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FACTORS AFFECTING AIRPORT ROUTE DEVELOPMENT ACTIVITY AND PERFORMANCE

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Abstract

Airports have become increasingly active in route development as a means of attracting, growing and retaining air services. However, little is known about the different levels of route development activity at airports, or the extent to which route development activity affects performance. Based on the findings of a survey of 124 airports worldwide, this study finds that larger airports are significantly more active than smaller airports. It also finds that private airports are more active than public airports, and that airports in Europe are more active than airports in other world regions, although differences according to ownership and location are not significant. Route development activity has a significant positive effect on performance. Factors associated with the airport business environment (market turbulence, competitive intensity, market growth and airport constraints) were not found to have a significant moderating effect on the relationship between route development activity and performance. However, two factors were found to have a significant direct effect on performance; market growth has a significant positive effect while airport constraints have a significant negative effect.

Key words: Route development; Air service development; Airport marketing.

1. Introduction

Airport route development, also known as air service development in some countries, is the process associated with attracting, growing and retaining air services at airports (Halpern and Graham, 2013). It is increasingly viewed as being crucial to the success of airports (Griffin, 2012; Martin, 2009), and because of this many airports have become active in route development, although the degree of activity may vary according to airport characteristics. For instance, in a survey of over 100 airports worldwide, ASM (2009) found that 94 per cent of all airports actively market their airport to airlines and while the proportion of active airports is consistently high, there appear to be different levels of activity according to airport size and the world region within which the airport is located. Despite this, little is known about the different levels of route development activity amongst airports, or the extent to which route development activity affects performance.

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Based on the findings of a survey of 124 airports worldwide, this study investigates the route development activities of airports and compares differences in the overall level of activity at airports according to characteristics including ownership of the airport operator, airport size, and the world region within which the airport is located. This study also investigates the extent to which route development activity affects performance, taking into consideration the impact that an airport's business environment, including the degree of market turbulence, competitive intensity, market growth or airport constraints, has on the relationship between route development activity and performance.

Section 2 of this paper outlines the conceptual framework for the study including an overview of the airport route development process and a description of the assumptions to be investigated. Section 3 describes the methodological approach including the construction of key variables and methods of analysis. Section 4 summarises the main findings. Section 5 provides a conclusion.

2. Conceptual framework

2.1 The airport route development process

The airport route development process is illustrated in Fig. 1. The process involves a number of stages and although it seems like a simple and logical sequence, the reality is that it is a complex and continuous process. Airports will be at various and often multiple stages of the process at any particular time. Airports will also need to constantly assess and adapt any decisions that they make in response to changes taking place in the dynamic business environment within which they operate.

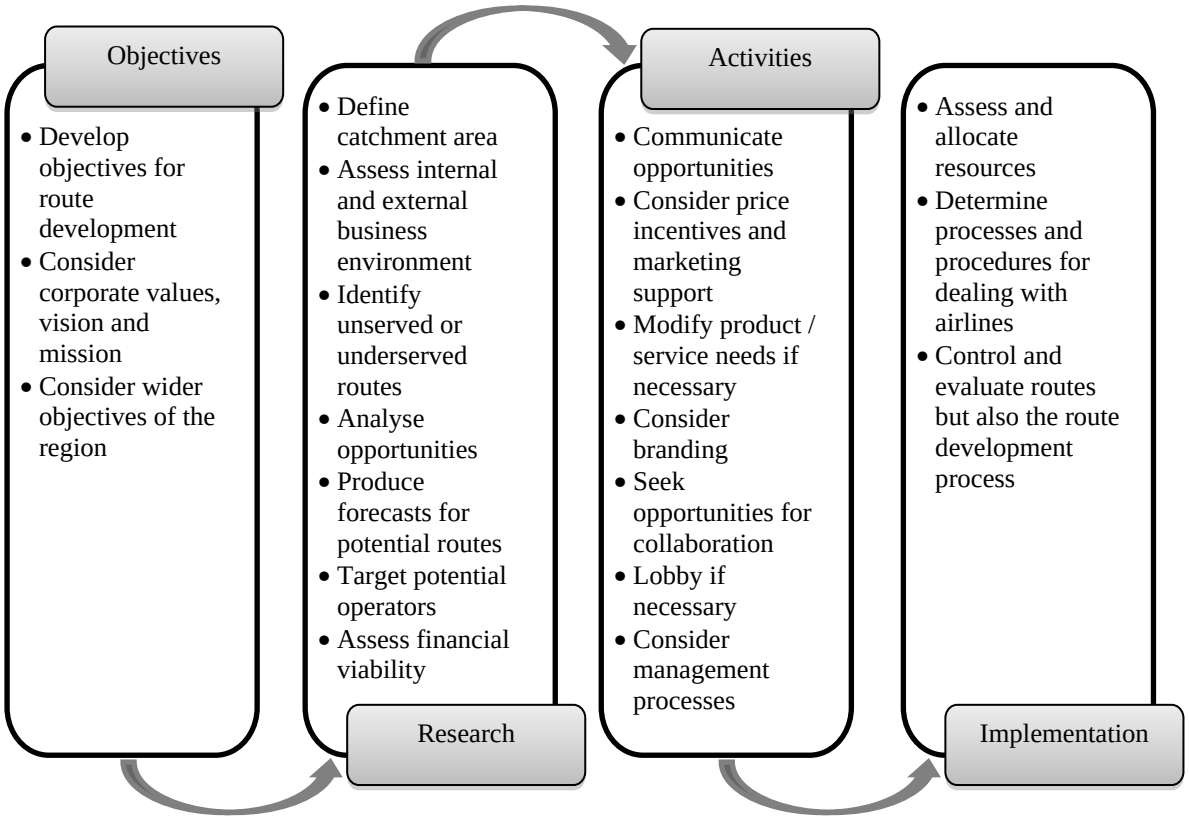

Fig. 1. The airport route development process.

