consider a peripheral location are concerned that their lack of an established reputation as a business destination creates a degree of risk to their client relationships (BC-Y-3, BC-X-2, BC-Z-32).

“Competitors haven’t gone there before. Why be a pioneer in a new market? Will we be able to convince our clients that the product delivers, and service will be the same? Will we be able to preserve the culture of the organisation? Do we not want to be in the main city?”

One major challenge is the NW region is forgotten... People like to back winners and it doesn’t seem as though the NW has historically been a winning region, so it is very easy to not want to go there (BC-Y-3).

They regard the funding, support provided by the CSPR, as a way of sharing this risk burden and it is likely, even when a location choice is motivated by the opportunity to make a positive social contribution, that it would have been more difficult to consider the region without it:

“We got financial and other support from the local government that clearly has helped sway the balance. We didn’t do it just for the money, but by being able to get financial support it helps de-risk some of the financial risk. It’s really done in the spirit of partnership. But because of the culture of the company, we are more willing to take on that challenge.” (BC-Y-3).

Theme Two: Business environment

There was broad consensus amongst the business interviewees that the condition of the business environment in the CSPRs, regarding the business support and funding they could access, did not hinder their businesses’ performance or ambitions for growth (BC-Y-3, BC-Z-4, BC-Z-7, BC-Y-9, BC-Z-11, BC-X-21, BC-Y-22, BC-Y-27, BC-Z-30, BC-Z-32). Whilst there were no examples of occasions when a need for support had been unavailable or rejected, there were instances when interviewees acknowledged they could have benefited had they engaged more with the support that was available (BC-Z-7, BC-Z-11, BC-X-21, BC-Z-30). A view that was echoed by LA and business association interviewees, though they believed that the types of businesses that could benefit most from the available support were the least likely to access it (BC-Y-1, BC-Z-4, LA-Z-20):

“In some businesses there is a lack of ambition. There is a typical rural small business mentality that the horizons they look at are just not broad enough. Their knowledge of how to benefit from equity investment, to understand where to sell it.

Entrepreneurship has been thrust upon them rather than really driven... I do think there is mentality that has been slightly substance based and deviating from their business plan to chase pots of funding money... There has been a grant dependant mentality in some quarters.

Not receptive is the phrase I would use... there are thousands out there that do see it [business support] as applicable to them. They are not receptive to it. We call them the hard to reach because we just can't get to them." (LA-Z-6).

The interviewees from Derry~Londonderry, with an interest in regional development, appear to have a particularly heightened awareness of the need for higher levels of engagement amongst local entrepreneurs. They attribute, what they consider to be, the low levels of engagement to insularity or lack of external exposure and, therefore, do not fully appreciate what is necessary if their innovations and businesses are to succeed in a competitive global market (LA-Y-1, BC-Z-4, LA-Y-10):

"The further you get out from Belfast they really wouldn't have learned that scenario [to take managed risk]. If you're heavy dependant on domestic trade, you are not exposed to the competition international and you're not aware of what you need to do." (LA-Y-1).

Young people

A specific concern that emerged about the business environment, one that is shared by both LA and business community interviewees from all the CSPRs, is the difficulty they have in recruiting to graduate and early career positions (LA-

Y-1, BC-Z-4, BC-Z-7, BC-X-8, LA-X-15, BC-Y-27, BC-Z-30). They attribute this to young people being attracted by the “*bright lights of the city*” (BC-Z-8) for quality of life, education, or employment reasons and then being reluctant to return. Whilst BC-Z-30 and BC-Z-32 consider this to be a positive phenomenon because when they return to the region, they bring with them new skills and experiences, it seems that it doesn’t occur sufficiently frequently to meet the needs of most of the interviewees (BC-Z-7, BC-Y-9, BC-Y-12, BC-X-25, LA-Y-29, BC-Z-30). BC-Z-7 did note that while there are qualified and experienced candidates locating into the regions, it was their experience that these people tend to be at a different point in their career than the candidates they typically required.

The experiences of three interviewees responsible for business interest in Derry~Londonderry highlight how structural the challenge caused by the outmigration of young people is for peripheral regions and their development. BC-Y-9 had recognised at an early stage that Derry~Londonderry had an underutilised population of well-educated young people who, with an investment in their training and development, could be a source of talent for that organisation. This talent pool and relatively low local business costs made the city an attractive destination to locate part of their knowledge-intensive business. BC-Y-3 was one of the larger knowledge sector employers to subsequently locate to the city for similar reasons. They recognised that their entry, into the region, would increase competition for talent overall but believed this would in time lead to the formation of a cluster of other knowledge firms, which would be a positive development. LA-Y-1 and LA-X-10 described how the local authorities, development agencies, and educational organisations are since coordinating their efforts and working towards

a similar goal of developing locally the skills and capabilities required by knowledge sector employers.

As LA-Y-1 notes, many of the young people when continuing to higher education will choose universities elsewhere and are unlikely to return to the region to continue their careers. The implications of this for regional development were described above by BC-Y-12. By not returning home, or otherwise not choosing the region, young people are not bringing back with them the experience gained from exposure to different places and practices, and the soft skills they have developed. Skills and experience that are essential to knowledge sector firms with a global market and international clientele.

"It's probably specific to some of the roles that we are hiring for. If you recruit somebody who lives in Derry, has only worked in Derry, has only lived in Derry it's really difficult to train them to think, when you answer that phone the person on the other end could be based in Singapore. And you have to act in a certain way. Versus, if somebody is lived in Singapore or they've lived in Australia or all over, they kind of get that they need to adjust culturally. There's a lot more of a training ground for somebody who hasn't been." (BC-Y-12).

Theme Three: PSO policy

There was agreement amongst the interviewees who had participated in contracting PSOs of the need to prioritise the region's business passengers (LA-Z-6, BC-X-2, LA-Z-13, LA-X-15, BC-Z-31) and they entered the tender process with a route service criterion designed to satisfy their needs. However, the Derry~Londonderry and Dundee interviewees discovered on receipt of the tender

response that there was a gap between the cost of this specified level of service and the budget that was available to fund it (BC-X-2, LA-X-15, SP-Y-16). Consequently, they were forced to amend their expectations of the service to remain within the fixed budget amount (LA-X-15, SP-Y-16). Most notably, this involved removing a mid-day rotation from the specified schedule (LA-X-15, SP-Y-16).

Increasing the funding budget to match the cost of the service originally specified, is not an option. The local authorities had already committed as much as was affordable to the region, given the budgeting need to balance the cost of this with their responsibility to provide local services (LA-X-15, LA-Y-19). According to LA-Y-19:

“The fact that it does put [large sums] into the airport [meaning both the airport and PSO] is already prioritising it. But you can’t go beyond the point prioritising something, at the expense of what? Is it community services, leisure, parks or greenways, our other economic development work that is big in itself? It prioritised enough. It’s about 6% of our budget. It’s quite hefty as a one ticket item.” (LA-Y-19).

As noted by SP-Y-16, the lack of tender responses removed any prospect, there might have been to drive additional value from the budget by exploiting competition between airlines. The reasons for the limited interest in the PSO contracts are not known because a post tender review is not the practice (LA-Y-19). One reason suggested by SP-Y-16 is that the two-year duration of the

contract might be a deterrent to airlines, given the complexity of the tender process.

The budget challenges faced by CSPR local authorities (LA) mean that a PSO service is not affordable without central government funding support, via the DfT (LA-Z-13, LA-Y-15, LA-Y-19). However, the funding commitment made by the DfT to Dundee and Derry~Londonderry was for two years, even though the permissible period in the EU regulations is four, whereas it was four years for Cornwall (LA-X-15, SP-Y-16, LA-Y-19). The Dundee and Derry~Londonderry interviewees were unable to explain the reason for the difference, as they had not been provided with a reason themselves. Regarding the Derry~Londonderry route, any support from the DfT for a renewed PSO would be at a funding reduced level, with either the NI executive or the Local authority expected to make up the difference (SP-Y-16).

The proposed reduction in funding support, after the two-year period, was not predicated on an expectation of performance improvements in Derry~Londonderry's economic circumstances or of demand for the route, which would cause the level of support necessary to be reduced (LA-Y-33). When the proposal for the renewed Cornwall PSO was being prepared at the same time, there was no requirement from the DfT to demonstrate the wider economic benefits that had been achieved because of the first PSO, or that would be gained from its renewal (LA-Z-13). Rather, it was understood to be about bringing the ratio of DfT funding in line with that for Cornwall and Dundee:

“I think it's reflective of what happens in other areas... There would be an expectation in terms of the business case in terms of the submission the airlines have made that there would be a higher level of uptake at the end of the second year than there was at the first year. That their yield would be better at the end of the second.

So, the situation is expected to improve. But I don't think it's going to improve to the point where it doesn't need support. It might need slightly less support, but not significantly less support for it to operate.” (SP-Y-16).

The interviews were conducted at a time when the NI executive was not functioning and, therefore, unable to make spending decisions, including about the PSO. LA-Y-19 was clear that the LA could not afford to make up the difference and by expecting it to would instead put the futures of the PSO and, consequently, the local airport at risk.

5.2.2 Technical themes

Theme Four: Route promotion

There was no expectation on the part of the LA that the route, or region, would be promoted by the airline. In fact, according to insights from SP-Y-16 and LA-Y-33, the expectation in Derry~Londonderry was that other than exploiting the route launch by the airline for publicity, the route would be promoted by the local airport. Though BC-X-2 and LA-Z-6 believe that the airline, operating the route to their regions, could do more to promote it to their own business users in and around their London base.

However, the attitude towards air transport connectivity, expressed by BC-Z-7, BC-Y-9, and BC-Z-11, is it is akin to any other business utility and the value to them is the same as the internet, and should be similarly promoted. BC-Z-7, BC-X-25, and BC-Z-30 concede that their perception of the air service, irrespective of the PSO funding, is it would be the most expensive transport choice and they would use it only for the most critical of business trips. If the service were to be promoted to them as are their other utilities, and which it is not, they might be persuaded to use it more frequently. In contrast to this, however, BC-Z-11, BC-Y-22, and BC-Z-32 took the view that the way in which the airlines managed the pricing of fares, the standard revenue management practices used across the sector, dissuaded them from using the service:

“Sometimes you can’t book that far ahead to get the cheap flights and you have to be there in a matter of days and it’s still cheaper to spend three hours getting up to Belfast.” (BC-Y-22)

It seemed to them that, given the lack of alternative options, when airlines increased fares when demand was high, they are exploiting a captured market. Given the circumstances of connectivity in peripheral regions, they believed airlines should instead respond by increasing capacity, or avoid large fare ranges so they could plan more effectively:

“I was looking at a flight to get to a conference I was going to go to I looked at the flights four weeks in advance. Normally four weeks in advance you can get a flight for about £30 or £40 quid. This time because there were only two seats left it was £101. I paid the price, but it didn’t stop me being irritated about it. At the end of the day, the plane is just an air version of a bus.

If I have the time and the price of the flight is redisclose, then I'm going to go by car. Purely for that reason.

If you can charge a flight for £35 one day and then charge it for £100, then obviously can afford it for thirty £35.... I'm a big believer in fair business, which is why I say I'd quite happily pay and meet you in the middle all the time and it be that every single time than having this uncertainty about how much it's going to be today.” (BC-Z-11).

Theme Five: Quality of the PSO service

There was a broad consensus that the quality of the PSO service did not satisfactorily fulfill the interviewees' connectivity requirements. The first issue with the PSO service is that of network reach, caused by a combination of the PSO service not flying directly to the UK destinations they require, and the London airport also not being able to facilitate easy onward connectivity to these destinations and to other national or international destinations. BC-X-25 was satisfied they could access the international destinations they required through a combination of Edinburgh and Glasgow airports networks. However, according to BC-X-8 and LA-X-15 these airports offer only a solution in part and do not fully satisfy the full needs of the region, because neither are hub airports with the necessary reach or network access.

There was also some disappointment in Dundee that the Amsterdam route was discontinued, because of the Network that could be accessed through Schiphol airport (BC-X-2, BC-X-8, LA-X-15). This service had the added benefit

of commencing the international leg through the smaller, therefore quicker, and more convenient, Dundee airport and only having to transit in Schiphol (BC-X-21, BC-X-25). The Derry~Londonderry interviewees used Dublin International Airport as a substitute to the PSO, as Stansted does not provide the network access they need (BC-Y-12, LA-Y-19).

There was a high level of enthusiasm amongst BC and LA interviewees for a Heathrow flight from the region, which was described by BC-X-2 as *“the holy grail”*, because of the access to London and onward connections:

“Because of the virtually unlimited places you can go. I’d rather fly into Heathrow and then Heathrow pretty much flies to every single country in the world, almost. I think you’ve just got a lot more flexibility in Heathrow.” (BC-Z-11).

To this end, LA-X-15 described how the region was doing everything it could to ensure it was *“Heathrow ready”* in anticipation of the third runway.

A second issue interviewees had with the level of service was the infrequency of daily flights and, in particular, the lack of a mid-day rotation (BC-Z-4, BC-X-8, LA-Z-14, LA-X-15), though this was only amongst Derry~Londonderry and Dundee interviewees, as Cornwall was already benefitting from one. The lack of a midday flight made interviewees feel as though they were wasting time while away on business trips, either waiting for the evening service or having to arrive at the destination earlier than was ideal.

“When you have a twice daily service it’s not terribly convenient for those who are not doing a standard business day and there are challenges. If you are finished at midday, a lot of people don’t want to hang around till 7:00pm to get the flight back. If that time is important to you, then you’ll go to Edinburgh and get one of the early afternoon flights back.” (LA-X-15).

The unease with the frequency of the service is compounded further by quality-of-service aspects. Issues such as the frequency of delays caused by weather or the aircraft sitting for long periods waiting to depart, which according to LA-Z-13 was due to ATC management of the slower type of aircraft used; longer flight times, compared to when the route was served by jet-engine aircraft (BC-X-21, BC-Y-22); aircraft cabins that are too small to comfortably use laptops during the flight (BC-Z-32); departure gate issues, such as unnecessarily strict security arrangements at the smaller local airport (BC-Z-32) or seemingly being the farthest in the Larger London airport (LA-X-15).

The implications of a minor detail like this, however, meant allowing more time to make the flight which in turn, because of the lack of alternative options, meant either curtailing the day’s business or staying over for an extra night, as well as the additional travel expenses either side of the flight:

“If you add up all the airport parking, the Gatwick express, the this, that, and the other, you can add about 70, 80 quid onto the cost of the whole journey. Which is a bit frustrating, but it really racks up the cost.” (BC-Z-30)

Theme Six: Service quality effects on outbound and inbound PSO demand

Outbound passenger costs

The interviewees demonstrated their willingness to look further afield for alternative travel options when they consider the PSO service quality to be unsatisfactory or the fares to be poor value, or unaffordable (BC-Y-3, BC-Y-9, BC-Z-11, BC-Y-22, BC-X-25). According to insights from Dundee and Derry~Londonderry interviewees, this involved travelling to airports farther afield. In the case of Dundee, this was to Edinburgh or Glasgow airports. In the case of Derry~Londonderry, it was to either of the Belfast airports or Dublin International airport. The advantage that Dublin offered, in addition to being a hub airport, was customs and immigration pre-clearance on flights to the United States. However, whilst the Belfast and Dublin airports were options in the short term, they incurred additional costs of their own:

“One of the biggest challenges is that we are in this location that’s just so far away from everywhere else, and it’s so expensive for the flights from Derry airport as well. And the times aren’t great. So, we will sometimes have to get a three in the morning bus from Derry to Belfast to get on a 6:15 flight to get into London at eight o’clock in the morning. You will get it much cheaper than if you just go the seven o’clock flight from Derry into London.

Of all the flights we have taken I’d say a third of them we flew out of Derry and the other two-thirds are out of Belfast. We don’t rely on that Derry connection; we are using Belfast to get to those places [our markets]. So, yes definitely [we would

want to be able to rely on the Derry flight more]. *It just kills us getting that bus, up at three in the morning. You could be over there for two days, but you are just knackered because you've had that really early start.*" (BC-Y-22).

Costs that the interviewees were uncomfortable subjecting their staff to in the short term and less willing to continue to incur in the long term (BC-Y-3, BC-Y-9, BC-Y-12, BC-Y-22, BC-Z-30, BC-Z-32). These costs, to themselves and their employees, included: particularly early starts or finishes to a working day; the increased likelihood of disruption to their travel arrangements, because of the additional legs; and the added time and money cost associated with the additional legs:

"It was the cost of the local people on their families because they'd have to get up at stupid o'clock in the morning, to drive to Belfast. See after about the 20th November to the 20th of March, this part of the world is terrible for fog on the Glenshane, snow, and ice on the Glenshane Pass. You have to go through that it that's dangerous... so that became a real problem." (BC-Y-9).

There were two types of responses to these costs amongst the interviewees, both of which could have a negative impact on the economic performance of the region and the demand for the PSO service. Either the interviewees have an attachment to the region and do not, therefore, anticipate relocating their business to a better-connected area, or they are unlikely to be willing to continue to incur these costs as frequently and this would, in turn, limit the growth potential of their business:

“It’s exhausting. Getting up at that time of the morning really takes it out of you and there’s only so much of it I would do. So yes, yes it would mean that it would limit the amount we could do” (BC-Y-22).

Or they would relocate more of their senior staff, who would need to travel more frequently, to offices in Belfast (BC-Y-3) or London (BC-Y-9, BC-Y-22, BC-Z-32) where they have better air transport connectivity options:

“The biggest implication for growth is we had committed to somewhere in the neighbourhood of 300 people initially. I don’t think we’ll ever get above 150 at most... we’ve had to redefine the nature of the roles; we’ve had to really look at the operational model for the region to create some success. If you look at the planned bottom line, it has taken us longer to get there as we’ve had to hire more talent here [in London].” (BC-Y-12).

According to the Cornwall interviewees they would, depending on the need to travel, substitute the PSO air service with either the rail service to London or to drive:

“It’s not so much the flights taking time, it’s the rigmarole around it. I turned at Newquay airport with 45 minutes until the flight was supposed to take off... but they told me I couldn’t get on the plane. I had to leave and get in the car and drive immediately to London and I ended up beating what my time would have been into central London.

So, it makes you think why I am flying because it takes so long. If I start from my house I've got twenty minutes from my house, an hour and a half in the airport if you turn up on time and do the requisite time in departures, the flying times pretty quick, then you are out, waiting for the buses, then you've got to get a ticket for the Gatwick express and if there's a queue that can take fifteen or twenty minutes, then the direct one into Victoria is twenty or twenty-five minutes, then if you are going to the city, for instance, you have still got to get across town. Logically there's no reason to get the flight, it just feels quicker.” (BC-Z-32).

In addition to arriving more conveniently to the heart of London, BC-Z-7, BC-Z-30, and BC-Z-31 believe that rail enables more productive use of their journey time, because they can plan more efficient trips, they can comfortably conduct meetings with colleagues en route, or they are able to get meaningful amounts of work completed. For instance, when BC-Z-7 is joining colleagues on the trip:

“It's actually quite convenient for us to jump on a train because the timings are comparable. By the time you've got yourself to the airport and got yourself through security, the timings aren't that far off. We can have all the necessary conversations on the journey into London...the cost is comparable, and the convenience is far greater.” (BC-Z-7).

Though BC-Z-7 did note that if they were travelling alone, they would be more inclined to use the PSO, because of their own proximity to the airport relative to the mainline railway station.

Inbound passenger demand constraints

There was a broad consensus across interviewees from each of the CSPRs that the quality issues they experienced were as problematic, if not more so, for inbound passengers. While LA-Y-19 from Derry~Londonderry regarded the proximity of Dublin airport as an asset to the region, they still considered a PSO service to London Heathrow to be the ideal airport, not only because of the more convenient access to London itself and the access to Heathrow's extensive international network but because it would also mean that passengers could purchase a ticket to Derry~Londonderry from anywhere in the world, which would be invaluable to the region's international ambitions. The interviewees believe, however, that the current quality of air transport connectivity from London to the CSPRs does mean the regions are missing out on business and investment opportunities. LA-Y-10 described how investors are deterred by poor connectivity from visiting a particular region, when assessing candidate destinations:

"I have a software engineering company coming in from London, say, and it's the CTO, CFO, and CEO. To get those three on the one plane at the same time is a feat in itself. We'll be in on the 9 am to Belfast and going out at five. We want to see this, this, this, and this. Where those examples are is bunched in and around Belfast. You have a time frame they have given you of say 6 hours. Some of the companies could be in Derry, but if they come in on a Belfast flight and you are taking them there, you are killing three hours with travel, you are going to see less and there will be better examples in the Greater Belfast Area." (LA-Y-10).

The critical importance of connectivity in facilitating FDI was described by BC-Y-9 as:

"I would go so far as to say that access to this market for inward investment is critical, absolutely critical... You have someone coming from Atlanta, lands in Dublin, has that drive, don't think so. Belfast to here is an hour and a half, two hours, I don't think so... If there wasn't the easy access, there are so many other places you can go that will give you easy access. You go to senior execs and say what's the biggest thing on their mind and it's time. It's not money, it's time.

The vast majority of corporate 'bods', that I know off, don't want to have to explain it away. It is far easier to say Belfast or Dublin... The more hurdles you give them to step over the chances are it won't happen... It's to do with a path of least resistance... Once you put something to step over, it's another reason why they won't do it." (BC-Y-9).

According to BC-Z-7, BC-Y-9, BC-Y-12, BC-X-21, and BC-Z-30, the London airport has a significant influence on their ability or willingness to invite clients or staff to visit their offices. BC-Y-12 believes that visits to their offices in Derry~Londonderry, because of the character of the building and their employees, could be advantageous business development or client relationship tool. However, such visits in the past had required their guests, who were travelling from different cities across Europe, to take different journeys arriving on the PSO via London, or by road via Belfast, London, and Dublin airports. Since then, regrettably, they have stopped making these invitations because of the complexity involved in coordinating such travel arrangements and the poor-quality experience this created. However, as BC-Y-9, BC-Y-22, and BC-Z-30 described, this problem is not limited to groups:

“We do have clients in Japan who really don’t want to come and visit us because they land in Heathrow and, although it’s a 45 min transfer in a car, it takes you 45 mins to get through terminal five. I’m in dialogue with a Taiwanese company. I’ve met the CEO in London because he flies into Heathrow. If he could fly to Newquay from Heathrow he could hop on a plane and it would only be another 40 mins. But having to do another hour and so transfer to get to Gatwick, stops him.” (BC-Z-30).

5.2.3 Tourism development

Theme Seven: Business traffic prioritised at the expense of tourism

A notable feature of the interviews was the absence of themes relating to the deployment of the PSO in support of tourism business development in the CSPRs, despite the importance of tourism to the development of the region being understood (LA-Y-1, LA-Y-5, BC-X-8, LA-X-23, LA-X-26). The two tourism markets commonly identified as important by the interviewees, who had an interest in tourism development in the regions, are London and the South East in England and inbound international tourists:

“London and the south east are our top generating area and is our top target area for English travellers to Scotland, by far.” (LA-X-23).

There is also a common recognition that these are competitive markets for the CSPRs to grow their market share:

“The thing is, it’s everybody’s top target. So, if you were to ask the Irish and the Welsh and the English regions, they would say the same thing, so we are in massive competition with international destinations.

An extra benefit of an airport within the region is facilitating inbound traffic:

“With all the development taking place in Dundee the ambition is that tourism will grow. The airport has a role in that.” (LA-X-26).

So, it’s very important to try and bring those overseas international visitors to the region... Probably the way they’ll come usually is by air. Then it’s moving them from those gateways into the region... At the moment, people are coming in a different way and are having to take two kinds of leaps to get here or the venue.” (BC-X-8).

“Particularly in terms of the city break market... if there were direct flights available between London and Dundee that were affordable, I can imagine they would be quite popular. Particularly with the culture-arty down in London wanting to come up and see the new VA and the highlands.” (LA-X-26).

Despite this, however, there did appear to be an acceptance of the fact that business traffic was the priority of the PSO service, which constrained the opportunity for it to support tourism development:

“It’s essentially a business link with the opportunity to tag on some weekend breaks from London.” (LA-X-24).

The effect of which is that the service does appear to fulfil the needs of tourism development in the region:

There are issues to do with the timings of it and whether it is there as a business route or a tourism route. There is a question of onward connectivity to international flights, which is often a challenge for City or Stanstead. I suspect that ninety-nine percent of people don't even realise there is an airport in Dundee." (LA-X-26).

"So, it's a regularity and building up the market. We are missing out on that opportunity. You have to plan to make sure... You can't just nip up." (BC-X-8).

It appears, therefore, air connectivity in general and the PSO in particular are effectively discounted as assets to be used in the development of tourism exports:

"The route into Derry is important, but it's not right up there. Our key market is international markets as opposed to GB. It's a hop-on from London, but it's coming back to, it's a small plane. It's the capacity." (LA-Y-5).

"Where the opportunity is, there is an opportunity to increase the visitors to Dundee using the airport... I do think tourism could be used to strengthen the case for more leisure, tourism flights in for the airport."

It wouldn't damage the tourism as it is now, but it would damage the ambitions for the future." (LA-X-26).

On completing research stages one and two a range of issues, relating to the PSO and what conditions are needed for it to make a greater contribution to the economic growth of a region, had been identified. These could be categorized

as relating to policy decisions, or as those concerned with technical aspects of the PSO service. The technical aspects are attributes of the PSO services that are the product of policy decisions, which from what the passenger encounters. These service attributes formed the basis of the next stage of field study and are described in detail in the next section of this chapter. The implications of the policy themes form part of the discussion that is presented in chapter seven.

5.3 Stage three: questionnaire

The final section of the chapter presents the findings of the third stage of the research, the survey questionnaire. The survey was designed so that two aspects of the PSO could be assessed. The first aspect was to assess what level of importance the participants attached to the eleven attributes of the PSO, that had emerged through the stakeholder interviews, as potentially being of high importance. The second aspect was to measure the level of satisfaction amongst the cohort, with the performance of the PSO, regarding these same eleven attributes. The attributes are presented in Table 24. These attributes were chosen to be surveyed as they are features of the service, that could have a direct or indirect impact on, current and latent, users’ perceptions of the PSO. The remaining themes from the stakeholder interviews are issues concerned with the decisions of policymakers that affect the way in which PSOs are imposed, and these are reviewed in the discussion chapter.

Table 5.21. Survey questionnaire attributes

| Attributes | |
|------------|---|
| 1 | Departs from the airport that takes the shortest time to travel to. |

| | |
|-----------|--|
| 2 | Arrives at an airport most convenient for London. |
| 3 | Arrives at an airport most convenient for catching onward flights. |
| 4 | The frequency of flights can fulfil most air travel needs. |
| 5 | Departure and return times make it simple to minimise the time spent on a trip. |
| 6 | The cost of fares does not restrict air travel to only the most critical trips. |
| 7 | We are made aware of ticket deals and fare promotions. |
| 8 | Suitable flights will be available for trips planned at short notice. |
| 9 | The service makes traveling to this region as convenient as it would be to any other region. |
| 10 | Reassure clients, investors, or partners, that location does not negatively affect capabilities. |
| 11 | It will provide confidence in the long-term future of air services to and from this region. |

The analysis of the survey responses followed two stages. The first stage used descriptive statistical analysis to calculate values for importance and performance and to measure the dispersion of responses. The second stage was to use Importance-Performance gap analysis to categorise responses according to the nature of the relationship, between the values for Importance and Performance. The findings indicate that there is strong agreement amongst the cohort about the high level of importance to them of these attributes. There is also a high level of agreement that the performance of the PSO is not satisfactorily fulfilling their expectations of them.

The Importance-Performance gap analysis (IPA) made it possible to categorise the attributes into four groups according to an order of priority by which they need further attention from policymakers, if the PSO is to better fulfil the needs of passengers. According to the IPA, only three of the attributes could be categorised as 'keep up the good work' with any certainty. None of the attributes

could be considered as of low importance to the cohort or to be over-delivering against expectation.

5.3.1 Demographic information

There were 36 responses to the questionnaire. These had been distributed amongst those that had participated in the stakeholder interviews, or who had been prepared to but were prevented by busy schedules. Demographic information about the respondents is presented in Table 25. The responses are divided into groups in three different ways. The first is to group responses according to which CSPR the respondent is located, the second is to group them according to the stakeholder group (SHG) they represent, and the third is by the industrial sector they are involved with. Analysis was completed for each of these groups at each stage, apart from the 'Airline and airport service provider' SHG and the 'Tourism, leisure, or hospitality' industrial sector because of the very small number of responses. These responses, however, are included within the ALL responses analysis.

