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- Airbus (2003), *Global Market Forecasts 2003-2022*, Toulouse: Airbus.
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- Forsyth P. (2002a), 'Privatization and Regulation of Australian and New Zealand Airports', *Journal of Air Transport Management*, 8, 19-28.
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- Skycontrol (2007) *easyJet welcomes European Commission's decision to limit PSO abuse in Italy*. 23<sup>rd</sup> April. Available from: <http://www.skycontrol.net/airlines/easyjet-welcomes-european-commissions-decision-to-limit-psy-abuse-in-italy/> (accessed on 22/08/2008).

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*Industry Perspectives* should be up to 1,000 words and provide a practitioner's point of view on contemporary developments in the air transport industry. Contributors should explicitly specify whether their views are espoused by their organization or not.

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Access to efficient and affordable air transport services is indispensable to economic communities made up of dispersed islands. It is often claimed that the contribution of the sector would be greatly debilitated, however, without the presence of national or regional flag carriers. A multi-method, net economic impact assessment indicates that the direct impact of the sector in terms of employment and contribution to GDP increases with the presence of local flag carriers. Yet the more significant indirect macroeconomic impacts of the sector, in terms of consumer surpluses, incoming visitor expenditures and business investments are all found to be better facilitated by foreign carriers. The magnitude of impact was primarily determined by exogenous factors namely, relative size of a state's real GDP, relative contribution of other sectors, relative level of trade dependency and relative level of socio-economic development, with larger impacts being noted in smaller, poorly diversified islands, chiefly dependent on sustaining a net surplus of air transport facilitated incoming visitor expenditure. Improvements to the performance of the sector are aligned with increases in aggregate incoming demand, thus far better supplied by cheaper, more frequent foreign carrier services providing a higher quality of service to and from the main source markets. Positive direct impact levels in those states with home carriers, low levels of service importing and an inverse relationship between local carrier absence and levels of connectivity show local carriers also play a significant facilitating role in the region's air transport sector.

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The effect of globalization is fast showing its attendant effects on the Nigerian aviation industry leading to an increase in passengers' traffic movement in Nigeria's airports. More importantly, there seems to be a paradigm shift which affects ownership and administration of operation in the Nigerian aviation industry. This study examines among others the impact of deregulation and liberalization in the Nigerian air transport industry; the effects of the latter on operation and control changes that affect operational efficiency in the airline business; and the impacts of liberalization on attracting foreign direct investment and foreign airline participation in the Nigerian aviation industry. The methodology used for this study is documentary research, which entails search of existing published and unpublished documents and databases of stakeholders in the Nigerian aviation industry and external sources with affinity to the sector. The results of this study reveal that an unprecedented growth has been recorded in Nigeria. It includes among others: healthy competition needed for growth and development; increased participation in the industry by foreign airlines; increased foreign direct investment in the airline business and airport infrastructure development.

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Recent events have confirmed the concerns that many within the aviation industry have held about the viability of the low cost business model for long-haul operations. This paper begins by reviewing the operating cost differences between low cost carriers (LCC) and legacy airlines in different regions of the world. This is followed by a summary of the various cost advantages of low cost carriers operating in short-

haul markets. The main focus of the work, however, is a cost simulation involving the use of a Boeing 767-300 by both a LCC and a legacy carrier under varying operating assumptions. The research demonstrates that in none of the cases cited is the LCC cost advantage greater than 10%.



## Editorial

This first issue of the second volume of the *Journal of Air Transport Studies* includes four carefully selected papers covering various topics. **Warnock-Smith and Morrell** study the importance of air transport for tourism and socio-economic development in the context of flag carriers in the Caricom region. They use an interesting synthetic methodology to assess the size of direct and indirect impacts of the air transport sector to conclude that both foreign and local carriers play a significant role in boosting the economy of the region.

Subsequently, **Syrigos and Kyrgidou** focus on the combination of strategic management and entrepreneurship to add value, increase productivity and create wealth in the airline industry. Based on panel data analysis, they highlight the role of technology and financial assets, among others, in shaping airline performance.

In the following contribution, **Oluwakoya** reviews the major developments in the Nigerian airline industry by primarily focusing on the post deregulation and liberalization era. Based on documentary research, the paper argues that despite the various problems, the air transport sector in Nigeria has recently experienced significant growth as a result of foreign direct investment, infrastructure development and healthier competition among incumbents and new entrants in the business.

Finally, **Moreira, o'Connell and Williams** examine the financial sustainability of the low cost business model in long haul airline operations. According to their cost simulation, the cost advantage of LCC in long haul markets is limited. This interesting result validates the concerns expressed by practitioners in the business and contributes to a better understanding of airline economics.

May we take this opportunity to thank all our authors and referees for their support in publishing this third issue of our Journal. Our continuing partnership with Air Transport News in conjunction with the open access character of the journal aim at ensuring that JATS can get a significant exposure to the academic and business audience and raise its profile accordingly. Enjoy reading!

*Dr Andreas Papatheodorou, Editor-in-Chief*

*Dr Kostas Iatrou, Associate Editor*

*Dr Zheng Lei, Assistant Editor*

# **An Empirical Study of the Socio-Economic Effects of Supporting Flag Carriers: The Case of the Caribbean community (Caricom)**

David Warnock-Smith<sup>1,a,\*</sup> and Peter Morrell<sup>1,b</sup>

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## **Abstract**

Access to efficient and affordable air transport services is indispensable to economic communities made up of dispersed islands. It is often claimed that the contribution of the sector would be greatly debilitated however without the presence of national or regional flag carriers. A multi-method, net economic impact assessment indicates that the direct impact of the sector in terms of employment and contribution to GDP increases with the presence of local flag carriers. Yet the more significant indirect macroeconomic impacts of the sector, in terms of consumer surpluses, incoming visitor expenditures and business investments are all found to be better facilitated by foreign carriers. The magnitude of impact was primarily determined by exogenous factors namely, relative size of a state's real GDP, relative contribution of other sectors, relative level of trade dependency and relative level of socio-economic development, with larger impacts being noted in smaller, poorly diversified islands, chiefly dependent on sustaining a net surplus of air transport facilitated incoming visitor expenditure. Improvements to the performance of the sector are aligned with increases in aggregate incoming demand, thus far better supplied by cheaper, more frequent foreign carrier services providing a higher quality of service to and from the main source markets. Positive direct impact levels in those states with home carriers, low levels of service importing and an inverse relationship between local carrier absence and levels of connectivity show local carriers also play a significant facilitating role in the region's air transport sector.

**Keywords:** National carriers, foreign carriers, macroeconomic impact, island states.

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<sup>b</sup> Peter Morrell holds a chair in air transport economics and finance at Cranfield University. He graduated in economics from Cambridge University and subsequently gained a Masters in air transportation from the Massachusetts Institute of Technology. He completed his doctorate at Cranfield University on airline capital productivity.

## **1. INTRODUCTION AND BACKGROUND TO CASE-STUDY REGION**

The principal benefit of air transport services operating in disparate island communities can be summarized by the fact that they provide a vital social and economic link between peoples, countries and cultures. The air transport sector, not only impacts an economy in terms of its direct, indirect and induced contribution to employment, but also serves as a strategic catalyst, enhancing business efficiency and productivity by providing easier access to suppliers and customers (Airports Council International, 2004). By opening up new markets for international travel, the sector is also considered to be a major driver for the tourism industry.

It has been noted that in regions where the provision of efficient air services are largely dependent upon the success of one national carrier, a sudden loss of direct services can have serious implications for a regional economy. This was found to be the case in a study which looked at the effects of the closure of Swissair on Zurich Airport as well as upon the region which it supports (Airports Council International, 2004). The direct, measurable impact of such a reduction in air services is not so severe if there are low barriers to foreign carrier entry and a low national carrier hub concentration ratio. In these instances, a continuation of services would ensure that an airport's employment density remained high and its direct impact buoyant.

It is also believed that accommodating a national carrier creates significant multiplier benefits within a national economy. However this hypothesis assumes that firstly there is no idle capacity within an economy. If there is, as is invariably the case, then increases in national output can just as easily be claimed by other public/private organisations. Second, it is assumed that the sector's direct output and employment would not be as efficiently provided by the private sector, by foreign carriers or a combination of both (Barrett, 2006). In fact, the general net social benefit sought by a protective air policy is rarely realised in reality. In 1969, a cost-benefit analysis conducted on behalf of Ireland's national airline Aer Lingus, proposed a true social rate of return on capital employed of between 11% and 26% (O'Donoghue, 1969) when benefits such as foreign exchange earnings, tourism promotion and additional income expenditure are included. These benefits are refuted and said to be overstated however by Barrett (2006) who contends that rather than having a positive social effect, protectionist policies actually lead to inefficiencies, high access costs and a loss of international competitiveness.

The method of 'shadow pricing' in order to take into account the indirect value of a national carrier can therefore be misleading. The true value creation of a national carrier can be better estimated within the context of a holistic impact study of a nation's or region's air transport sector. Net economic contribution according to Pearce (2005) means total value created by the sector in excess of the cost. For customers this means value in excess of ticket costs, for producers this means revenue in excess of operating costs and for an economy as a whole it means impact on GDP from boost to productivity, foreign exchange earnings and business investment in excess of congestion and the next best use of capital and labour. Thus the direct and multiplier impacts of national carriers can be better estimated within the context of its relative role within the wider mix of producers and suppliers involved in the provision of air transport services.