The process involves the setting of objectives for route development. This may include attracting new routes with new airlines, attracting new routes with existing airlines, growing

existing routes, or influencing change to existing routes such as improved frequency, timing or aircraft type. Objectives may also focus on the retention of existing routes that may be at risk and/or are considered to be of strategic importance to the airport (Halpern and Graham, 2015). According to STRAIR (2005), route development objectives may also target specific areas such as those related to connectivity (e.g. number of destinations served, frequencies and capacity) or traffic (e.g. number of passengers arriving, departing and transiting, cargo value, weight and volume). The type of service being targeted may also vary, for instance, by airline (e.g. mainline, low cost, regional, leisure/tourism charter, private/business charter, general aviation, cargo) or destination (e.g. domestic, international within the same world region, intercontinental).

Objectives for route development will be influenced by the corporate intentions of the airport in terms of its overall vision, values and mission. For instance, an airport may seek to establish itself as the main airport in a particular region for a certain type of air service, or it may seek to capture a certain share of a particular market within a given time period. Objectives for route development will therefore need to support such intentions.

Airports are often viewed as spheres of influence for regional development (e.g. see Bandstein et al., 2009; Kupfer and Lagneaux, 2009; York Aviation, 2004). This means that stakeholders may seek to influence or even become involved in route development decisions at an airport in light of the influence that it can have, for instance, on employment, inbound tourism, trade and business activity, or travel opportunities for local residents and their friends and family. Wider regional objectives should therefore also be taken into consideration when setting objectives for route development.

In order to be successful in route development, airports need to undertake a considerable amount of marketing research, often in association with any stakeholders that may have an interest in airport route development (STRAIR, 2005). In particular, airports will need to define their catchment area, undertake market assessment in terms of their internal business environment such as the way in which the airport is owned and operated. The external business environment within which the airport operates will also need to be assessed including political, economic, socio-cultural, technological, environmental, legal and regulatory forces. This should include an assessment of key trends that are likely to affect the airport's current and future routes, market and competitive forces that the airport is exposed to, and the airport's ability to respond to key trends and forces.

Airports will need to identify unserved or underserved routes. This involves significant data requirements such as those from national statistics offices, schedules or origin and demand databases, published reports, or surveys (e.g. of passengers, travel trade, local businesses, or local residents) (Halpern and Graham, 2015). Opportunities may then be analysed using a range of tools such as traffic allocation models, a Quality of Service Index (QSI), connection builders, or market simulation forecasts (Halpern and Graham, 2015). Such tools are useful in producing a growth forecast for potential routes. Airports will also need to identify possible airlines to operate the routes and undertake a financial viability assessment of each route.

Once the appropriate research has been undertaken, airports need to make strategic choices on how to approach their route development decisions in terms of the activities to be used to market specific route development opportunities to target airlines. This includes the strategy for communicating opportunities to airlines, which was traditionally achieved by meeting with airlines at the airport or in airline offices, perhaps with a bespoke report written for them or by sending marketing materials by post, fax or email. Advertising in a range of media is also used but this approach tends to be very expensive and therefore beyond the budget of

most airports. Besides, it only tends to communicate general messages to a broad audience rather than communicating specific route development opportunities to target airlines.

Some airports, especially those targeting tourism-related markets, attend travel trade exhibitions such as WTM in London, ITB in Berlin, FITUR in Madrid, and MITT in Moscow (e.g. see AENA, 2014). These events provide networking opportunities for airports with the wider travel trade industry. More recently, there has been a growing trend for airports to take part in networking events that are specifically focused on route development such as Routes, JumpStart or French Connect. The events provide opportunities for one-to-one meetings between airport operators and airlines. This is a relatively recent concept that has experienced rapid growth over the years. For instance, the first ever Routes event was held in Cannes, France in 1995. It has been held every year since then and in addition to World Routes, there are now regional events including Routes Asia, Routes Africa, Routes Americas, and Routes CIS. World Routes 2014 was held Chicago with a delegation of about 3000 including 800 airports, 300 airlines, and 200 tourism authorities. Approximately 10,000 pre-arranged meetings took place (Routes, 2014).

There are also route development websites such as The Route Shop and Route Exchange that offer airports the opportunity to advertise vacant viable air services in a type of online route supermarket. For instance, airports that subscribe to The Route Shop can advertise their unserved routes, along with additional information on The Route Shop website (e.g. about airport infrastructure and services, catchment area, or potential for demand). This allows airlines to see which airports are hungry for growth, the opportunities that airports have identified, and more importantly, what evidence the airport has to suggest that a particular route should be operated. As of June 2014, The Route Shop listed over 3700 routes at more than 300 airports worldwide (anna.aero, 2014).

Many airports use their own website to communicate route development opportunities with airlines, often via a business-to-business section of the website. Many airports also use their website to provide travel planning support to passengers (Halpern and Regmi, 2013). While this is not directly associated with route development, it can subsequently encourage passengers to use air services at the airport and therefore contribute to the success of the airport's route development efforts. Social media can be used in a similar way to airport websites, for instance, by communicating opportunities to airlines but also to create awareness amongst potential passengers for new and improved services at the airport, and special offers that may be available (ACI-Europe, 2012).