Table 5.22. Survey responses demographic information

| | Count | Percent (%) |
|-------------------------------------|-------|-------------|
| All responses Total | 36 | 100 |
| Case study region | | |
| Derry~Londonderry | 12 | 33.3 |
| Cornwall | 12 | 33.3 |
| Dundee | 12 | 33.3 |
| Stakeholder group | | |
| Airline or airport service provider | 2 | 5.6 |
| Business community | 25 | 69.4 |

| | | |
|-----------------|---|------|
| Local authority | 9 | 25.0 |
|-----------------|---|------|

5.3.2 Survey analysis stage one: descriptive analysis

Distribution of responses

The first step of the descriptive analysis was to measure the frequency of the responses for each of the attributes, for importance (IMPT) and performance (PERF), and the frequency with which the response is the same for IMPT and PERF. The survey question asked the participants to assess the importance of the PSO attributes on a 5-point scale from 5, very important, to 1, unimportant (See appendix 8). 54% of all IMPT responses, for all attributes, are for 5, and 91% were ≥ 3 . 6% for 3, and 3% are ≤ 3 . This can be seen in Figure 19, in which green represents ≥ 3 , amber is equal to 3, and red is ≤ 3 . Attributes Seven [*Promotions*], Three [*Onward connections*], and Eight [*Short notice*] have the fewest number of responses ≥ 3 . Attribute Seven stands out as having the lowest number of responses ≥ 3 , 58%, the highest for 3, 25%, and ≤ 3 , 17%. The next lowest is attribute Three, with 83% of responses are ≥ 3 , 14% are for 3, and 3% are ≤ 3 . Attribute Eight is the only other attribute with fewer than 90% of responses ≥ 3 , 89%. It has 11% responses for 3 and ≤ 0 . The remaining attributes have between 92% and 100% of responses ≥ 3 .

Figure 5.13. Distribution of IMPT. response values

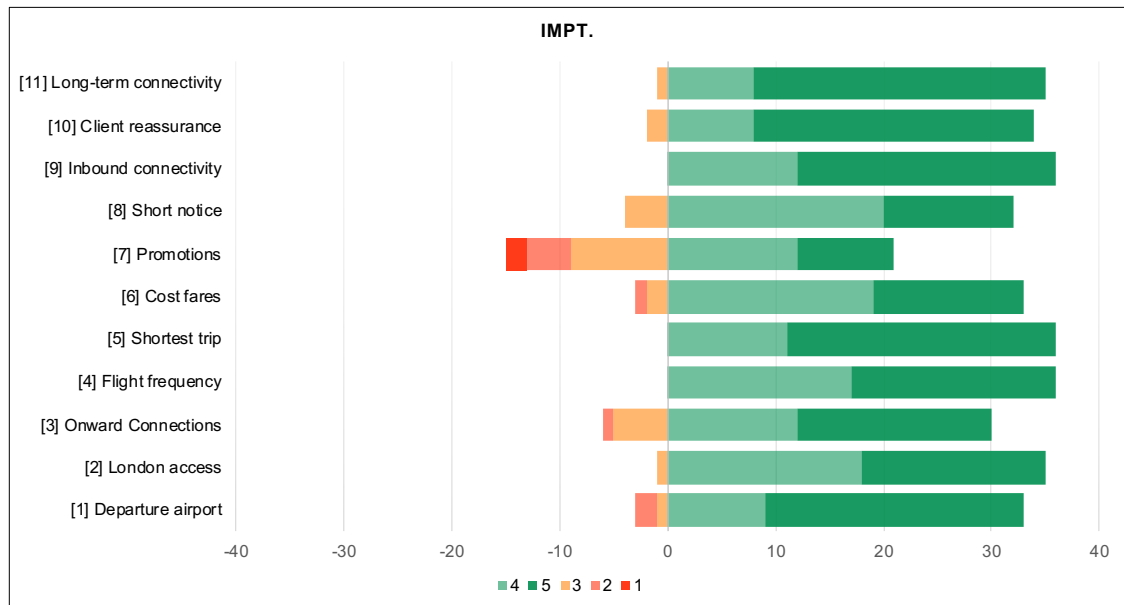
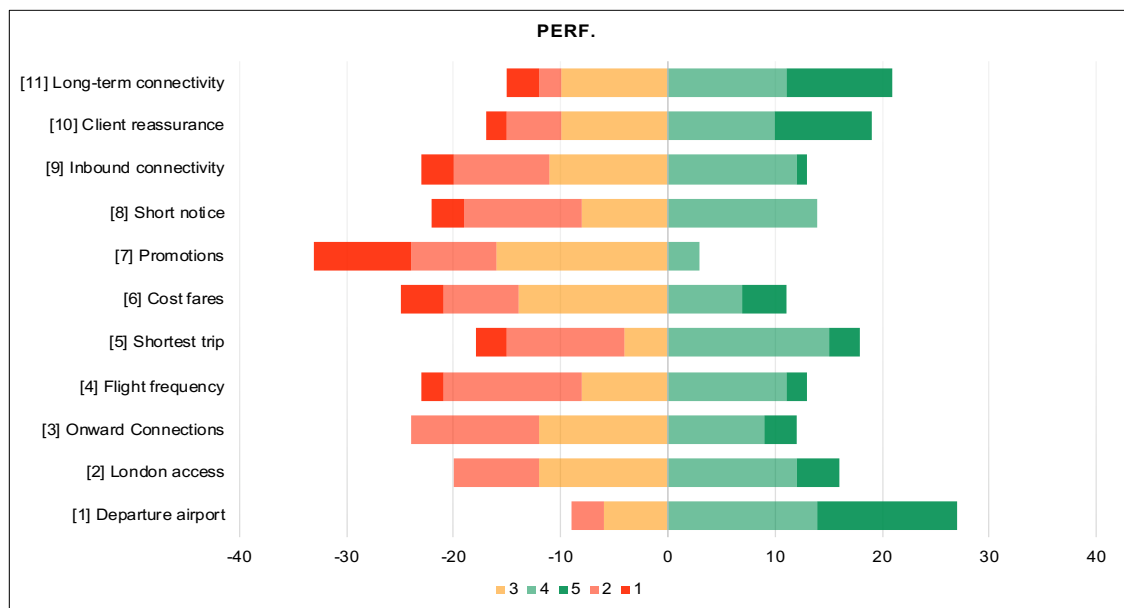


Figure 5.14. Distribution of PERF. responses



The distribution of PERF. response values can be seen in Figure 20. A higher proportion of the PERF. responses are for the lower values. 58% of all responses are equal to or <3, with 30% equal to and 28% less than. There are 49% fewer PERF responses >3 than there are for IMPT. Attribute One [*Departure airport*] has the highest number of responses, 75%, >3 and attribute Seven [*Promotions*] has the lowest, just 8%. The remaining attributes range between

31%, for attribute Six [*Cost fares*], and 58%, for attribute Eleven [*Long-term connectivity*]. Attributes Five [*Shortest trip*] and 11 [*Long-term connectivity*] have the lowest responses equal to 3, with 11% and 17% respectively. The remaining attributes range between 22%, for attributes Four [*Flight frequency*] and Eight [*Short notice*], and 44% for Seven [*Promotions*]. One [*Departure airport*], Eleven [*Long-term connectivity*], and ten [*Client reassurance*] have the lowest number of responses <3, with 8%, 11%, and 19%. The remaining attributes range between 22%, for attribute Two [*London access*], and attribute Seven [*Promotions*], with the highest number of 47%.

The proportion of IMPT responses that are for high values indicates that the participants agree about the importance of the PSO attributes surveyed. The nature of the gap, between the responses for importance and performance, further indicates a high level of dissatisfaction with the performance of the PSO service regarding these attributes. However, as Figure 20 illustrates, while there is agreement amongst the participants about the performance of the PSO overall, the degree to which they agreed varies across the attributes.

To better understand these variations and whether they differed when the participants' responses were grouped by CSPR or stakeholder group (SHG), mean averages were calculated for IMPT and PERF responses and the distribution of responses was calculated using standard deviation (SD). An IMPT-PERF Gap value was calculated by subtracting the IMPT mean value from the PERF value.

Central tendency and variability

Mean averages were calculated for ALL responses, responses grouped by CSPRs, responses grouped by SHG. Mean values were calculated for two different dimensions of the responses. The first was an Overall mean of means. The mean of each participants responses to all eleven attributes was calculated and the mean of all 36 participants means was calculated to provide the mean of means. This was done for both IMPT and PERF (Table 20). The IMPT-PERF Gap is the IMPT mean subtracted from the PERF mean. The second dimension was to calculate a mean value for each attribute, which was a mean of all 36 responses for that single attribute.

Overall, for all responses

The overall IMPT mean is 4.42. This ranges by 1.45, from 5.00 to 3.55. The overall SD for all IMPT means is 0.369. Suggesting a high degree of agreement amongst respondents about the importance of the PSO Overall. The Overall mean for PERF is 3.17. This ranges by 2.82, from 4.36 highest to 1.55 lowest (Table 26). The overall SD for PERF is 0.742. The mean range and SD for PERF that are twice that of IMPT suggests a wider range of opinions about the performance of the PSO. Although the PERF range of mean values is below that of IMPT and, consequently, there is a large gap between the IMPT and PERF overall means, of negative (1.25). The IMPT-PERF Gap range is by 3.00, from 0.09, the only one positive value, to (2.91). The SD is 0.805 and although this is consistent with a wider number of opinions on the level of performance, the means is still clearly within the negative range.

Table 5.23. Mean values for All responses and responses by group

| Groups | IMPT. | PERF. | Gap |
|--------------------|-------|-------|-------|
| All responses | 4.42 | 3.17 | -1.25 |
| Derry~Londonderry | 4.36 | 3.33 | -1.02 |
| Cornwall | 4.45 | 3.20 | -1.26 |
| Dundee | 4.46 | 2.99 | -1.47 |
| Business community | 4.46 | 3.13 | -1.33 |
| Local authority | 4.41 | 3.31 | -1.10 |

Grouping the responses into CSPRs and SHG does not cause this pattern to change (Table 27). The IMPT means range by 0.11, from 4.46 to 4.36. Dundee, Cornwall, and the business community group are marginally higher larger than for All responses, and Derry~Londonderry and the Local authority group are marginally lower. The SDs range by just 0.13, from 0.44 to 0.31. The PERF means the range is 0.34, from 3.33 to 2.99. Cornwall, the local authority group, and Derry~Londonderry are higher than All for All responses, and Dundee and the business community group lower. The SDs range by 0,193, from 0.81 to 0.62. The IMPT-PERF Gap is slightly wider again, ranging by 0.45 from (1.02) to (1.47). Dundee and the business community group, which have the lowest overall PERF means, are above the All responses mean, Cornwall is equal to it, and Derry~Londonderry and the local authority group are below it.

Table 5.24. Range and SD values for All responses and responses by group

| Groups | IMPT. | | | | PERF. | | | | Gap | | |
|---------------|-----------|-----------|-------|------|-----------|-----------|-------|------|-----------|-----------|-------|
| | Min value | Max value | Range | SD | Min value | Max value | Range | SD | Min value | Max value | Range |
| All responses | 3.55 | 5.00 | 1.45 | 0.36 | 1.55 | 4.36 | 2.82 | 0.74 | -2.91 | 0.09 | 3.00 |

| | | | | | | | | | | | |
|-----------------------|------|------|------|------|------|------|------|------|-------|-------|------|
| Derry~ Londonderry | 3.55 | 5.00 | 1.45 | 0.44 | 2.09 | 4.36 | 2.27 | 0.70 | -2.91 | 0.09 | 3.00 |
| Cornwall | 3.91 | 5.00 | 1.09 | 0.31 | 2.00 | 4.36 | 2.36 | 0.67 | -2.45 | -0.18 | 2.27 |
| Dundee | 4.00 | 5.00 | 1.00 | 0.32 | 1.55 | 4.18 | 2.64 | 0.80 | -2.91 | -0.45 | 2.45 |
| Business community | 3.55 | 5.00 | 1.45 | 0.35 | 1.55 | 4.36 | 2.82 | 0.61 | -2.91 | 0.09 | 3.00 |
| Local authority | 3.73 | 5.00 | 1.27 | 0.39 | 2.36 | 4.18 | 1.82 | 0.79 | -2.18 | -0.27 | 1.91 |

Individual attributes for All responses

The IMPT mean for each attribute is >4, except for one. The means range by 0.50, from 4.72 to 4.22. The SD for all responses for each attribute ranges by 0.37, from 0.83 to 0.46. Attribute Seven [*Promotions*] has the lowest mean of 3.61 and an SD of responses of 1.17. Attribute Eleven [*Long-term connectivity*] has the highest mean value, 4.72. Attributes Five, [*Shortest trip*], and attributes Nine [*Inbound connectivity*] and Ten [*Client reassurance*], have the next highest means, with 6.69 or 4.67. Attributes One [*Departure airport*] and Four [*Flight frequency*] each with a mean of 4.53. The PERF means are all <4, with the expectation of one attribute. They range by 1.67, from 4.03 to 2.36. and the SD range is 0.23. This is lower than for IMPT, but with higher values from 1.18 to 0.93. Attribute One [*Departure airport*] is the only attribute with a PERF mean >4, with an SD of 1.10. Attributes Eleven [*Long-term connectivity*] and Ten [*Client reassurance*], which had the highest means for IMPT, have the next two highest PERF means, of 3.64 and 3.53. They and attributes Two [*London access*], Five [*Shortest trip*], Three [*Onward connections*], and Six [*Cost fares*] have means > 3.

Attributes Nine [*Inbound connectivity*], Four, [*Flight frequency*], Eight [*Short notice*], and Seven [*Promotions*] have means are <3. Consequently, except for attribute One [*Departure airport*], all attributes have negative IMPT-PERF Gap that are > (1). Ranging from (1.08) to (1.69). Attributes Nine [*Inbound connectivity*], Five [*Shortest trip*], and Four [*Flight frequency*] have the largest IMPT-PERF Gaps of (1.69) and (1.58). The attribute One [*Departure airport*] gap is (0.50). Then Eleven, Two [*London access*], and Ten [*Client reassurance*], are (1.08), (1.11), and (1.14). The remaining attributes are between (1.22) and (1.31) (Table 28).

Table 5.25. Mean Values for individual attributes

| Attribute | | IMPT. | PERF. | Gap |
|-----------|--|-------|-------|-------|
| 1 | Departs from the airport that takes the shortest time to travel to. | 4.53 | 4.03 | -0.50 |
| 2 | Arrives at an airport most convenient for London. | 4.44 | 3.33 | -1.11 |
| 3 | Arrives at an airport most convenient for catching onward flights. | 4.31 | 3.08 | -1.22 |
| 4 | The frequency of flights can fulfil most air travel needs. | 4.53 | 2.94 | -1.58 |
| 5 | Departure and return times make it simple to minimise the time spent on a trip. | 4.69 | 3.11 | -1.58 |
| 6 | The cost of fares does not restrict air travel to only the most critical trips. | 4.28 | 3.00 | -1.28 |
| 7 | We are made aware of ticket deals and fare promotions. | 3.61 | 2.36 | -1.25 |
| 8 | Suitable flights will be available for trips planned at short notice. | 4.22 | 2.92 | -1.31 |
| 9 | The service makes traveling to this region as convenient as it would be to any other region. | 4.67 | 2.97 | -1.69 |
| 10 | Reassure clients, investors, or partners, that location does not negatively affect capabilities. | 4.67 | 3.53 | -1.14 |
| 11 | It will provide confidence in the long-term future of air services to and from this region. | 4.72 | 3.64 | -1.08 |

Individual attributes for CSPR and SHG groups

As with the overall means, separating the responses by CSPR or by SHG group does not reveal a significant deviation to the pattern that has emerged (Table 23). The IMPT mean of all attribute means for All responses is 4.42 and they range by 1.11. The IMPT mean values remain similar to these when the participants are separated into respective CSPRs and SHG. The mean of attribute mean ranges for the groups by 0.11, with Cornwall and Dundee and the business community SHG means being greater than for All responses, and Derry~Londonderry and local authority being lesser than. The range from the max to min means for the CSPRs and SHGs is like that for All responses. Within this, however, Derry~Londonderry is the only group with an attribute mean, other than Seven, <4.00. The value is 3.75, which is 0.56 less than the next value for Seven. It could be that this reflects that the region has access to Dublin hub airport that is more convenient for Heathrow.

The PERF mean of attribute means for All responses is 3.17 and attribute averages range by 1.67. This ranges for the different groups by 0.40, which is slightly greater than for IMPT, from 3.38 to 2.99. This wider gap is largely due to the local authority group having the highest averages for eight of the eleven attributes, and therefore, a mean of means 0.21 greater than for All responses. Plus, the Dundee CSPR having means for attributes Four [*Flight frequency*], Eight [*Short notice*], and Eleven [*Long-term connectivity*] that are markedly lower than they are in the other groups. The IMPT-PERF Gap mean of attribute means is (1.25) and these attributes averages range by 1.19. The local authority group, which has the highest PERF values, has the lowest IMPT-PERF Gap mean, of (1.01). Derry~Londonderry and Cornwall mean of means are also less than All

responses. The business community SHG and Dundee, which is 0.22 greater than for All responses, are both higher.

Table 5.26. Mean values for individual attributes, by All responses and by responses per group

| Attribute | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| All responses | | | | | | | | | | | |
| IMPT. | 4.53 | 4.44 | 4.31 | 4.53 | 4.69 | 4.28 | 3.61 | 4.22 | 4.67 | 4.67 | 4.72 |
| SD | 0.80 | 0.55 | 0.81 | 0.50 | 0.46 | 0.69 | 1.14 | 0.63 | 0.47 | 0.58 | 0.51 |
| PERF. | 4.03 | 3.33 | 3.08 | 2.94 | 3.11 | 3.00 | 2.36 | 2.92 | 2.97 | 3.53 | 3.64 |
| SD | 0.93 | 0.94 | 0.95 | 1.05 | 1.17 | 1.13 | 0.95 | 1.01 | 1.01 | 1.17 | 1.18 |
| Gap | -0.50 | -1.11 | -1.22 | -1.58 | -1.58 | -1.28 | -1.25 | -1.31 | -1.69 | -1.14 | -1.08 |
| Derry~Londonderry | | | | | | | | | | | |
| IMPT. | 4.50 | 4.42 | 3.75 | 4.50 | 4.83 | 4.17 | 3.67 | 4.25 | 4.75 | 4.50 | 4.58 |
| | 0.87 | 0.62 | 0.92 | 0.50 | 0.37 | 0.60 | 1.23 | 0.60 | 0.43 | 0.76 | 0.64 |
| PERF. | 4.17 | 3.33 | 3.00 | 3.33 | 3.33 | 3.33 | 2.17 | 3.00 | 3.08 | 3.83 | 4.08 |
| | 0.90 | 0.83 | 0.90 | 0.92 | 1.16 | 1.30 | 0.92 | 0.86 | 0.95 | 1.01 | 0.86 |
| Gap | -0.33 | -1.08 | -0.75 | -1.17 | -1.50 | -0.83 | -1.50 | -1.25 | -1.67 | -0.67 | -0.50 |
| Cornwall | | | | | | | | | | | |
| IMPT. | 4.67 | 4.50 | 4.67 | 4.58 | 4.75 | 4.25 | 3.33 | 4.42 | 4.50 | 4.67 | 4.67 |
| SD | 0.47 | 0.49 | 0.47 | 0.49 | 0.43 | 0.90 | 1.09 | 0.49 | 0.50 | 0.47 | 0.47 |
| PERF. | 3.83 | 3.25 | 3.33 | 3.08 | 3.08 | 2.92 | 2.50 | 3.17 | 3.00 | 3.42 | 3.58 |
| SD | 0.90 | 1.11 | 1.04 | 0.90 | 1.14 | 1.08 | 0.76 | 0.92 | 0.80 | 1.04 | 1.30 |
| Gap | -0.83 | -1.25 | -1.33 | -1.50 | -1.67 | -1.33 | -0.83 | -1.25 | -1.50 | -1.25 | -1.08 |
| Dundee | | | | | | | | | | | |
| IMPT. | 4.42 | 4.42 | 4.50 | 4.50 | 4.50 | 4.42 | 3.83 | 4.00 | 4.75 | 4.83 | 4.92 |
| | 0.95 | 0.49 | 0.65 | 0.50 | 0.50 | 0.49 | 0.99 | 0.71 | 0.43 | 0.37 | 0.28 |
| PERF. | 3.83 | 3.25 | 3.33 | 3.08 | 3.08 | 2.92 | 2.50 | 3.17 | 3.00 | 3.42 | 3.58 |
| | 0.95 | 0.86 | 0.76 | 1.11 | 1.19 | 0.92 | 1.11 | 1.11 | 1.21 | 1.37 | 1.23 |
| Gap | -0.33 | -1.00 | -1.58 | -2.08 | -1.58 | -1.67 | -1.42 | -1.42 | -1.92 | -1.50 | -1.67 |
| Business community | | | | | | | | | | | |

| | | | | | | | | | | | |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| IMPT. | 4.50 | 4.46 | 4.50 | 4.54 | 4.71 | 4.33 | 3.67 | 4.25 | 4.58 | 4.79 | 4.75 |
| SD | 0.77 | 0.58 | 0.65 | 0.51 | 0.46 | 0.75 | 1.22 | 0.61 | 0.50 | 0.41 | 0.52 |
| PERF. | 3.88 | 3.29 | 3.13 | 2.83 | 3.08 | 3.00 | 2.46 | 2.83 | 2.96 | 3.50 | 3.50 |
| SD | 1.01 | 0.97 | 1.00 | 1.08 | 1.27 | 1.31 | 0.92 | 1.08 | 0.95 | 1.26 | 1.33 |
| Gap | -0.63 | -1.17 | -1.38 | -1.71 | -1.63 | -1.33 | -1.21 | -1.42 | -1.63 | -1.29 | -1.25 |
| Local authority | | | | | | | | | | | |
| IMPT. | 4.50 | 4.50 | 4.20 | 4.50 | 4.60 | 4.10 | 3.50 | 4.30 | 4.90 | 4.60 | 4.80 |
| SD | 1.01 | 0.53 | 0.83 | 0.53 | 0.53 | 0.60 | 1.13 | 0.67 | 0.33 | 0.73 | 0.44 |
| PERF. | 4.20 | 3.50 | 3.10 | 3.20 | 3.20 | 3.10 | 2.10 | 3.20 | 3.10 | 3.70 | 4.00 |
| SD | 0.67 | 1.00 | 0.97 | 1.12 | 1.00 | 0.71 | 0.87 | 0.87 | 1.30 | 1.05 | 0.87 |
| Gap | -0.30 | -1.00 | -1.10 | -1.30 | -1.40 | -1.00 | -1.40 | -1.10 | -1.80 | -0.90 | -0.80 |

Although the attribute IMPT and PERF means for each of the CSPRs are within similar ranges, there is considerable variation in the order of the attribute values in each of the CSPRs. The only attribute in the same position for IMPT and PERF and for all CSPRs is attribute Seven. Attributes Ten and Eleven are both in the top four in each of the groups for IMPT and PERF. Otherwise, there is no consistency to the order across the regions (Table 29).

Descriptive analysis of the survey responses does confirm that there is agreement, amongst the cohort, of a high level of importance to all but one of the attributes. The exception being attribute Seven [*Promotions*], for which there is agreement about it being of relatively low importance. Analysis of the responses organised by groups indicates that there is some degree of variation in the value of importance. However, with the exception Seven, all the attributes have an importance value >4.00. The descriptive analysis also confirms the cohort agrees that the performance of the PSO in satisfying their requirements of the attributes is markedly lower than their importance (Table 30). All attributes have mean

values <4.00 for All responses. Only attribute One [*Departure airport*] has a value >4.00, though only by 0.03. The second step of the analysis was to categories the attributes according to the relationship between the IMPT and PERF values. This was done using IPA gap analysis.

Table 5.27. Attribute value order, by group

| Derry~Londonderry | | | | | | Cornwall | | | | | | Dundee | | | | | |
|-------------------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|
| IMPT. | | PERF. | | Gap | | IMPT. | | PERF. | | Gap | | IMPT. | | PERF. | | Gap | |
| Attribute | Value | Attribute | Value | Attribute | Value | Attribute | Value | Attribute | Value | Attribute | Value | Attribute | Value | Attribute | Value | Attribute | Value |
| 7 | 3.67 | 7 | 2.17 | 9 | -1.67 | 7 | 3.33 | 7 | 2.50 | 5 | -1.67 | 7 | 3.83 | 7 | 2.42 | 4 | -2.08 |
| 3 | 3.75 | 3 | 3.00 | 5 | -1.50 | 6 | 4.25 | 6 | 2.92 | 4 | -1.50 | 8 | 4.00 | 4 | 2.42 | 9 | -1.92 |
| 6 | 4.17 | 8 | 3.00 | 7 | -1.50 | 8 | 4.42 | 9 | 3.00 | 9 | -1.50 | 1 | 4.42 | 8 | 2.58 | 6 | -1.67 |
| 8 | 4.25 | 9 | 3.08 | 8 | -1.25 | 2 | 4.50 | 4 | 3.08 | 3 | -1.33 | 2 | 4.42 | 6 | 2.75 | 11 | -1.67 |
| 2 | 4.42 | 2 | 3.33 | 4 | -1.17 | 9 | 4.50 | 5 | 3.08 | 6 | -1.33 | 6 | 4.42 | 9 | 2.83 | 3 | -1.58 |
| 1 | 4.50 | 4 | 3.33 | 2 | -1.08 | 4 | 4.58 | 8 | 3.17 | 2 | -1.25 | 3 | 4.50 | 3 | 2.92 | 5 | -1.58 |
| 4 | 4.50 | 5 | 3.33 | 6 | -0.83 | 1 | 4.67 | 2 | 3.25 | 8 | -1.25 | 4 | 4.50 | 5 | 2.92 | 10 | -1.50 |
| 10 | 4.50 | 6 | 3.33 | 3 | -0.75 | 3 | 4.67 | 3 | 3.33 | 10 | -1.25 | 5 | 4.50 | 11 | 3.25 | 7 | -1.42 |
| 11 | 4.58 | 10 | 3.83 | 10 | -0.67 | 10 | 4.67 | 10 | 3.42 | 11 | -1.08 | 9 | 4.75 | 10 | 3.33 | 8 | -1.42 |
| 9 | 4.75 | 11 | 4.08 | 11 | -0.50 | 11 | 4.67 | 11 | 3.58 | 1 | -0.83 | 10 | 4.83 | 2 | 3.42 | 2 | -1.00 |
| 5 | 4.83 | 1 | 4.17 | 1 | -0.33 | 5 | 4.75 | 1 | 3.83 | 7 | -0.83 | 11 | 4.92 | 1 | 4.08 | 1 | -0.33 |

5.3.2 Survey analysis stage two: Importance-Performance analysis

The attribute mean values are plotted onto the IPA graph, using the mean value for IMPT and PERF as the coordinates for their location, with PERF along the x-axis and IMPT along the y-axis. The graph is divided into four quadrants by drawing a vertical line on the x-axis to represent the cut off between high and low

PERF, and a horizontal line from the y-axis to represent the cut of between High and Low IMPT. These two lines create a set of 'cross hairs' that divides the graph into four quadrants. The High IMPT-Low PERF quadrant is labelled 'Concentrate here', the High IMPT-High PERF as 'Keep up the good work', the Low IMPT-Low PERF as 'Low priority', and the Low IMPT-High PERF as 'Possible overkill' (Figure 21). The placement of these lines is scale-centred and uses the mean of survey scale for IMPT and PERF. Therefore, the high-low line for PERF and IMPT was placed at 3.0 on the x axis and the y axis.

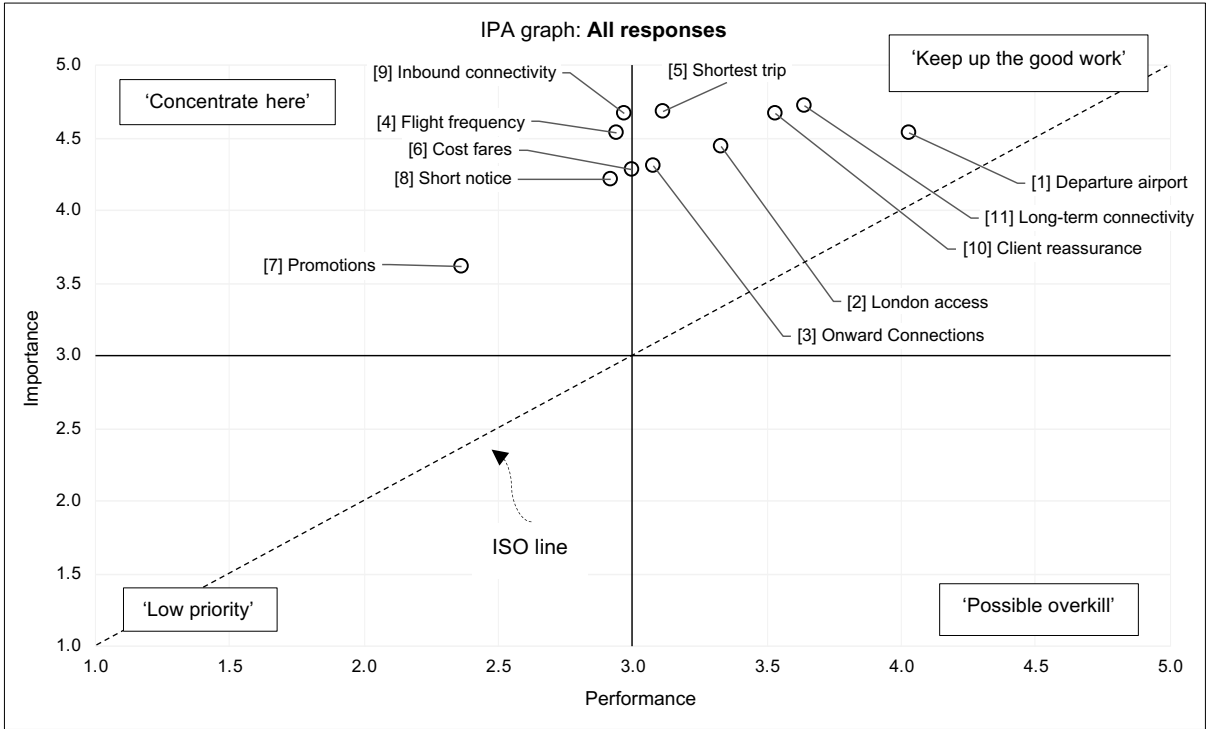
Importance-Performance quadrant analysis: All responses

The first graph created was for All response, using the mean of means PERF value for each attribute, along the x-axis, and for IMPT, along the y-axis. As the nature of the gap between PERF and IMPT is negative for the attributes, they are all above the ISO line (Figure 21). According to the location of the attributes on the graph, they are divided between the high-IMPT low-PERF quadrant and the high-IMPT high-PERF quadrant. Attributes Four [*Flight frequency*], Six [*Cost fares*], Seven [*Promotions*], Eight [*Short notice*], and Nine [*Inbound connectivity*] are in the 'concentrate here' quadrant. Attributes One [*Departure airport*], Two [*London access*], Three [*Onward connections*], Five [*Shortest trip*], Ten [*Client reassurance*], and Eleven [*Long-term connectivity*] are in the 'keep up the good work' quadrant. Though, as the nature of the gap for all attributes was negative, these attributes are all positioned above the ISO line. However, it is also apparent that the attributes are clustered into three groups.