Table 1 reflects the consistently poor financial performance that has plagued the Caricom region's protected home carriers since the 1970s. Although these losses have frequently been linked to the industry's facilitating role for regional integration, a lower rate of decline in average real yields on Intra-Caribbean markets points towards pent up cost side inefficiencies when compared to other regional air markets (See Figure 1). Except for the years 1997 and 1998, country-pairs on which foreign carriers had the lion's share of capacity<sup>1</sup> showed constant year on year reductions in real yield between 1996 and 2004.

Conversely, on intra-Caribbean country-pairs, where regional flag carriers enjoy a greater market share, average real yields have failed to decline so markedly. In fact from 2002 to 2004 real intra-Caribbean yields actually increased<sup>2</sup>.

**Table 1:** Recent financial data for the main Caribbean based air carriers

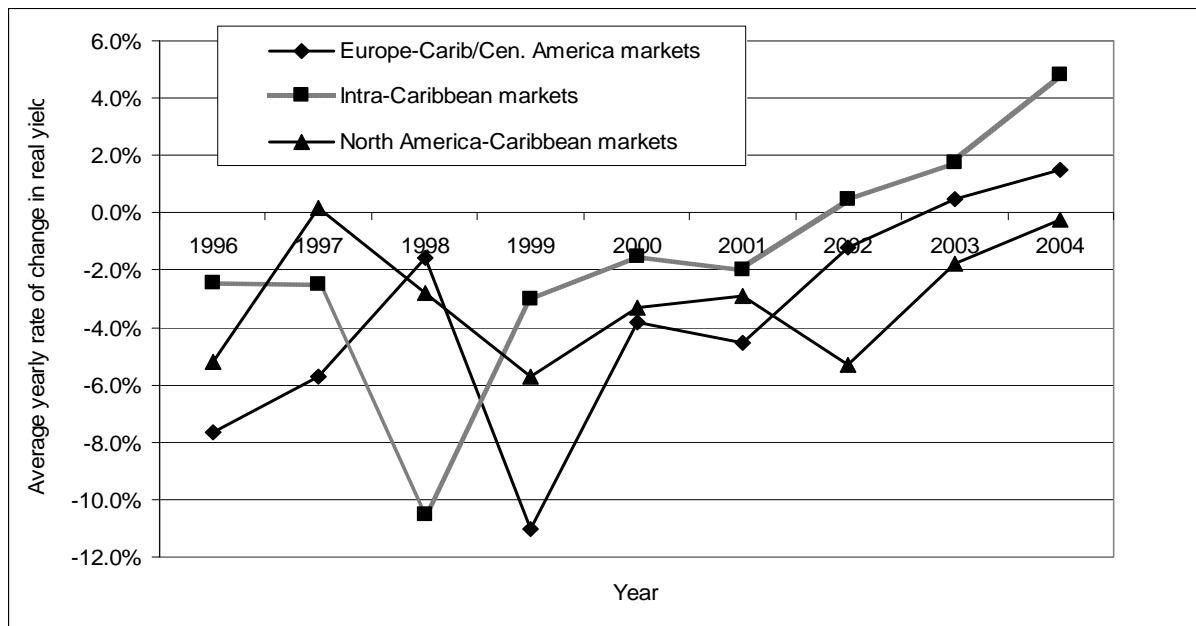
Net profit (loss) US\$m	BWIA (BW)	LIAT (LI)	Air Jamaica (JM)
1976	(2)	(2)	(1)
2004	(15)	(11)	(99)
2005	(27)	(8)	(131)
2006	(50)	(20)	(128)

Sources: World Bank document (2006), ICAO data for 1976 financial information, airline annual reports

<sup>1</sup> Average foreign carrier capacity shares between 1996 and 2004 were 4.4%, 66.4% and 59.6% for Intra-Caribbean, Europe-Caribbean and North America-Caribbean markets respectively (OAG, 2008).

<sup>2</sup> Absolute differences in yield relating to average sector distance and aircraft size are isolated from possible cost side affects by using percentage rates of change as shown in Figure 1.

**Figure 1:** Average percentage change in real yields for selected intra-Caribbean, North America-Caribbean, and Europe Caribbean markets 1996-2004



Source: ICAO Air Transport Bureau (2005)

It would therefore appear that loss-making local carriers are not creating as much consumer welfare in the form of lower airfares as on routes with a higher concentration of foreign carriers, something which clearly needs to be tested further when attempting to estimate the catalytic contribution of the sector<sup>3</sup>.

Pagliari (2003), in an air transport study of the Scottish Highlands and Islands, noted that in order to maintain social cohesion in displaced island communities, the high costs associated with operating air services combined with the need to maintain air transport infrastructure even for the smallest populations normally requires a predetermined level of governmental subsidy. But instead of adopting a comprehensive and well organised Essential Air Service (EAS) type system of subsidies as organised in the United States or a system of route tendering and franchising as witnessed in Europe, local carriers in the Caricom region have periodically received large cash injections on an ad-hoc basis from interested governments (see Table 2) without any predetermination of required service levels or timetables for reducing subsidy levels in line with forecasted increases in route densities.

<sup>3</sup> In this example, additional consumer surplus is classified as a catalytic impact given that foregone disposable income spent on airfares is no longer available for expenditure in other areas of an economy.

**Table 2:** Five year subsidy assigned to the Caricom region's major flag carriers 2002-2006 (US\$mn)

Year	Carrier	BahamasAir (UP)	BWIA (BW)	LIAT (LI)	Air Jamaica (JM)
2002		12.0	13.0	14.5	70.0
2003		0.0	0.0	14.5	30.0
2004		0.0	0.0	14.5	30.0
2005		0.0	0.0	8.0	32.5
2006		28.5	250.0	8.0	32.5
5 year totals		40.5	263.0	59.5	195.0

*Sources:* World Bank document (2006), CRSTDP (2007), Caribbean Development Bank (2007), airline data

*Notes:* LIAT figures do not represent actual yearly injections but an average of the cumulative totals indicated in the Trinidad Guardian (2006) 2002-2004 and World Bank study (2006) 2005-2006. The unusually high injection for BWIA in 2006 was related to its closure and the associated writing off of its long term debts in readiness for the creation of new carrier Caribbean Airways in January 2007

In macroeconomic terms, direct subsidy forms a negative tax on production and thus acts as a moderating force on the sector's direct contribution to GDP. It is one of the aims of this study to estimate the extent to which, in a sample of Caricom states, the sector's direct impact has been suppressed by the continued subsidy of local carriers by comparing states that have not been subjected to this financial burden to states that have. Assuming it is the aim of government to maximise, *ceteris paribus*, the macroeconomic contribution of the sector, it is important to find ways to reduce subsidy whilst ensuring service and efficiency levels on a route level are not compromised. Any commercially viable routes are then automatically served by a combination of local and foreign operators.

The concept of national loyalty as a social benefit must also be considered especially in the case of small island states that have, in the main, only recently inherited sovereignty from their old colonial powers. In a study of 427 Canadian travellers Bruning (1997) discovers that although a certain amount of national loyalty is present, if continued operations result in service or price disadvantages, consumers will tend to switch to foreign carriers. Thus, as well as dealing further with the quantitative aspects as previously mentioned, a further intention of this study is to assess the possible influence of a passenger's country-of-origin on choice of carrier in the Caricom region with reference to the findings of Bruning (1997).

## 2. PREVIOUS IMPACT ASSESSMENT WORK

Raguraman (1997) contends that tourism impact studies must be extended to include outbound local tourists and the means of transport. Impact studies that account for expenditure outflows are typically referred to as net impact assessments. In air transport

literature this net impact forms part of a bundle of contributions arbitrarily termed catalytic impact.

It is important for tourism intensive economies to note however that international airlines also generate expenditures in their own right, which can represent sizeable injections into the local economy (Raguraman, 1997). But it is also of equal importance to account for the importation of airlines services and the repatriation of profits. As most international air services are provided on a third and fourth freedom basis (Doganis, 2003), capacity increases available for foreign tourists would inevitably translate into equal capacity increases for local populations wishing to take expenditure out of an economy<sup>4</sup>.

This was also one of the main criticisms of the scope of a recent impact study of national flag carrier, Air Jamaica on the national economy of Jamaica (Clarke et al, 2005). Madjd-Sadjadi (2005) claims that, in the paper, there is no accounting for the fact that passengers travelling on Air Jamaica are often originating from Jamaica. This leads to unrealistic assumptions of the true facilitating role of an airline to a nation's GDP.

The social benefit derived from increased travel opportunities for local populations is not considered either by the study itself or by Madjd-Sadjadi's criticism. In a global study, the Air Transport Action Group (2005) state that this perceived increase in quality of life can in fact encourage locals to remain in their home countries and improve their labour productivity as a result of the greater work/life balance afforded by access to international travel. The Madjd-Sadjadi (2005) study does allude to the fact that local employment will often rise as a result of increased usership no matter if passengers originate in the host country or not. Although it is difficult to qualitatively account for the first consideration, both are important omissions which need to be assessed more thoroughly in a more extensive impact assessment.