In addition, airports will need to decide whether to offer financial support, for instance, in terms of price incentives such as discounted user charges or the offer of marketing support for joint advertising and promotional campaigns (e.g. see Fichert and Klophaus, 2011; Weatherill, 2006). Airports may need to modify their products and services in order to meet the needs of airlines and passengers. They may also place an emphasis on branding (e.g. see Castro and Lohmann, 2014; Halpern and Regmi, 2011), which has become popular amongst airports targeting tourism markets such as Rovaniemi Santa Claus Airport in Finland and Bardufoss Snowman International Airport in Norway. There may also be opportunities for collaboration, for instance, with stakeholders via some kind of airport development group or with other airports as part of an effort to grow or attract new routes between specific points.

Examples of stakeholder collaborations have become increasingly common in recent years. For instance, The Barcelona Air Route Development Committee was created at the beginning of 2005 by the Spanish airports authority AENA, the Catalan Autonomous Government, Barcelona City Council and the Barcelona Chamber of Commerce in order to promote the development of new intercontinental routes from Barcelona Airport (see GPA, 2014).

Similarly, Connect Sweden is a collaborative project that aims to strengthen Sweden's international air links. It was established by the Swedish airport operator Swedavia in 2013 in collaboration with SATSA II (European regional development funding), and support from Swedish businesses, the City of Stockholm, and a number of other national and regional organisations (see Connect Sweden, 2014). There is also a growing number of collaboarations between airports. For instance, following the recent launch of direct air services between Birmingham Airport in the UK and Delhi International Airport in India, the two airports signed a memorandum of understanding in 2013 for the two airports to become 'Sister Airports' – see Stone (2011) for a discussion on sister airports. This signalled a formal commitment by both airports to work collaboratively in order to strengthen trade and tourism links between the two cities (Birmingham Airport, 2013).

Opportunities for route development may be affected by certain obstacles such as legal or regulatory conditions, infrastructure constraints, or limited operating conditions or capabilities. Decisions relating to such obstacles may not be controlled by the airport, for instance, in terms of restricted hours of operation that may affect the airport's ability to attract certain air services. Airports may therefore need to lobby for changes to be made.

Management processes play an important role in the airport route development process, especially at larger airports or at airports that belong to an airport group and therefore have a larger and more complex organisational structure where management decisions regarding route development may be made at different levels in the organisation, and involve a number of departments. Some airports, such as Aberdeen Airport in the UK, have been known to use a so-called 'entry into service' process where a specific project manager is assigned as a point of contact and provider of assistance to airlines. Key account managers are employed by many airports and will assume a similar role. This might not be necessary at smaller and/or independently owned airports, where the organisational structure may be less complex.

Resource needs for route development can be significant so airports need a strategy for implementation in terms of the financial and human resources that will be committed. As mentioned previously, it will be important as well to determine the processes and procedures necessary for dealing with airline customers at all stages of the route development process – from first contact, to the launch of a new or changed route, and on going care to ensure that route opportunities are maximised and that a mutually beneficial long-term relationship is established and maintained with airline customers. This may include route launch protocol. It may also include an assessment of the roles and responsibilities for route development and the organisational structure for route development, including its position within the airport's overall organisational structure. This can have an impact on the extent to which route development is prioritised within the organisation, and how successful it is.

Not only does an airport need to control and evaluate its route development efforts but it also has to assess the performance of individual routes and the relationship that it has with its airline customers. It will need to focus on the effectiveness of the airport's route development strategy in terms of its long-term success but also the way in which it is operationalised (e.g. through the various activities that it uses). The former may be controlled on an annual basis or as part of an overall route development cycle. However, the latter will need to be controlled and evaluated on a regular basis, and frequently enough to assess progress, identify any issues or problems, and address them before they get worse. The findings of any control and evaluation should also feed into the setting of new or revised objectives as part of an on going process.

2.2 Research assumptions

It is the route development activities that are of particular interest in this study. Historically, governments or airlines decided where to fly to and from so the airport role was largely to respond to requests from airlines. This is still the case in some parts of the world. However, increasingly, airports have become more active in their approach to route development and many airports now play a proactive role in encouraging airlines to develop air services at their airport (Halpern and Graham, 2015).

Successful route development allows airports to grow and improve their provision of air services, which is likely to contribute to the commercial success of the airport and offer wider benefits that air services bring to surrounding regions in terms of tourism and connectivity for businesses or local residents. Contributing to the commercial success of the airport is important given that airports are increasingly commercialised, and in some cases operated by owners with private interests that seek to gain a return on investment (Graham, 2014; ACI-Europe, 2010). An assumption therefore is that airports operated by an owner with part or full private interests will be more active in their approach to route development than those that are operated by full public interests. The assumption is tested in this study by hypothesis one (H1).

H1. Privately operated airports have a significantly higher level of route development activity than publicly operated airports.

Airport marketing for small airports that have minimal budgets for such activities is particularly challenging (Kramer et al., 2010). In their survey of route development activities at airports, ASM (2009) found that lack of budget is the main reason for no activity. The findings of their survey also suggest that activities used by airports vary according to airport size, which they measured by total annual passengers served. In particular, their survey found that smaller airports were less likely to use more expensive activities such as attending route development networking events or meetings with airlines in their offices. An assumption, therefore, is that larger airports are more active than smaller airports. This is because smaller airports are expected to have more limited resources and expertise for route development but also because they may have a smaller market and potential demand for air services, and therefore have less to gain from being more active in route development. Of course, there may be situations where an airport does not have to worry much about route development. For instance, if it is a large hub airport for an airline or if it enjoys a monopoly situation as a number of particularly large airports do. However, there is still evidence of such airports competing fiercely in the area of route development. For instance, Oslo and Copenhagen airports competing to be the main hub airport for northern Europe. The assumption is tested in this study by hypothesis two (H2).