The first of these three groups are attributes that are closely clustered around the performance high-low line, including those located in the high-IMPT

low-PERF quadrant but excluding attribute seven, plus attributes Three and Five, which are located close to the high-low line and are both below the 3.17 mean of attributes means for performance. The second group consists only of attribute Seven which, although it is in the high-IMPT low-PERF quadrant, is closest to the IMPT high-low line, and is the only one of the attributes in the quadrant below 4.0. The third group consists of the remaining four attributes located in the high-IMPT high-PERF quadrant. However, these are more dispersed than the first group. IPA graphs were prepared for each individual attribute, on which the CSPR and SHG group responses are located by each group's IMPT and PERF mean of means for that attribute. A review of these graphs suggests that it is appropriate to group the attributes in this way.

Figure 5.15. IPA graph for All responses



Individual attributes, All responses

According to the All responses graph, the attributes fall into either the 'Concentrate here' quadrant or into 'keep up the good work'. IPA graphs were

then prepared for each individual attribute to identify if any different patterns became apparent. Additionally, it is clear that attributes Three [*Onward connections*] and Five [*Shortest trip*], while in 'keep up the good work' are very close to the performance high-low line, and that attribute Seven [*Promotions*] is of markedly lower importance to the respondents than the other attributes in 'Concentrate here'. The individual attribute graphs allowed these to be explored to see if the aggregate All responses graph might also be masking important underlying patterns in the responses.

Derry~Londonderry is notable for being positioned most clearly in the High-IMPT high-PERF quadrant on the graphs for attributes Four [*Flight frequency*] and Six [*Cost fares*] (Figure 22). This is notable since the Derry~Londonderry route has fewer daily rotations than Cornwall service and the fares are not subsidised to a greater extent. It could be that this is indicative of Derry~Londonderry's stakeholder's willingness to travel to either Belfast or Dublin airports to gain access to better connections and fares. Whereas Cornwall is the only group to be in the high-IMPT high-PERF for attribute Eight [*Short notice*] (Figure 23), which could reflect the more frequent rotations on that route. Conceivably, if there was the same number of rotation on the other PSO routes stakeholders in those regions might assess PERF similarly (See appendix 9 for all group IPA graphs).

Figure 5.16. IPA graph, Derry~Londonderry responses for attributes Four and Six only

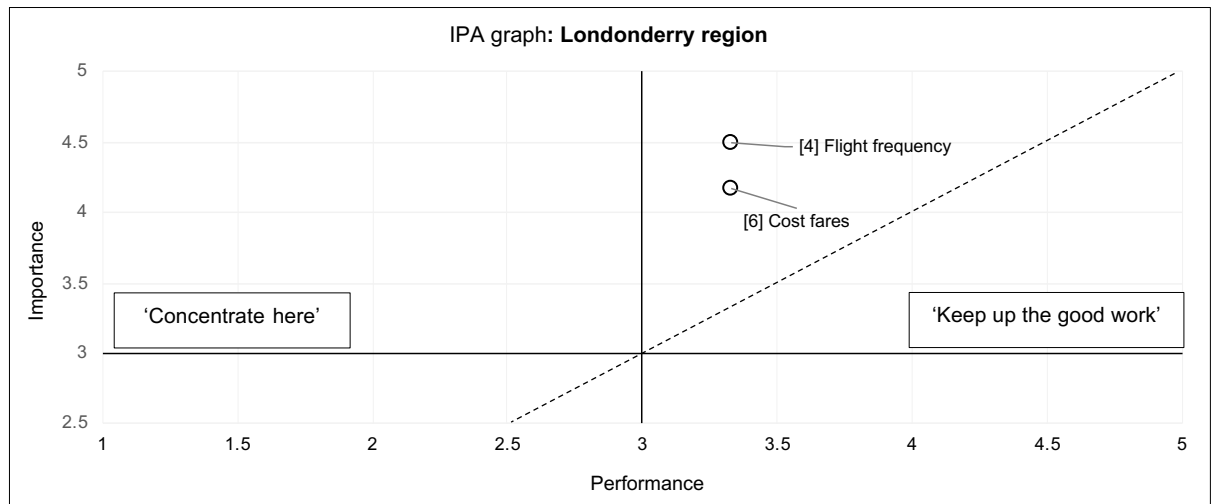
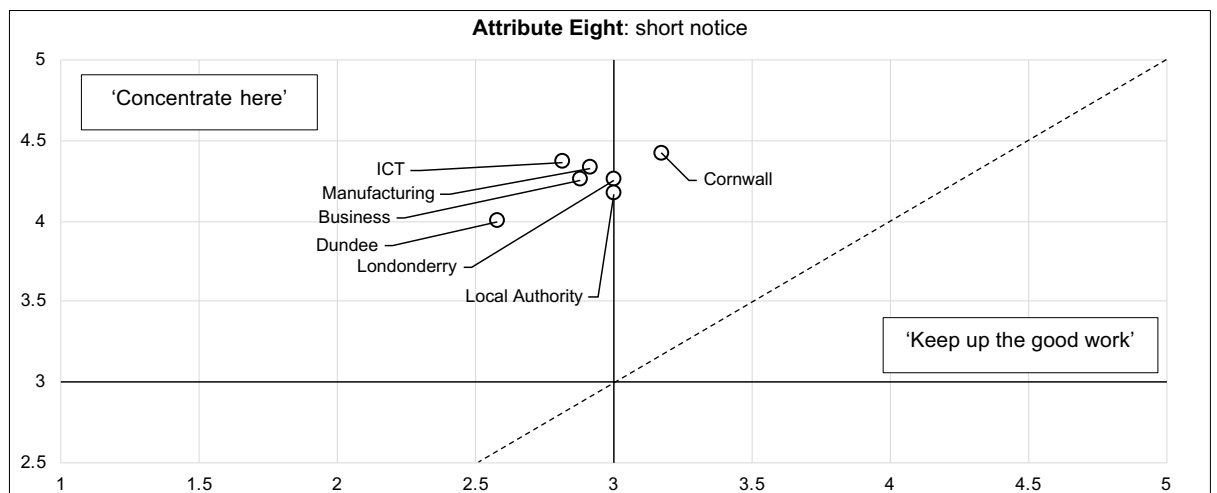


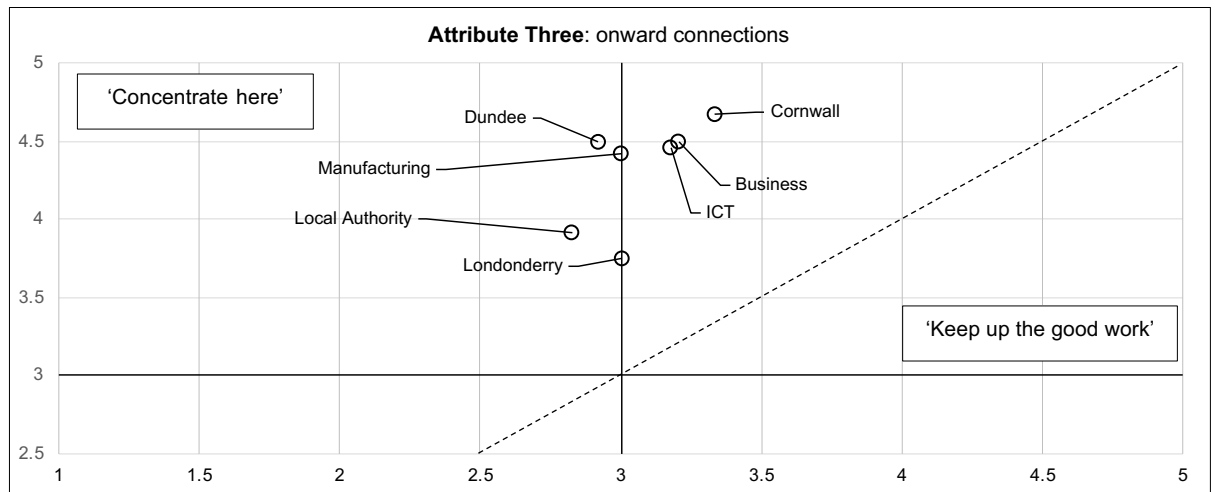
Figure 5.17. IPA graph, all groups responses for attribute Eight



On the attribute three graph, both Dundee and Derry~Londonderry are in the 'concentrate here' quadrant, whereas Cornwall is in 'keep up the good work' (Figure 24). This could reflect the fact that, at the time the survey was conducted, the Cornwall PSO had recently been renewed and included daily services to London Heathrow airport, whereas the other two CSPRs are serviced by Stanstead airport. However, the Cornwall PERF score is closer to 3.0 than it is 4.0 and it is the highest group on the IMPT axis. It is conceivable, therefore, that if the prospect of a Heathrow service was removed, and therefore, the quality of onward connectivity reduced, this would be reflected in the PERF score.

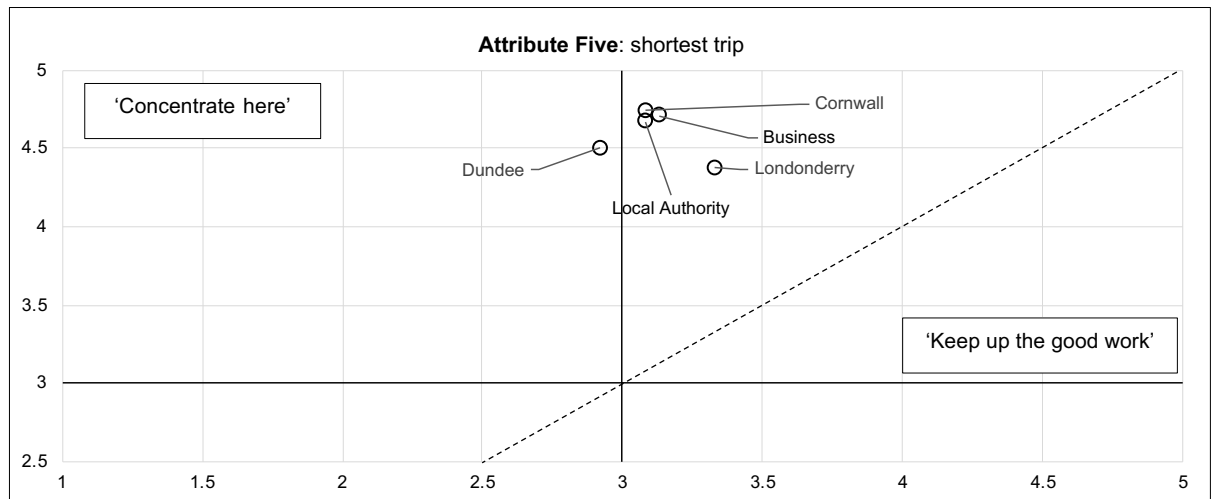
Therefore, attribute three should be categorised as those in the ‘concentrate here’ quadrant.

Figure 5.18. IPA graph, all groups for attribute Three



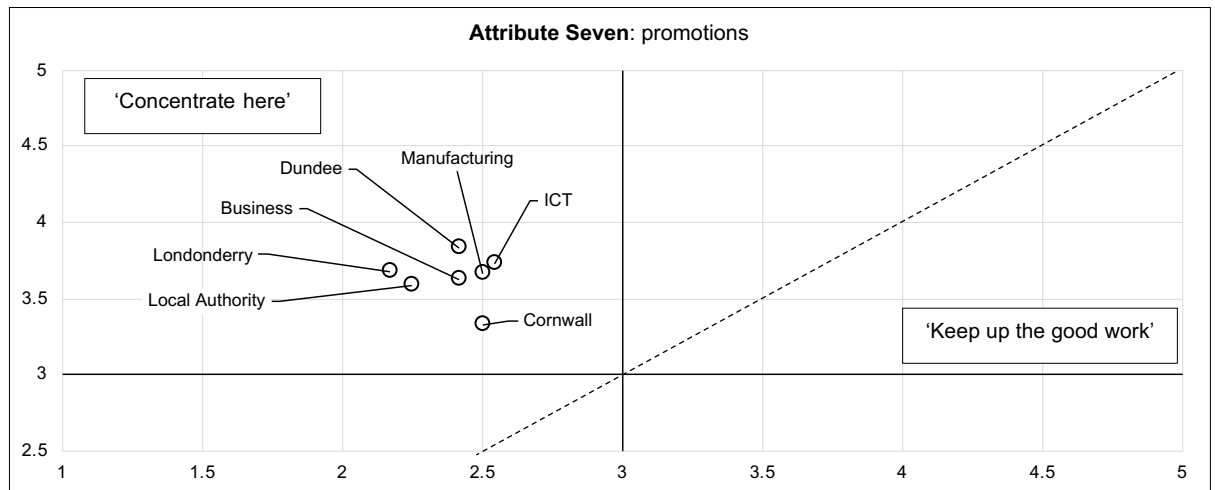
On the attribute Five graph, the CSPRs and SHG are all, with the one exception of Dundee, located in the high-IMPT high-PERF quadrant (Figure 25). Dundee is the one group located in high-IMPT low-PERF. Derry~Londonderry is the farthest from the performance high-low line, but only marginally so. Both the All responses and the attribute Five graph illustrate how, although the attribute is in the ‘keep up the good work’ quadrant, it is still markedly above the ISO line and below the 4.42 mean of the attribute means, indicating that while it may not be in the highest priority attribute, it still requires the attention of policymakers to maintain the current and improve the future PSO performance of this function. This applies to attribute Two also. It could be that the CSPRs and SHGs locating the attribute in the ‘keep up the good work’ is indicative of the PSO is preferable to the alternative possibilities, that is farther away airports and no air transport service. However, it is also positioned markedly above the ISO line and below the 4.42 mean of the attribute means.

Figure 5.19. IPA graph, all groups responses for attribute Five



The locations CSPRs and SHGs on the attribute Seven graph are closely clustered around the location of the attribute on the All responses graph (Figure 26). Although they are all located in the ‘concentrate here’ quadrant, they are also all below 4.0 on the importance axis. This suggests, that while there is a low level of satisfaction with the performance, and that its location on the graph means it is not unimportant, there is a lesser degree of importance attached to it and therefore, is less of a priority for attention than the other attributes in the same quadrant. The CSPRs and SHGs have all located attributes One [*Departure airport*], Ten [*Client reassurance*], and Eleven [*Long-term connectivity*] in the ‘keep up the good work’ quadrant. However, these attributes are above the ISO line, meaning that the assessment of performance is still below that of their importance. Attribute One [*Departure airport*] is the only attribute above the 4.0 point on the PERF axis and is the closest to the ISO, indicating the value of the asset that the local airports are (See appendix 10 for all attribute IPA graphs).

Figure 5.20. IPA graph, all groups for attribute Seven



5.4 Summary

The first stage of documentary research was undertaken to better understand the economic conditions that existed in each of the CSPR, and the circumstances in which the PSOs are operating. Doing so identified how each of the regions is facing challenges that, whilst different in complexion, are similar in principle. They are each taking an endogenous approach to development to unlock from their current negative economic trajectory, and are pursuing technology and knowledge-intensive economies, that are externally facing, as a means to improve local employment opportunities and quality of life. The geographical peripherality of the CSPR has compounded a thin transport infrastructure that leaves them vulnerable to isolation when any part of the system is disrupted. The PSO is crucial in maintaining air transport access to the region. However, the approach to funding them, and of the local airports from which they operate, causes significant variations in the level and length of the PSO support, the level of PSO service, and the relative cost to each region's local ratepayer.

The second research stage, the stakeholder interviews, provided important insights into the stakeholder's attitude towards the PSO service. It identified a series of key findings that could be grouped into three thematic groups. The first group is concerned with the broad environmental factors that relate to local conditions and policy issues: the reputational risk caused by a peripheral location and how the PSO is used to mitigate this; a business environment in which the main concern is the recruitment of employees the necessary experience and, primarily, soft skills; and a policy approach that constrains the effectiveness of the provided PSO service. The second group is concerned specifically with technical issues with the PSO and include the failure to promote the route effectively; failings with the quality of the PSO service; and causes of constraints and leakages of demand. The final theme is that business passenger demand is prioritised at the expense of tourism.

The third stage sought to assess how the participant cohort assessed the key attributes of the PSO service, identified in stage two, and the extent to which they were in agreement. The data collected was, first, analysed using straightforward descriptive statistical analysis. However, this did highlight and provide strong evidence of the high level of importance that the respondents attached to the service attributes they were asked about. It also provided evidence of a significant gap between this and the level of satisfaction the respondents have with the performance of the PSO. The evidence also indicates that there is a high level of agreement amongst the respondents about both the high level of importance and relatively lower level of performance as, apart from some minor variation, the outcomes were the same whichever way the responses were grouped. The next step, in the analysis, was to assess the importance and

performance together to gain a combined view of the respondent's assessment of the PSO service, using IPA analysis.

The purpose of IPA analysis is to guide decision-makers in judgments about where to focus their attention and resources. The overall All responses graph indicated initially that the attributes fell into either the 'Concentrate here' or 'keep up the good work' quadrants. However, by analysing the individual attributes it becomes apparent that particular groups do have a distorting effect on the location of the attributes on the All responses graph. The purpose of IAP analysis is to guide decision-makers to the areas where they should focus their attention and available resources, to make the improvements that will return the largest potential benefits, meaning the more clearly defined the groups are, the more targeted and effective the actions by decision-makers can be. These findings are discussed together with the policy issues that were identified in stage two and with reference to the current academic literature in the next chapter.

Chapter Six: Discussion

6.0 Overview

This study has aimed to identify the conditions necessary to maximise the contribution of PSO to the development of peripheral regions, which in turn would create conditions to stimulate greater demand for the service, and how a PSO could best contribute to achieving these conditions. As demand is a product of economic activity this investigation has focused, therefore, on understanding the extent to which local conditions and capabilities influence the ability of case CSPRs to achieve regional development, and how fully the current PSO service supports regional development strategies. The findings of this research have identified that consistent with the current theory of regional development, the CSPRs are each taking an endogenous approach to regional development that is focused on place-based development strategies. The key outcomes of which are to improve the quality of employment prospects and the quality of life for the local populations. However, the time and money costs, caused by the region's peripheral locations and compounded by their inferior transport infrastructure and uncompetitive access to air transport connectivity, could have a constraining effect on the potential success of the CSPRs development strategies and the extent to which they can achieve their key outcomes.

6.1 Discussion of findings

Changing economic circumstances and conditions, in the regional aviation market in the UK, has resulted in airlines removing the services they had operated

from the CSPRs to London. To protect this route, because of its perceived importance of it to the local economy, a PSO service was imposed that prioritised the needs of local business users. In this chapter, the degree to which the PSO service is satisfactorily fulfilling the needs of this user group is discussed. After which, NEG thinking is applied to the two key parameters of this study, that is air transport and regional development, to highlight the strategic potential of a PSO in regional development. It then considers how current thinking towards PSO, as a remedial intervention, by policymakers could be preventing the full potential of a PSO from being recognised and, therefore, utilised. Finally, it discusses the effects that prioritising outbound business users might be having on the PSOs potential to support the regions' tourism strategies.

The findings of the IPA analysis of the third stage of fieldwork highlight how the current PSOs are failing to fulfill the needs of peripheral passengers. The survey had two purposes. First, it was to assess the degree to which the cohort agreed that the attributes, that emerged through the stakeholder interviews as being of importance, were important. It is maybe unsurprising that, no matter how the responses were grouped, there was agreement about the high level of importance of these attributes. Not only because they had been identified as such through the interviews, but also because they are the same benefits that had motivated the liberalization of the European air transport. According to Reynolds-Feighan (1996), the increased choice, higher service quality, and reduced airfares and which many passengers in non-peripheral regions have benefited from. Benefits that had previously been protected for peripheral regions by the interventions of national governments, including the UK's (Barrett, 2000; Button, 2001). The survey findings demonstrate that the service expectations of a

peripheral passenger are the same as passengers in any other region and do not differ in any way because of their peripheral location. Their willingness to bypass the closer PSO route, to access one that better satisfies their needs, illustrates how they are no more tolerant of a service that does not satisfy their needs, even when doing so comes at a cost they are still, on balance, better served.

The second was to assess the performance of the PSO in these attributes. Arguably what should be concerning for policymakers is a similar level of agreement that the performance of the PSOs does not satisfactorily fulfil their own personal requirements from it, and that it is unlikely to do so for passengers travelling into the region. Meaning that, despite the imposition of PSOs, peripheral passengers continue to contend with the negative effects of the market failures caused by introducing competition into the market– namely the risk of losing services, as highlighted by Brathen (2011), or a reduction in choice and service quality and increased fares, as described by Brathen & Eriksen (2016)– which does little to improve economic and social cohesion for the populations of regions like the CSPRs, as was the intention of the EC (European Commission, 2011b). Furthermore, the service failings identified in the survey are despite the PSOs having been imposed, specifically, to serve the needs of just one passenger type, business passengers.

The questionnaire survey responses identified that the respondents attached a higher level of importance to all the attributes of the PSO service than they did for performance. The use of IPA analysis (Martilla & James, 1977) makes it possible to divide the attributes into categories according to the order of priority by which they require the attention of policy and decision-makers. **Category one**

attributes have the most urgent need of attention. They are Three [*Onward connectivity*], Four [*Flight frequency*], Six [*Cost of fares*], Eight [*Short notice*], and Nine [*Inbound connectivity*]. **Category two** are attribute Two [*London Access*] and attribute Five [*Shortest trip*]. Although they are in the 'keep up the good work', their closeness to the performance high-low line, distance from the IMPT mean of means value, and the gap to the ISO line indicates that, in addition to the need to maintain the current level of performance, they also require further improvements. **Category three** consists of only attribute Seven [*Promotions*] and could be considered as an attribute that has underdeveloped potential to make a positive impact on demand for the PSO. **Category four** attributes include One [*Departure airport*], Ten [*Client reassurance*], and Eleven [*Long-term connectivity*]. Despite being in the 'Keep up the good work' quadrant, it would be a risk to dismiss these attributes as not requiring ongoing attention to maintain the current level of performance. It would also be beneficial to identify ways to enhance the derived benefits of these attributes and maximise the benefit gained from the asset of an airport in proximity.

The survey results show that several service attributes, those in category four, were assessed comparatively well by the respondents. In particular is the closeness of the region's PSO airports, suggesting these are assets that could be particularly advantageous to regional development efforts. Mathisen & Solvoll (2012) have argued that, as road conditions improve it is reasonable to expect passengers to travel further to fewer airports to allow a PSO network to be reduced in size, and therefore, cost.

Lian (2010) has suggested that there was a preference amongst peripheral passengers to travel farther, as roads improve, to the larger airports that offer cheaper fares and more route options. It emerged during the stakeholder interviews that this is something the interviewees do also. Rather than it being their preference, however, it is something they feel they must choose to do because of unaffordable PSO fares or inadequate network connections. It is a decision they make based on a balance of benefits, but they would prefer for it not to be necessary because it is not without high costs. Costs that include especially early starts and finishes to the business day, the additional time and inconvenience for each extra part of the journey, the incremental expenditure, and an increased risk of disruption to travel arrangements made greater by the lack of alternative travel options. The impact of passengers bypassing the PSO airport, in the short term, is the leakage of demand for the current service. The longer-term impacts are, however, that it could constrain regional development and, therefore, the future level of demand for the air service.

One reason for this is that, ultimately, these costs could limit the growth potential of local enterprises. Although a strong attachment to the region prevents local entrepreneurs from considering relocating to better-connected regions, there is a limit to the high level of inconvenience they are prepared to incur in the long term. Whereas Korent *et al.* (2015) suggested that peripheral entrepreneurs lacked the same level of ambition, like those from core centres, because they prioritise their quality of life, these findings suggest that it is these higher-levels of transport trade costs, that entrepreneurs in core regions do not incur, that is instead the constraint. Furthermore, the interviewees could be categorised as the 'opportunity' entrepreneurs described by Stephens & Partridge (2011) and

Greenberg *et al.* (2018), who are driven to pursue an opportunity, rather than the necessity entrepreneurs Baumgartner (2012) and (McElwee, 2010) describe, who become entrepreneurs in response to their changing circumstances, rather than to realise an ambition. Opportunity entrepreneurs are of higher value to a peripheral region (RELU, 2013) and it is these to whom the CSPRs are promoting the quality-of-life benefits that make the CSPRs an attractive business destination. A strategy that could be undermined if the costs on quality of life, created by poor quality connectivity, are greater than the value of the benefits gained by locating to the region.

A second reason is the way in which they are influencing how larger firms organise their operations, which is contrary to the objectives of the CSPRs development strategies. Spatial fragmentation (Fujita & Thisse, 2006) and congestion in core centres are creating an opportunity for the CSPRs to host knowledge-intensive sectors and the strategic functions of larger organisations. However, dissatisfaction with the PSO and the alternative connectivity options has caused firms to review how they structure their operations. They would consider relocating their travel-intensive and higher-quality roles to better-connected locations, which some have already done. While the less travel intensive, lower quality roles, would remain in the CSPRs. This is consistent with the process described by Gillespie *et al.* (2001) in which consumer contact operations remain near the market, and back-office functions are relocated to less expensive regions. The potential risk to the outcomes of the CSPRs development strategies is, it creates the prospect that the CSPRs could become the de-industrialised equivalent of competing based on cheap labour as a factor input, which is not the

outcome for employment opportunities described in any of the CSPRs development strategies.

Two further attributes that were assessed comparatively well are the reassurance a PSO provides external organisations about the capabilities of local firms, and about the region's long-term connectivity. These are two functions of the PSO that have not yet received attention in the academic literature. The PSOs have been imposed on routes to London that have served the CSPRs for many years, and research by Merkert & O'Fee (2016) indicated that there is little prospect of a route becoming a commercial service once a PSO has been imposed. However, despite the IPA analysis highlighting the important role a PSO has in developing confidence in a peripheral region as a business destination, by providing reassurance about its connectivity into the future, the EU regulations limit the imposition of a PSO to four years.

The reason for this is to ensure a PSO is removed should the commercial circumstances of the service improve. However, Laird & Mackie suggest that structural changes to an economy can take two or three times this period to occur from the first improvement in connectivity. Now that EU regulations have been transferred into UK law (UK Gov. 2018b) the DfT has an opportunity to make changes to the EU regulations and could extend the permissible period of a PSO imposition. However, it is equally as reluctant to make market interventions (UK Gov., 2013) and references to PSO in the 'Future Aviation Strategy' (UK Government, 2018d) indicate this is not the intention. However, it could be that this is the level of reassurance the investors, firms, or workers do require before they are prepared to commit to the regions.

Whereas the proximity of the airport, from which the PSO operates, is an asset with the potential to be exploited to enhance a region's reputation as a business destination, the survey results suggest that the quality of the PSO service is curbing this potential. Concerns about the poor quality of the inbound connectivity, provided by the PSO, emerged during the stakeholder interviews and were confirmed by the survey responses. It has caused investors reluctance to invest in the region, stopped firms inviting clients to their offices for business development or relationship building reason, and prevented employers from bringing in their staff from other territories for meetings in person or for training. In fact, the IPA analysis has assessed each of the attributes, concerned with both inbound and outbound connectivity, as having the most urgent need of attention from policymakers.

Although the PSO regulations do, deliberately, include restrictive stipulations about the justification for the imposition of a PSO, they do also allow for a PSO service of a standard that is proportionate to the economic need of a region. The specification for what service standard is necessary on a route is at the discretion of the member state (MS) (European Commission, 2017) and, as noted by Williams & Pagliari (2004), it has been liberally interpreted by many. However, Brathen & Eriksen (2016) make the point that defining a service, able to satisfy a wide range of users' needs, and the scrutiny of the local populations, is a complicated task. Though Merkert & O'Fee (2016) suggest that, this creates a type of pressure which motivates decisions makers to be innovative in developing a service that most satisfactorily accommodates local needs and circumstances. However, from the account given by stakeholders who were involved in negotiating PSO, it does not seem that the shortcomings, identified in

the PSO, could be attributed to a lack of motivation by the LAs to provide local business passengers with the service they required, or even, as Papatheodorou and Koura (2012) highlight the importance of, a failure by airlines to fully understand the needs of their passengers on a route. Rather, the shortcomings appear to be a consequence of funding constraints and the need to remain within a budget. This issue is discussed in greater detail later in this chapter.