In a report commissioned by the Civil Aviation Authority (1994), which assessed the economic impact of new, foreign carrier, long-haul routes to and from the UK, it was found that, despite the fact UK airlines would experience a revenue loss of £5.5 million per year per new route, and a high proportion of traffic would have been UK originating leisure traffic, it was still likely that the overall effect on the UK was an additional gross expenditure

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<sup>4</sup> Since the introduction of seat only sales, charter carriers operating into the region have also had the ability to tap into local markets.

of £1.5 million. This translated into an estimated 33 extra jobs per year in the aviation/tourism sector. It would follow that in Caribbean nations with generally low expenditure outflows and poorly performing local carriers, the introduction of new foreign services may result in economic benefits of a greater magnitude than those found in the CAA study. This is especially so in cases where foreign carrier surpluses are passed on to the consumer in the form of lower fares, where new services lead to greater tourism inflows and where improved levels of customer service are introduced onto a network. National earnings from foreign carriers in the form of landing/parking fees, fiscal revenues, commission to local travel agents and capital investment income generation also need to be considered in markets where protectionist measures are stifling the provision of services by foreign operators.

Montalvo (1998) introduces the concept of 'transferability' which also needs to be considered in any net impact assessment. In the absence of a general equilibrium analysis it is difficult to quantify the amount of job and income substitution that would take place in the absence of a national carrier. As air transport and travel are interdependent however, tourism dependent, poorly diversified economies would clearly suffer if the absence of a national carrier would lead to an overall decrease in output. By extension, it is also reasonable to assume that a decrease in total air capacity regardless of whether it was provided by a domiciled carrier or not could lead to displaced employment when this employment cannot be easily incorporated into other sectors.

### **3. RESEARCH PLAN**

Using a representative sample of seven Caricom states, it was possible to estimate the disaggregated net economic impact of the industry for the year 2006 broken down by island states where national carriers were present as opposed to markets where they were not. There are clearly many different facets related to economic impact which use a number of distinct measures. For the purposes of this study, the widely accepted ICAO (2005) definition of the breakdown of impacts was used as a basis by which to ensure a wider range of contributions were considered (See Table 3).



**Table 3:** ICAO impact classification

Classification	Players	Activities
Direct	Airport firms and organisation based on site	-Involved directly in the delivery of air transport services to end users and to industries -Order intermediate services and products from various suppliers -Create on site employment, pay taxes and accrue profits (losses)
Indirect	Suppliers based off site	-Involved in delivery of intermediate products and services to airport firms based on site -Order various intermediate inputs from various suppliers -Create off site employment, pay taxes and accrue profits (losses)
Induced	All concerned firms and individuals	-Deliver goods and services to off site suppliers -Direct and indirect employees spend wages in other sectors -Create employment, pay taxes and accrue profits (losses)
Catalytic	Passenger and freight transport users	-Expenditure in wider economy -Travel agent commissions and consumer surpluses -Create additional employment, payment of taxes and accrual of profits (losses)

Source: ICAO (2005)

An input-output analysis along with a general equilibrium model had to be avoided due to limited access to a full breakdown of supplier expenditure and revenues for each branch of economic activity in the region. It was still possible, using an indicative case study based supplier probe in the contrasting island states of Barbados and Trinidad & Tobago to gain a better understanding of the possible upstream impacts of a given level of air service on GDP and its resulting effect on employment.

A comprehensive passenger survey was designed to firstly capture data pertaining to consumer surpluses which could then be disaggregated by local and foreign carrier for each sampled state, secondly to estimate the correlation between the sector's overall economic contribution and the level of air carrier exportation/importation and finally to measure counterfactually the approximate reduction in demand if local flag carriers were no longer in operation. An accompanying business survey, targeted at regional companies from a range of sectors, was undertaken to establish the extent to which investment plans have been cancelled or delayed by real or perceived deficiencies in intra and extra-regional air services. Published balance of payment and national account data from the Caricom Secretariat and governmental central banks respectively were also employed to examine whether states with home and/or foreign carriers had a higher impact factor in terms of direct foreign exchange as well as direct/indirect GDP and employment contributions. The supplier probe gave a clear indication of direct (on site) and indirect (off site) wages available for expenditure in the wider economy. An estimate of induced impact in the country with and

without a local carrier could then be computed despite the small sample size of some of the off site companies involved in the production of air transport services<sup>5</sup>.

All relevant data was collected between April 2006 and February 2007, but due to the cross-sectional nature of the research undertaken, it was not possible to determine annual variability in the magnitude of the sector's economic contribution. Thus, reliable conclusions can only be drawn for the year 2006. Cost information on wages, government taxes, capital investments and spending on intermediate products was collected from companies in Barbados and Trinidad and Tobago as part of the supplier probe. This type of sensitive data was typically given on the condition that company names remained anonymous.

Based on a cluster sampling technique (Lind et al, 2006), it was estimated that it was possible to quantify and qualify the direct and catalytic impacts for any of the twenty (20) Caricom full and associate member states arriving at a final sample size of seven countries including the Bahamas, Barbados, Dominica, Guyana, Jamaica, St. Lucia and Trinidad & Tobago. Countries were grouped according to geographical position, national output levels (GDP) and the level of air transport activity<sup>6</sup>. By extension, despite the economic heterogeneity present between the economies of Barbados and Trinidad & Tobago, it was not feasible to make any regional generalisations from the induced impact results of the supplier probe or indirect results of the national account data.

After a pilot survey was undertaken in Barbados, it was found that variation in passenger expenditure required a minimum sample size of 307 for the passenger survey, and variation in firm size suggested an estimated sample size of 220 for the business survey. In total, 211 business and 327 passenger survey responses were actually gathered between the months of May 2006 and February 2007; the first by means of an on-line survey and the second in the form of a structured interview carried out in the departure areas of seven of the region's main airport terminals. A total of 1,400 on-line surveys were sent to Caricom based businesses with an approximate response rate of 15%. The airport interview was conducted

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<sup>5</sup> With low standard errors of estimate (z-values) the business population's average total wage bill was estimated to be US\$1.5mn for Barbadian firms and US\$3.5mn for Trinidadian firms. Subsequently it was found that, using a sample size of 39% and 29% of the population of firms in Barbados and Trinidad, sampling error was low, at US\$-0.15mn for Barbados and US\$-0.5mn for Trinidad.

<sup>6</sup> This was estimated by proxy using the average of total air arrivals and the ratio of air arrivals to arrivals by all modes. Other possible variables for clustering include the percentage of the labour force involved in air transport or the number of air journeys per capita versus GDP per capita.

face-to-face and although some passengers refused to participate, it was still possible to complete as much as 93% of a predetermined target of 350 responses.

To further validate the use of annual Caricom generalisations, the passenger survey was performed using a method called 'stratified random sampling' (Lind et al, 2006). An approximately equal number of responses were collected from each member state. Out of the seven versions of the survey, four were carried out during the low season (May to November) and three during the high season (December to April); four on busy days and three on relatively quiet days. On an aggregate regional level this ensured seasonal variation could be accounted for by the sample. In addition, all responses were as evenly spread as possible throughout the designated survey day in order to capture variations between peak and off-peak periods, short, medium and long haul destinations, business and leisure passengers, resident and foreign travellers, and regional and foreign carriers.

The passenger survey was modelled on a combination of a typical Civil Aviation Authority (CAA) passenger survey (2004) along with a Caribbean Tourism Organisation (CTO) survey (2004) which is targeted at long-stay tourists travelling by air. This ensured that questions pertaining to air transport, socio-economic, air traveller, air travel choice, and expenditure variables were all taken into account, and not just variables relating to airport activity variables or incoming tourism activity only. The business survey was adapted from an Oxford Economic Forecasting (OEF) survey of UK companies (2006).

## **4. RESULTS AND FINDINGS**

### ***4.1 DIRECT & INDIRECT EVIDENCE***

In terms of foreign exchange earnings it is evident that islands with national carriers are more likely to create a greater direct impact than those islands without. This is due to the fact that a greater proportion of total operating costs are internalised and a lower percentage of total revenues are repatriated to foreign countries. Table 4 shows however that in those states which are entirely dependent on foreign carriers, continued growth in overall on-site output ensures a net balance of payment surplus for the sector. This is because the increased output induces more on-site commercial expenditure, employment and use of local products and services as well as providing a source of fiscal revenues.

**Table 4:** Balance of payment (BoP) surplus (deficit) against presence (absence) of a local carrier among the sampled Caricom member states (2000)

Caricom Member Country	BoP surplus (deficit) \$USmn	Home based carrier
Bahamas	419.08	Yes
Barbados	58.78	No
Belize*	22.09	Yes
Dominica	1.46	No
Jamaica	337.17	Yes
St. Lucia	44.18	No
Trinidad & Tobago	97.07	Yes
Aggregated Totals	979.83	Yes = 4, No = 3
Mean average	139.97	-

Source: Caricom Trade in Services report (2002)

\*Guyana data not available. Belize used as a Caricom substitute.

The two anomalies are shown to be Barbados and Belize. Barbados returned a notably higher direct impact value than the other sampled islands without a national carrier. This could be due to the fact that Trinidadian carrier BWIA and to a lesser extent Antigua and Barbuda based LIAT were using Barbados as a secondary regional hub at that point bringing with it more direct employment and output growth than would normally be the case for an island without an airline based there. Barbados was also the major shareholder of LIAT during this period and despite the continued financial burden of the carrier (as described in Table 1) on the Barbadian taxpayer, contributions towards aeronautical and non-aeronautical revenues as well as payments to airport service providers may have compensated for this deficit<sup>7</sup>. Although Belize has two locally based carriers (Maya and Tropic Air), their limited output of less than 200,000 passengers per annum, along with their insignificant network of international routes suggested low direct contributions to both foreign exchange and internal expenditure.