H2. Larger airports have a significantly higher level of route development activity than smaller airports.

The survey by ASM (2009) also suggests that regional differences exist. In particular, airports in Europe were generally found to be more active than airports in the rest of the world. This may be due to the relatively high level of competition, commercialisation, and private ownership of airports in Europe (e.g. see Thelle et al., 2012). An assumption, therefore, is that airports in Europe are more active than airports in the rest of the world. The assumption is tested in this study by hypothesis three (H3).

H3. Airports in Europe have a significantly higher level of route development activity than airports in the rest of the world.

As mentioned previously in this paper, route development activities are viewed as being crucial to the success of airports. An assumption, therefore, is that the more active an airport is with route development, the better it will perform compared to similar or competing airports in terms of attracting, growing and retaining air services. The relationship between route development activity and performance may also be moderated (i.e. strengthened or weakened) by the business environment within which an airport operates. In particular, the effect may be strengthened at airports that operate in turbulent markets (characterised by rapid changes in airline customers, routes, frequencies or capacities), when competitive intensity is high (characterised by an environment where airports compete fiercely with other airports for air services, and where airports are likely to lose out to competitors if they fail to satisfy airline customers), and when market growth is strong (characterised by current market growth or potential future growth). This is because more active airports will perform better than similar or competing airports under more challenging market conditions or when there are opportunities for growth.

Alternatively, the effect of route development activity on performance may be weakened at airports where future growth is constrained (e.g. by legal or regulatory conditions, infrastructure constraints, or limited operating conditions or capabilities). This is because the scope for expanded or improved services is restricted, regardless of how active an airport is in its route development efforts. Moreover, it will not make much sense for an airport that is constrained (especially in situations where their capacity is being fully utilised) to be active in route development, unless there is scope to improve existing services, for instance, by influencing change to existing routes such as encouraging airlines to use larger aircraft in order to grow passenger throughput without increasing aircraft movements.

The assumptions are tested in this study by hypotheses four to eight (H4-H8).

H4. The greater the level of route development activity at an airport, the better its route development performance.

H5. The greater the market turbulence, the stronger the relationship between route development activity at an airport and its route development performance.

H6. The greater the competitive intensity, the stronger the relationship between route development activity at an airport and its route development performance.

H7. The greater the market growth, the greater the relationship between route development activity at an airport and its route development performance.

H8. The more constrained the airport, the weaker the relationship between route development activity at an airport and its route development performance.

Hypotheses H5 to H8 investigate the moderating effect of factors associated with the airport business environment on the relationship between route development activity and performance. However, it is possible that the factors affect route development performance themselves, especially in the case of market growth because airlines may decide to serve an airport with strong market growth or potential regardless of the extent to which the airport is active in route development. The direct effect of each factor on route development performance is therefore also investigated in this study.

3. Methodology

3.1 Variables

A number of variables needed to be created in order to test the assumptions presented in Section 2.2. The variables, source of data, and the way they were constructed can be seen in Table 1.

Table 1. Variables used in this study.

Variables	Source	Construction
Antecedent variables		
Ownership	Official records	0 'full public', 1 'part or full private'
Size (passengers in 2012)	Flightglobal Pro	0 '<1 million', 1 '1 million or more'
Location	Flightglobal Pro	0 'other', 1 'Europe'
Independent variables		
Route development activity	Survey – 18 items	See Table 3
Moderator variables		
Market turbulence	Survey – 3 items	See Table 3
Competitive intensity	Survey – 2 items	See Table 3
Market growth	Survey – 2 items	See Table 3
Airport constraints	Survey – 1 item	See Table 3
Dependent variable		
Route development performance	Survey – 5 items	See Table 3

Three variables, antecedents to route development activity, were created using secondary data. Airport size is dichotomised between smaller airports (with less than one million passengers) and larger airports (with one million or more). The variable was created using data on total passengers served by each airport in 2012. The data was taken from Flightglobal Pro – a leading information source for the aviation industry with data and information on about 1800 airports worldwide. Ownership of the airport operator is dichotomised between public airports (with a full 100 per cent publicly owned operator) and private airports (with an operator that is owned by at least part private interests, which includes those with majority public ownership). Information on ownership of the airport operator was gathered from a search of the website or other official records for each airport. Location is dichotomised between airports in Europe and airports in other world regions. The variable was created using information on the location of airports from FlightGlobal Pro. Airports were also grouped according to world region (Africa, Asia/Pacific, Europe, Latin America/Caribbean, Middle East, and North America) so that regional differences can be investigated.

Remaining variables were created from a wider survey conducted by the authors to investigate all aspects of the route development process at airports (see Halpern and Graham, 2015). The effect of the moderator variables on the relationship between market orientation and the performance of airports was investigated by Halpern and Pagliari (2008), and the items used to construct those variables have been taken from that study. It might have been possible to use actual traffic and schedules data for the moderator and dependent variables instead of using survey data but we concluded that there were problems in defining appropriate indicators to measure these and that there were a number of factors (e.g. comparative airport performance, future potential), which could not be captured by the data.