Varying levels of market access

The recent imposition of PSOs on the London routes demonstrates that nearly three decades after the liberalisation of the European aviation market, passengers in peripheral regions are still contending with uncertainty about the long-term future of air connectivity from their regions. This is in addition to the service quality issues with the PSO, identified in the survey, intended to mitigate the negative effects of market liberalization. Even the security of the airlines, that have been prepared to operate PSO services in the UK, has proven uncertain, with two having ceased trading after being awarded PSO contracts. Koo & Papatheodorou (2107) have suggested that the LCC business model might provide new opportunities for services to regional airlines.

Derry~Londonderry's recent experience with Ryanair, which switched the London route to Belfast despite consistent annual passenger numbers, suggests it might not be an option that peripheral regions could rely on to provide sustainable connectivity. Derry~Londonderry's experience is consistent with a trend identified by Dobruszkes (2013) and Dziedzic & Warnock-Smith (2016). As the business model has matured, LCC airlines have begun to compete with traditional airlines on thicker routes and the commitment to routes from regional

airports has, according to Wit & Zuidberg (2016), become more volatile. All of which means that the quality of air transport connectivity is continuing to inhibit the access the CSPRs have to global markets and opportunities presented by globalization (Laird & Mackie 2016; Rasker *et al.*, 2009), or parity of access to finance and investment, skilled labour, business services, and tourist (National Connectivity Task Forces, 2015; Transport Committee, 2015). However, the 'National Infrastructure Strategy', which sets out how investments in transport infrastructure are to support the Government's 'levelling-up agenda', refers to the role of aviation in ensuring the UK has a high level of access to global markets.

The 'National Infrastructure Strategy' highlights the national advantage the UK gains from its hub airports because, in facilitating access to the world's third largest aviation network, they reduce the transport cost of international trade, which does imply that all regions of the UK benefit equally. However, the York Aviation (2018) BCMI illustrates how this is not the case for the CSPRs, as despite the imposition of PSOs on routes to London, the CSPR remains at the bottom of all UK airports for the quality of business connectivity. They have only marginally better aviation connectivity than the Highland and Island of Scotland airports, which are served by PSOs imposed for social benefit. Rather than benefiting from the UK's extensive international aviation network, liberalization has reduced access to it. The survey findings confirm that the PSOs have not provided a solution to this, so, as per Reynolds-Feighan (1995), the CSPRs continue to be at a competitive disadvantage in accessing external markets and exploiting the trade opportunities created by globalisation. Which is despite successive governments acknowledging the criticality of air transport to the economic

prospects of peripheral regions (Osborne & Alexander, 2013; UK Gov, 2015; UK Gov, 2018d).

The level of air transport connectivity, to which that the CSPRs do have access, is because the LAs have recognised its importance and have been prepared to commit funding towards it. In Derry~Londonderry and Cornwall this means providing funding annually to subsidise their region's airport, in addition to that for the PSO. The cost of which is, as (LA-Y-5) described, the largest single ticket item the LA funds. However, as tables the way this cost is borne by the local populations is not consistent across the CSPRS, and neither is the PSO service they gain (See appendix 7). The absolute cost of aviation is greatest for Derry~Londonderry and Cornwall because they subsidise both the PSO and the region's airports. Whereas the relative cost per head of the population is greatest in Derry~Londonderry, because the costs are distributed amongst a smaller population, who are also funding it for the benefit of a much larger airport catchment population, unlike either of the other two CSPRs. Cornwall, unlike Derry~Londonderry and Dundee, has benefited from a midday rotation, more frequent weekend service, and service to London Heathrow.

The inconsistency across the UK CSPRs, in the imposition of PSOs, uneven provision of services, and service levels determined by budget considerations and not connectivity needs, are the same types of concerns that had been raised by Brathen & Halpern (2012), Merkert & Williams (2013), and Reynolds-Feighans, (1999) from there not being one set criterion for the imposition of PSO across the EU. They argue that a standard criterion, consistently applied, would ensure the equitable provision, quality, and cost of

PSOs that are determined by need and not where a person lived. Arguably, the argument for having such a standard for imposing PSO is as valid in the UK also, as it would ensure that regions contending with similar economic challenges, caused by a similar set of economic and transport circumstances would benefit from similar levels of PSO connectivity. Instead, it is the DfT's intention that each LA will become responsible for a greater share of PSO funding (UK Government, 2018d), irrespective of the effects the issue of affordability will have on the PSO service in each region.

If the government went ahead with this intention, it would be occurring at a time when the less remote regions of the UK stand to benefit from an infrastructure revolution, the intention of which is to radically improve the quality and integration of the UK's strategic transport network corridors (HM Treasury, 2020b). However, these corridors do not reach as far as the CSPRs and, when combined with the current connectivity deficit, it means the CSPRs could become comparatively even more peripheral.

6.1.2 Applying NEG thinking to identify the strategic value of a PSO imposition

Peripheral regions and an endogenous competitiveness agenda

The CSPRs are typical of early settlements described by Combes & Overman (2004) that had achieved prosperity by exploiting the advantages of a natural endowment. Topographic features of the Derry~Londonderry and Dundee coasts enabled them to become key points for transatlantic crossings and international trade, while mineral deposits allowed Cornwall to become the world's

largest tin and copper producer. The regions sustained their early prosperity, in a way described by Fujita & Mari (2005), by being early adopters of emergent technology. Such as shirt manufacturing in Derry~Londonderry, the production of Jute in Dundee, and exporting mining technology in Cornwall.

Eventually, however, the CSPRs succumbed to seismic shifts in national and global economic structures– the structural shift of the UK economy away from agrarian and mineral extraction (Stephens & Partridge, 2011), the doubling of the worlds labour force that wiped out a labour cost input advantage (Freeman 2007; Kitson *et al.*, 2004), and the technological advancements and reduction in trade regulations exposed them to international competition (Nuur & Laestadius, 2010), which diminished the value of the industries that had been the source of their wealth. Consequently, the regions have been on a negative path trajectory, from once leading to now lagging local economies. The impacts of this on the local populations, in employment opportunities and income levels, can be seen in tables 6, 11 and 16. The risk of a negative path trajectory to the CSPRs future prosperity is described by Arthur (1989) and David (2001). If they remained locked into the conditions and behaviours that have been established during past periods of prosperity, they will be unable to adapt and respond to new circumstances as they emerge and the opportunities these may present.

According to Stephens & Partridge (2011), the higher average age and lower levels of educational attainment of the populations in the CSPR is characteristic of a lagging peripheral region, because the young and ambitious are drawn towards greater employment and quality of life opportunities available in the core centres. The interviewees described how they are struggling to recruit

young employees with the technical and soft skills, that they require, and that this is one of their key business challenges caused by location. The danger of which is that it leaves a region ill-equipped to participate in the economy of the future (Stephens & Partridge, 2011), particularly because of the technology and knowledge-intensive economy envisaged by the UK government (DTI, 2001; HM Treasury, 2021). A future economy, that reflects the fact that, as has been the experience of the CSPRs, in which the UK can no longer compete based on low factor input costs and cheap commoditized goods that can be supplied and produced more cheaply elsewhere in the world (Edmonds, 2000; HM Treasury, 2021).

The lagging economies and employment conditions in the CSPRs represent the extent to which they have lost out in, what Fujita & Thisse (1996) describe as, the push and pull between centripetal and centrifugal forces. They cannot offer the types of Marshallian externalities and scale economies that underpin agglomeration economies (Rosenthal & Strange, 2004) and has caused the economy of the UK's largest agglomeration, London, to grow at twice the rate of the UK's overall (Harari & Ward, 2107). They seem also to confirm the position of Gren (2003) and Partridge & Rickman (2008) that the spillover of benefits from agglomeration— which according to the World Bank (2009) is how a country benefits from agglomerations, and why governments should not interfere in their growth with redistributive development policies— are insignificant once they have reached peripheral regions. Fujita & Thisse (2003) argue that the growth of core centres has not been at the expense of peripheral regions. But, as Devenport & Zaranko (2020) note, the UK economy is one of the most spatially unequal of the developed countries and it appears the difference in growth between London's

and the CSPRs has become a feature of the economy that Gardiner *et al.* (2011) suggested is unavoidable.

The CSPRs employment and demographic conditions also suggest that Kalder (1970) was right in arguing that economic convergence is not inevitable. Rather, these are conditions more consistent with the findings of Boris & Metiu (2013), the European Central Bank (2017), and Franks *et al.* (2018), who argue that the gap between core and periphery regions are persisting and will continue to grow. Rodriguez-Pose & Fitjar (2013) cautioned that if regions, like the CSPRs, fail to develop strategies, that equip them for the realities of modern economic circumstances and to exploit the opportunities of globalisation, they risk remaining locked into a cycle of continued economic decline and subsidy dependency. It seems clear, therefore, if the CSPRs are to improve their economic circumstances they need, as David (2001) argues, to break free of those forces locking them into their negative path trajectories and the conditions of their lagging economies.

The CSPR's development strategies indicate clearly that the LAs have recognised this need. Moreover, the nature of economies that they are pursuing, for which they have received funding commitments from the UK government, is aligned to the government's goal of a national economy based on technology and knowledge-intensive industries. However, unlike Baldwin & Krugman (1986) or David (2001), who suggest that a large exogenous or hysteresis type event is required to cause a de-locking, the LAs are taking an endogenous approach to their economic development, of a type advocated by Martin & Sunley (2006) that takes account of the different conditions and assets in each region (Pike *et al.*, 2007). The UK remains, however, one of the most spatially unequal of the

developed countries and, as Devenport & Zaranko (2020) highlight, this can only be resolved by the place-based efforts of individual regions and supporting them to do so, according to the government, is central to a renewed levelling up agenda (UK Gov, 2021).

Taking a NEG view of the development and connectivity relationship

The need for the CSPRs to de-lock from a negative economic trajectory and the question of the role a PSO has, in this, typifies the ‘chicken and egg question’ that remains largely unanswered in the academic literature. Which is to query, does economic activity cause the demand for increased air transport services, or does the improvement in aviation connectivity, such as by the imposition of a PSO, cause the growth in economic activity? One approach to understanding this is to think about it in NEG terms, as these conditions, transport, and the thickness of economic activity, could be regarded as two key NEG parameters.

The economic conditions in the CSPRs is the first NEG parameter. The lagging economic conditions at the CSPRs mean they are unable to offer firms the benefits available in core agglomerations, namely, the scale economies, input sharing, labour market pooling and knowledge spillovers that are derived from the proximity of firms and workers, as described by Fujita & Thisse (1996) and Rosenthal & Strange (2004). These create beneficial conditions that are attractive to yet more firms, workers and investors and sets up a ‘snowball’ cycle (Baldwin & Martin, 2004). That is to say that Krugman’s (1991) process of circular causation ensues and that sustains further agglomeration of economic activity. A process that could, in turn, lead to an increase in demand for air transport services in the

region. The transport cost of trading from the CSPRs is the second NEG parameter. As Venables (2001) sets out, the thin inter-regional transport system connecting the CSPRs and unsatisfactory air transport connectivity, such as those discussed above, will add to the transport costs incurred when trading from them (Venables, 2001). Which Thisse (2009) maintains could result in any benefit, that might potentially be derived from being in the CSPR, becoming unviable.

According to Krugman (1991; 1998), it is when a region has gained enough manufacturing firms, to create centripetal forces and strong scale economies, and when transport costs of trade become sufficiently low so the process of circular causation is established, that leads to concentration of economic activity in that region. The documentary research indicates that, the CSPR local LAs recognise the importance to their regions of each of these two parameters individually. A PSO could, in terms of NEG thinking, be regarded as a local authority intervention that is, artificially, reducing the transport cost of trading from their CSPR. However, the cost of transport is only one of the two NEG parameters necessary to establish circular causation and it would be unable, by itself, to bring about a change to the economic circumstances in the CSPRs. However, the separate development strategies being pursued by the LAs, could be regarded as an effort to create place-based advantages that could in time become sufficiently strong centripetal forces. The fact that the PSO and development strategies are occurring independently of each other does suggest that they are not yet viewed this way and the potential benefits of their interacting together are not understood.

Exploiting centripetal and centrifugal forces

To-date NEG thinking has, as Krugman himself explains (1998), been concerned with the balance between the opposing forces of market size benefits, that attract firms to concentrate into one location, and the congestion costs of concentration, or the immobility of factor inputs, that causes the dispersion of firms. What Fujita & Thisse (1996) refers to as the 'push and pull' of the centripetal and centrifugal forces that firms base their location decisions upon. As already noted above, the CSPRs lack the market size necessary to provide firms with the types of agglomeration benefits available in core centres. However, in taking an endogenous approach to regional development, their place-based strategies have presented an opportunity to overcome this perceived weakness in two, complementary, ways by exploiting the effects of both centrifugal and centripetal forces. The first is in recognising that absent from the business environment, of peripheral regions, are the diseconomies that are presented in congested agglomerations and, when combined with the appeal of the immobile, local natural environment can have the potential to pull, towards the regions, those entities for whom the cost of a core location have become too great. Which, when combined with the social assets, such as heritage and traditions, can be a strong centripetal force for attracting modern wanderlust tourists. Tourism is discussed in greater detail in the last section of this chapter.

A common feature of CSPRs strategies is an emphasis on the range of amenities and benefits the region can offer. Such as lower business and living costs, the prospect of a higher quality of life, and the wide range of leisure and recreational opportunities. These conditions are the antithesis of the centrifugal forces present in the, increasingly congested (United Nations, 2015a), core

centres, and they are the types of amenities being sought by the modern industrial sector and technology-enabled firms and professional or skilled workers (Batevik *et al.*, 2002; Rasker *et al.*, 2009; World Bank, 2009). NEG thinking maintains there are high communication costs when staff are not in proximity, because it slows down the production responses to market changes (Venables, 2001). However, this concern highlights the bias, which is of its time, in NEG thinking towards the manufacturing firms of an industrialised economy.

A contemporary approach to NEG thinking would recognise the de-industrialised nature of modern economies in developed countries, a feature of which is how the dispersion of workers is less impactful to knowledge-intensive activities than it is to production. A feature that Fujita & Thisse (2006) referred to as 'spatial fragmentation' because manufacturers have separated their production functions, which they locate in regions where factor inputs are least expensive, from their strategic functions and high-skilled employees, who have become concentrated into core centres. (BC-Z-7) described how they can produce and install updates for a client's IT system in Taiwan from their office in Cornwall.

A second feature of the strategies is that each of the CSPRs specifies key industrial sectors, in which they are seeking to develop a regional specialisation. These are all in the non-resource dependant traded clusters and are of a type advocated by Porter as the most valuable to a region (2003). The regions are promoting the high levels of business and funding support made available to new entrants from these key sectors, as well as emphasising the sophistication of the region's business environment and infrastructure. This seems to be providing reassurance about the suitability of the region as a business destination because,

as Korent *et al.* (2015) maintained, it has been the lack of these features that puts firms in peripheral regions at a disadvantage to those in core centres. The approach to development, being taken by the CSPR, and the types of industrial sectors they have identified as key, is consistent with the framework for endogenous de-locking advocated by Martin & Sunley (2006). For instance: Derry~Londonderry is focused on opportunities created by the fourth industrial revolution. Dundee is furthering its digital and creative 'ecosystem', while also developing specialisation from the region's experiences with offshore energy decommissioning. Cornwall is creating regional specialisation in modern mining approaches, while also promoting itself as a base for new space and aerospace innovation. The technology and knowledge-intensive nature, of the CSPRs strategies, is consistent with those envisaged by the UK's long-standing competitiveness agenda (Edmonds, 2007), the government's most recent 'Plan for Growth' (UK Gov., 2021), and to which it has committed funding support through the 'growth deals' (Sharma, 2014).

The CSPRs development strategies create the prospect that they could appeal to the firms and workers dispersed from congested core centres. While also attracting firms from key sectors through the support and incentives they can offer, and the investments being made in the regions' facilities and infrastructures. Those firms that are attracted to the region will then add further benefit and thus the earliest stages of circular causation have been established. However, the development strategies are in their infancy and government investment funding has only recently been agreed. Meaning the regions are at the very earliest stages of de-locking and the process of circular causation is still embryonic and fragile—according to Lard & Mackie (2018), structural changes in an economy can take up to fifteen years to occur, which is a similar period to the timescales envisaged

in development strategies, that extend to 2039. Arguably, this means the process of circular causation would be particularly sensitive to the transport trade costs as they might tip the push and pull of opposing centripetal and centrifugal forces in favour of core centres, or different regions. Because, as noted above, they would nullify any value of benefits to be gained by locating to the region (Thisse, 2009).

When thinking in NEG terms about the place-based development strategies being pursued by the CSPRs, it seems apparent that the relationship between these and transport costs is a symbiotic one. In which PSOs should be seen for the strategic role, they can have, in ensuring the transport cost of trading from the CSPRs, or other peripheral regions taking an endogenous approach to development, are kept at a sufficiently low level, so that the value of benefits gained, by locating to them, is greater than the transport cost incurred, while the process of circular causation is established, and the agglomeration benefits strengthened. Thereby increasing demand for the PSO service till the point is reached when public support can begin to be reduced and the route, ultimately, becomes self-sufficient. In the next discussion point, Bertalanffy's General Systems Theory has been used to explicate, one, the symbiotic nature of the relationship between the transport cost of trading from a peripheral region, and the agglomeration of place-based economic activity at them, and two, the strategic nature of the role a PSO has in ensuring these transport costs are sufficiently less than the value of the benefits gained at a peripheral location.

6.1.3 A general system view of a strategic PSO

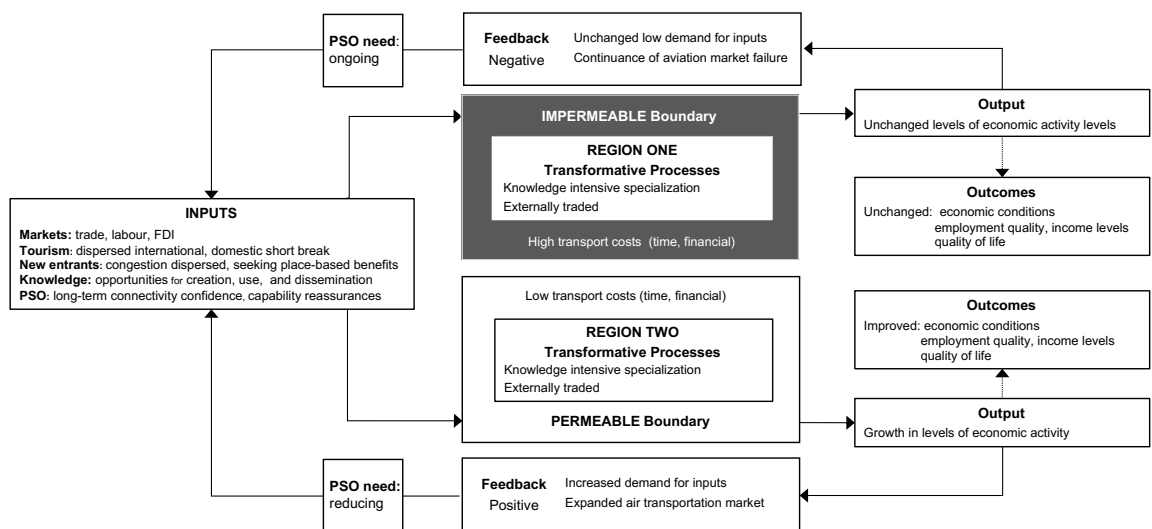
As explained by the OECD (2011) an endogenous approach to regional development is growth-orientated and seeks to identify and valorise a region's unique endowment of tangible and intangible place-based assets. According to Cook & Memedovic (2003) and Ward & Brown (2009) these can be used to create a strong competitive advantage for one region over other remote regions and urban centres. They can also be used in one of the ways advocated by Martin & Sunley (2006) to develop regional specialisations, or industrial clusters (Martin & Sunley, 2010). Which the World Bank (2009) and OECD (2000) maintain is one of the most effective tools in enabling peripheral regions to realize the opportunities of globalization. To achieve growth, however, the valorised assets need to be traded on international markets (Porter, 2003). The regional development activities of one region are not occurring in isolation and it is likely that other regions will be attempting to exploit their own endowments of place-based assets, and will have access to, at least, the same calibre of competencies and funding necessary to valorise these. However, all regions are not equidistant from the core centres of economic activity.

Peripheral regions are the farthest distance, putting them at a geographic disadvantage which the European Commission (1993) maintains inhibits their market access and causes a lack of competitiveness. Air transport is, according to Graham (1998) the most effective way of minimising the cost disadvantage, in time and money, to peripheral regions of distance, according to the Airports Commission (2013) and ICAO (2019), gaining the productivity benefits associated with connectivity and access to global markets for trade, tourism, investment, and

skills and knowledge. Meaning that peripheral regions without access to the same level of air transport connectivity and, therefore incur higher transport costs, are at a competitive disadvantage to those places that do (EUR-Lex, 2012b).

The purpose of a PSO is to minimise the level of these transport costs and, in doing so, provide peripheral regions with competitive access to the markets necessary to achieve growth. The nature and effects of these relationships are demonstrated in figure 27. It is a model that has been developed from the findings of this study, discussed in this chapter, that have been overlaid on Bertalanffy's General Systems Theory.

Figure 6.1. General systems view of strategic PSO in regional development



The model illustrates how, in keeping with NEG thinking, the imposition of a PSO alone cannot cause the transformation of a lagging peripheral region. Rather, it illustrates how a PSO only has a role in growth when it is acting, in conjunction, with a regional development strategy investing in creating sufficiently attractive place-based benefits. In which case the role of the PSO is to ensure the trade cost of transport is sufficiently low to make the value of the benefits, gained

in a region, worthwhile. The components of the diagram are the same as those for General Systems Theory, onto which the points discussed in this chapter have been overlaid:

Internal components. The transformative processes are the activities of the local businesses and organisations that are involved in valorising and trading tangible and intangible place-based assets. These are the activities that are intended to either attract entities that are dispersed by centrifugal forces at core agglomerations, and that could have a part in establishing centripetal forces within the peripheral region itself. The outputs are the benefits created by the increased levels of economic activity and the improved economic conditions. Outcomes are the key objectives of the regional development strategies. Namely, improved employment opportunities increased income levels, and higher living standards.

External inputs. A range of external inputs includes the new entrant firms, investors, and workers that are identified as key, in the development strategies, and necessary to perform the functions of the transformative processes; the necessary access to markets for trade, tourism, investment, and skills and knowledge; market confidence in the capabilities of local businesses, and the quality and long-term certainty of the region's connectivity. The external inputs need to be able to flow into the transformative process at a rate necessary to maximise outputs.

The boundary. The external inputs are separated from the internal components, of the system, by a boundary. The permeability of which regulates the rate at which the inputs can flow into the internal components. The boundary is formed

by, firstly, the spatial distance between the locations of each of the external inputs and the internal components, and secondly, the relative pecuniary and nonpecuniary costs of traversing the distance between these two locations. The boundary is impermeable if the transport costs prevent the inflow of inputs into the system at the rate necessary to achieve growth. The boundary permeability increases at a rate proportionate to the degree to which a PSO reduces transport trade costs.

The model consists of two separate general systems that represent two different peripheral regions, at a NUTS 3 level. Both regions are served by a route on which a PSO has been imposed.

Region One is served by a PSO that is ineffective in reducing the transport trade cost sufficiently. Therefore, the boundary is impermeable, and the inflow of inputs is at a slower rate than necessary for the transformative processes to generate growth. Consequently, the system outputs are below the necessary level, and the strategic outcomes are not achieved. In this region the level of economic activity is unchanged and the level of demand for the PSO remains static. A negative feedback loop means the need for public support for the PSO is ongoing.

Region Two is served by a PSO that is effective at reducing transport trade costs. Therefore, the boundary is permeable and the rate of inflow of inputs is at the rate required by the transformative processes to generate growth. Consequently, the outputs and strategic outcomes of the strategy are achieved. In this region the level of economic activity grows, which in turn causes a growth in the demand for the PSO service. A positive feedback loop raises the prospect of, in time, the

emergence of normal market conditions on the route and the possibility for a decrease in the level of public support necessary. Until the point is reached at which the route become self-sustaining and commercially viable.

The model assumes that the CpFs in each region are equally strong. The difference between the two regions is the transport trade cost. In region one they are not sufficiently low as to make the value of benefits gained worthwhile. Whereas in region two they are. The positive feedback loop is also the process of circular causation that leads to the agglomeration of economic activity in the region. However, the feedback loop remaining positive is contingent on the PSO continuing to effectively maintain transport trade cost at a sufficiently low level.

6.1.4 Policy thinking limits on the strategic contribution from PSOs

An uneven allocation of PSO support

As discussed above, each of the CSPRs have similar economic and connectivity challenges. They face the same quality of employment and income challenges caused by their lagging economies. To overcome these challenges and to improve outcomes for their populations, they are each taking an endogenous approach to regional development, based on regional specialisation in traded industrial sectors. Likewise, the geographic peripherality of their locations is also compounded by thin and vulnerable inter-regional transport connections, whilst being equally reliant on a PSO service to maintain their aviation connection to London. However, despite the similarities, of the challenges, they face and the equal importance of access to international

markets, for trade and other inputs, the regions do not all have PSOs of comparable quality, while the cost of the PSO is different for each of their populations. Despite these differences, the CSPRs are in the same position in that, while the responsibility for imposing a PSO in the UK is devolved to LAs, the CSPRs are reliant on central government for funding support to make the PSO service, as it is, affordable. The importance of the government's support is illustrated by Table 25 .

The funding provided by the government to the CSPRs, to support the PSO, is a greater amount than that provided by the CSPRs themselves. Though it is evident that nature of this support is different for each of the regions. Dundee council makes a markedly smaller contribution, to aviation services, than either Derry~Londonderry or Cornwall, because 100% of the airport subsidy is provided by Transport Scotland, and 88%, of the PSO subsidy, is provided by a combination of the DfT and Transport Scotland. Whereas Derry~Londonderry and Cornwall provide 100% of the subsidy required by their region's airport. Cornwall has benefited from a four-year funding commitment from the DfT for the PSO, whereas it has only been a two-year commitment for Derry~Londonderry and Dundee. Which might possibly be because the Cornwall PSO has required 55% less government support than Dundee and 36% less than Derry~Londonderry, has required, in the same four-year period (See table 6.16). Though it was required to contribute the least amount to the funding for its first PSO imposition. Derry~Londonderry had to contribute 2.65 times more funding to its first PSO than was required of Cornwall.

The four years limit, for a PSO, is defined by EU regulations as a way of ensuring the commercial circumstances of the route and the need, for a PSO, are regularly reviewed (European Commission, 2017). However, the two-year funding period for Derry~Londonderry and Dundee is imposed by the DfT, though the economic rationale for this is unclear. According to the insights of interviewees who participated in a PSO imposition, it was not to assess any outcomes from its imposition on the local economy or performance expectations it had of the service. There have not been any academic studies, nor have the DfT or European Commission conducted research, of the effects on either the route performance or economic impacts of limiting the period a PSO can be imposed to two or four years. However, the survey responses do demonstrate the importance, to the CSPRs, of a PSO in creating a positive message about the region's future connectivity.

The reasons for the differences, in the DfT's support of each of the PSOs, is unclear because there is not a defined criterion or consistently applied standard that these could be measured against. As is discussed above, a similar lack of a standard criterion, across Europe, has caused concerns about the negative impacts of inconsistent imposition of PSOs (Brathen & Eriksen, 2016). The lack of a standard UK-wide approach has resulted in the funding of each PSO occurring within a context of several complicated factors that appear to impact the affordability of PSO services in each region and, therefore, the service from which regions benefit. The responsibility for imposing and funding PSOs in the UK is devolved to the LAs, who must balance the cost of funding them, and the region's airport, with their responsibility to provide community services. However, the level of support the LA can commit is influenced by several interconnected interrelated

factors, including the relative population sizes of the region and the airport catchment area, the leakage of PSO demand to competitor airports, the impacts of budget constraints and the absence of competition for PSO contracts.

Population. The relationship between the imposition of a PSO, and supporting the local airport from which it operates, and the size of the local population is an important one because, as rates payers, the whole population is funding the necessary financial support these require. The way in which the scrutiny, of a local population, can positively influence the match between a PSO service and local passenger needs is identified by Halpern & Pagliari (2007) and Merkert & O'Fee (2016). The influence such scrutiny has on the decisions LAs make about the way it funds a PSO, or whether it would make different decisions if it had a clearer understanding of the community support for a PSO, has not been yet been studied. However, it does appear that the cost, to each of the CSPRs populations, does differ, which raises a question about the equity of the current approach.

The Dundee population is a similar size as Derry~Londonderry's. However, the Derry~Londonderry population, per head, is contributing sixteen times more to support their PSO and Airport. The population size of the Cornwall LA area is almost four times larger than that of the Derry~Londonderry LA area. Therefore, the cost of supporting the airport and PSO is distributed amongst four times as many rate payers (See appendix 7). In addition to which, the population of Cornwall's LA area and airport's catchment area are the same. Meaning that the population that benefits from and funds the airport and PSO are also the same. Whereas the population of Derry~Londonderry airport's catchment area is 4.5 times larger than the LA area population. Meaning that the population that benefits

from Derry~Londonderry's airport and PSO is four times greater than the population funding it.