Jamaica and the Bahamas noted the highest direct impact values. Aside from the fact that they too had national carrier bases, there was evidence that the high number of leisure travellers passing through the islands' major gateways provided a major source of commercial airport revenues and consequently direct foreign exchange earnings. It is unlikely to be a coincidence that of the sampled island states, the Bahamas (18%) and Jamaica (11%) also recorded the highest tourism sector contributions as a ratio of GDP (Tourism Satellite Accounts, 2000-2006). It is these same long-stay visitors that are more likely to buy last minute memorabilia and souvenirs from the airport's retail outlets.

<sup>7</sup> This was estimated for the latest available year with regional Balance of Payment data (2000).

**Table 5:** National account extract for Barbados and Trinidad & Tobago (2005)

Caricom state	Sector	Sector components	Constant Prices (US\$m)	Full time jobs
Barbados	Air Transport (Airlines only)		3.86	255
		Supporting and auxiliary services	35.90	2,370
	Cargo handling Storage and warehousing Airport services and other support Travel agencies, tour companies etc.		7.81	515
			0.77	51
			8.79	581
			18.53	1,223
	Total Barbados		39.76 (0.92% of GDP)	2,625
Trinidad & Tobago	Air Transport (Airlines only)		84.33	1,507
		Supporting and auxiliary services	158.42	2,835
	Cargo handling Storage and warehousing Airport services and other support Travel agencies, tour companies etc.		61.45	1,100
			5.45	98
			22.80	406
			68.72	1,231
	Total Trinidad & Tobago		242.75 (1.78% of GDP)	4,342

Source: Barbados and Trinidad & Tobago statistical service

Note: Disaggregated employment values were estimated iteratively using ratios between GAV's of different sector components

Expenditure and employment data pertaining to on and off site air transport activity was available for Trinidad & Tobago and Barbados through their national account data, which was last performed for a limited range of sectors in the year 2005. Although not an exhaustive list, a fair indication of indirect activity as a ratio to direct, on site activity could be assembled and commented upon (See Table 5). Under the sub-heading 'supporting and ancillary air transport services', activities relating to off site cargo handling, storage and warehousing, ground handling administration and travel agency/tour company interests were included. Off site output in Barbados was around ten times more significant than on site output. This was only achievable because of the large contribution made by travel agents and tour operators, reflecting a higher level of visitor activity taking place outside the airport vicinity in comparison to Trinidad. Trinidad not only had a lower indirect to direct ratio of around two but also had a relatively low travel agency and tour company contribution to total indirect output levels. This shows that Barbados' lack of a national carrier was partially compensated indirectly through greater levels of visitor related output off site. On the other hand the situation in Trinidad implied a heavier reliance on the direct contributions of home carrier BWIA and the continued operation of its Piarco base given its comparatively low level of off site tourist activity.

For Trinidad & Tobago, the direct impact value of US\$84 million in the national account extract was broadly consistent with the Balance of Payment value of \$US97 million as shown

by Table 4 adding validity and reliability to the secondary data sources. Having a flag carrier based in Trinidad also led to investment in on site freight, maintenance and technical facilities. Trinidad's reputation for technical expertise also led Caribbean Star to directly invest in a small crew and maintenance facility at Piarco in 2005, which was later incorporated into the LIAT entity after the two carriers merged in 2007. While Barbados was a sub-regional hub for LIAT and BWIA, not having any aircraft based at Grantley Adams inevitably explained the lower levels of employment and expenditure recorded there. The national account direct impact value is also much more modest for Barbados than it is in the Balance of Payment table. The inference here is that the continued blanket subsidy for poor performing LIAT by the Barbados government between 2001 and 2005 may have resulted in a reduced direct impact contribution. This is especially the case given large sums of this subsidy was invested, not in expanding activities in Barbados, but in furthering LIAT's presence as the home carrier of Antigua and Barbuda. Barbados therefore did not experience the assumed direct impact benefits that Trinidad & Tobago enjoyed as a result of providing financial support to a local carrier.

## **4.2. INDUCED & CATALYTIC EVIDENCE**

### **4.2.1. SUPPLIER PROBE**

Due to expenditure leakages in the form of capital or infrastructure investment and the associated importation of intellectual property, construction material and technology, the gross on site and off site expenditures as noted in Tables 6(a) and 6(b) have to be netted before being inputted into the national accounts as additional value creation for an economy (See Table 5). Owing to its wider ranging manufacturing base however, the absolute difference between gross expenditure and net value added is not as marked in Trinidad as it is for Barbados. Despite the leakages, a sizeable quantity of expenditure clearly flows down the air transport supply chains both in Trinidad and Barbados. The presence of a home carrier in the case of Trinidad clearly contributed to the fact that more employee income was generated by Piarco than it was by Grantley Adams, where a greater proportion of airline expenditure in the form of employee wages was repatriated back to the carrier's country of origin. Using the representative supplier probe sample, an estimation of total population income generation was derived from the computed average income per organisation. For Trinidad this equated to a total income generation of around US\$150 million for the year 2006 where as in Barbados it was valued at US\$48.86 million. Net of any

household leakages in the form of product and service imports, these values form an estimation of the induced impact of the sector to Trinidad and Barbados in extra internal spending and savings.

**Table 6(a): Barbados international airport supplier probe**

Account item (US\$m)	Airlines (n=9)		Airport authority (n=1)		Ground handling agents (n=2)		Travel agency (n=1)		Catering supp. (n=1)	
	On site	Off site	On site	Off site	On site	Off site	On site	Off site	On site	Off site
Department location										
Spend on inter. goods	70	12	12	0	2	1	0	3	0	2
Spend. on investment	5	8	81	0	2	1	0	7	1	0
Wages/Salaries	3	2	5	0	6	0.2	0	2	0.3	0.6
Government taxes	13	3	7	0	1	0.5	0	1	0.2	0.3
Total expenditure	91	25	105	0	11	2.7	0	13	1.5	2.9
Jobs created	126	84	211	0	174	15	0	78	12	22

*Note:* All passenger and freight airlines with base, secondary hub or regional offices were included in sample

**Table 6(b): Trinidad international airport supplier probe**

Account item (US\$m)	Airlines (n=9)		Airport authority (n=1)		Ground handling agents (n=2)		Travel agency (n=1)		Clothing supplier (n=1)	
	On site	Off site	On site	Off site	On site	Off site	On site	Off site	On site	Off site
Department location										
Spend on inter. goods	132	23	51	0	5	4	0	3	5	1
Spend. on investment	12	31	28	0	1	2	0	2	7	0
Wages/Salaries	14	15	4	0	4	0.5	0	2.5	0.2	1.8
Government taxes	25	9	13	0	1	1	0	1	2	0.2
Total expenditure	183	78	79	0	11	7.5	0	8.5	14.2	3
Jobs created	682	738	160	0	214	22	0	95	6	56

*Note:* All passenger and freight airlines with base, secondary hub or regional offices were included in sample

In terms of induced income generation, it would appear that Trinidad has benefit from supporting a national carrier. However, it must be noted that, due to the limited contribution of other sectors in Barbados relative to other sectors in Trinidad & Tobago, net contribution to GDP was actually 18% higher for Barbados. The macroeconomic impact of the presence of a home carrier can therefore be moderated or intensified depending on a nation's level of sector diversification.

#### 4.2.2. CONSUMER SURPLUS

Value placed on a journey, net of ticket cost is called consumer surplus. When every individual in a market is sampled, this measures the portion of a downward sloping demand curve that would have paid more than the price they were actually offered. This value is frequently converted into extra expenditure at a destination or further business travel which otherwise would not have taken place if air carriers were to capture every individual's consumer value. For this reason it is inextricably linked with the catalytic or spin-off effects of the provision of air services.

**Table 7:** Net consumer surplus segmented into type of resident, carrier and route

Explanatory variable	Net consumer surplus per passenger (US\$)
Caricom resident (n=219)	108.26
Foreign resident (n=259)	176.87
Caricom average (n=478)	144.31
Caricom carrier (n=215)	98.39
Foreign carrier (n=187)	149.36
Caricom and foreign carrier combined (n=76)	261.79
Caricom average (n=478)	144.31
Intra-regional routes (n=121)	81.96
Extra-regional routes (n=357)	206.66
Caricom average (n=478)	144.31

*Source:* Author's survey

*Note:* n is greater than the total number of survey responses. This is because some responses consisted of groups or families covering multiple air fares. Sub-fields may not work out into the exact Caricom average due to rounding errors

On average, respondents of Caricom residence placed less additional value onto their air tickets than foreign residents did (See Table 7). This could be explained by the respective differences in disposable incomes and by the higher airfares being charged to local travellers. As distances are much lower for intra-regional routes, average consumer surplus appears to be disproportionately low when compared to extra-regional routes. This could be exacerbated by the fact that regional carriers typically present the only option for Caricom residents travelling between intra-regional points giving local carriers the opportunity to exercise greater fare flexibility. Conversely, respondents making interline connections with both a Caricom and a foreign carrier gained the highest amount of consumer surplus. For a passenger to go through the inconvenience of purchasing multiple fares and connection waiting times, a high level of demand inelasticity is assumed. The practise of interlining may be a more viable alternative in the US, for example, where there is often a critical mass of frequencies and airline co-operation. This level of convenience often does not exist in the Caribbean, adding weight to the idea that passengers interlining in the Caribbean place high



values on their ability to do so. It further suggests that catalytic impact through higher levels of consumer surplus can be maximised if foreign carriers are allowed to operate freely into the sampled states, creating more opportunities for highly valued feeder services provided by local carriers to islands which do not currently benefit from trunk route services.