The survey was administered online using the Questback Ask and Act survey tool. The survey was written in English. A participating pre-test of the survey was carried out with 16 experts from industry and academia that have specialist knowledge of airport route development. An undeclared pre-test of the revised and final version of the survey was then carried out with four airports in order to check the standardisation of the survey. The survey items used to construct the independent, moderator and dependent variables can be seen in Table 3, along with the scales used to measure the responses from airports, which are provided in the notes that accompany Table 3.

Flightglobal Pro was used as a sampling frame for the population of world airports. At the time of conducting this study, Flightglobal Pro provided profiles for 1791 airports worldwide Only airports on Flightglobal Pro with a complete profile including an email address and traffic data were included. This provided a gross sample of 934 airports that were emailed a URL link to the survey. The net sample represents the respondents to the survey. Responses were received from 124 airports resulting in a response rate of 13 per cent. Eight of the 124 airports that responded to the survey were not active in route development and are therefore not included in the analysis. Most of the airport email addresses on Flightglobal Pro were for the general administration of the airport operator, so where possible, airport websites were searched in order to find more appropriate addresses. Forty eight per cent of responses were from email addresses for named route development personnel, 28 per cent for other named personnel, and 24 per cent for the general administration and so there was a fairly high degree of certainty that most of the respondents were qualified to answer the questions.

The low response rate (in relation to the size of the sampling frame and gross sample) and the small overall number of responses is a limitation of the findings in this study. It is unfortunately characteristic of studies of this nature. For instance, the survey on passenger air service development techniques by Martin (2009) is based on responses from 41 US airports, while the survey on airport route development strategies by ASM (2009) is based on responses from 100 airports worldwide. However, it is important to note that a large number of airports listed in the sampling frame and gross sample are facilities dedicated for general aviation or very small airports that would not be undertaking relevant route development practices. In addition, a large number of airports in the profiles come under the same management (e.g. Infraero 63 airports in Brazil, AENA 47 airports and two heliports in Spain, Avinor 46 airports in Norway, Aeropuertos Argentina 2000 33 airports in Argentina) and may therefore have common route development practices for all or specific groups of airports under their control. Therefore, despite the low response rate relative to the sampling frame and gross sample, we believe that this study still provides an important contribution to research on route development although clearly there is a need for further research with larger samples.

The findings in this study are also affected by bias in the sample of respondents according to airport size and location (see Table 2). The sample has a greater proportion of larger airports and airports from Europe – possibly because they are more active in route development, and therefore more interested in taking part in the survey. Data on ownership of the airport operator is not provided for the sampling frame or gross sample due to difficulties associated with finding the necessary information.

Table 2. Samples by airport characteristics (per cent).

Airport characteristic	Sampling Frame	Gross sample	Net Sample	Difference (net – frame)
Ownership of the airport operator				
Full public	-	-	79.0	-
Part or full private	-	-	11.3	-
Size (total passengers, 2012)				
<1 million	66.4	50.1	47.6	(18.8)
1 million or more	33.6	49.9	52.4	18.8
Location				
Europe	32.4	48.7	58.1	25.7
Other	67.6	51.3	41.9	(25.7)

3.2 Analysis

Cronbach's alpha is used to test scale reliability for variables created using three or more items (see Table 3). This helps to determine the internal consistency of the items used. Independent samples t-tests were used to investigate hypotheses H1 to H3 by comparing mean levels of route development activity according to ownership of the airport operator, and airport size and location. Stepwise regression analysis is used to investigate hypothesis H4 with route development activity as the independent variable and route development performance as the dependent variable, while controlling for factors associated with the airport business environment; market turbulence, competitive intensity, market growth, and airport constraints.

Hypotheses H5 to H8 test the interaction effect of variables that moderate the relationship between route development activity and performance, for instance, by altering the direction or strength of the relationship. Route development activity is the independent variable (predictor), route development performance is the dependent variable (outcome), and the moderator variables are market turbulence, competitive intensity, market growth, and airport constraints. Interaction effects are investigated using multiple regression analysis. In multiple regression analysis, problems are often experienced due to explanatory variables being highly correlated. This is especially the case when using interaction terms. Therefore, the independent variable and moderator variables were standardised by subtracting each score on each variable from the mean of all scores on that variable, divided by the standard deviation.

An initial regression is conducted to test the effect that route development activity and a moderator variable has on route development performance. This is then followed by a second regression that is the same as the first but includes an interaction term created by multiplying route development activity with the moderator variable. The idea is to test if the interaction term has a significant effect, and if so, to see if adding the interaction term leads to a significant improvement in how well the regression is performing. If the interaction is improving the regression, R^2, which shows how much the variance in route development performance is explained by the model, is expected to increase significantly.

4. Findings

4.1 Descriptive statistics and scale reliability

Scale reliability of the items used to construct the variables; route development activity, route development performance and market turbulence, is shown in Table 3. Cronbach's alpha indicates high levels of internal consistency (alphas of .884, .722 and .883 respectively). For route development activity, the item 'hire a consultant to conduct activities' has an alpha of .889. This may mean that airports using a consultant have different patterns of activity to those that conduct route development activities in-house. The item was therefore deleted from the construct. The remaining 17 items were combined to provide a measure of the overall extent to which respondent airports are active in route development with an average score ranging from 1 'not at all' to 4 'to a great extent'.

Five items were combined to provide a measure of how respondent airports have performed at route development during the last 12 months compared to similar or competing airports with an average score ranging from 1 'much worse' to 5 'much better'.