Arguably, if the Derry~Londonderry LA were able to distribute the cost, of the PSO or Airport, across a similar-sized population as Cornwall, then it too might be able to allocate a greater amount to the PSO and thus benefit also from higher quality service, such as Cornwall's additional mid-day rotation or service to Heathrow airport (DfT, 2018b). Ultimately the approach to funding has resulted in a situation in which the population contending with the most challenging economic conditions is contributing the most per person, but it is also doing so on behalf of the population much larger than it.

Demand. The increase in funding Cornwall was able to contribute, to the renewed four-year PSO, coincided with a reduction in the operating subsidy required by Cornwall airport, suggesting a correlation between the PSO funding and the airport's commercial performance. As the airport annual subsidy has decreased year-on-year as the terminal and PSO passenger numbers increased (See appendix 5 and 6). The way in which regional airports are maximising their commercial performance is highlighted by Malina *et al.* (2012), who attribute this to their recognising increasing demands on the public funds used to subsidise their operation. Whilst it might be the case that the improved commercial performance in Cornwall could be attributed to the management of the airport, it is also the case that there is no competitor airport to which demand could have leaked.

Mathisen & Solvoll (2012) highlight the benefits from a wide airport catchment area that maximises demand for a PSO service and reduces the need for support. However, Derry~Londonderry LA outsourced the airport operations and effective management company has resulted in stable operating costs and a consistent subsidy requirement. As Figure 32 (see appendix 6) illustrates, this becomes relatively more expensive as terminal passenger numbers decline. Unlike Cornwall, Derry~Londonderry's airport does face competition, from the two Belfast and Dublin international airports, to which demand can leak. The willingness of Derry~Londonderry passengers to travel to these airports emerged during the interviews and can also be seen in the IPA analysis of the survey.

In figure 30 and 31 (see appendix 6), Derry~Londonderry's vulnerability to the LCC airline's route churn, described by Wit & Zuidberg (2016), is also apparent in the dramatic decline in terminal passenger numbers once Ryanair had discontinued its service in 2016. Wittman *et al.* (2016) described how critically important PSO services have become to the survival of regional airports and, because City of Derry airport has become so reliant on its PSO, it was not just the future of the service that the LA was concerned about when the funding for the renewed PSO was in question, it was also the future of the airport.

Budget. As Davies & Mitche (2011) highlight, decisions about the affordability of a PSO are inevitably influenced by local budgets that are already under pressure from lower tax revenues and higher cost-per-capita services, because the spatial circumstances of a peripheral region cause less advantageous scale economies in the provision of services to a more dispersed, and expensive to reach population. As discussed already, it is a balance that the LAs are sensitive to.

Nonetheless, it emerged through the stakeholder interviews that the PSO services that are currently contracted are not based on the identified needs of the local users. Instead, they are based on, or constrained by, the budget that was in place to fund them. This phenomenon is explained in Theme Three.

Although the LA negotiators did begin the tender process with a clear set of expectations for the PSO, the cost of this in the tender responses was greater than the available budget. Consequently, they selected a package of service attributes from the tenders they believed to be the least bad, of available options, and renegotiated these with the airline. However, as Merkert & O'Fee (2013) and Williams & Pagliari (2004) caution, it is in the LA's interest to maximise interest in the tender process and competition amongst airlines. Otherwise, the LAs negotiating position is weakened. As the interviewees explained, there is a lack of interest in the UK PSO contracts and this will inevitably weaken their negotiating position and put them in a price taking position.

The reasons for a lack of interest in UK PSO contracts is not understood because conducting post-tender reviews does not occur. However, these do need to be better understood if the negotiating position of the LAs is to be improved and if competition for contracts is to drive down costs and improve the service. Academic literature does offer theories about the lack of competition for PSO contracts. Some suggest that airlines could be prevented from responding because of the way the contract and route information is communicated (Merkert & O'Fee, 2014), service requirements are onerous and overly specific (Williams & Pagliari, 2004), the belief that the service specification is written with a preferred airline in mind (Merkert & O'Fee, 2014), or the level of sunk costs preparing a bid

or high risks and uncertain returns means it is not worthwhile (Williams & Pagliari, 2004). Though these reasons seem improbable, as the tender followed the process set out by the EU and the service requirements are relatively straight forward.

Another reason airlines may not consider them to be worthwhile is if they are not commercially attractive. The EU regulations, by design, have very strict route eligibility criteria that could deter the interest of airlines (European Commission, 2017). Such as preventing contract periods longer than four years, routes that include stopovers, or bundling services together in way that could make them more cost effective and commercially attractive. It might also be that the commercial oriented airline operators are aware that the LAs will prioritise budget certainty and that they will not, therefore, have the opportunity to work in partnership with the LAs and develop demand on a route. Merkert & O'Fee (2013), Merkert & Williams (2013), and Merkert & Hensher (2013) explain that the effect, of inflexible contracts, forces airlines to make conservative cost provision to protect them against volatile costs, which inflates the level of subsidy and removes any scope to be enterprising on route developments.

A feature of the PSO contracts in the UK is that the level of subsidy provided to the airlines is reduced when route demand outperforms the contracted level. A feature that, according to Merkert & O'Fee (2013b) actively disincentivizes airlines from investing in route development. They also make the point (2016) that given this, and if the LAs are unconcerned with developing demand on the route, there is no reason why they would take the risk to invest in

doing so. Particularly, as Merket & Williams (2013) point out, they risk losing any of the gains from their efforts at the contract end.

Many of these factors are outside of the direct influence of the LA and the degree to which they do influence LAs PSO funding decisions is unclear. What is clearer is that when determining what level of funding that should be committed from the local public budget the principal judgement concerns the maximum amount affordable, when balancing it with the cost of providing community services for the region's population. It is clear also that, irrespective of the outcome of this judgment, the CSPRs are reliant on central government to close a gap between level of funding affordable to them and what the cost of a PSO service is. Whereas the judgements, made by LAs, may be concerned with maximising benefits for their own CSPR, those of central government have, to date, been primarily concerned with their VFM at a national level. Nonetheless, the results of the IPA analysis highlight that these combined amounts have been insufficient to fund a PSO service that satisfies the needs of local passengers.

The need for a shift in paradigm towards strategic PSOs

It is apparent from the DfT's guidance on PSOs (UK Government, 2013a) that it regards the imposition of PSOs as no more than a remedial intervention of last resort. Whilst acknowledging a role in protecting regional services, the guidance also highlights a need to limit interventions in the market, to protect existing routes at risk of discontinuation, and to ensure only a "minimum" (emphasis by DfT) (p.3) service provision. The economic justification being to protect those current benefits to the local economy of the service. Its aviation strategy paper (Gov UK, 2018d) is clear that PSOs in the UK have represented

poor value for money. The paper refers to the lack of interest from airlines in operating these routes, because of low levels of demand, as evidence that “*conventional*” economic benefits are minimal (p.89). However, this way of viewing a PSO seems to be detached from the reality that it is the lack of economic activity in a region, which in addition to causing poor employment opportunities and low levels of income, is causing the lack of demand for air transport services and the need for a PSO. The sole purpose of the PSO mechanism and only justification for their imposition on a route is to protect commercially unviable routes (European Commission, 2017, para.10). As Merkert & O’Fee (2016) emphasize, these are routes that would not exist without a PSO.

As the DfT must maintain a national-level perspective, Value for Money (VFM) is the key measure that has been used to assess the economic case for the PSO funding proposals. While this is done by calculating a Cost-Benefit ratio (Gov UK, 2013; 2017b), the DfT modelling excludes induced investment, labour supply effects, or agglomeration benefits, because it believes the value of these impacts from a PSO is negligible, which is based on a paper by Laird & Mackie (2018). Furthermore, the modelling is limited to the duration of the PSO and is based on an ex-ante extrapolation of current, actual, levels of demand. It cannot, therefore, consider latent demand, such as the leakage described above, that could be persuaded to use a PSO if it satisfactorily met their needs. Nor can it consider an increase in demand that could flow from the growth in economic activity, during and after the period of the PSO. This is not to argue that a PSO can trigger a transformative bifurcation, of the type described by Krugman (1991), and that the modelling cannot capture. Rather, it is to suggest that it is unable to capture the benefits accrued to a region through de-locking activities, as

described by Martin & Sunley (2006), and supported by the PSO in the strategic way that is discussed above. However, the Laird & Mackie (2018) paper goes on to make the point that, if the economic activity had previously been constrained by inadequate transport connectivity, and if the movement was from the core, to escape cost and capacity constraints, to the periphery and it resulted in specialisation, inward investment, productivity improvements, and employment gains that was greater than that lost in the core, it would be additional.

Arguably, there are inherent limitations in an approach to assessing value for money that is heavily reliant on economic modelling, because it prevents the strategic value from being recognised. The economic case is only one of the five different cases, including the strategic case, that should form the complete business case on which funding decisions should be made. However, the DfTs guidance (UK Gov, 2013) does not refer to the need to present a strategic case as a part of a PSO proposal.

The argument being made, that the way in which a PSO is currently assessed is unable to recognise the potential strategic value of a PSO, is consistent with the findings of the recent Treasury Green Book review (HM Treasury, 2020). It found that the proposal assessment process had become a 'black box', was overly reliant on Cost-Benefit calculations, was poorly understood by anyone other than experts in the process, and therefore, was a process with which few LAs feel able to engage. It highlighted a critical need for greater focus on the strategic, non-monetisable, goals of a proposal if they are to deliver "*truly place-based*" strategies (p.4). However, it stresses the need for a more robust

understanding and greater clarity about what the strategic objectives and contributions of the proposed strategy are.

This outcome of the green book review could provide an impetus for a shift in the paradigm through which PSOs are viewed by policymakers. From regarding PSOs as a short-term and remedial mechanism, used only to maintain the status quo, to recognising their greater strategic value in supporting place-based development strategies, by maintaining sufficiently low transport cost of trading from a peripheral region. To allow the process of circular causation to become established and the agglomeration of economic activity to occur, until it becomes sufficiently thick to remove the need for support and the eventual marketisation of the route. Otherwise, as evidence gathered by Merkert & O'Fee suggests, the imposition of a PSO is conferring on it a subsidy dependency, and the long-term prospect of a quality of connectivity that is determined by affordability rather than need.

6.1.4 The unrecognised value of PSO to place-based tourism strategies in peripheral regions

The value of tourism to a local economy has been recognised for many years (Eurostat, 2020; UNWTO, 2014) and the emergence of a new type of 'wanderlust' tourism consumer is creating a new opportunity for the CSPRs to benefit from, and to escape the 'shadow' of core tourism agglomerations (Papatheodorou, 2004). They now have a growing opportunity to valorise their unique endowment of tangible and intangible assets as part of an endogenous approach to regional development (Lane *et al.*, 2016; Novelli & Benson, 2005;

Salvatore *et al.*, 2018). the CSPRs can package and promote to attract this emerging consumer group of tourists to visit their region (UNWTO, 2002). The types of benefits a region gains from tourism, that are in addition to the direct expenditure by tourists in the region and the multiplier effect of this (Oxford Economics, 2013; WTTC, 2012), are well aligned to the specified objectives and outcomes of the CSPRs place-based development strategies. Dwyer *et al.* (2000) highlights the training and career development opportunities it creates for unskilled and semi-skilled workers. The ODI (2014) highlights the opportunities it creates for Local SMEs, either within in the sector, or its supply chain. The benefit of both becomes greater the stronger the regions tourism cluster thickens, because competition increases, and supply chain leakages are reduced.

It is unsurprising, therefore, that tourism forms an important part of the development strategies of the CSPRs. Investments are being made by them to develop and promote a distinct local tourism product, as the regions seek to increase the volume of tourism visitors, and the value of these by increasing the share of higher value overnight visitors and lengthening the appeal of the region outside of the traditional tourism season. Tangible and intangible tourism assets being valorised are as unique and diverse as a sectarian conflict to whiskey production, industrial mining heritage, and computer game design. An organic cluster has emerged in Derry~Londonderry around its sectarian history and 'the troubles'. Built and natural environment assets include the Dundee waterfront, famous television and films scenes in Cornwall, and the Atlantic and Causeway coasts in Derry~Londonderry. These are typical of the idiosyncratic advantage a peripheral regions tourism offer has over core tourism destinations (Papatheodorou, 2004) and all fall within Novelli & Benson's (2005) typology of

niche tourism experiences that are particularly suited to peripheral tourisms. To expand the tourism season Cornwall has opened the Eden project and Dundee the V&A museum. Derry~Londonderry has made the construction of a similar attraction a priority and it too has been connected with an Eden project. However, in the same way as the CSPRs have each recognised the benefits to their economies from tourism, as the Derry~Londonderry tourism strategy notes (DCSD, 2018b), so too have other peripheral regions and they too will be employing a broad range of policy and product interventions to grow market share.

According to Dwyer & Forsyth (1993) and Schubert *et al.* (2011) tourism can also have a positive effect on place because it unlocks investment to develop new tourism products, construct new infrastructure, and repurpose or preserve the natural and built environment. While these are primarily intended to increase the appeal of the region as a tourism destination, they also lead to a general improvement in the quality of life in the region. Which strengthens the quality-of-life aspect that the CSPRs are promoting as part of their appeal as a business destination. However, as Papatheodorou (2004) notes, peripheral tourism destinations are more costly to visit than core tourism destinations. It is surprising, therefore, that the travel needs of tourist visitors are not being taken into consideration when PSOs are imposed on services to the CSPRs.

Overcoming remoteness as a barrier to tourism dispersal

In the same way that the CSPRs only gain the economic benefits created in agglomerations if the spillover from these reaches as far as them, the CSPRs can only gain the benefits of direct tourism expenditure if tourists are prepared to incur the costs of travelling to them (Papatheodorou, 2004). However, research

by Khadaroo & Seetanah (2007) and Prideaux (2000) suggests that tourists are reluctant to incur a cost for intermediary travel in addition to their main journey. This is supported by data from Visit Britain (2016) and illustrates the scale of the challenge the CSPRs have in persuading their two key segments to visit them. Namely, inbound international tourists and domestic short break visitors.

Half of all international visitors to the UK arrive via London and only one fifth of them are prepared to travel beyond it. This is because of the strength of the London tourism offer, but is also partly because of their concerns with the complexity and inconvenience of travelling to other regions and their unwillingness to incur the additional costs (Visit Britain, 2016). Which is consistent with the findings of Khadaroo & Seetanah (2007) and Prideaux (2000) that time and cost is preventing tourism dispersal beyond gateway cities. Although leisure travellers are commonly considered to be more flexible when it comes to booking holiday travel (Francesco & Pagliari, 2012), data from Visit England (Visit England, 2014) indicates that this description does not apply to domestic short break visitors in the same way, who, unlike when they book an annual holiday, are not prepared to make changes to their normal schedule to accommodate a short break. Rather, because these trips are in addition to an annual holiday, plans for them are determined by whether they will fit within their normal schedule. Likewise, they are more conscious about the budget for a short break and plans will be influenced by the extent to which they can maximise value they can gain the available budget. Meaning that if the CSPRs are to attract both these types of tourists, the transport cost of choosing to them must be reduced as a deterrent.

NEG thinking can be applied to the relationship between the strength of the appeal of the CSPR as a tourism destination and the transport cost to the tourist of travelling to it. If the cost of travelling to the region is insufficiently low, relative to the value to the tourist of the experience to be gained at the CSPR, it is unlikely that they will choose to do so. Particularly if they are sensitive to the constraints of a budget they have allocated for time or money. Meaning that if the CSPRs are to persuade inbound international and domestic short break tourists to select their destination to visit, ahead of all other options available to them, including remaining in the gateway city in which they arrived or live, the transport cost of travelling to them should be removed as a deterrent.

Koo *et al.* (2012) have identified the advantage of air transport in dispersing tourists beyond gateway cities, such as London. Although each of the CSPRs are connected to London via a PSO route, no evidence emerged during any stage of the research that meaningful consideration has been given to understanding whether these PSOs are being used by tourists, are satisfactorily fulfilling their travel needs, or if their needs could be better served and, if so, how. Which is a likely consequence of the LAs that are resigned to prioritising the needs of business passengers over those of tourists, possibly because of the constraints of the funding budget, and the DfT is concerned only with maintaining the economic status quo. Which has resulted in a PSO service schedule that is concentrated into the business week and a timetable that accommodates the needs of a working day. Whereas the weekend schedule is underserved and unlikely to accommodate the travel needs of a typical weekend break.

The data from Visit Britain and Visit England illustrates how the air transport requirements of tourists, of the type that are key to the CSPRs tourism strategies, are like those of business travellers. In that their flexibility is restricted by the needs of their schedule, including that of the main trip, and convenience and efficiency are equally as important to them. Arguably, therefore, they would have similar issues with the PSOs as those of the business passengers surveyed. It is unlikely, therefore, that tourism travellers, who have greater discretion about the choices they make from the wide range of options available to them, would assess that the PSO service performs any more satisfactorily for them and could, therefore, be a constraint of the potential for tourism growth in the CSPRs.

Realising Derry~Londonderry's potential as a route and gateway destination

Derry~Londonderry's tourism plan highlights that, of all visitors to the region, only one third are visiting for leisure or a holiday, of which two thirds are day visitors. To redress this and increase the share of overnight visitors, the region is promoting itself as a tourism 'hub'– the centre of which is the walled city of Derry~Londonderry itself, surrounded by countryside activities, the Sperrin Mountains and the Foyle estuary, and the starting point for the internationally recognised 'Causeway Coastal Route', to the north of the City, and the 'Wild Atlantic Way' to the west. This structure, of a hub destination with radiating tourism routes, is the same as the route and gateway concept described by Myers (2014). Which consists of three components, each of which Derry~Londonderry possess: a staging area or tourism cluster, which is the walled city of Derry; the tourism route, of which Derry~Londonderry benefits from two; and a transport gateway, which the Derry of City Airport has the potential to be.

Research published by Tourism NI (2018) shows that only 2% of international tourism arrivals into Derry~Londonderry are via City of Derry Airport, a share that has decreased from 5% in 2014. Whereas 55% arrived via Dublin Airport– which is the highest for all regions in NI– and has increased since the PSO replaced the LCC service in 2017. Half of them are arriving from Great Britain. The journey to Derry~Londonderry from Dublin Airport involves a three-hour road trip, suggesting that leisure travellers are as prepared to incur as high a level of inconvenience and avoid the PSO service, as the business passengers who participated in the field studies. Furthermore, half of these arrivals via Dublin are VFR, suggesting that cost of fares could be a motivating factor. These patterns of travel indicate that there is still scope for Derry~Londonderry's airport to be further developed as a tourism asset, being the gateway in a 'route and gateway' tourism structure. A PSO that better accommodated the tourist passenger needs could, arguably, at least recapture the 3% latent demand that has leaked to other airports since the PSO began. In addition to this would be the demand generated, if the PSO service more closely matched the needs of tourism travellers and the cost of using it was reduced, so that it can become a convenient gateway to the Derry~Londonderry 'Hub' destination.

6.2 Summary

Throughout this discussion, an attempt has been made to highlight how PSOs could be used to make a greater contribution to endogenous regional development, if a more strategic approach could be taken to the way in which they are imposed. It began by discussing how the connectivity needs and expectations of passengers, in peripheral regions, are not any less than those that passengers

from less remote regions have become accustomed to, following market liberalisation by the EU. But that there is a gap between these needs and the PSO service that is available to them. The next point to be discussed is how applying NEG thinking to the relationship between the role of the PSO and the endogenous development activities are inseparable. It will be challenging for Local authorities to achieve their local development strategies and deliver the outcomes for the local populations, and to which the government is contributing substantial public growth funds if the cost of transport remains a barrier to trading from that region. No matter what efforts the local authorities are making to improve the region as a business destination, if the transport cost are too high, and potential new entrants have other destination choices, trading from the region remains unviable. The PSO, and the types of interventions they provide governments with could be crucial to reducing the cost of transport as a barrier. However, as the next discussion attempts to emphasise, this is not the view of PSOs that is taken by policymakers.

Policymakers view PSOs as short term and remedial intervention that represents poor value for money. A view that is reaffirmed by the current way in which VFM is assessed, with a reliance on the narrow mathematical modelling of the economic case. This view of PSO is resulting in PSO contracts, and services, that are constrained by cost, rather than being based on need. A review of the Treasury's Green Book, prompted by the governments levelling up agenda, has placed new emphasis on the strategic case for funding proposals, such as for PSOs, while highlighting the need for greater clarity about what the strategic objectives are. Such as that which this discussion is attempting to set out for air transport PSOs.

Taking such a strategic approach to PSOs might then allow the emphasis, on which users groups needs a PSO should fulfil, to be widened beyond the current prioritisation of outbound business passengers. This could lead to the needs of inbound tourism passengers also being taken into consideration when imposing a PSO. Despite place-based tourism strategies being a growing economic opportunity for the peripheral region and a large part of their development activity, this is not currently the case. Yet tourism passengers, of the type that are key to peripheral tourism, are also deterred from visiting a region by the high cost of transport, in both time and money, no matter how appealing the region might be.

Chapter Seven: Conclusion

7.0 Introduction

The aim of this research study has been to explore what technical and policy conditions are needed, at either a local or national level, in order that air transport PSOs can contribute most substantially to the economic development of UK peripheral regions. Conditions which could, in turn, create the possibility for a reduction in the level of support provided to PSOs and the possibility for the eventual marketization of these routes. The intended outcome of the study was to propose a new framework of these conditions that could be used as a guide by policymakers and practitioners when defining an appropriate criterion for a PSO service and, their proactive use as part of a regional development strategy. In achieving this aim, the study has been guided by four objectives that were established at the outset of the research.

In this chapter, those objectives and the contributions the study makes, on the use of air transport PSOs as a tool for regional development, are reviewed. After which an assessment is made of the research journey, what limitations of the study there are, and finally, recommendations for further research that could build on the findings of this thesis.

7.1 Review of the research questions

One: what approach are the local authorities of peripheral regions taking to achieve regional economic development?

A review of the academic literature on regional development identified two key theories to be of importance to this thesis. The first is the theory of New Economic Geography, as this explains the formation of the core-periphery structure and the role of the transport costs within this. The second is the endogenous approach to regional development, which is increasingly being adopted by policymakers in developed nations as an approach to supporting growth in the lagging economies of peripheral regions.

NEG theory explains how the intersection of scale economies and the transport costs of market access determine the location of economic activity, and how the 'Marshallian externalities' created by firms in proximity causes the agglomeration of economic and social activity in core centres. This 'agglomeration effect' is advocated by supranational organisations and national governments because of the greater economic gains it generates at a national level, causing higher value economic spillovers to peripheral regions and leading eventually to their economic convergence. Although the global trend towards urbanization confirms the strength of the agglomeration effect, convergence is not occurring at the same rate and economic divergence between core and peripheral regions has become a spatial feature of developed nations. Urbanisation is also influencing the demographic profile of the peripheral workforce, as it is causing the outflow of the young and well-educated population who are attracted to core centres for the economic and social opportunities available.

Proponents of agglomerations maintain that because they grow at a faster rate divergence is an unavoidable characteristic of regional development. They argue against diluting potential economic gains through policy interventions that

seek to redirect economic activity towards lagging peripheral regions. Nevertheless, governments have a responsibility for the wellbeing of peripheral populations, as well as the economic imperative to maximise the region's productive capacity. Influenced by cluster thinking and the need to reassess how they will continue to be competitive in a globalized world, there has been a shift from exogenous to endogenous in the approach taken by developed nations to achieve this. An endogenous approach is bottom up and emphasises place and investment over sector and subsidy. Governments in developed nations are now pursuing agendas of regional specialisation in technology and knowledge intensive sectors, that are underpinned by place-based strategies that seek to identify and valorise local tangible and intangible assets.

Two: what influence do place-based conditions have on endogenous development in peripheral regions?

Research question two was answered in two stages. The first stage was to undertake documentary research of the large volume of contextual data that already exists relating to the imposition of PSOs in the UK, by a wide range of institutions and organizations. The second was to gather the perspectives and insights of the stakeholders with direct or indirect influence on economic policy in the region. Both stages were guided by the conceptual framework developed through the review of the academic literature.

The first stage confirmed the lagging economic status of these peripheral regions, as well as how fundamentally similar the cause and effect of their challenges are. In that they have each been on a path trajectory of economic decline, from once prosperous economies, leading to poor employment

opportunities, low earnings, and low household income levels for the local populations. The regions are each seeking to de-lock from these trajectories by pursuing place-based development strategies that develop regional specialisation in technology and knowledge-intensive sectors, in industries in which the region already possess assets or capabilities. Parallel to this is a strategy to exploit changing tourism trends and grow the economic contribution of tourism by increasing the share and value of high-quality tourism visitors.

These strategies are aligned to the UK government's competitiveness agenda, which has invested in them with 'growth deal' funding. The key outcomes from these strategies are improved employment opportunities in high quality jobs for the local populations and improved quality of life. As the sectors, that are key to these strategies, are externally facing and rely on international markets for trade and essential inputs, competitive access to these markets from the regions is crucial for successfully delivering these outcomes. However, peripheral regions do not have access to the same quality transport connectivity as non-peripheral regions have.

The second stage identified how stakeholders in the region, who are motivated by achieving growth, are satisfied that they can access the business and financial support they need to support their business ambitions from within the region. It does not appear that this has been negatively affected by peripherality. A common concern that they do have with the local business environment, and which has the potential to constrain growth, is difficulty recruiting young people who are at the stage of their career they require and possess the skills and experiences which they need. This they attribute to a trend

amongst young people to leave the region to pursue education, career, and social opportunities in cities.

Three: in what ways do pecuniary and non-pecuniary costs of transport compound a region's peripherality?

As with research question two, question three was answered through the contextual data consulted in the documentary research and through the insights provided during stakeholder interviews. Additionally a fully structured questionnaire survey was used to assess the consensus amongst PSO users their importance to them in supporting growth in the region and how well they perform in this regard.

The EU views the role of air transport connectivity as crucial to the goal of economic, social, and territorial cohesion, in facilitating a single European market, and in providing access to global markets for all regions of Europe. It was to enhance these benefits, as doing so would enhance the functioning of the single European market, that the EU embarked on the liberalization of the European aviation market and the introduction of unhindered competition. Liberalization has resulted in improved outcomes for passengers, through increased service and quality and reduced fares, for all Europeans other than those living in peripheral regions. The new aviation regulations prevented the protectionist government interventions that had protected unprofitable services on thin routes to peripheral regions and meant that airlines would no longer operate unprofitable routes. Leaving peripheral regions vulnerable to reduced or removed services.

In the UK hub airports provide access to the third largest global air transport network and gives UK firms competitiveness and productivity advantages.

However, inferior access to air transport connectivity in peripheral regions means the cost of accessing this network, and the opportunities created by globalization, will be greater than they are from all other regions of the UK. In addition to which, passengers in peripheral regions assess the performance, of the PSO services, as failing to fulfil their connectivity needs. To the extent that they are prepared to incur additional costs and inconvenience to access services that better satisfy their needs. Though there is a limit to the period for which they would be prepared to do so, and this will have long-term consequences for economic growth in the region.

An issue that PSO users do have to contend with, that is caused by the region's peripherality, is the negative perception amongst external clients about their capabilities. Instinctively prospective clients conclude, firms that can provide the capabilities and support they require, would not be in peripheral locations. This is an issue these firms continually must readdress as part of their business development efforts. Access to high-quality connectivity is a crucial component of this, and more generally to the region's reputation as a high calibre business destination. Therefore, ongoing speculation about the survival of the local airport and the PSO service creates uncertainty about the quality of the region's connectivity in the future.

Four: how could the imposition of PSOs best support endogenous regional development in peripheral regions?

So that PSOs can best support endogenous regional development, a shift is needed in the way they are viewed by policymakers. From a restrictive and remedial intervention that prioritises the avoidance of market distortion and is concerned only with

maintaining the economic status quo, to their having a strategic role as an enabler of the type of economic activity that is crucial to and inseparable from place-based development strategies, until the point where the agglomerated economic activity generates sufficient demand for the route that the dependence on public funding support can be reduced. Such a paradigm shift will enable the cost of a needs-based service to be assessed against a broad range of long-term strategic objectives, rather than a narrow and short-term cost-benefit calculation that is resulting in inadequate budget-constrained service.

As NEG theory (Kurgman, 1991) explains, sufficiently low transport costs of trading from a place are crucial to the location of economic activity. These are both the financial and time costs of covering the greater distances between their location and their markets. Meaning that the quality and level of PSO service are as important as the affordability of the service. Neither of which are sufficiently low on PSO routes, because of how they are imposed and administered. In addition to service improvements that could be achieved by assessing the VFM of a need-based PSO against the full range of strategic benefits, improvements could also be achieved by increasing the appeal of PSOs to commercial operators, and by contracting in a way that encourages a partnership approach and enables the commercial instincts of airlines to build demand for the service over the long-term.

7.2 New contributions to the theory

The research approach taken was influenced by a need to be strategic and to explore and discover the important issues as they relate to the development of peripheral regions and the role that PSOs have in this, rather than to measure or

explain issues that are not, as yet known. This approach is consistent with the outcomes of HM Treasury's review of the Green Book Review, which stated that the strategic case for spending proposals should now take priority over the econometric case, but that a clear and precise understanding of the objectives of a proposal is essential. Therefore, the research strategy was designed to allow a wide range of high-quality and in-depth data to be collected from a variety of sources. Doing so allowed different facets of regional development and the imposition of PSOs, and how these are perceived by stakeholders impacted to be discovered through an in-depth study of a small number of cases. These findings could now be the basis for a fourth stage of the study with a larger sample so that these findings can become generalisable.