#### **4.2.3. FACILITATION OF EXPENDITURE**

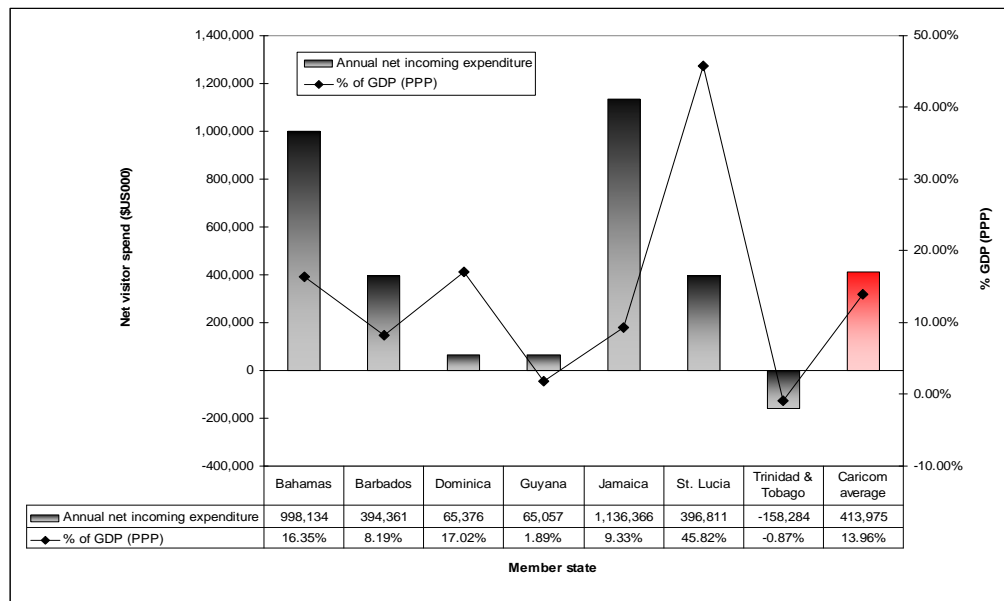
Although invariably there are competing claims within an economy as to which sector(s) are to be credited with incoming visitor expenditure, it is important to consider the possible magnitude of expenditure facilitation when attempting to undertake an extended approach to the sector's socio-economic impact. It can be assumed therefore that non-apportioned visitor expenditure as estimated in this paper equates to the maximum possible contribution or upper impact limit of net airport user expenditures in the wider economy<sup>8</sup>.

As predicted, the aggregate Caricom passenger survey results showed a net surplus of air transport user expenditure (Figure 2). This was supported by an estimated incoming traffic ratio of 65%. Moreover, outgoing local respondents tended to spend less per night than incoming foreign visitors. This served to increase the net incoming expenditure result further. Despite a high Caricom average, which was estimated at over \$US400 million, disaggregated results show a high variability among the sampled states. Trinidad & Tobago was the only sampled state to return a net deficit, but due to the relatively small contribution of tourism spend to GDP (PPP), this deficit affected GDP by less than 1%. On the other hand, total visitor spend in St. Lucia was below average in absolute terms but this impact equated to approximately 46% of GDP (2006). This may be explained by the relatively high importance of visitor expenditure to the small island's economy when compared to the larger, diversified economies of Trinidad & Tobago and Jamaica. However sampling error may have also contributed to what appears to be an overstated estimate. Only 14% of responses gathered in St. Lucia were local residents but according to St. Lucia airport authority statistics for the year 2006, as much as 34% of travellers were outgoing St. Lucian residents (SLASPA, 2007).

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<sup>8</sup> Note however that marginal contributions in terms of crew and general aviation visitor spend have been included in catalytic impact studies at other airports (e.g. Los Angeles, USA) yet they have not in this paper.

**Figure 2:** Net incoming visitor expenditure and % contribution to GDP



*Note:* To arrive at annual net impact estimates, a scaling factor was derived from the ratio between the sample number of observations and the net incoming expenditure they produced. A multiple was then applied using net yearly incoming passenger arrivals to arrive at an annual approximation for the year 2006.

The presence of Air Jamaica in Jamaica and BahamasAir in the Bahamas does not seem to have had a modifying effect on the amount of net incoming expenditure. In fact, although secondary airports like Freeport (Grand Bahama) and Marsh Harbour (Abaco island) have benefit from an increasing number of direct flight in recent years, the role of BahamasAir in providing domestic feeder services between Nassau and the outer islands clearly facilitated extra catalytic expenditure and as well as improved social cohesion between the islands. Trinidad & Tobago has seen a dearth of medium and long haul flights provided by foreign carriers when compared to other Caricom states. A lack of tourism infrastructure, increasing local crime rates in Port of Spain and the continued presence of BWIA may have been factors causing the missed incoming visitor opportunities which have been provided by foreign US and European carriers in the Bahamas, Jamaica and Barbados.

The case of BWIA in Trinidad & Tobago appears to imply that there is a trade-off to be made in order to ensure the maximum net macroeconomic impact accrues to the national economy. If incoming visitor traffic has been suppressed due in part to the lack of foreign carriers offering routes into Trinidad & Tobago, then this detriment appears to have been compensated by the direct and indirect output and employment created by the presence of a domiciled flag carrier. The existence of high multipliers (see Table 8) in some of the other

sampled states however, hint at more substantial macroeconomic gains from a greater focus on increasing incoming passenger expenditure in the wider economy.

#### **4.2.4. LEVEL OF CARRIER IMPORTATION, EXPORTATION AND DOMESTIC CONSUMPTION**

The survey results suggest that Caricom travellers, when the option is available to do so, usually choose to travel with regional carriers as opposed to foreign carriers and vice versa reflected by the fact that only 35% of respondents chose to import air services from foreign carriers. On international routes with choice, local travellers generally continued to choose to travel with regional carriers despite the fact that the survey results generally suggest higher fares and lower frequencies than those offered by foreign carriers. It may be the custom or the norm for Caricom customers to avoid importing air services. Loyalty programmes offered by Air Jamaica, BWIA and LIAT may have prevented carrier switching to a certain extent in addition to the idea of familiarity with carrier customs and practises as sometimes being a social factor which can override purely economic considerations (Yoo & Ashford, 2007).

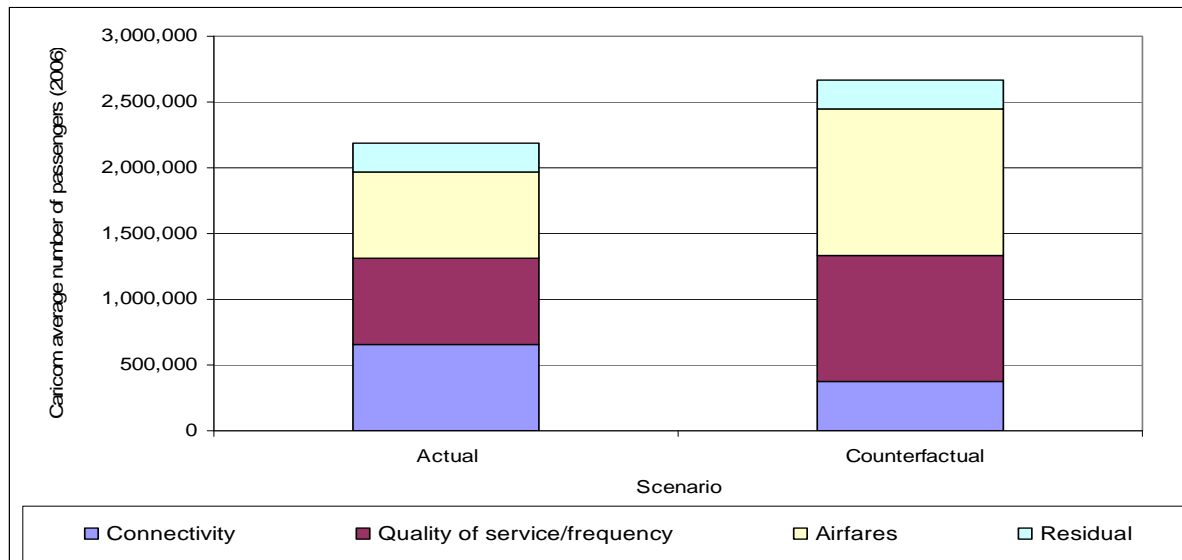
Of the 478 sampled airfares, only 16% covered respondents making connections in the region. Thus, given the majority of travel to and from the region is direct and the lion's share of net incoming expenditure is provided by foreign visitors travelling on foreign carriers, it is important to point out that, at least in the short to medium term, foreign carriers appear to play a greater role in facilitating incoming catalytic spending than do the region's home carriers. By extension, if feeder services in the region are intensified, there is no reason to believe that local carrier contributions to net visitor spend cannot be enhanced.

#### **4.2.5. REDUCTION IN DEMAND AND JOB DISPLACEMENT IN ABSENCE OF LOCAL CARRIERS**

It was possible to estimate counterfactually, using the percentage of respondents who stated that demand would decrease as a result of a reduction to three important air transport service aspects, the amount of full time equivalent jobs that would be lost as a result of such a reduction in output. To discover if long run levels of output would actually reduce in the absence of local carriers however, respondents were also asked if they

believed the three service indicators<sup>9</sup> would improve or deteriorate if the loss making local carriers ceased operations. The aggregate results are presented in Figure 3.