Items were combined, where relevant, to create the variables market turbulence, competitive intensity, market growth and airport constraints. These variables provide a measure of the overall extent to which respondents agree that their airport operates in such environments with an average score ranging from 1 'strongly disagree' to 5 'strongly agree'.

Table. 3. Descriptive statistics and scale reliability for key items.

Survey items	Mean	Std. Dev.	N	Alpha if deleted
Route development activity (alpha .884, 18 items) [a]	2.75	.596	113	-
1. Attend route development networking events	3.35	.990	113	.877
2. Present itself on route development websites	2.52	1.226	113	.877
3. Invite target airlines to visit the airport	2.96	.910	113	.874
4. Seek to meet airlines in their offices and present to them	3.25	.987	113	.875
5. Send electronic marketing materials to airlines by email	2.87	.996	113	.873
6. Send printed marketing materials to airline by post or fax	1.82	.928	113	.883
7. Target a specific airline and produce a bespoke report for them	3.04	1.089	113	.873
8. Provide route development information on the airport website	2.34	1.014	113	.876
9. Communicate opportunities with airlines via social media	1.77	.926	113	.877
10. Hire a consultant to conduct route development activities	2.37	1.241	113	.889
11. Modify facilities or services to meet airline needs	2.94	.879	113	.880
12. Promote a recognised airport brand	2.73	.957	113	.880
13. Lobby for the removal of obstacles to further development	2.33	1.056	113	.880
14. Use strategic marketing partnerships	3.12	.898	113	.877
15. Collaborate with other airports	2.68	.928	113	.881
16. Offer flexibility on pricing	3.11	1.021	113	.876
17. Develop joint advertising or promotional campaigns	3.07	.979	113	.873
18. Improve processes for providing assistance to airlines	2.79	1.056	113	.878
Route development performance (alpha .883, 5 items) [b]	3.42	.826	100	-
1. Attracting new routes with existing airlines	3.45	1.058	100	.848
2. Attracting new routes with new airlines	3.25	1.095	100	.876
3. Retaining existing routes	3.56	.998	100	.851
4. Growing existing routes	3.54	.999	100	.845
5. Influencing change to existing routes	3.30	.835	100	.867
Market turbulence (alpha .722, 3 items) [c]	3.88	.948	116	-
1. We experience changes to frequency or seat capacity each year	4.25	.950	116	.651
2. We gain or lose routes each year	3.80	1.275	116	.567
3. We gain or lose airline customers each year	3.60	1.291	116	.675
Competitive intensity (no alpha, 2 items) [c]	3.93	.930	116	-
1.We compete fiercely with other airports for air services	3.90	1.139	116	-
2. We will lose out to competitors if we fail to satisfy our airlines	3.94	1.032	116	-
Market growth (no alpha, 2 items) [c]	4.07	.890	116	-
1. The market for air services has grown rapidly in recent years	3.83	1.182	116	-
2. Potential demand in our region offers significant opportunities	4.32	.900	116	-
Airport constraints (no alpha, 1 item) [c]	3.15	1.562	116	-
1. Future growth in air services at our airport is constrained	3.15	1.562	116	-

Notes:

[a] To what extent has your airport used the following methods to market itself to airlines or trade during the last 12 months? 1 'not at all' to 5 'to a great extent'.

[b] How has your airport performed during the last 12 months compared to similar or competing airports in terms of the following route development objectives? 1 'much worse' to 5 'much better'.

[c] To what extent do you agree or disagree with the following statements about your airport? 1 'strongly disagree' to 5 'strongly agree'.

The total number of respondents was 116 although for some questions a slightly smaller number is listed due to a few respondents not answering all of the questions.

The mean values for overall route development activity, route development performance, market turbulence, competitive intensity, market growth and airport constraints, are the mean values of the individual items combined.

From Table 3, it can be seen that on average, respondents tend to agree that the market for air services in their region offers significant opportunities for growth. However, respondents also tend to agree that the market for air services is fiercely competitive and turbulent in terms of changes to existing routes, airline customers, capacity and frequency. In terms of route development activity, active and targeted forms of personal selling are used most by airports to communicate opportunities for route development such as attending route development networking events, seeking to meet airlines in their office and present to them, and targeting a specific airline and producing a bespoke report for them. Respondents also demonstrate the

need to have a collaborative approach to route development (e.g. by using strategic marketing partnerships) and to share in the risk associated with route development (e.g. by offering flexibility on pricing and developing joint advertising and promotional campaigns).

4.2 Statistical analysis

Results from the independent samples t-tests, with the overall route development activity indicator as the dependent variable, are shown in Table 4. The average level of route development activity for all respondents (as shown in Table 3) is 2.75 or 2.8 when the number is rounded up. There is a significant difference according to airport size with larger airports averaging 2.9 compared to 2.5 for smaller airports. This supports hypothesis H2 and is likely to reflect the more limited internal resources and expertise available for route development at smaller airports. Differences are observed according to the way in which airports are operated with an average of 2.7 for public airports compared to 3.0 for private airports. However, the difference is only significant at the 10% level, partially supporting hypothesis H1. Airports in Europe have an average of 2.8 compared to 2.7 for airports in the rest of the world. This is only a very small difference and the difference is not significant. It can be seen in Table 5 that respondents from the Middle East and North America also have fairly high scores of 2.8 and 2.7 respectively. However, readers should note that the limited number of responses for the different regions such as the Middle East with just one response is by no means considered to be representative of airports in the Middle East. This means that hypothesis H3 is not accepted.