The data that was collected, and the in-depth study of it, was undoubtedly enriched by the willingness of very senior individuals and business leaders to share their personal experiences, insights, and opinions. The breadth and quality of the data gathered have created the opportunity for several research contributions to be made that researchers, policymakers, and practitioners will find helpful and worthwhile. These contributions to theory and practice are set out in the next section of this chapter. After which there is a review of the research journey, its limitations, and suggestions for future research that could develop further the findings of this research.

7.2.1 Applying NEG to explain the strategic case for PSOs

In explaining the Core-Periphery model 'Globalization and the Inequality of Nations', Krugman & Venables (1995) demonstrates that if the decrease in the

transport cost of trade, that first incentivise firms to agglomerate into core cities, continued it would eventually lead to the de-agglomeration of firms from cities into the peripheries. When the transport costs become sufficiently low, firms would be incentivised to relocate back to the peripheral regions where wages had remained lower than in the core, where they had been driven up by the competition. The dispersal effect of competition and congestion in the core, which causes high wages and other costs, is an example of the centrifugal forces that oppose the centripetal forces that cause the agglomeration of economic activity (Krugman, 1998). As Fujita & Thisse (1996) explains, centripetal and centrifugal forces push and pull firms towards locations that provide maximum benefit to them. The extent to which a reduction in air transport costs contributes to the agglomeration effect and creates a 'hyper-mobile' population is described by Papatheodorou (2002), Papatheodorou & Lie (2006), and Forsyth (2006).

The rate of global urbanisation suggests that the process of de-agglomeration anticipated by Krugman is not yet occurring (United Nations, 2015a) and, although it is argued that uneven levels of prosperity, between core and peripheral regions, is an unavoidable feature of regional development growth (Fujita & Thisse, 2003; Gardiner *et al.*, 2011), peripheral economies are not benefitting from agglomerations in the way their advocates, like the World Bank (2009), argued they would (Boris & Metiu, 2013; European Central Bank, 2017; Franks *et al.*, 2018). Since NEG theory first emerged there have been significant changes in the nature of the economies of developed nations on which it had focused. As Krugman acknowledges, there was a bias in NEG thinking towards mass manufacturing in advanced economies of the past and a focus on the *“tangible causes of concentration in a world increasingly dominated by*

intangibles” (Krugman, 2011, p.5). Globalization has since provided firms with access to even cheaper wages in developing nations and, therefore, has removed from peripheral regions in developed nations any remaining wage cost advantage. According to Krugman (2011), NEG’s relevance today is, when it is applied to the fast-growing economies of emerging nations that mirror the manufacturing intensive economies of developed nations in the past. Rather than the ‘intangible’ modern economies of developed nations.

Applying NEG theory to endogenous regional development is an approach that had not previously been taken. However, this thesis has done so by taking a contemporary view of the economic forces that push and pull modern knowledge-intensive firms towards the locations of optimal benefit to them. Doing so has elucidated the strategic potential PSOs have in an endogenous approach to regional development strategies. Central to NEG theory is the relationship between two key parameters: the benefits of scale economies derived from the concentration of firms in a place, and the transport cost of trade that determines whether locating to a place, to gain such benefits, is worthwhile. While a shift which has occurred in developed nations from mass manufacturing to economies based on ‘intangibles’ has reduced the influence of scale economies in this relationship (Krugman, 2011), the endogenous approach to regional development, being taken by developed nations, seeks to replace these with a different type of place-based benefit (Barca *et al.*, 2012).

ICT enabled knowledge-intensive and creative firms (Batevik *et al.*, 2002; Rasker *et al.*, 2009; World Bank, 2009), and the spatial separation of the strategic and production functions of manufacturing firms (Deardorff, 2003; Fujita & Thisse,

2006; Jones, 2000) means that economic activity is now highly mobile and peripheral regions can appeal to those modern firms, that are dispersed by centrifugal forces or are motivated by the new type of place-based benefits. The transport cost of trading from a peripheral region, and whether they are sufficiently low to make the contemporary place-based benefits worthwhile, remains a key parameter in the location decision of modern firms. At the early stages of de-locking from a negative economic path, a peripheral region will lack sufficient agglomeration thickness to be a centripetal force. Which is the reason why routes to these regions are thin. An air transport PSO is, in effect, a proxy for the positive benefits that would accrue, to the passengers, under normally competitive market conditions on a thick route. That is to say that, through the imposition of a PSO the contracting authority is seeking to either reduce the cost of fares or improve the level or quality of services on that route. Put into NEG parlance, it is attempting to reduce the transport cost of trading from that region.

According to NEG theory (Krugman, 1991), however, the transport costs need to be sufficiently low that the benefits gained from locating to a region are greater than those forgone by not remaining located in a core centre. While the imposition of a PSO alone cannot create a bifurcation and cause a transformational inflow of economic activity to a peripheral region, it can protect the earliest stages of the agglomeration of economic activity drawn to a region by its place-based benefits. A PSO can achieve this by maintaining sufficiently low transport costs, so that gaining these benefits is worthwhile for firms, until the point that the agglomerated activity creates the level demand that enables public support for the route to be reduced and the potential is created for its marketization. Rather than being viewed as a short term and remedial instrument,

therefore, by which the benefit is limited to protecting the economic status quo of a peripheral region, a PSO should be recognised for the strategic role they can have, as an enabler of the types of economic activity that are crucial to an endogenous approach to regional development.

Tourism

NEG theory can be applied to explain the same strategic potential of a PSO to tourism destination development in peripheral regions. Modern touristic preferences are creating new economic opportunities for peripheral regions to exploit their endowment of place-based tourism assets (Lane *et al.*, 2016; Papatheodorou, 2004; Salvatore *et al.*, 2018). However, recent studies have shown, that the characterisation of tourism passengers having greater flexibility when making travel arrangements (Francesco & Pagliari, 2012), does not apply in the context of tourism travel to peripheral regions. Tourism passengers of the type key to tourism in peripheral regions, namely international inbound and domestic short breaks, are as sensitive to incurring additional time and money costs as business passengers (Khadaroo & Seetanah, 2007; Prideaux, 2000). These costs create a barrier to their travelling beyond gateway cities to peripheral tourism destinations (Visit Britain, 2016, 2020). Koo *et al.* (2012) have identified the advantage of air transport in dispersing tourists beyond gateway cities. Despite all these factors, however, there is little evidence that the needs of tourism passengers are given much consideration when defining the service criteria for a PSO.

Increasing the share of high-quality tourism is an important element of the place-based development strategies being pursued by LAs in peripheral regions

and local authorities are investing in developing tourism assets to strengthen the appeal of the regions as tourism destinations. However, the appeal of a destination, the benefit a tourist derives from visiting it, is just one of the two key NEG parameters. It is as important to tourism as it is to businesses passengers that transport costs incurred when visiting peripheral destinations, are sufficiently low that the benefits offered become worthwhile. Meaning that the strategic potential of a PSO in supporting tourism development is the same, and as crucial, as it is in supporting wider regional development, in that it facilitates inbound tourism passengers until the destination becomes established and sufficient business and tourism demand exists for the PSO route to becoming less dependent on public funding.

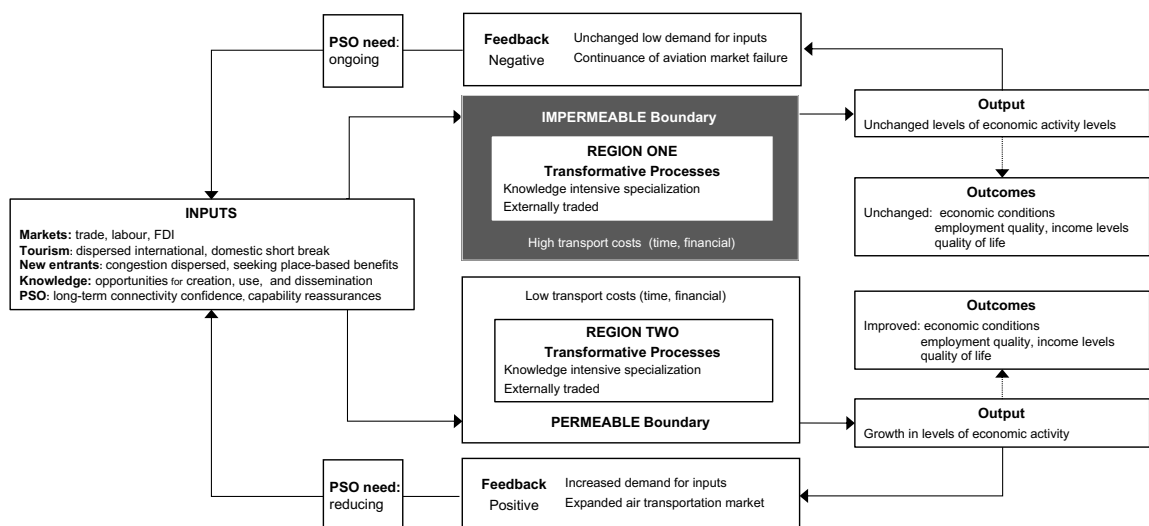
7.2.2 A General Systems model of the role of PSOs in endogenous regional development

An endogenous approach to regional development is a bottom up and growth-orientated approach that seeks to valorise a region's unique endowment of tangible and intangible place-based assets (OECD, 2011). According to Cook & Memedovic (2003) and Ward & Brown (2009) these can create a strong competitive advantage for a peripheral region over other peripheral regions and core centres. They can also be used, as advocated by Martin & Sunley (2006), to develop regional specialisations, or industrial clusters (Martin & Sunley, 2010). Which the World Bank (2009) and OECD (2000) maintain is the most effective tool in enabling peripheral regions to realize the opportunities of globalization. To achieve growth, however, the valorised assets need to be traded on international markets (Porter, 2003). If peripheral regions are to gain the benefits of

globalization, they first need access to the international markets (National Connectivity Task Force, 2015), and this is inhibited by poor air transport connectivity (Laird & Mackie, 2016), as demonstrated by York Aviation (2018).

Peripheral regions are at a geographic disadvantage because of their distance from core economic centres and hub airports. The higher transport financial and time costs (EUR-Lex, 2012b) that local firms incur covering this distance causes a lack of competitiveness (European Commission, 1993). These are costs that air transport can most effectively minimise (Graham, 1998).

Figure 7.1. General systems view of strategic PSO in regional development



The symbiotic nature of the relationship between the benefits of place and the transport costs of trading from it— which are the two key parameters central to NEG theory— in the context of endogenous regional development is illustrated in Figure 28 The model also illustrates how the boundary, between the necessary economic inputs and the peripheral region, would be highly impermeable without a PSO, and that the region would be unable to access the inputs at the rate necessary to generate growth. Meaning the outcomes being pursued by the

place-based development strategies could not be achieved. Which in turn constrains growth and sustains the ongoing need to support the PSO route with public funds.

7.2.3 A framework of technical and policy conditions to guide the strategic imposition of PSOs

Before the liberalization of the European air transport market in 1992, thin services to peripheral regions were protected by national governments. While liberalization has created positive outcomes for most European passengers, services on thin routes are now at risk when they become commercially unviable for an airline. The purpose of the PSO mechanism is to replace the air transport services, to peripheral regions, that were lost because of the liberalization. However, the review of the academic literature on PSOs, presented in chapter three, highlights how the focus of studies on PSO has been concerned with supply-side and policy issues that affect the administration of PSOs, rather than how outcomes for PSO users can be improved.

The potential to cause negative outcomes, for peripheral passengers, by removing competition on regulated PSO routes is an issue that was first raised by Reynolds-Feighan (1996). Though it is also noted that PSOs are increasingly facing competition from improved rail and ferry services (see Bergantino *et al.*, 2015; Calzada & Fageda, 2014; Rigas, 2009), and from competitive airports made accessible by road network improvements (Lian & Ronnevik, 2011; Mathisen & Solvoll, 2012). Lian (2010) highlights how PSOs protect passengers incurring the costs of airlines' promotional activity on competitive routes and Francesco &

Pagliari (2012) identified how removing a PSO can create negative outcomes by making local communities reliant on seasonal and expensive commercial services. Calzada & Fagedas (2012), Fageda & Flores-Fillol (2012), and Valido *et al.* (2014) present evidence that attempting to maximise the benefit to peripheral passengers, by providing a discount directly to them serves only to increase fares by the value of the discount.

The importance of competition, to the tender process, in preventing purchasing authorities from becoming price takers is highlighted by Markert & O'Fee (2013) and Williams & Pagliari (2004). The types of barriers that could be discouraging airlines from participating in a tender process, or that could be inflating the cost of a PSO contract (Pita *et al.*, 2014), include poor communication process and inadequate data, excessive commercial risk, or unviable sunk costs, overly restrictive contract criteria, and commercially unattractive contracts (see Markert & O'Fee, 2014; Markert & O'Fee, 2013b; Williams & Pagliari, 2004). In addition to which, Markert & O'Fee (2016) highlight how airlines are disincentivised to invest in the long-term development of route demand because contracting authorities prioritise cost reduction and budgetary certainty, and penalise airlines for outperforming contracts SLAs by reducing the subsidy level by an equivalent amount (Markert & O'Fee, 2013b).

A key debate within the literature has been about whether PSOs are more effectively administered by individual member states or centrally by the European Commission. The argument, for the administration to remain with member states, is that they understand the local challenges and conditions and can impose a PSO that best fits these needs (Grubestic & Wei, 2013; Halpern & Pagliari, 2007;

Merkert and O'Fee, 2013). Whereas proponents of administration by the European Commission argue that one clearly defined and consistently applied criteria would ensure PSOs imposed based on need, rather than according to the differing interpretations of the regulations and the political inclinations or economic circumstances of a member state (Brathen, 2018; Merkert & Williams, 2013; Reynolds-Feighan, 1999).

An issue, that has not been addressed by the literature, however, is the effect that a justification criterion, that has been made deliberately restrictive by the EU, to prevent market distortion, has on the commercial appeal and service quality of a PSO contract (European Commission, 2017). Nor has it addressed, more generally, the demand side of air transport PSOs, to gain a better understanding about which conditions would cause a growth in demand for a PSO route. Which is what this thesis has done. Its findings have highlighted how high-quality outbound and inbound air transport connectivity is no less important to passengers in peripheral regions than it is to those in core regions. Namely, the high-quality services, extensive networks, and reduced costs that have been the positive outcomes of the liberalization of the European aviation market. It has also identified, however, that current PSOs' performance is constraining demand from peripheral passengers.

The thesis aimed to identify a framework of technical and policy conditions necessary to stimulate demand for a PSO service and maximise its contribution to regional development. The following is a framework of conditions that could guide a new and strategic approach to the imposition of PSOs, as an enabler of

the types of economic activity that are crucial to the successful delivery of endogenous regional development strategies (Figure 29).

Table 7.1. Technical and policy conditions framework

| Area | Condition | Objective |
|------------------|--------------------------------------|--|
| TECHNICAL | Closest proximity peripheral airport | <ul style="list-style-type: none"> - Minimise the time and financial cost of airport access - Reduce anxiety and complexity of travel arrangements - Eliminate the risk of disruption to additional journey legs |
| | Sufficient daily rotations | <ul style="list-style-type: none"> - Enable dovetailing of travel arrangements with arrangements for the primary trip purpose - Maximise trip productivity by reducing the redundant time spent in a destination - Eliminate the necessity to curtail the primary purpose of a trip to accommodate subpar travel arrangements |
| | Convenient core airport | <ul style="list-style-type: none"> - Minimise incremental time and financial cost of destination access - Reduce anxiety and complexity of travel arrangements - Reduce the risk of being stranded in the destination through travel disruption |
| | Connected core airport | <ul style="list-style-type: none"> - Provide convenient onward access to current and future market destinations - Provide convenient connections for inbound passengers |

| | | |
|---------------|-----------------------------------|---|
| | | <ul style="list-style-type: none"> - Minimise incremental costs and disruption risk from access to onward or inbound connections |
| | Modified fare strategies | <ul style="list-style-type: none"> - Reflect the essential nature of a PSO service in the absence of comparable travel alternatives - Avoid restricting affordability to the wealthiest firms and passengers, or to critical travel only |
| POLICY | Strategic role recognition | <ul style="list-style-type: none"> - Impose PSOs as an integral part of place-based development strategies, in regions where peripherality is compounded by inadequate transport connections with core centres and hub airports - Align the commitment to a PSO with the long-term horizons of development strategies - Assess the business case for a PSO according to the strategic potential and long-term objectives |
| | Consistent justification criteria | <ul style="list-style-type: none"> - Ensure the provision of a needs-based service - Presumption of achieving transport connectivity quality with non-peripheral and competitor regions - Equitable allocation of the cost of funding support |
| | Recognition of important | <ul style="list-style-type: none"> - Enhance the reputation of the region as a business destination |

| | | |
|--|---|--|
| | non-connectivity benefits | <ul style="list-style-type: none"> - Provide reassurance to firms, workers, and investors about the regions long-term connectivity - Align the commitment to a PSO with the long-term horizons of a region's development strategies |
| | Satisfy the needs of all passenger groups | <ul style="list-style-type: none"> - Services that fulfil the needs of all groups are crucial to delivering the regions' development strategy. Including: <ul style="list-style-type: none"> ▪ inbound and outbound passengers ▪ current and latent users ▪ business and tourism passengers ▪ young people |
| | Purposeful route demand development | <ul style="list-style-type: none"> - Long-term and partnership approach to route development - Incentives airlines to outperform contract SLAs, locking in passenger number baseline increase at contract renewal - PSO criteria and tender process that enhance the commercial appeal of PSO routes and harnesses the entrepreneurial instincts of commercial airlines |

7.3 Recommendations for policymakers and practitioners

A key feature of the EU regulations is that the need for a PSO and the way in which it will be funded and administered is determined by individual member states. The European Commission has no jurisdiction over these decisions, other than to ensure each PSO imposition complies with the requirements of the regulations (European Commission, 2017). A concern that has been raised about

this in the academic literature is that this will, inevitably, lead to inconsistent interpretations of the regulations and the inequitable impositions of PSOs across the EU. Peoples' access to connectivity will be determined by issues of political predisposition and affordability, and not by their need. It is the case today that of all PSO imposed across the EU, one country accounts for almost a quarter and five countries for three quarters, while half of all member states have not imposed any (European Commission, 2020).

The UK government has further devolved the justification and administration of PSOs as a matter for regional authorities. Though a gap, in the cost and affordability, has meant that local authorities remain heavily reliant on the central government for financial support. The UK government currently views PSOs as a remedial and short-term market intervention, intended only to maintain the economic status quo in a region. It also prioritises, as does the EC, the avoidance of causing market distortions by their imposition (UK Gov., 2013). This is reflected in the way in which the DfT focuses narrowly on evaluating the economic case for a PSO proposal and calculating VFM (UK Gov., 2017b), rather than understanding and assessing its strategic case (UK Gov., 2013). Consequently, they consider them to have limited economic benefit:

“the fact that no airline is willing to run the [PSO] route implies that demand is low and therefore conventional economic benefits are minimal” (UK Gov, 2018, p.89).

As a result of this and the lack of a consistent criterion for the justification and funding of PSOs and compounded by sets of local circumstances that are outside the control of the local authorities, there are differences in the funding support which regions receive from the central government, in the cost to local taxpayers

of aviation connectivity and in who the beneficiaries of this are, and the level and quality of service they benefit. This is resulting in a PSO service unable to fulfil the needs of peripheral passengers and, therefore, is not reducing sufficiently the transport costs of trading from the regions. Meaning that without changes that align the imposition of a PSO to the development needs of a region, and basing funding decisions consistently on a single justification criterion, it is likely that peripheral passenger's access to air transport connectivity will continue to be determined by local circumstances and affordability and not by the economic need or opportunity in the region.

The thesis is, therefore, advocating a shift in the paradigm of air transport PSOs funding by the UK government and the DfT, from that of subsidising an air transport service to an investment in the economic development of the peripheral regions they serve. When deployed strategically, as an integral part of regional development strategies, they can be the enabler of the types of economic activity key to a region's particular place-based development strategy.

The recent review of the Treasury's Green Book draws attention to the need for greater emphasis to be placed on the strategic case for a funding proposal and that to do so effectively will require greater clarity about a scheme's objectives and expected outcomes (HM Treasury, 2020). The contribution of this thesis is to provide policymakers, preparing or assessing a PSO funding proposal, with clarity about what the strategic and crucial contribution of a PSO is as part of an endogenous approach to regional development. The post-Brexit era now provides the UK government with the opportunity to make changes to the PSO regulations necessary to facilitate this strategic contribution (UK Gov., 2018b).

7.4 Recommendations for further study

Several gaps remain in the knowledge around the role of air transport PSOs that would benefit from further research, to develop an approach to their imposition that ensures that the quality of connectivity a peripheral region has to external markets for trade and other inputs is eliminated as an inhibitor of sustainable regional development while maximising the opportunity for the reduction of public support for the service:

1. Based on the general systems model of the role of PSOs in regional development, evaluate the difference in the outputs of an endogenous & place-based regional development strategy that is supported by a strategically imposed, and therefore, needs-based PSO service. Also evaluating the period necessary between a PSO's imposition and the point and rate at which public funding support can be removed without negatively impacting the outputs of the development strategy.
2. In-depth exploration of how these evaluations would vary in international peripheral regions where local governments and regional development resources are less comprehensive than at the case study regions in this thesis.
3. Conduct research to capture from external firms and investors what the place-based and PSO connectivity inhibitors are and how these can be overcome, to remove them as deterrents from locating or investing in peripheral regions.
4. Conduct research to capture from inbound international and domestic short break tourists what they require from a PSO service, to remove transport costs as a barrier to peripheral tourism development.

5. Complete a Stage 4, as described in section 7.2. Particular attention needs to be paid in this stage to ensure the necessary representation amongst the harder to reach businesses and tourism businesses and should include those that do not currently use the PSO service. The population would also be expanded to include cases located outside the case study regions that have had or would have in the future, a reason to consider locating or investing in it.
6. In-depth exploration of the changes that are necessary to the justification, contracting, and administration of PSOs to make them appealing to a greater number of commercial airlines, and what changes to the now UK PSO regulations would also be necessary.

7.5 Reflections on the research journey

The intention at the outset was, that the research findings would be a helpful contribution to the process of aligning more closely the imposition of an air transport PSO with the connectivity requirements of endogenous regional development strategies in peripheral regions and to improving the likelihood of positive outcomes. To this end, ensuring confidence in the findings was crucial and to achieve this it was important to maintain a commitment to ensuring they were derived from data gathered from the accounts of individuals with the necessary insights and experiences of, or interest in, the PSO service. Confidence can be derived from the fact that the study benefited from the high-quality perspectives and insights of senior stakeholders, who have been closely involved in the imposition of a PSO or are directly impacted by the quality of its performance. However, securing the participation of stakeholders of the necessary calibre proved to be an even more arduous and protracted process

than had been anticipated. This was, of course, due to their position meaning they had higher priorities and pressing matters to deal with. It was also compounded, to a degree, by the geographical spread of the case study region. Entire research trips and interview schedules, that had taken many weeks to organise were cancelled or curtailed, often at very short notice, for reasons that ranged from everyday changes to the participants' schedules, through to weather disrupting entire trips and even, on one occasion a riot. The process of rescheduling or replacing these interviews was no less protracted. Nonetheless, when the interviewees did occur the participants were highly engaged and interested in the study and, without fail, were extremely generous with both their contributions and time.

How the potential participants were identified and contacted did mean that the final sample was skewed towards participants who were motivated and highly engaged with matters which they believed were beneficial to their business performance or their community. Although this meant that they had a wealth of high-quality insights and experiences to share, it also meant that the less engaged and harder to reach cases were not included in the sample. There was, understandably, a reluctance by organisations to share contact details of local potential cases with a cold calling PhD student and the cases were, therefore, identified through desktop research. It also meant that it was not possible to identify cases that had previously expressed interest in locating or investing in the region. Since meeting with representatives of many of these organisations, through the course of the research, and having had the opportunity to demonstrate the value of it, they have expressed a greater willingness to provide information in the future, making a Stage Four feasible.

A phenomenon that had not been anticipated, was a reluctance by some to formally participate because, despite assurances provided about confidentiality and anonymity, they had concerns that doing so could negatively impact in some way the prospects of future PSOs. It was not possible, however, to establish more about the reasons for these concerns or why they believed their contribution might be quite so impactful. Arguably it is an indicator of the importance of the PSO service to them and, possibly, reflects a level of uncertainty or inconsistency surrounding them. These were from both the business community and local authority stakeholder groups which, nevertheless, were well represented in the research. The stakeholder group that was particularly under-represented was that of the aviation service providers. It is possible that this was because of the commercial circumstances that existed throughout this research, during which time two of the three airlines operating a PSO route to London had ceased operating. It does serve to illustrate a weakness in the current PSO arrangements, in which the number of airlines willing or able to participate in the UK PSO market has been critically low.

The final reflection on the research journey is that it started while Brexit became a reality and is concluding at a time when the world is contending with SARS-CoV-2. Both of which, at this time, remain unresolved and their full effects are yet to be known. However, it is unlikely that either will diminish the importance of air transport connectivity to peripheral areas unless the endogenous approach to regional development and the government's levelling-up agenda are abandoned. Arguably, Brexit increases the importance of air transport connectivity if peripheral regions are to benefit equally from any new global trade

opportunities. Likewise, if the Covid-19 pandemic slows or even reverses the trend towards urbanisation, as has been suggested by some, connectivity will be essential to ensuring peripherals regions are equally able to attract firms dispersed from cities.

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Appendices

Appendix 1: interviewee information

Details of interview participants.

| | Stakeholder group | Region? | Sector | Comment |
|----|---------------------------|------------------|-------------------------------------|----------------------|
| 1 | Business community | Northern Ireland | ICT, creative, or another knowledge | CTO |
| 2 | Business community | Northern Ireland | ICT, creative, or another knowledge | CEO |
| 3 | Business community | Cornwall | Innovative goods or manu-services | Owner (Partner) |
| 4 | Local authority | Northern Ireland | Tourism, leisure, or hospitality | MD |
| 5 | Business community | Cornwall | Innovative goods or manu-services | Owner |
| 6 | Local authority | Dundee | | Councillor |
| 7 | Local authority | Cornwall | | Director |
| 8 | Business community | Cornwall | Agency | CEO |
| 9 | Business community | Northern Ireland | ICT, creative, or another knowledge | CEO & Owner |
| 10 | Business community | Northern Ireland | ICT, creative, or another knowledge | CEO & Owner |
| 11 | Business community | Dundee | ICT, creative, or another knowledge | CEO & Owner |
| 12 | Business community | Northern Ireland | ICT, creative, or another knowledge | CEO & Owner |
| 13 | Local authority | Dundee | Tourism, leisure, or hospitality | Regional director |
| 14 | Business community | Dundee | Tourism, leisure, or hospitality | COO |
| 15 | Business community | Dundee | Agency | CEO |
| 16 | Aviation service provider | | | Chairman |
| 17 | Local authority | Dundee | | Partnership director |
| 18 | Local authority | Cornwall | | CEO |
| 19 | Local authority | Northern Ireland | | Director |
| 20 | Business community | Northern Ireland | Agency | Regional director |

| | | | | |
|-----------|---------------------------|------------------|-------------------------------------|--------------------|
| 21 | Local authority | Dundee | | Head of Department |
| 22 | Local authority | Northern Ireland | | Councillor |
| 23 | Business community | Cornwall | ICT, creative, or another knowledge | Owner (Partner) |
| 24 | Aviation service provider | | | Contract director |
| 25 | Local authority | Northern Ireland | | Head of Department |
| 26 | Business community | Dundee | Innovative goods or manu-services | Owner |
| 27 | Business community | Northern Ireland | Innovative goods or manu-services | Owner |
| 28 | Business community | Cornwall | ICT, creative, or another knowledge | Founding director |
| 29 | Business community | Dundee | Innovative goods or manu-services | Director |
| 30 | Local authority | Dundee | Tourism, leisure, or hospitality | Head of Department |
| 31 | Local authority | Dundee | | Director |
| 32 | Business community | Cornwall | Tourism, leisure, or hospitality | Owner |
| 33 | Aviation service provider | | | Retracted |
| 34 | Aviation service provider | | | Retracted |
| 35 | Local authority | | | Retracted |

Appendix 2: sample interview transcript

Sample interview transcript and all transcript files download details.

Transcript of interview with interviewee BC-Y-12.

Researcher. Why did you choose to locate your new European office in Derry?

Interviewee. Simply put, economic support. We had more economic support from Northern Ireland. We felt like they understood our business better. Their programmes were a lot easier to subscribe to.

So, we did a business case particularly on that market. There were three locations we were looking at Derry, Carlisle and Swindon. We determined tech talent, things like being able to travel there, rates, economic support from the region, etc, etc. We actually took into account a lot of things. We're actually doing the same continental Europe. We're going through the same kind of exercise of: is it easy to do business, is it politically safe, is there the economic support?

So, we chose Derry for that reason. Good tech talent, good location, very inexpensive to hire talent there, as well as rent and things like that. The biggest thing was Northern Ireland. InvestNI is one of our biggest partners.