**Figure 3:** Possible impact on output levels of a given selection of service indicators in the absence of regional carriers



Source: Caricom passenger survey, author's calculations

With an assumed residual of 10%, the average output level for the sampled states of 2,188,000 passengers was believed to be determined by the three endogenous variables equally. Ability to make connections either by interlining or onlining for instance, was thought to produce 30% of total output for 2006. This output was then multiplied by the ratio of respondents who agreed or strongly agreed that demand within, to and from the region would decrease if there was a reduction in air connectivity and again by the ratio of respondents stating that connectivity would reduce in the absence of local carriers. Consequently, an adjusted counterfactual ratio for connectivity was estimated at 13%, giving an output reduction of 17%. This iterative process was repeated for frequency/quality of service and airfares but unlike the first service indicator, respondents supported the hypothesis that output would actually increase as a result of foreign carrier airfare reductions and quality of service improvements in the absence of local carriers. Overall, the passengers surveyed felt that aggregate output would increase by 12% or by 263,360 passengers in the absence of local carriers (Figure 3).

<sup>9</sup> The three air transport related factors which were declared to be most influential on aggregate demand in the region were the level of connectivity, the level of airfares and the level of frequency/quality of service.

While the validity of the results is based on the subjective views of the survey's passenger respondents, it must not be overlooked that stated travel preferences and factors influencing decisions to travel are in themselves highly subjective. Thus the opinions of the traveller were considered to be one of the most appropriate methods by which to examine counterfactually what would happen to demand when subjected to the impairments described in Figure 3.

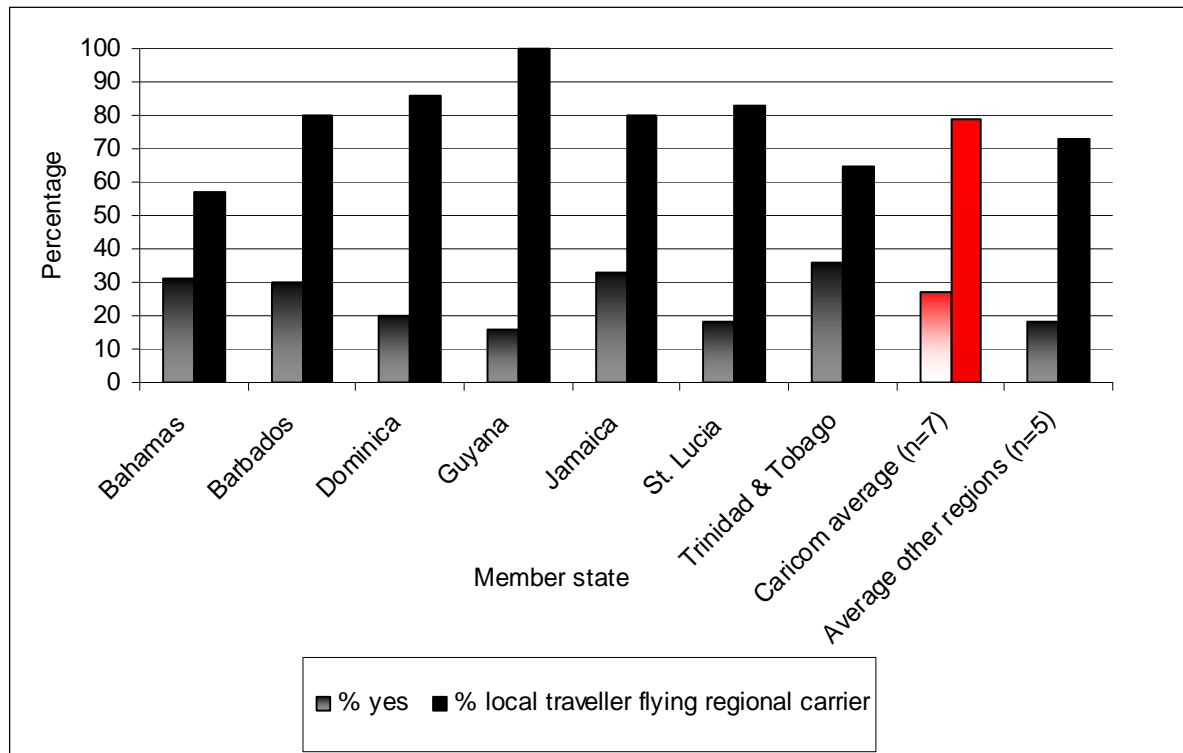
In the scenario where the absence of local carriers does lead to a reduction in output and related employment, the ability of an individual sampled economy to incorporate the displaced workers is dependent firstly upon its magnitude and secondly upon its sector diversification as measured by the number of industries directly and indirectly dependent upon an economy's air transport industry. If output is said to decrease by 10% as a result of a reduction in local carrier services, on average, it is estimated that on site companies and off site suppliers would have to downsize by approximately 164 full-time equivalent jobs. In turn, a further 72 jobs could be lost in the wider economy if displaced workers could not find jobs in other sectors with equivalent wage rates.

#### ***4.2.6. INVESTMENT PLANS AFFECTED BY PERCEIVED LOCAL CARRIER DEFICIENCIES***

Previous studies have recorded the relative importance of good air transport links when making decisions regarding new capital investments (OEF, 2006). A study commissioned by the Department for Transport (2004) also suggests that availability and efficiency of routes and perceived and actual air connectivity between states are the most relevant factors in determining the role of air transport in facilitating international business activity and investment. Overall, 27% of Caricom business respondents cited that perceived or actual deficiencies in air transport had affected their decisions to invest in other countries (Figure 4). Given that approximately 80% of respondents chose or had to travel by one of the region's flag carriers; this implies that the majority of these complaints were related to air services provided by regional carriers, LIAT, Caribbean Star, BWIA, Air Jamaica and BahamasAir. Around 57% of business investments that were said to be hindered by air transport cited a lack of direct flights, high freight rates/airfares, low capacity, low frequency and an unreliable and inconsistent service as the main reasons why investments were affected. Four respondents went as far as to say that the region's loss making carriers actually damage the region's reputation as a suitable place to do business and that, in part,

perceived deficiencies had actually prevented foreign companies from investing in the region.

**Figure 4:** Percentage of investment decisions that were effected by perceived air transport deficiencies



Source: Business survey, OEF (2006)

Some of the responses from the smaller states in the region namely Dominica and St. Lucia and the sample's peripheral state, Guyana, did not cite, as frequently, the air transport sector as a hindrance to business investment. This may have been due firstly to a lower absolute level of investment activity and second to a higher tolerance level for the region's carriers whose routes to their countries are actually subsidised by other member states. A global sample of five countries in another study (OEF, 2006) returned a lower ratio of 'yes' responses for the investment question to the number of resident travellers choosing to fly with national carriers (OAG, 2007) than the ratio shown for the sampled Caricom countries. This indicates perhaps that there is a greater correlation between usage of national carriers and hindrance of business activity than for countries in other regions.