Table 4. Route development activity according to ownership, size and location.

Route development activity	N	Mean	Std. Dev	Std. Error Mean	t-test for equality of means
Ownership of the airport operator					
Private	20	2.98	.433	.097	*t* 1.979(111), *p*.050
Public	93	2.70	.616	.064	
Size					
Large	62	2.95	.532	.068	*t* 4.377(111), *p*.000
Small	51	2.50	.579	.081	
Location					
Europe	69	2.80	.583	.070	*t* 1.105(111), *p*.272
Other	44	2.67	.616	.093	

Note: equal variances are assumed for each test (Levene's test for equality of variances provided an *f* statistic with a *p*-value that is greater than .05).

Table 5. Route development activity according to world region.

Region	Mean	N	Std. Dev	One-Way ANOVA
Africa	2.59	2	1.414	
Asia Pacific	2.55	8	.611	
Europe	2.80	69	.583	
Latin America/Caribbean	2.55	3	.885	
Middle East	2.77	1	-	
North America	2.71	30	.585	
Total	2.75	113	.596	*f*.366(5,107), *p*.871

Table 6 provides the results of a stepwise regression analysis for the effect of individual route development activities on performance. Only the activities that have a significant effect on performance ($p<.05$) are listed, and the coefficients represent the mean change in the dependent variable for one unit of change in the independent variable while other variables in the model remain constant. Two key areas of activity have significant positive effects on performance; collaboration (through the use of strategic marketing partnerships and collaborating with other airports) and active and targeted forms of personal selling (inviting target airlines to visit the airport and attending route development networking events). The strength of effect from each area of activity is fairly similar, as represented by the coefficient

values. Surprisingly, offering flexibility on pricing such as with discounted user charges or other incentives is found to have a significant negative effect on performance. However, this may be since the airports that had poor performance because of inherent weak factors, such as a limited catchment area, felt that they had a greater need to offer price incentives to attract traffic that may have not initially considered operating at their airport as a feasible option.

The average overall level of route development activity at airports is found to have a significant positive effect on route development performance, therefore supporting hypothesis H4 (see Table 7). Of the environmental factors included in the analysis, market growth and airport constraints were found to have a significant effect. Market growth has a significant positive effect while airport constraints have a significant negative effect. The strength of the effect of route development activity, as represented by the coefficient value, is much stronger than the effect of the environmental factors suggesting that the level of route development activity has a much greater impact on route development performance than the environment within which the airport operates.

Table 6. Stepwise regression for individual route development activities on performance.

	Unstandardized coefficients		Standardized coefficients		
Model	B	Std. Error	Beta	T	Sig.
(Constant)	1.526	.330		4.629	.000
Use strategic marketing partnerships	.285	.098	.301	2.922	.004
Invite target airlines to visit the airport	.281	.089	.304	3.168	.002
Offer flexibility in pricing	-.286	.091	-.315	-3.138	.002
Collaborate with other airports	.173	.084	.198	2.072	.041
Attend route development networking events	.171	.084	.195	2.026	.046

Note: Dependent variable: Route development performance (overall score from the items listed for route development performance in Table 3). R^2.393.

Table 7. Stepwise regression for route development activity on performance controlling for external factors.

	Unstandardized coefficients		Standardized coefficients		
Model	B	Std. Error	Beta	T	Sig.
(Constant)	1.265	.488		2.593	.011
Route development activity	.549	.127	.385	4.341	.000
Market growth	.229	.087	.233	2.641	.010
Airport constraints	-.102	.047	-.192	-2.200	.030

Note: Dependent variable: Route development performance (overall score from the items listed for route development performance in Table 3). R^2.281. Independent variables are based on the overall scores from the items listed for each variable in Table 3).

Results of the tests for moderation can be seen in Tables 8 to 11. Model one (without the interaction term) and model two (with the interaction term) is significant in each case. For instance, with market turbulence, $F(2,96)12.964$, $p<.001$ (for model one) and $F(3,95)10.169$, $p<.001$ (for model two). However, in each case, model two does not account for significantly more variance than model one meaning that there is no evidence of a significant moderation taking place. For example, in the case of market turbulence, the interaction between route development activity and performance (with the interaction term) did not account for significantly more variance than route development activity and performance (without the interaction term). R^2 change is .030, p.054. This means that hypotheses H5 to H8 are rejected.

Table 8. Market turbulence and the relationship between route development activity and performance.

	ANOVA[c]					Change Statistics				
	Sum of		Mean			R Square	*F*			Sig. *F*
Model	Squares	Df	Square	*F*	Sig.	Change	Change	df1	df2	Change
1 Regression	14.360	2	7.180	12.964	.000[a]	.213	12.964	2	96	.000

	Residual	53.168	96	.554							
	Total	67.527	98								
2	Regression	16.414	3	5.471	10.169	.000[b]	.030	3.819	1	95	.054
	Residual	51.113	95	.538							
	Total	67.527	98								

[a] Predictors: Constant, ZMarket turbulence, ZRoute development activity.
[b] Predictors: Constant, ZMarket turbulence, ZRoute development activity, Product ZMarket turbulence.
[c] Dependent variable: Route development performance.

Table 9. Competitive intensity and the relationship between route development activity and performance.