Researcher. You're looking at continental Europe, is that expansion or is that because of Brexit?

Interviewee. It's possibly a little bit of both. Its expansion to some extent. We will open an office in Frankfurt in the first quarter of next year. That is to provide closer support to Europe. Gdansk is on the list, Lisbon is on the list, another location outside of Warsaw. I am happy to give you that list. But it is also Brexit motivated because we just do not know what is going to happen. We just want to be fully covered.

Researcher. Has Brexit not been occurring do you think you would have concentrated expansion into current locations? Or would you have been pursuing expansion anyway?

Interviewee. We would have increased our footprint anyway; it has just been accelerated a little bit.

Not to bore you but there are a number of things that go into our reasoning behind a location in central Europe. One of the things is that Derry has

become more and more costly for us. Not just in terms of rent but in terms of talent.

What our competitors in this ecosystem have discovered is, there is a direct flight from London, oh I can get people here so easily, I don't have to offer them London salaries. So, we've had to increase salaries in Derry pretty significantly. So, you kind of lose your whole thought around labour arbitrage at that point. So, we asked the question at that point, should we go to Gdansk? You can probably get good talent there for a lower rate. So, to be candid, I think that that is one of the main drivers as well.

Researcher. Would that be a certain level of talent, a certain type of talent?

Interviewee. It's typically usually tech related talent. It would be at an analyst or very junior consultant level. So, think about, our consultants travel out to all of our customer sites. The people that we have in Derry typically don't. They are typically behind the scenes and configure the technology. It's very technical, it's data reporting, integrations, things like that. That would be the same if we opened another location. We wouldn't put professional services, senior consultants in those locations. They would come out of London or Frankfurt.

Researcher. Would it be fair then to characterise the Derry office as more of a back-office function location?

Interviewee. Yes absolutely. In fact, that's exactly what it is. We call it our service centre, it houses our global help desk, it houses our application management services, which is our post go live it houses integration for the most part, it houses some of our back-office functions, like payroll and things like that.

Researcher. So, it is those types of personnel that you are finding more expensive?

Interviewee. What happened was when we initially went on the ground in Derry, we said that that was going to be our only location in the united kingdom. We may have a small sales office in London. But what happened was, we hired about 45 people straight away, and we certified them in Workday technology. Workday technology is our software partner. We certified them in that technology and said you are going to be the software services consultant going out to that customer. Flying everywhere, doing all of that. But they just couldn't absorb it, that type of role. We really struggled in the beginning. But once they are certified in the Workday technology, they become very lucrative in the market.

And so, we've had a couple of competitors come in only offer 10 or 15% more. But we've also had some that have offered 50 or 60% more. So, what happened was, those people left, so we have had to increase salaries in order to retain people. So, we went through a whole salary banding exercise, to see

are we actually paying people what we need to? We did some banding exercises through an agency. We did further studies and things like that. I hope that that is helpful

Researcher. Yes it is very helpful extremely thank you very much. Is that something that you had anticipated?

Interviewee. Not a bit. We probably should have. In discovering where we wanted to put our next location, we probably should have figured, our main competitor has a very large office in Belfast and a satellite office in Derry. I wasn't involved in the initial search. You think we would have said that that could be a problem. From a war on talent standpoint later.

Researcher. When you were doing your assessments on potential locations, did you retain do you have a pro forma that you did the assessment against? Did you do that internally or did you have consultants?

Interviewee. We did use consultants. We worked with a local consulting firm here in London. They guided and directed us. To be honest with you damian, I don't think we had a very good proforma. I think it was a little bit sloppy if I'm honest. So, a lot of what I have done since I took over the region is to unravel some of the things and try and figure out, what is our plan? What do we really need to be doing? And just work to that.

Researcher. Do you think it's a case of being sloppier with the benefit of hindsight, or was it just sloppy?

Interviewee. It was just sloppy.

Researcher. When you mentioned about the talent and the difficulty absorbing some of the meeting people face to face roles, can you put that down to anything? Is it cultural? Is it training?

Interviewee. It's a little bit cultural, to do with experience and training. Probably not even to do with the training part was pretty significant, they literally were trained for months. But I think it was probably a little bit cultural and a little bit experience.

We would send a consultant out to do a workshop and they would just say I can't do this. Whereas you might pick up someone here in London who might just say yeah i'll give it a try.

Researcher. Would you attribute that to lack of exposure ?

Interviewee. Yes.

Researcher. Do you see any change in that? Do you see that changing? As Derry picks up in the way that you describe, do you see those improving?

Interviewee. I do. It could be because we know what to look for better. We know whoever we hire we will need immediately to identify the gaps that are there. We will need to support those gaps. So, part of the reason we have now built the team London based is to support some of that, so that we could bring people on who wouldn't be afraid to go and do a design workshop.

So, there is a little bit of that going on. I think that once we determine Derry's best service is in the back office functions, that's when we really started some movement in the organisation.

Researcher. Before you identified that would commitment to Derry have become fragile?

Interviewee. Very much, yes very much.

There were a couple of points where are board based in the USA said do we need to close Derry?

Researcher. Can I ask what the saving factors were?

Interviewee. Probably me saying that I don't think it's wise. There are a couple of things there. One, I don't think that we should do that to the people that we have there. They have made too much of a commitment and some of the people who have been there, have been there from the beginning. They have weathered everything with us. The second piece is, we made a commitment to the community. I have met the mayor there, I have spent a lot of time there with the people, I have made a commitment. Our footprint may not be as large as the original people who founded it said it would be, but we will have a good footprint there. And we need to be a good employer there.

And a third piece is that it reflects bad for us in the work ecosystem if we say we're going to go and close a location. So, I said to our board, can you please just give us a chance to figure out what's the best model other than what we have. We started to show profit and contribute back to the organisation

Researcher. Was the door open to be pushed on as far as the board was concerned or was it a hard sell?

Interviewee. It wasn't necessarily a hard sell, but it was not an easy one.

Researcher. You mentioned about the economic Derry was able to provide you, was that to overcome particular challenges that you saw in Derry that otherwise would have made it unviable?

Interviewee. I don't think so I think it was that's the consultant we used to set up highly recommended that we do that for whatever reason. Actually, in our study in continental Europe we are looking at the same thing. Because there are some locations that will say we want business here and we're going to help support. Even places in the USA do that. So, I think that was probably just a factor that we wanted to make sure was there. It was kind of a bonus I think. I don't think it was if we don't get that we're not going to be make this thing work. Because we had a pretty significant amount of funding going in.

Researcher. Do you then assess it as a marker of the level of commitment to you, to work with you?

Interviewee. Yeah, I think there was a very high level. There continues to be a high level of commitment. InvestNI has been a really good partner for us. In a lot of ways, they have helped us out in terms of finding talent, when we've had some issues finding property services. I've been to a lot of their events and have showcased our offices in Derry for them. We've done shows for firms that are based elsewhere full of them. That they are trying to bring to Northern Ireland. So, we have had a good partnership that has been very collaborative.

Researcher. Have there been any challenges with Derry the area that you have had to overcome or that you have turned to InvestNI to help overcome?

Interviewee. The biggest issue we have is around property services. Recently they came back and said we didn't really tax you properly so we're going to give you a £140,000 invoice that you need to pay back. InvestNI try to help us and they said the best they can do is reduce it slightly and challenge a couple of pieces. That was probably our biggest challenge with Derry to this point. It feels a little bit like it's maybe slightly corrupted in certain areas. In most areas you go to there are some political things that go on, but there has been a little bit of that.

The other piece for me has been more culturally. Derry is an interesting location from a cultural standpoint because it is a very close community. So, if you move to terminate someone, it's like you terminate five people. Because they are all connected. And there is a level of maturity that is very low there.

So, if we terminated someone here in London they just go off and it doesn't become a big deal. If we terminated someone in Derry it's a big deal.

If you were to go and look at our glassdoor reviews from a year or a year and a half ago you would think wow what a horrible place to work. But there were like three people who were writing most of those. So, it's an interesting

culture and you kind of have to be aware. We really had to think that through as we made decisions for the region.

Even talking about adding another location in continental Europe I have to be very specific about during the quarterly talks with the whole team. Everyone joins and we talk about the business and when I had to say we are looking at another location I had to specifically say that we are not closing Derry. This is not a replacement for Derry, this is in excess of what we are doing.

Researcher. Have you seen any change in that overtime?

Interviewee. A little bit.

Researcher. Has that been as quickly as you would have wished?

Interviewee. No, it has been a lot slower.

Researcher. Will that create risk for your level of commitment to Derry?

Interviewee. I don't think so.

Researcher. But does it limit... sorry, I'm just trying to work out the implications for growth?

Interviewee. I can tell you the biggest implication is we had committed to employing somewhere in the region of 300 people initially. I don't think we'll ever get above 150 at most.

Researcher. Is that because you've had to redefine the nature of rolls?

Interviewee. We've had to redefine the nature of the rolls; we've really had to look at the operational model for the region to create some success. We did a whole project in the last year, re-organised the whole region.

The expansion contributes to that. There are things we would need to do in different languages that we wouldn't necessarily be able to support out of Derry. Moving into doc, you know you have to think about German speaking. That kind of things.

That's not readily available in Derry.

Our commitment to Derry is pretty strong and will continue to be. So, if you look at the functions we have the global help desk. It's a good thing to have. There a university produces quite a few multi-lingual students and that's a great entry point for us as an organisation. We have a pathways programme

where they can enter the organisation. It's a relatively easy job and then they can look at some of the other things they want to do in the company.

There's our integration support. So, the tech talent there is very, very strong. We will continue to hire and grow that. There is the payroll piece, which we have to process in the UK. Because its UK payroll we have to process it in the UK or some other exotic location that process is UK payroll. So, we'll always have that function there as well.

Then there's our application services management function, it's a global service and we will probably expand that a little bit more and then we may put another team on the ground somewhere else in Europe. From a language standpoint. Does that help?

Researcher. Yes, but as a bottom line as a bottom line the opportunity was 300, the reality is 150. And that's a direct consequence of the conditions you found when you went in there?

Interviewee. Yes.

The difference for us is if you look at the planned bottom line it's taken us longer to get there because we've had to hire more talent here in London. Which you'll definitely pay more money here for. And then with the increase in Derry it's just taken us a little bit longer than what we thought it would.

Researcher. That's great thank you very much. Could I then just ask you a broad question about Derry and then i'll move onto transport questions? For other businesses from any sector looking to establish in Derry, what do you think the main challenges that they would face are going to be?

Interviewee. I think probably that's a good question because I do think Derry's supportive of business and InvestNI pushes it pretty strongly. For me the biggest the biggest challenge in Northern Ireland are there legal pieces. Here in England, we're a little more flexible in what we can do. In Northern Ireland we have to be very specific. I think compliance is a little bit of a risk if companies don't know all of the things they need to know when they set up.

There's a little bit of a risk around talent. There is a little bit of a cultural thing ... the folks in Derry like to have their nice cars and their blin gee type stuff. So, they are always looking for what my next opportunity. So, there's a little bit of a risk around talent. Both finding it initially and actually retaining the talent. I think they are the two biggest challenges.

Researcher. Would you find your attrition and areas actually higher than what you might find in other offices?

Interviewee. Yep.

Researcher. Is that markedly so?

Interviewee. Yes for us it has been, in my experience. It has slowed down a little bit recently. Again, because we've put some market adjustments in place, we've done some things to improve the office. I think there are somethings just culture that have changed. But our attrition rate is still higher than what it is in London for example.

My understanding is damian, that some of our competitors, who I have a good relationship with, they have offices in Poland's and Czechoslovakia and other places, and their sense is that people are more loyal and it's not always just about the pay. It's about I get to work for certain organisations. I haven't tested that yet, but that's what I understand.

One of the competitors is the one in Northern Ireland and they tell me that their folks in Poland are a lot more loyal than those in Northern Ireland.

Researcher. When it came to deciding on Derry as a location did connectivity, air transport connectivity, have a bearing in anyway?

Interviewee. Again, I wasn't there at the beginning, but I can tell you my feeling around it. I would never step foot on a Ryanair plane, but that was the only opportunity to get to Derry. So, I would fly to Belfast and then 90 minutes in the car. So, my feeling initially was why the hell did we pick Derry?

It felt like it was so far away. If you have ever made the drive from Belfast to Derry it is not an easy drive. Especially in the winter. If the pass is snowed in you're stuck on one side or the other.

Since BMI took over the flight route it's been a real pleasure to get there. Because Liverpool street Stanstead express to Stanstead, a flight to Derry and taxi to the office, simple right. So, you literally can do a trip in a day. I can't imagine that we looked at that and said that it's an easy place to get to. Because it's really not. There are only certain routes that run from other locations in the summer.

So, one of the things we've looked at as we looked at other locations in Europe is how we can get there from other major cities. From London, Frankfurt, etc. To try and get there from Derry you've got to fly through somewhere to get to somewhere, or through Belfast.

Researcher. So, as you're looking to expand your footprint you're actually becoming more particular about your connectivity requirements?

Interviewee. Yes.

Researcher. Is that from a quality of consumer experience perspective? Or is it purely from a connectivity point of view?

Interviewee. It's a little bit of both I think. So, the connectivity is really important. So, for me to be able to have to go to something good Derry I can fly in for the day, or I can have a quick overnight. Our management team here will manage the officers wherever they land so Frankfurt so we need to have locations that are easy to get to. To be relatively easy to spend time with our people on the ground. So that's an important piece and I think that translate into better quality. So, we might have a country manager on the ground in Germany but many of us will need to be able to get there to help support that.

Researcher. When it came to redefining the model in Derry did the difficulty in getting personnel out did that play a direct role in anyway?

Interviewee. Yes. So, we had to do in the new model some redundancies. And that was really, really difficult, and it was a really painful time. We went through a period of about six months when it was just really painful.

Researcher. Can I ask then, when it came to redefining the model and when considering the connectivity and the difficulty getting people out to visit clients what practical bearing did that have? Or how is that taken into account?

Interviewee. The primary area where we took that into account was our professional services delivery. 40 of our clients are the London based or pretty close to London. So, it's a lot easier to have a consultant based here. It's easier to get to those clients we literally have five clients within walking distance. So, somebody from the office can walk to one client and walk to another client, you can literally do three clients in a day.

Our professional services were the area with the biggest impact. Because that's the most customer facing piece.

Researcher. That was purely about time and distance and the difficulty getting people there?

Interviewee. Yes. Time, distance, and costs. Because we have to bill back to our clients. So, the fact that we've got these customers, it's walking time right.

Researcher. So, the disconnect between that office and your clients is that a limiting factor in itself?

Interviewee. Yes. Which is why we moved all the office functions there because it doesn't matter where you're located.

Researcher. With all of the factors you just described do you think the decision if you were here at the time with the decision-making process and had the benefit of the experience you have now, do you think at the time you might have made a different location decision?

Interviewee. Yes, absolutely. First of all, I would have set the model up differently. I would have set it up more towards what we have today because it's a core function model that we can expand. I don't think we ever thought about that in the beginning. We thought we were going to put everything in Derry and run it all out of Derry. No one said wow Workday is right here should someone be close to Workday?

I might have put a footprint there, but I probably would have chosen somewhere else to be honest. Because of the difficulty in ... the difficulty in finding the talent but a loss in retaining the talent. Those pieces are really really difficult.

Researcher. So actually, they're more of a primary concern than the disconnect between your office and client?

Interviewee. Yes certainly. We've had to think about things very differently than we would have here.

Researcher. I had a question about how fully does the PSO service to London satisfied the needs of the Derry office, but that's more but that's more about you and your team travelling into there, than Derry out?

Interviewee. It's a little bit of both. A good example is we have a customer in Glasgow, and we have a meeting with that customer tomorrow. Our manager in Derry is attending with us one of the managers has to drive to Belfast to get the flight to Glasgow. Whereas here we can obviously just go two there in a day. So, I think there is a challenge. If you're coming to London it's not so much of a challenge because you have the BMI flight. But if they're going anywhere else it become a real challenge because they've got to get to Belfast and potentially Dublin if they have to go to Dallas. It probably a little more this way to there.

Researcher. In terms of any tole that Derry would have to play in the future, would that involve those sites in Europe?

Interviewee. Yes. The expansion plan I presented to our board, we said our applications services team, which supports our technology when it goes live, would all be housed in Derry. At least for the foreseeable future. And if we can cover that from a language standpoint because we do have some German speaking

people, if we can train them and get them to cover that, that covers that for us.

Researcher. In terms of the need for you staff to travel and the types of difficulties you have just described, and therefore the benefit of direct connectivity to London, or the staff every likely to go any further afield. In which case it becomes necessary to fly into London and fly onto Seoul, or somewhere like that?

Interviewee. Yes, absolutely. We do have a few consultants there, plus a management team that would either have to get to client location, for us could be Singapore, Hong Kong, India, anywhere like that. Or they would need to get to the corporate offices in Dallas. Which really the best route is to get to Dublin and fly from there.

Researcher. Does the London-Derry route satisfy those requirements?

Interviewee. Yes. I think BMI has done a really great job. They are a very good regional airline. I'm hoping their pilots don't go on strike.

Researcher. The potential demand in growth for that, from your point of view, as actually limited by the nature of the model you have now identified?

Interviewee. I say that for us. What I've noted lately, it could be because its summertime, is its (a) sometimes hard to get a flight and (b) they are always full. So, I think there is a higher demand. It used to be I could just hop on the plane and there would be ten people on the plane. Now its 100% full. There were a couple of points when I had to go the day before or the day after if I want to take that flight. Or I can go to Belfast and drive.

Researcher. My final question really is then, is there anything that could be done from a connectivity point of view to overcome the difficulties of location for Derry, that could change your current define model for Derry. And give greater opportunity for job creation and the quality of jobs?

Interviewee. I suppose there could be. The way we've designated it as an operations service centre is probably the right model. But potentially if were easier to get people moved around we would probably think about expanding our professional services footprint there. Because I do think there is probably to good talent. Particularly around the UK payroll area. We've found that that's a good place for that talent.

It could affect it. It probably wouldn't affect it greatly, because will continue to build on the model we have. But it could defiantly affect it.

Researcher. So, the opportunity exists?

Interviewee. Yes.

Researcher. But at the moment the limitations are cost, time, and distance remain.

When you were talking about compliance and the tax bill that you had, was that a HMRC thing or was that a rate...?

Interviewee. It was land and property services in Northern Ireland.

It was a mistake they made three years ago, and then it was plus, plus, plus. This may make me sound slightly paranoid, because of some of the things we've gone through there, but it almost felt to me like we did something in the past few years. And that was fine. And then somebody went to them and said actually, you need to go back and e-look at that. We had a disgruntled employee who left and seems to never get over that. And I could just see that happening. Its kind of that whole local mentality when you kind of go....

Another great example is we had a driver... when flying into Belfast we had a car service we used. We used it frequently. All our executives from the states, all of us from London. Everyone. I feel like we kept this guy's kids in in university. All of a sudden he said I just can't drive you anymore. When I asked why he said it's because we're not good people. You'll find out. Still to this day damian and I don't know what that is all about. But it just felt very strange. So, I'm sure there are ties throughout that community but you kind of go ...

Researcher. You mentioned you on you to the role, when you were first thinking about the role did the history of Derry come into your considerations at all?

Interviewee. Yes absolutely. It affected us one day when there was a football match on we said it would be great to have a match on and get some pizzas in. The manager that was heading the office at that time said that we can't. I asked why not? He said you can't because it's going to cause a riot. Because everyone will be on opposing sides and everyone's going to know who's catholic and who's protestant. I was I was just like, okay. Never mind I shouldn't have suggested it.

It's less now it might have been the early days where people tried to stir it up. Though even with a compliance thing, when we do interviews, we have to keep records of who's catholic and who's protestant. So that was an interesting thing for me.

But I do see things in Derry changing. I was there two weeks ago, and I was walking to the office and there were a number of pride flags. So, I thought either all the bars have gone to gay bars or there is somethings going on. And

they had the pride festival there, and which apparently is a really big thing and I thought that is just great I thought that's just great. That just shows that the diversity there is actually occurring. So, I think that's a great thing and I do think Derry is evolving.

Researcher. Would you say your recruits are typically the young generation?

Interviewee. Yes.

Researcher. And do you find they are becoming more open minded and more globally aware then?

Cats. Not really. It funny because you would think... I have two daughters in their early 20s and they both think very globally. They both work for global organisations; they both think very globally. They're mentality is just that. I have one that lives in the us and one that lives in Paris, so they are just at complete opposites. I find that with the younger people in Derry it's all about well what's in it for Derry. They don't really think about.... I'm not really sure.... I'm not sure what doc is all about let alone why we would even go there.

There was a lot of that mentality when we started to expand London. Even with our HR manager on the ground there. She was like, they just keep hiring people in London instead of Derry. There's a sensitivity, there's a little bit of it about pride, but it's kind of in a warped way.

I really don't think they understand the global piece as much. Some of the people that we've hired in their late 30s or early 40s they get that piece.

Researcher. Do you think that's people who have left and come back?

Interviewee. Yes, absolutely. I hired a woman to head one of our teams there, she's originally from Derry but she's lived all over the world. Her view then is entirely different from a 25-year-old that we've just hired.

Researcher. Do you find that you get... in terms of recruitment is the diaspora important to you?

Interviewee. I do. I do have a preference. I think that if they've had some broader experience then it's really helpful.

Researcher. Is that a general attitude or is that specific to two challenges that you're in experiencing?

Interviewee. It's probably specific to some of the roles that we are hiring for. If you recruit somebody who lives in Derry, has only worked in Derry, has only lived in

Derry it's really difficult to train them to think, when you answer that phone the person on the other end could be based in Singapore. And you have to act in a certain way. Versus, if somebody is lived in Singapore or they've lived in Australia or all over, they kind of get that they need to adjust culturally. There's a lot more of a training ground for somebody who hasn't been.

Researcher. So, is it the case that you don't have the social skills or life experience that you need?

Interviewee. That's correct. One day I was sitting behind somebody on the helpdesk and I said that the person you are talking too doesn't understand the Derry slang. So, you've got to work on getting out of that when you're talking to somebody.

Researcher. How did they react to that coaching?

Interviewee. Good they're pretty good. Generally, they are pretty good. Now that doesn't mean they don't go away in crime the corner because the bosses yelled at them. That's the other thing that's very interesting there, they are very very hierarchical. No matter how many times I say you can just pick up the phone and call me if you need help if I'm here just. They just won't it's kind of like the boss is here we can't speak to him. Because anybody here in London would do that.

Researcher. Do you wonder if you're in a similar type of location in America would you have a similar attitude?

Interviewee. I think it would be different I grew up in the Midwest in the town very similar to Derry and I don't think you would find that there. You'd find a little bit of the pride. But they would be more outspoken. So that's probably because they're Americans.

Researcher. Do you think that has to do with pride? Or is it vulnerability about their work or is it a lack of confidence?

Interviewee. I don't think... it might be a lack of confidence. It might be a lack of confidence, depending on how much training they've had. We used to hear a lot I haven't had enough training. And I used to think I don't know how much training I can give you. I think it's a little bit of a ... there's a weird dynamic there which is I don't ever want to tell you when I've done something wrong. You don't have to go through the conversation, it's okay to make a mistake, we just have to understand how and why and how we can help.

Researcher. With time with your employees, do you see that changing culturally?

Interviewee. I do. When the cultural change really happens is when you get a few local people that can start to adapt, and then they become the example for other people. We've got a few key people, they're not even in leadership, they're just good key people that are a good example to the others. And I think that really helps to drive a better culture there.

Researcher. Just on the culture, do you ever find the green and orange situation permeates the working environment?

Interviewee. It doesn't interestingly. Enough it used to, and I think some of that was driven by some of the people we used to have there. But I think I don't think it's a big deal now. We've got I think 63 people there now and I think 15 of those are on the global helpdesk and are not from there. We've got one from Germany, one from Spain, a guy from France, a guy from turkey. Even in some of their other teams we have a guy from Africa, and a girl from Mumbai. And you've got some cultural differences there that I think makes the catholic protestant thing irrelevant.

Researcher. The recruitment of these people, has that happened from within Derry or have you had to recruit externally for them?

Interviewee. If their Derry based than they live somewhere around Derry. The Indian girl is based 2 hours outside of Derry but that's her closest location, so that would be her home base.

Researcher. So, you've been able to find those staff in the local area, you've not had to make special arrangements to recruit?

Interviewee. No.

Interviewee. One more from me that I think you'll find helpful. Whereas a company we do like to showcase Derry to our prospects answer our customers. So, when I think about transport, that's a really big key issue because not all of our customers necessarily come from London and can get on the BMI flight. So, I do think if they were improved transportation links we might be more apt to do things more in Derry versus London.

This is the London office it's this size Derry is 6 times this. It's a great facility, it's an absolutely beautiful facility. Its exposed brick, it's an old shirt factory, we did lots of really nice things to it. It's got glass offices it's just a beautiful building. It's really, really a great place to take people. The restaurants are good, it's right on the river, it's a great place and you can do a tour of the city and there are so many great things you can do. But because it's so difficult logistically to get 10 people there, right, we tend to say let's just meet in the London office.

I had a meeting here yesterday, where I would have loved to have gone to Derry with everybody

Researcher. So even though your business development happens out of London you would still like to be able to use Derry as a shop window for the business but because it's so complicated to get them there you don't?

Interviewee. It's hard. So, the majority of our business is around UK payroll. So, the services we provide are on UK payroll. And I post technology go life support that's all housed there. So, prospects and customers like to see, who am I going to be dealing with what does the facility look like. Rentokil is one of our customers and we took them to Derry. Logistically a little bit of a nightmare because we had to get people from France and other places. We got everybody there and it was really, we find that when we take any prospects there we most always closed the deal. Because it's an impressive space. We create an experience for them in the office we create an experience for them by dinner, we take them on a tour of Derry we talked to them about the history and the culture. We do a lot to say this is the lifeline of our business. This is where the majority of our people are housed. It gives him a higher comfort level.

Researcher. Is that particular to UK business development or would that apply equally to throughout Europe?

Interviewee. It could apply equally throughout Europe because we'll run the application management out of Derry.

Researcher. Would you be as inclined to bring other European clients to Derry in the same way?

Interviewee. Yes absolutely. Because again it's great, the city itself is very interesting, there's a lot of great restaurants there. There are some local restaurants where we know the owners and we go there pretty regularly, and we have a local relationship with the local hotel. We bring our customers there and they treat them like they are family. It's an experience you're creating an experience. And people want to buy because of that.

Dropbox login details to access all interview transcripts.

Appendix 3: survey participant information

Details of survey participants.

| | Which of the following groups best describe your organisation? | Which of the following airport serves your region? | Which of the following best describes your business? | At what stage is your business? |
|----|--|--|--|----------------------------------|
| 1 | Airline or airport provider | City of Derry Airport | | |
| 2 | Local government | City of Derry Airport | | |
| 3 | Local government | City of Derry Airport | Tourism, leisure, or hospitality | Maturity or renewal |
| 4 | Business community | City of Derry Airport | ICT, creative, or another knowledge | Expansion new geographic markets |
| 5 | Airline or airport provider | City of Derry Airport | ICT, creative, or another knowledge | Growth & establishment |
| 6 | Business community | City of Derry Airport | Tourism, leisure, or hospitality | Growth & establishment |
| 7 | Business community | City of Derry Airport | ICT, creative, or another knowledge | Seed or start-up |
| 8 | Business community | City of Derry Airport | Innovative goods or manu-services | |
| 9 | Business community | City of Derry Airport | Tourism, leisure, or hospitality | Growth & establishment |
| 10 | Business community | City of Derry Airport | ICT, creative, or another knowledge | Growth & establishment |
| 11 | Business community | City of Derry Airport | Innovative goods or manu-services | Seed or start-up |
| 12 | Local government | City of Derry Airport | | |
| 13 | Business community | Cornwall Airport | ICT, creative, or another knowledge | Growth & establishment |
| 14 | Business community | Cornwall Airport | ICT, creative, or another knowledge | Growth & establishment |
| 15 | Local government | Cornwall Airport | | |
| 16 | Business community | Cornwall Airport | Innovative goods or manu-services | |
| 17 | Local government | Cornwall Airport | | |

| | | | | |
|----|--------------------|------------------|-------------------------------------|----------------------------------|
| 18 | Business community | Cornwall Airport | ICT, creative, or another knowledge | Growth & establishment |
| 19 | Business community | Cornwall Airport | ICT, creative, or another knowledge | Seed or start-up |
| 20 | Business community | Cornwall Airport | Innovative goods or manu-services | Growth & establishment |
| 21 | Business community | Cornwall Airport | Innovative goods or manu-services | |
| 22 | Local government | Cornwall Airport | | |
| 23 | Business community | Cornwall Airport | ICT, creative, or another knowledge | Expansion new geographic markets |
| 24 | Business community | Cornwall Airport | Innovative goods or manu-services | Growth & establishment |
| 25 | Business community | Dundee Airport | Innovative goods or manu-services | Seed or start-up |
| 26 | Local government | Dundee Airport | | |
| 27 | Business community | Dundee Airport | ICT, creative, or another knowledge | Maturity or renewal |
| 28 | Local government | Dundee Airport | | |
| 29 | Business community | Dundee Airport | Innovative goods or manu-services | Growth & establishment |
| 30 | Business community | Dundee Airport | Innovative goods or manu-services | Seed or start-up |
| 31 | Local government | Dundee Airport | | |
| 32 | Business community | Dundee Airport | ICT, creative, or another knowledge | Growth & establishment |
| 33 | Business community | Dundee Airport | Innovative goods or manu-services | |
| 34 | Business community | Dundee Airport | Tourism, leisure, or hospitality | Seed or start-up |
| 35 | Business community | Dundee Airport | Innovative goods or manu-services | Growth & establishment |
| 36 | Business community | Dundee Airport | Innovative goods or manu-services | Growth & establishment |

Appendix 4: informed consent

Interview participants invitation and informed consent form.