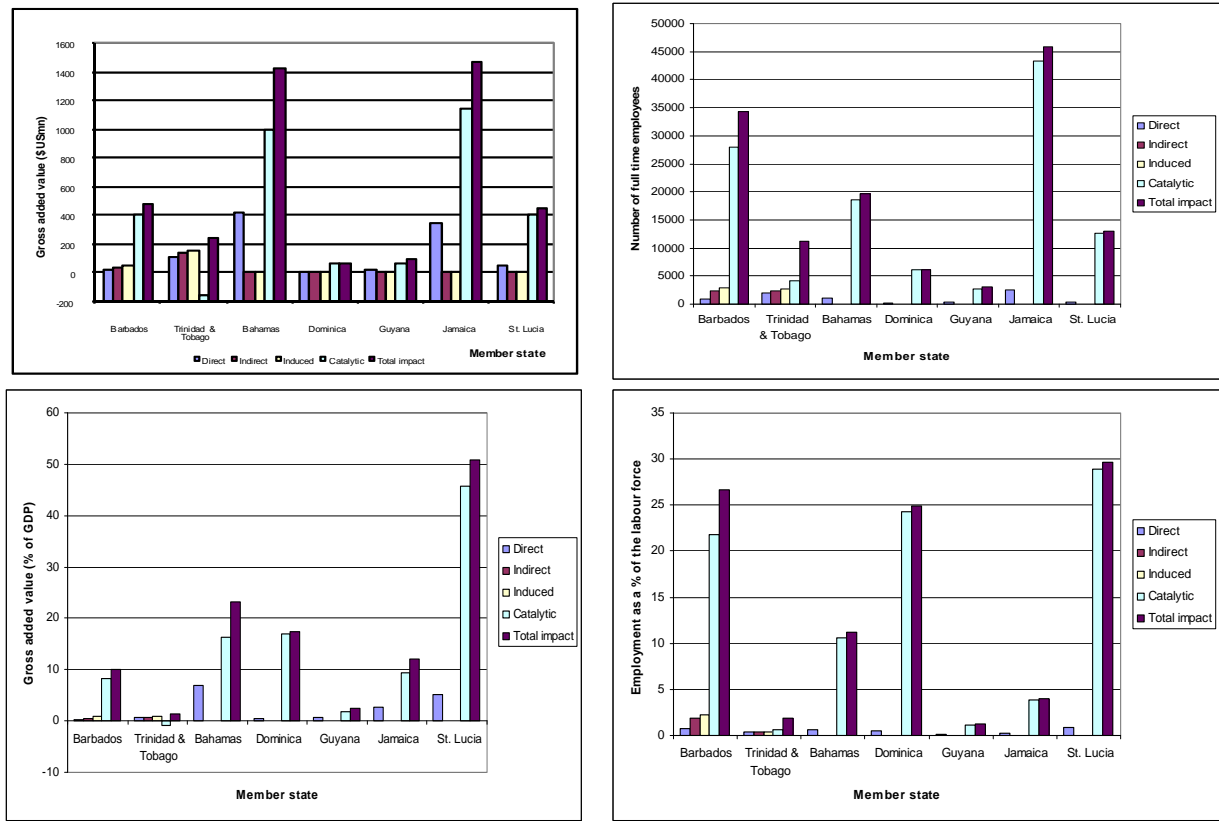
#### **4.2.7. OVERALL IMPACT COMPARISON BETWEEN MEMBER STATES**

Estimates of net visitor spend facilitated by the region's air transport sector represent values approaching their upper limit. Accordingly, the omission of indirect and induced impact values for five of the sampled member states serves to reduce the risk of overstating the sector's overall impact magnitude. Despite the omissions, a clear pattern emerges from both the disaggregate expenditure and employment results as presented in Figure 5. While none of the sample airports processed more than four million passengers in 2006, off-site activity was still found to be thriving, especially within the travel, tourism, hospitality and ancillary service sectors. Invariably those states which experienced large numbers of long-stay visitor traffic, also proved to be the same states that enjoyed high impact multipliers both in terms of expenditure and employment. This occurred to varying degrees in Jamaica, the Bahamas, Barbados, Dominica and St. Lucia. The multiplier in Jamaica and the Bahamas was moderate in comparison to Barbados, St. Lucia and Dominica. This largely agrees with the finding that the presence of domiciled carriers can produce high direct, on-site impact values and employment even if carriers are subsidised and loss making<sup>10</sup>. The resulting catalytic to direct impact ratio was therefore dampened in the case of Jamaica and the Bahamas. Nevertheless, it appears that, in countries that are completely at liberty to attract further extra-regional visitor spend, facilitated by lower priced foreign carriers (See Table 7), multiplier values are most significant. Without the direct market presence of regional carriers, St. Lucia, Dominica and Barbados are free to attract extra services from Europe and North America without having to worry about the economic implications for competing local carriers. Jamaica, the Bahamas and Trinidad & Tobago do not seem to exercise the same amount of freedom although in practise more. Estimated direct, indirect, induced and catalytic impact of the air transport sector for the selected Caricom member states flexible approaches in the Bahamas and Jamaica have helped to reap the desired effect in terms of foreign carrier facilitated tourism spend (83% and 70% of direct extra-regional services respectively in 2006).

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<sup>10</sup> It was not possible however to compare the long-term effect of local carrier losses and continued subsidy due to the cross-sectional nature of the study.

**Figure 5:** Estimated direct, indirect, induced and catalytic impact of the air transport sector for the selected Caricom member states



Sources: Author, Caricom member state national account data (2005), Caricom Balance of Payment data (2002)

Notes: Consumer surplus values (catalytic) evident from the Passenger Survey results are not included in the annual statements. For direct impact GAV estimation, Belize was used as a substitute for Guyana due to the omission of Guyana in the BoP data. **GAV Multiplier: Barbados = 35.98, Trinidad & Tobago = 2.08 (Bahamas = 3.38, Dominica = 45.78, Guyana = 3.94, Jamaica = 4.37, St. Lucia = 9.98)**

The case of Dominica shows that although absolute values are relatively marginal, when estimated in terms of percentage of GDP (PPP) it becomes clear that net economic impact is more significant in small islands with low levels of sector diversity and internal growth. The priority for states like Dominica must be to balance the need for intra-regional connectivity which appears to be better provided by regional carriers with the need for additional extra-regional visitor spend which has hitherto been facilitated mainly by foreign carriers. Furthering efforts to improve interlining capability and marketing Dominica as a suitably priced alternative destination for intra-regional passengers may encourage further joint participation from both local and foreign carriers.

As the only member state to experience a net deficit in catalytic expenditure, Trinidad & Tobago is currently more dependent on its role as a regional centre for technical and



manufacturing expertise rather than incoming visitor expenditure. Of all the sampled states, it was noted that Trinidad & Tobago enjoyed the highest number of contributions from ancillary service providers driven in part by the presence of local carrier BWIA and also by the record levels of economic growth currently benefiting the manufacturing based island. Consequently, despite direct and indirect activity more than compensating for the deficit in catalytic expenditure, overall impact in absolute and percentage terms was insignificant. Catalytic contributions can be further enhanced if Trinidad & Tobago can manage to secure additional low cost and more convenient air services. A high percentage of business travellers also cited that air transport has at one time or another hindered their investment opportunities. As the Trinidad economy expands, it is critical that its reputation as a competitive place to do business is not affected by poor local carrier service levels. Tobago, as Trinidad's tourism based sister island, would also benefit from additional direct foreign carrier services in addition to the important connecting service already provided by Caribbean Airlines through Port of Spain.

## **5. CONCLUSION**

The overall impact of the sector was shown to be related to the magnitude of a state's spill-over effects, which itself is invariably linked to aggregate levels of incoming passenger throughput and the additional expenditure which this creates. When mixed or foreign carrier dominant markets were assessed, it was found that rates of capacity have increased more rapidly than on local markets which have been dominated by regional carriers. This suggests that although having a flag carrier base is advantageous in terms of its direct, on-site impact, the sector's wider role in facilitating and promoting further tourism and business activity overwhelms the direct impact variability shown between states that benefit from a local carrier and those that do not. In fact, of the three sample states with the highest overall gross added value estimates (as a percentage of GDP): St. Lucia, Bahamas and Barbados, only the Bahamas, with its notable network of domestic and international routes provided by flag carrier Bahamasair returned a significant on-site to total activity ratio.

However, it has also been observed that national flag carriers do have a macroeconomic role to play although their value creation has often been overestimated by previously studies limited in scope (e.g. Clarke et al, 2005). The survey results suggest current low levels of air carrier importation. Carrier loyalty schemes as well as carrier familiarity with local cultural

practises must not be overlooked purely because it is difficult to quantify the macroeconomic impact of such preferences. In the counterfactual analysis passengers also eluded to the role of the region's flag carriers in sustaining island connectivity although when traded-off against possible decreases in air fares and improvements in quality of service in the absence of such carriers, overall predicted output levels was estimated to increase. In line with the findings of Bruning (1997), the counterfactual results imply that perhaps further foreign carrier entry on traditionally local routes and vice versa may lead to the desired competitive efficiency effects that would in turn lead to the higher levels of carrier switching alluded to in that study (1997).

Local business travellers, who mainly travel on the region's national carriers, pointed towards high freight rates/airfares, a low number of direct flights, few and inconvenient frequencies and schedules, and under-capacity in terms of seats and cargo as the main reasons why investment plans were hindered. Consumer surpluses were buoyant for both local and foreign carriers although significantly reduced for both the region's flag carriers and for local travellers, who were found to pay disproportionately high fares for some of the regions short sector routes (Figure 1).

The supplier probe in Trinidad & Tobago and Barbados highlighted BWIA's role in facilitating income expenditure in the wider economy with more modest results for Barbados in the absence of a domiciled carrier. It suggested Barbados' induced impact could be further enhanced if periodical subsidies to LIAT translated into an expansion of LIAT activity at Grantley Adams airport. Differences in absolute levels of GDP however resulted in a greater relative income contribution in Barbados than in Trinidad, denoting the moderating effect exogenous factors can have on the magnitude of the sector's economic impact.

## References

- Airports Council International Europe (2004), *The social and economic impact of airports in Europe*.
- Air Transport Action Group (2005), *The economic and social benefits of air transport*, Final Report, May 2005.
- Barrett, SD. (2006), Commercialising a national airline – the Aer Lingus case study, *Journal of Air Transport Management*, 12, 159-167.
- Bruning, ER. (1997), Country of origin, national loyalty and product choice: The case of international air travel, *International Marketing Review*, 14, 59-74.
- Caribbean Development Bank (CDB), *On-line project information*, available from: <http://www.caribank.org>.