		ANOVA[c]					Change Statistics				
Model		Sum of Squares	Df	Mean Square	*F*	Sig.	R Square Change	*F* Change	df1	df2	Sig. *F* Change
1	Regression	13.598	2	6.799	12.103	.000[a]	.201	12.103	2	96	.000
	Residual	53.929	96	.562							
	Total	67.527	98								
2	Regression	13.869	3	4.623	8.185	.000[b]	.004	.480	1	95	.490
	Residual	53.658	95	.565							
	Total	67.527	98								

[a] Predictors: Constant, ZCompetitive intensity, ZRoute development activity.
[b] Predictors: Constant, ZCompetitive intensity, ZRoute development activity, Product ZCompetitive intensity.
[c] Dependent variable: Route development performance.

Table 10. Market growth and the relationship between route development activity and performance.

		ANOVA[c]					Change Statistics				
Model		Sum of Squares	Df	Mean Square	*F*	Sig.	R Square Change	*F* Change	df1	df2	Sig. *F* Change
1	Regression	16.519	2	8.260	15.545	.000[a]	.245	15.545	2	96	.000
	Residual	51.008	96	.531							
	Total	67.527	98								
2	Regression	17.265	3	5.755	10.877	.000[b]	.011	1.408	1	95	.238
	Residual	50.263	95	.529							
	Total	67.527	98								

[a] Predictors: Constant, ZMarket growth, ZRoute development activity.
[b] Predictors: Constant, ZMarket growth, ZRoute development activity, Product ZMarket growth.
[c] Dependent variable: Route development performance.

Table 11. Airport constraints and the relationship between route development activity and performance.

		ANOVA[c]					Change Statistics				
Model		Sum of Squares	Df	Mean Square	*F*	Sig.	R Square Change	*F* Change	df1	df2	Sig. *F* Change
1	Regression	15.429	2	7.714	14.215	.000[a]	.228	14.215	2	96	.000
	Residual	52.099	96	.543							
	Total	67.527	98								
2	Regression	15.541	3	5.180	9.467	.000[b]	.002	.206	1	95	.651
	Residual	51.986	95	.547							
	Total	67.527	98								

[a] Predictors: Constant, ZAirport constraints, ZRoute development activity.
[b] Predictors: Constant, ZAirport constraints, ZRoute development activity, Product ZAirport constraints.
[c] Dependent variable: Route development performance.

5. Conclusion

This study investigates the different levels of route development activity at airports and the extent to which airport route development activity affects performance. It is based on the findings of a survey of 124 airports worldwide, and although this had responses concentrated from larger airports and from airports in Europe, it nevertheless makes an important contribution to the knowledge about airport route development.

The study finds that larger airports are significantly more active than smaller airports. It also

finds that private airports are more active than public airports, and that airports in Europe are more active than airports in other world regions. However, the differences according to ownership and location are not significant.

From a list of 18 different types of route development activity, two key areas of activity have significant positive effects on performance; collaboration and the use of active and targeted forms of personal selling. The need to collaborate (e.g. through the use of strategic marketing partnerships and collaborating with other airports) emphasises that airport management must work with their stakeholders when developing route development strategies. Stakeholders here will typically include regional economic development agencies, destination management organisations or tourism authorities, and Chambers of Commerce or other business associations. By doing so, they can pool resources (e.g. in terms of gathering market intelligence or financial support for new or improved air services) and develop an integrated approach that takes into account the wider regional objectives for route development such as to attract inbound tourism or inward investment to the region, or to influence business location decisions. Airports, along with their stakeholders, can then develop active and targeted forms of personal selling (e.g. by inviting target airlines to visit the airport and attending route development networking events) in order to communicate potential opportunities. This is quite different to the passive approach that was typically used by airports in the past where they simply responded to requests from airlines seeking to develop air services at their airport.

Airport user charges have been known to play a key role in the decision of airlines to serve an airport, especially for low cost carriers because charges often contribute a greater proportion of their total operating costs than they do for other airline business models. It was therefore surprising to find that offering flexibility on pricing (e.g. with discounted user charges or other incentives) has a significant negative effect on route development performance. However, as mentioned in the findings, this may be since the airports that had poor performance because of inherent weak factors such as a limited catchment area, felt that they had a greater need to offer price incentives to attract traffic that may have not initially considered operating at their airport as a feasible option.

The overall level of route development activity at an airport is found to have a significant positive effect on performance. Factors associated with the airport business environment (market turbulence, competitive intensity, market growth and airport constraints) were not found to have a moderating effect on the relationship between route development activity and performance. This means that airport management is likely to benefit from developing its route development activities if it is seeking to improve route development performance, regardless of what is happening in its business environment. However, two factors associated with the airport business environment were found to have a significant direct effect on route development performance; market growth has a significant positive effect while airport constraints have a significant negative effect. This means that regardless of how much effort an airport puts into route development activities, there is no substitute for having a market that is growing or demonstrates potential for growth. In addition, airports that are constrained (e.g. by legal or regulatory conditions, infrastructure constraints, or limited operating conditions or capabilities) are inherently likely to be poor performers when it comes to route development.

In terms of more general implications of this study, the findings provide a basis for further, more comprehensive studies where views from other bodies involved in this activity, for example regional governments or development agencies, could be sought and compared, especially given that collaboration seems to play a key role in route development activities and performance. Moreover, they could be used to inform the design of additional qualitative

analysis amongst the stakeholders in order to gain a better understanding and insight into some of the issues that have been identified as being important in this study. Of particular interest would be the airline stakeholders. Research into their opinions on which are the most salient route development techniques could be compared with the airport views to assess to degree of consensus between these two key industry sectors. Another broader area of research could actually investigate the relative importance of route development activities compared to other factors that influence routes at airports and the role of the decisions of other important players such as airlines or governments.

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