Dear

I am writing to formally introduce myself and the research study that I am conducting. My name is Damian Devlin, and I am a PhD researcher with the London Geller College of Hospitality and Tourism at the University of West London. My study is being supported and supervised by the following academic team:

Professor Alexandros Paraskevas, (Principal Supervisor); alexandros.paraskevas@uwl.ac.uk
Professor Andreas Papatheodorou; a.papatheodorou@aegean.gr
Dr Cristina Maxim; Cristina.maxim@uwl.ac.uk

The study is provisionally titled “Air Transportation Public Service Obligations: from Public Drain to Economic Gain, by Way of Regional Development Success.” The purpose is to study the conditions in which air transport public service obligations (PSO) can most substantially contribute to the economic development of geographical peripheral regions. In doing so to try and identify what conditions need to exist so that a PSO can best bring about economic development in these regions.

As a participant in a research interview, your involvement should not take any longer than 60 minutes. However, your participation is entirely voluntary and at any time you can withdraw your consent to be interviewed or for the use of any data already provided. It is intended to audio record the interviews. To ensure privacy, these recordings will be uploaded onto a PC and the files and computer will be protected by separate passwords. Only I will have access to the computer and the recordings. The interview recordings will be kept for a period no longer than 5 years after the completion of the study. As the research finding may be made public the data collected will be anonymised and the interviewee identities will be replaced with a pseudonym.

The study has received ethics clearance from the University of West London. However, should you have concerns at any time about the conduct of the research, you should contact any member of the research supervisory team, or the University of West London Research and Enterprise office: Research and Enterprise, Room B0.02, University of West London, St Marys Road, London W5 5AF; Research@uwl.ac.uk; 020 8231 2255.

Below is a copy of an informed consent form which I will review with you and ask you to sign prior to commencing with the interview.

Finally, I would like to thank you for your interest in this study and for agreeing to take part in the interview.

I, the undersigned, confirm that (please tick box as appropriate):

| | | |
|----|--|--|
| 1. | I am happy that I understand the purpose of this project. | |
| 2. | I have been given the opportunity to ask questions about the project and my participation. | |
| 3. | I voluntarily agree to participate in the project. | |
| 4. | I understand I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn. | |
| 5. | The procedures regarding confidentiality have been clearly explained (e.g. use of names, pseudonyms, anonymization of data, etc.) to me. | |
| 6. | I understand that the interview will be audio recorded and do agree to this. | |
| 7. | I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of the data and have agree to the terms specified in this form. | |
| 8. | It has been explained to me that the audio recording of the interview will be password protected and will be stored on a secure computer with restricted access to it. | |
| 9. | It has been explained to me that the data collected will be kept for up to 5 years after the completion of the study. | |

Interview participant:

Name of Participant Signature Date

Damian Devlin

Name of Researcher Signature Date

Appendix 5: PSO funding analysis

Analysis of public funding support provided for local airport and PSO impositions.

Table A.1. Annual financial support by central and local authority, to PSO airport and PSO route

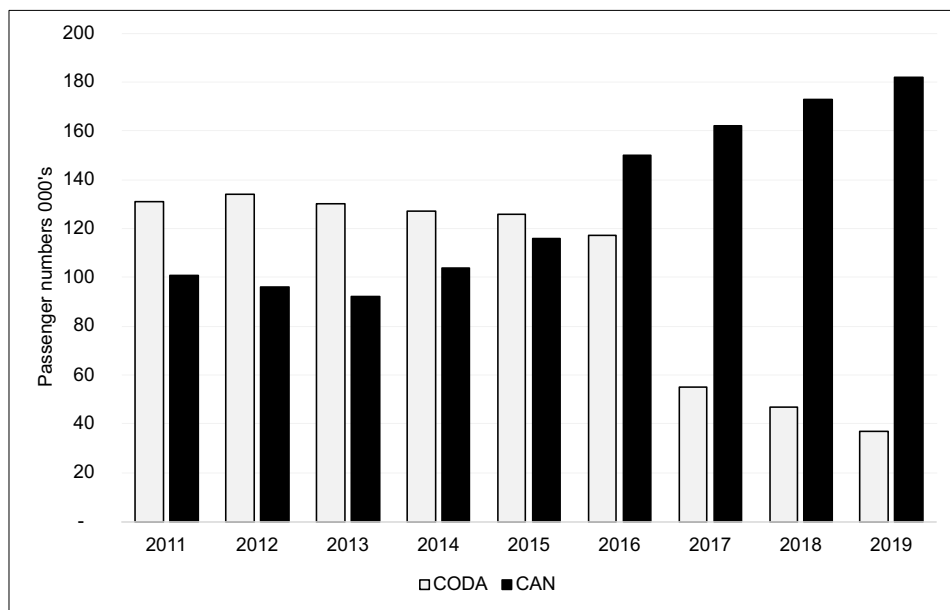
| | | City of Derry Airport | | Cornwall Airport | | Dundee Airport | |
|--------------------------|-----------------|-----------------------|---------------|-------------------|---------------|-------------------|---------------|
| | | Airport £000,s | PSO £000's | Airport £000,s | PSO £000,s | Airport £000,s | PSO £000,s |
| 2014 | Local authority | 2,152 | | 2,809 | 336 | | 390 |
| | UK government | | | | 2,464 | 3,224* | 2,857 |
| 2015 | Local authority | 2,145 | | 2,430 | | | |
| | UK government | | | | | 2,774* | |
| 2016 | Local authority | 2,514 | | 1,793 | | | |
| | UK government | | | | | 2,808* | |
| 2017 | Local authority | 2,145 | 516 | 1,363 | | | 444 |
| | UK government | | 3,784 | | | 1,447* | 3,256 |
| 2018 | Local authority | 2,409 | | 1,334 | | | |
| | UK government | | | | | 2,482* | |
| 2019 | Local authority | 2,405 | 378 | 1,325 | 1,700 | | 417 |
| | UK government | | 2,770 | | 1,700 | 2,864* | 3,473 |
| Airport Total | Local authority | 13,770 | | 11,054 | | | |
| | UK government | | | | | 15,559* | |
| PSO Total | Local authority | | 889 | | 2,036 | | 1,250 |
| | UK government | | 6,554 | | 4,164 | | 9,170 |
| * Scottish government | | | | | | | |

Source: adapted from CODA (Operations) Ltd (2019); Cornwall Airport Ltd (2019); Dundee Airport Ltd (2019)

Appendix 6: PSO route performance analysis

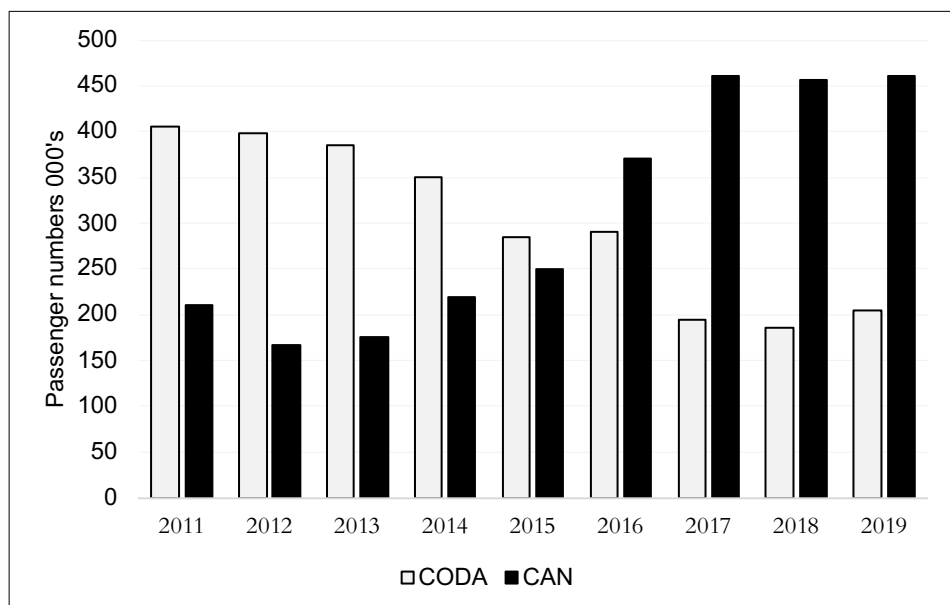
Analysis of the route and terminal passenger demand for City of Derry airport and Cornwall airport, and their relationship with the absolute and relative levels of financial provided by the respective local authority.

Figure A.1. Comparison of Derry~Londonderry-London and the Cornwall-London route passenger numbers



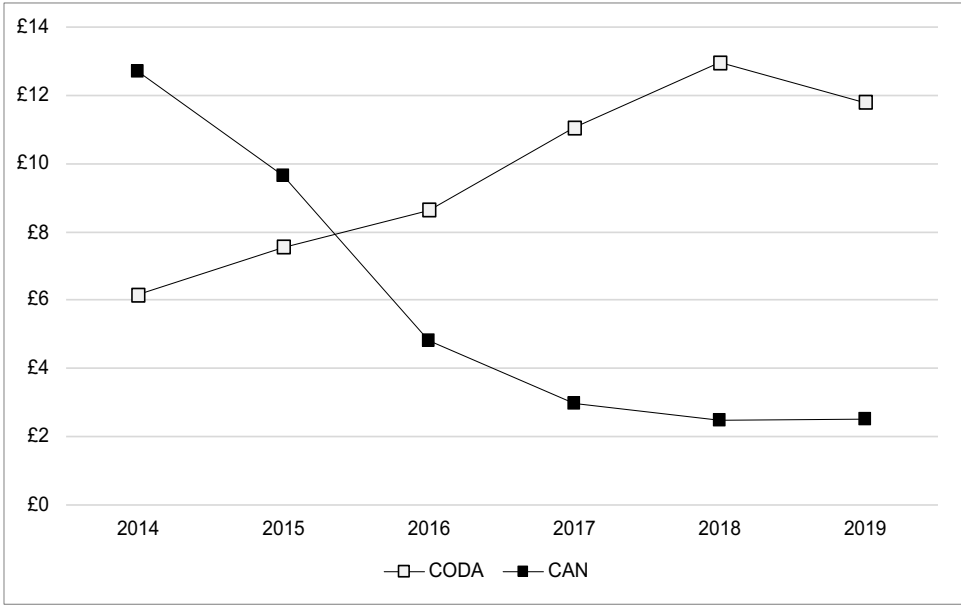
Source: adapted from CAA (2020)

Figure A.2. Comparison of City of Derry airport and Cornwall Airport terminal passenger numbers



Source: devised by author from CAA (2020)

Figure A.3. Comparison of per passenger financial support provided to City of Derry airport & Cornwall Airport



Source : adapted from CAA (2020); CODA (Operations) Ltd (2019); Cornwall Airport Ltd (2019)

Appendix 7: PSO routes funding comparison

Analysis of the relationship between the cost of aviation services to a local authority, and the size of the local authority population.

Table A.2. Financial support provided to PSO airports and PSO routes in 2018, per head of the council area population

| | City of Derry Airport | | Cornwall Airport | | Dundee Airport | |
|--|-----------------------|---------|------------------|--------|-----------------|---------|
| Council area population | 151,000 | | 561,000 | | 149,000 | |
| Catchment area population ^a | 691,000 | | 596,000 | | 452,000 | |
| | Local authority | UK gov. | Local authority | UK gov | Local authority | UK gov. |
| PSO ^b | £1.47 | £10.85 | £0.45 | £0.92 | £1.05 | £7.67* |
| Airport ^b | £15.20 | | £3.28 | | | £17.40* |
| Combined cost | £16.67 | £10.85 | £3.73 | £0.92 | £1.05 | £25.07* |
| * Combined from UK and Scottish governments | | | | | | |
| ^a Population within 60mins | | | | | | |
| ^b Per head of the population, per annum | | | | | | |

Source: adapted from Cornwall Council (2018); DCSD council (2018); NISRA (2020); NOMIS (2020)

Appendix 8: survey data

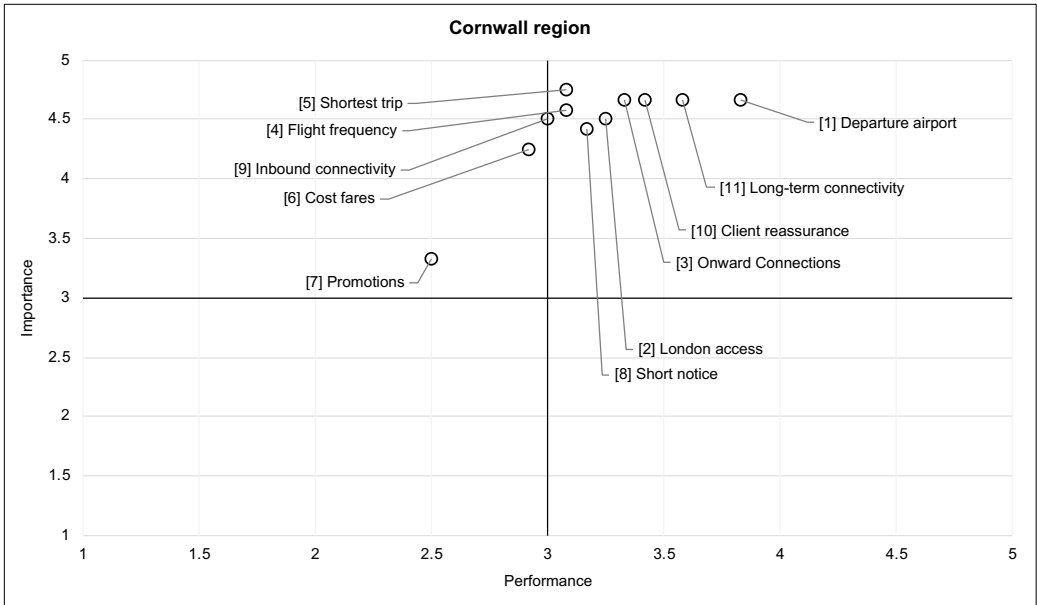
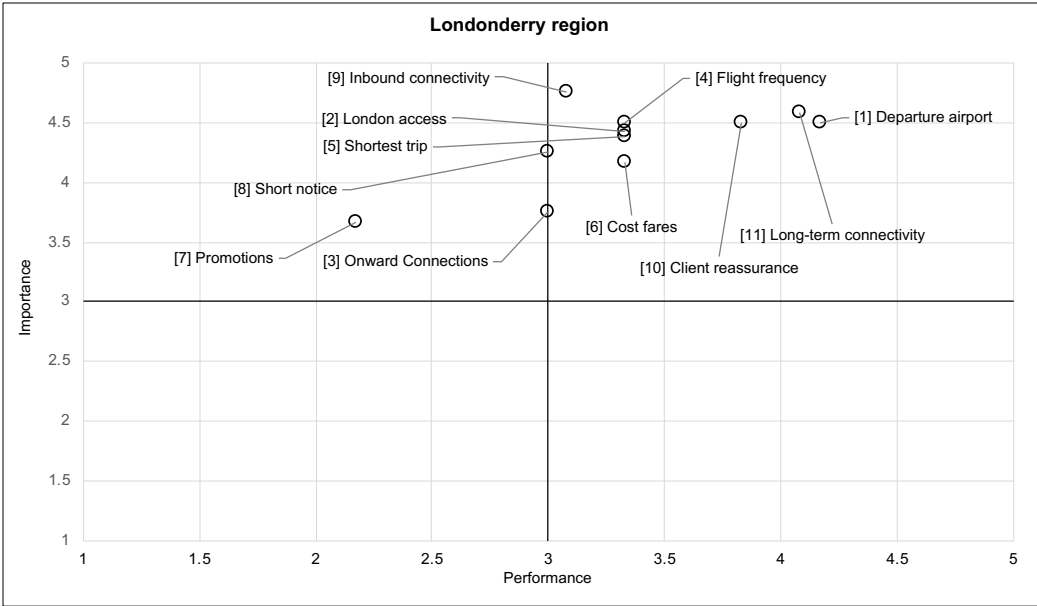
Questionnaire survey responses: importance.

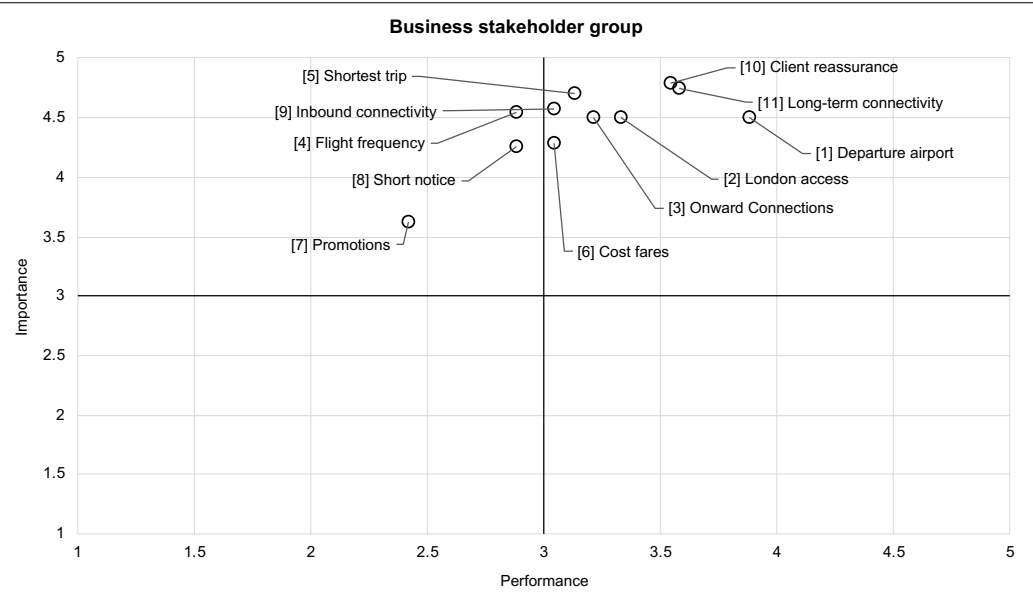
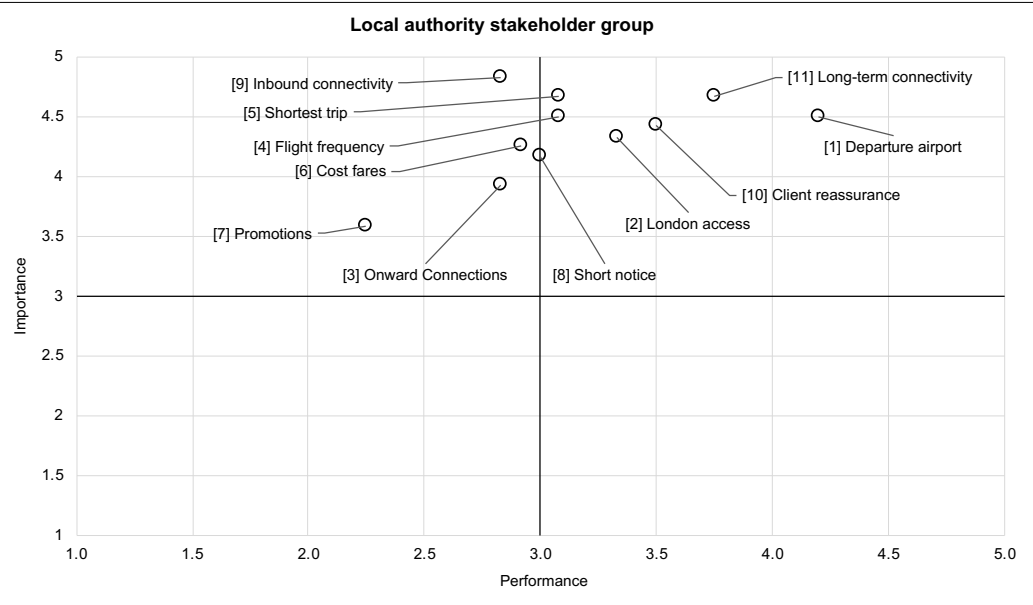
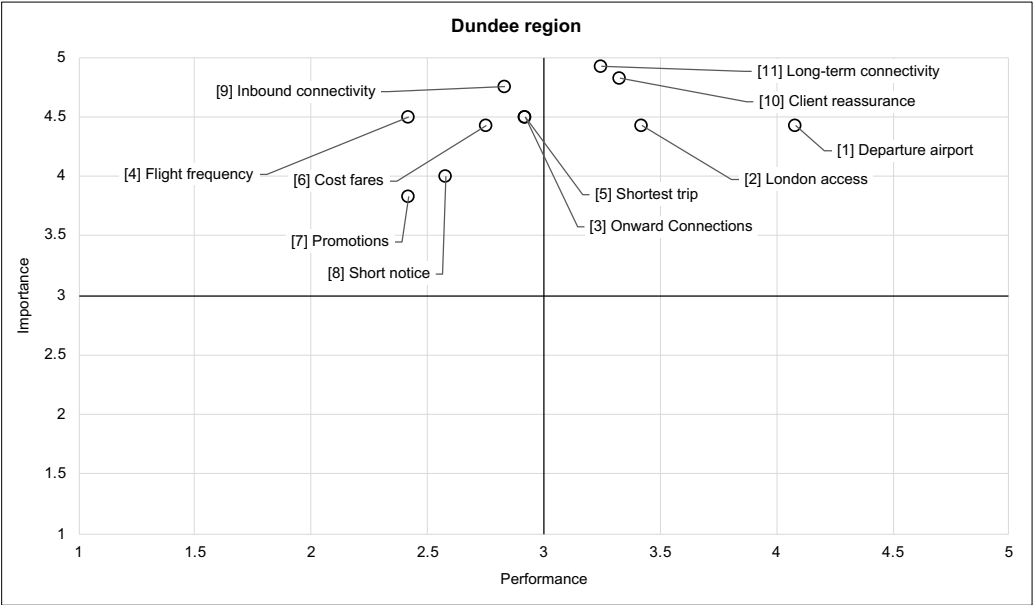
| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 |
|----|----|----|----|----|----|----|----|----|----|-----|-----|
| 1 | 5 | 4 | 2 | 4 | 5 | 5 | 3 | 3 | 4 | 4 | 4 |
| 2 | 5 | 5 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| 3 | 2 | 4 | 3 | 4 | 5 | 4 | 3 | 4 | 5 | 3 | 4 |
| 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 |
| 5 | 5 | 4 | 3 | 5 | 5 | 4 | 4 | 4 | 5 | 3 | 4 |
| 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 7 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 |
| 8 | 5 | 5 | 4 | 4 | 5 | 4 | 1 | 5 | 4 | 5 | 5 |
| 9 | 4 | 3 | 3 | 4 | 5 | 3 | 2 | 4 | 4 | 4 | 3 |
| 10 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 5 |
| 11 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 5 |
| 12 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 |
| 13 | 5 | 5 | 5 | 4 | 5 | 5 | 1 | 5 | 5 | 5 | 5 |
| 14 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 |
| 15 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 16 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 5 |
| 17 | 5 | 5 | 5 | 5 | 5 | 3 | 3 | 5 | 5 | 5 | 5 |
| 18 | 4 | 5 | 5 | 5 | 5 | 2 | 2 | 4 | 5 | 5 | 5 |
| 19 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 |
| 20 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| 21 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 5 |
| 22 | 4 | 4 | 5 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 |
| 23 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| 24 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 |
| 25 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 26 | 5 | 5 | 5 | 5 | 4 | 4 | 3 | 4 | 5 | 4 | 5 |
| 27 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 5 |
| 28 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 4 | 5 | 5 | 5 |
| 29 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 5 | 5 | 5 |
| 30 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 5 |
| 31 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 3 | 5 | 5 | 5 |
| 32 | 5 | 4 | 4 | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 5 |
| 33 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 34 | 2 | 4 | 5 | 4 | 4 | 4 | 3 | 3 | 5 | 5 | 5 |
| 35 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 5 |
| 36 | 5 | 4 | 5 | 4 | 4 | 4 | 3 | 5 | 5 | 5 | 5 |

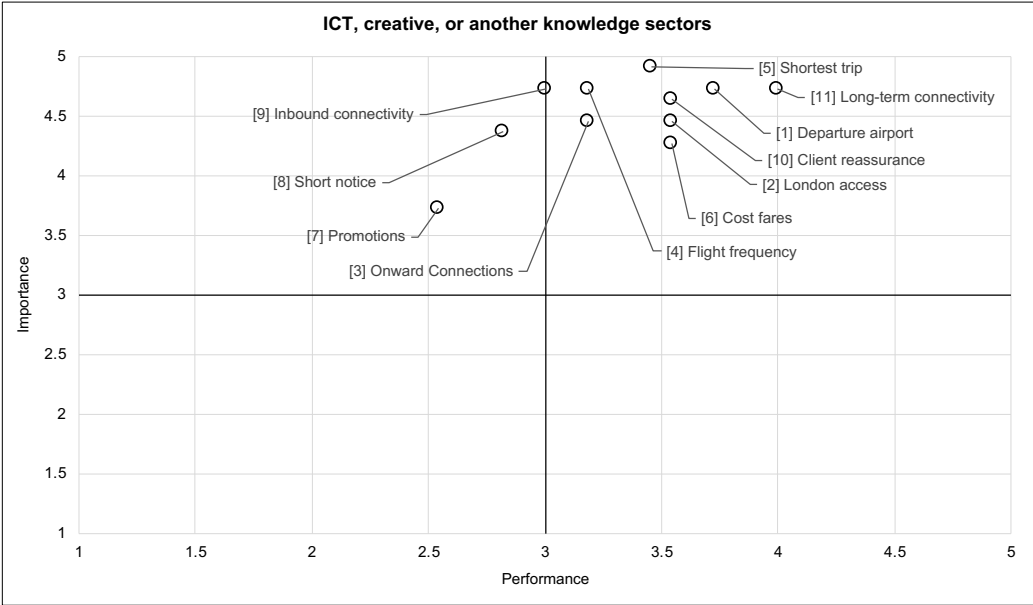
Questionnaire survey responses: performance.

| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 |
|----|----|----|----|----|----|----|----|----|----|-----|-----|
| 1 | 5 | 3 | 2 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 3 |
| 2 | 5 | 3 | 2 | 3 | 4 | 2 | 2 | 4 | 4 | 5 | 5 |
| 3 | 5 | 3 | 3 | 4 | 2 | 3 | 1 | 2 | 2 | 3 | 4 |
| 4 | 4 | 4 | 3 | 4 | 4 | 5 | 3 | 3 | 4 | 5 | 5 |
| 5 | 5 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 3 | 4 |
| 6 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 5 | 3 |
| 7 | 4 | 4 | 3 | 4 | 5 | 5 | 3 | 3 | 4 | 5 | 5 |
| 8 | 5 | 5 | 5 | 4 | 5 | 5 | 3 | 4 | 4 | 4 | 4 |
| 9 | 4 | 3 | 3 | 2 | 2 | 4 | 3 | 3 | 2 | 2 | 3 |
| 10 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 |
| 11 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 3 |
| 12 | 4 | 4 | 4 | 5 | 4 | 4 | 2 | 4 | 4 | 4 | 5 |
| 13 | 5 | 5 | 5 | 4 | 5 | 5 | 3 | 4 | 4 | 4 | 4 |
| 14 | 4 | 2 | 2 | 2 | 2 | 4 | 3 | 2 | 2 | 2 | 4 |
| 15 | 4 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 5 | 5 |
| 16 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 |
| 17 | 3 | 4 | 4 | 4 | 4 | 4 | 1 | 4 | 4 | 4 | 5 |
| 18 | 2 | 4 | 5 | 4 | 4 | 4 | 1 | 4 | 4 | 4 | 5 |
| 19 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 3 |
| 20 | 3 | 2 | 4 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 |
| 21 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 |
| 22 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 3 |
| 23 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 |
| 24 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 5 | 5 |
| 25 | 4 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 4 |
| 26 | 5 | 3 | 2 | 2 | 2 | 3 | 1 | 2 | 1 | 2 | 3 |
| 27 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 2 | 3 | 3 | 2 |
| 28 | 4 | 4 | 4 | 2 | 4 | 4 | 2 | 4 | 4 | 4 | 4 |
| 29 | 5 | 4 | 3 | 2 | 4 | 3 | 4 | 2 | 4 | 4 | 4 |
| 30 | 2 | 3 | 2 | 2 | 2 | 3 | 1 | 2 | 3 | 5 | 4 |
| 31 | 4 | 5 | 4 | 5 | 4 | 3 | 3 | 4 | 5 | 5 | 4 |
| 32 | 3 | 4 | 3 | 2 | 4 | 2 | 4 | 2 | 3 | 4 | 4 |
| 33 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 5 | 5 |
| 34 | 5 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 35 | 5 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | 3 |
| 36 | 5 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Appendix 9: IPA graphs for individual groups.







Appendix 10: IPA graphs for all attributes, individually.