- Caribbean Region Sustainable Tourism Development Programme (2007), *A proposed policy regime for ensuring the sustainability of the Caribbean's air transport services sector*, Barbados, August.
- CARICOM Secretariat (2002), Trade in Services report 1990-2000, *Statistics sub-programme*, July.
- Chouthi, S. (2006), LIAT moves from red to stable, *Trinidad Guardian*, 8<sup>th</sup> July
- Civil Aviation Authority (2004), *CAA passenger survey report 2004: Survey of passengers at Gatwick, Heathrow, Luton, Manchester & Stansted Airports*, Economic Regulation Group.
- Civil Aviation Authority (1994), *Economic impact of new air services: A study of new long haul services at UK regional airports*, CAP 638, November 1994.
- Clarke, J-P, Miller, B, Riedel, R, Pamidimukkala, P, Raimondi, M. (2005), *Estimation of the economic benefit of Air Jamaica to Jamaica between 1995 and 2004*, Report No. ICAT-2005-3, MIT International Centre for Air Transportation, Massachusetts Institute of Technology, July.
- Department for Transport (2004), *The importance of transport in business location decisions*, Napier University, January.
- Doganis, R. (2003), *Flying off course: The economics of international airlines* (3<sup>rd</sup> Edition), London: Routledge Taylor & Francis Group.
- International Civil Aviation Organisation, (2005). *Caribbean/South American regional traffic forecasts 2004-2015. Doc. 9878*. Report by the CAR/SAM Traffic Forecasting Group, Lima, Peru.
- International Civil Aviation Organisation (2005), *Economic contribution of civil aviation*, Circular 292-AT/124, November.
- International Civil Aviation Organisation (ICAO), *On-line flight stage statistics facility*, available from: <http://icaodata.com>.
- Lind, D.A, Marchal, W.G, & Wathen, S.A. (2005), *Statistical techniques in business and economics* (12<sup>th</sup> edition) , McGraw Hill publishers.
- Madjd-Sadjadi, Z. (2005), Comments on the recent MIT economic benefit study, *Jamaica Observer*, August.
- Montalvo, J.G. (1998), A methodological proposal to analyse the economic impact of airports, *International Journal of Transport Economics*, 25 (2), 181-203.
- O'Donoghue, M. (1969), A cost-benefit evaluation of Irish airlines, *Journal of the Statistical and Social Inquiry Society of Ireland*, 1968/1969 22, 155-180.
- Official Airline Guide (2007), Subscribed global schedules iNET data.
- Oxford Economic Forecasting (2006), *The economic contribution of the aviation industry in the UK*, Oxford, October.
- Pagliari, R. (2003), The impact of airline franchising on air service provision in the Highlands and Islands of Scotland, *Journal of Transport Geography*, 11, 117-129.
- Pearce, B. (2005), *New evidence on the wider economic benefits of air transport*, International Air Transport Association (IATA).
- Raguraman, K. (1997), Airlines as instruments for nation building and national identity: case study of Malaysia and Singapore, *Journal of Transport Geography*, 5, 239-256.
- St. Lucia Air and Sea Ports Authority (SLASPA). *On-line air traffic statistics*, available from: [http://www.slaspa.com/c\\_reports.php](http://www.slaspa.com/c_reports.php).
- World Bank Document, (2006), *Caribbean air transport: Strategic options for improved services and sector performance*, Finance, Private Sector and Infrastructure Department, Washington, DC.
- World Travel & Tourism Council (2005), Travel & tourism: Sewing the seeds of growth, *Travel and tourism research*, Caribbean region Tourism Satellite Accounts.
- Yoo, KE, Ashford, N. (2007), Carrier choices of air passengers in Pacific Rim: Using comparative analysis and complementary interpretation of revealed preference and stated preference data, *Transportation Research Board*, 1652, 1-7.

# Examining the Relationship between Firm Resources and Firm Performance: An Insight into the Airline Industry

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## Abstract

Several scholars have pointed to the benefits that can be acquired by the combination of strategic and entrepreneurial activities with the aim of creating wealth and increased performance outcomes (e.g. Ireland et al., 2003; Sirmon et al., 2007; Monsen and Boss, 2009). In this vein, we employ the Resource-Based View (RBV) of the firm and examine whether the balanced implementation of both opportunity and advantage-seeking activities enhances the relationship between a firm's resources and its performance outcomes. Using panel data from the airline industry, our findings reveal important implications for business success and for future research directions.

**Keywords:** Firm resources; performance; airline industry; content analysis.

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## **1. INTRODUCTION**

Seeking the integration and balanced implementation between value-creating (entrepreneurial) and competitive advantage-seeking (strategic) activities (e.g. Ireland et al., 2003; Sirmon et al., 2007; Monsen and Boss, 2009) constitutes a key challenge for several firms in a variety of industry settings.

This work, in particular, aims at investigating the impact of the balanced implementation of opportunity and advantage-seeking activities, also termed as strategic entrepreneurship (Ireland et al., 2003), on the relationship between firm resources and performance, examining whether organizations that indeed implement these two approaches simultaneously outperform those that are either solely strategically or entrepreneurially driven. In attempting to address the above knowledge gap, we examine the impact of this integration on the linkage between firm resources and performance. In order to better comprehend the particular relationship, the focus shifts on the effect of firms' external environment, since environmental factors are considered to exert a strong effect on performance (Spanos and Lioukas, 2001). This is particularly true within the airline industry, since passenger mobility and cargo transportation diminish, causing a parallel revenue decrease for airline firms (Miller and Chen, 1996).

In this vein, the paper draws upon the Resource Based View (RBV) of the firm (e.g. Penrose, 1959; Wernerfelt, 1984), which considers the effect of several internal and external firm resources on competitive advantage creation and performance differentials efforts, followed by the theoretical arguments and the conceptual framework of the current study. The paper is based on a cross-sectional empirical investigation of 30 airline companies (with 10 observations for each, equalling 300 in total) included in Top 100 Passenger Ranking of the Airline Business Magazine. Results are then analyzed based on current knowledge and certain conclusions and implications are generated, while future research directions are identified.

## **2. LITERATURE REVIEW**

### **2.1. ENTREPRENEURIAL AND STRATEGIC ACTIVITIES**

The parallel implementation of strategic and entrepreneurial activities in order to maximize efforts towards wealth creation has increasingly been acknowledged as a priority for all firm

types (Ireland et al., 2003), since it potentially constitutes a reply to the complexity of continuously reorganizing efforts towards competitive advantage creation under uncertain market and industry conditions (Hitt et al., 2001; 2002; Ireland et al., 2003). Although the potential benefits of combining entrepreneurship and strategy have been broadly discussed, research on the combined implementation of these two domains still remains in early stages, whereby insight with regard to this combination remains limited and their application is insufficiently examined (e.g. Hitt et al., 2001; 2002; Ireland et al., 2003). Ultimately, this leads to the need for further examination into ways in which these two, at times opposing activities, can be effectively managed to create value and competitive advantage.

The most comprehensive model of the aforementioned integration to date, also termed strategic entrepreneurship, pertains to that of Ireland, Hitt and Sirmon (2003). Their framework consists of four activities switching between entrepreneurial and strategic orientations and sets of tasks in a linear process, leading to the creation of competitive advantage and wealth according to the authors. The strategic entrepreneurship construct focuses on optimum ways in which opportunity-seeking and advantage-seeking activities can be implemented towards wealth creation (Ireland et al., 2003). Yet, research has not examined what supportive determinants might involve this 'balance' so that they would aid these two different behaviours to be effectively implemented. Entrepreneurial behaviours are oriented towards the exploration of new possibilities, experimentation, and opportunity identification, while strategic behaviours orient a firm towards the further establishment of present advantages and sources of value creation, the effectiveness of firms at wealth creation consequently requires them to adapt an ambidextrous approach (e.g. Atuahene-Gima, 2005; March, 1991; Gibson and Birkinshaw, 2004; Birkinshaw and Gibson, 2004), translated into a balanced implementation between entrepreneurial and strategic activities.

The above discussion demonstrates that it is at the intersection between entrepreneurial and strategic activities where dynamic processes can occur and enable firms to maximize their wealth creation potential (Hitt et al., 2002). As such, the acquirement and effective deployment of firm resources appear critical in the examination of wealth creation initiatives.

Entrepreneurial actions pertain to the identification and exploitation of entrepreneurial opportunities that have not been discovered by rivals (Ireland et al., 2001 & 2003). Strategic actions pertain to the development and reinforcement of existing sources of competitive advantage creation, however also providing the strategic platform for entrepreneurial actions that are oriented towards new potential sources of value (Hitt et al., 2002).

## **2.2 FIRM RESOURCES**

Literature with regard to firm resources emerges from the Resource Based View (RBV) of the firm (e.g. Penrose, 1959; Wernerfelt, 1984; Barney, 1991; Rumelt, 1984), which was later extended by the evolution of the Dynamic Capabilities (Teece et al., 1997). The RBV argues that firm resources contribute to increased firm performance through competitive advantage formation (Ireland et al., 2003). According to the Resource Based View, resources are characterized as those tangible or intangible assets possessed by a firm, enabling it to adapt strategies generating performance differentials (Maijoor & Van Witteloostuijn, 1996). This ability is created by the use of stable routines which constitute the basic components of capabilities (Nelson et al., 1982). Drawing upon definitions of routines and capabilities provided by scholars such as Nelson and Winter (1982), most researchers interpret the term capability as a superior routine or combination of routines (Winter, 2003). Unexploited resources, when combined with managerial skills may lead to opportunities that when appropriately exploited, can lead to competitive advantages and constitute important novel sources of customer value.

Nelson & Winter (1982) are concerned about particular routines followed in companies, arguing that firm behavior, particularly with regard to the exploitation of firm resources, is subject to routines over a period of time. The outcome would be that it is not very likely that firms develop identical routines. There are several resource types a firm possesses, which either individually or combined may lead to different sources of competitive advantage creation. In the following, we attempt to identify and analyze those resource types that are considered as more relevant within the airline industry and for the purposes of the current study.

## **3. HYPOTHESES DEVELOPMENT**

Although some kind of relationship is, therefore, assumed between firm resources and performance, it becomes apparent that the mere possession of firm resources is not necessarily sufficient for value creation (e.g. Barney & Arkan, 2001; Priem & Butler, 2001) or firm performance increase. Further examination on the linkage between a firm's resource portfolio and its activities towards increased firm performance over time is required. Although a firm's resource portfolio builds its unique identity, it may also impose limitations with regard to firms' operations, thus, eliminating their strategic direction and potential towards profit realization, in turn leading to increased performance. In the present study, we



concentrate on the role of the combined integration of strategic and entrepreneurial activities in fostering firm efforts towards enhanced firm performance, by aiding firms to take advantage of the full potential of their resource base.

### **3.1 THE CONTRIBUTION OF FIRM RESOURCES**

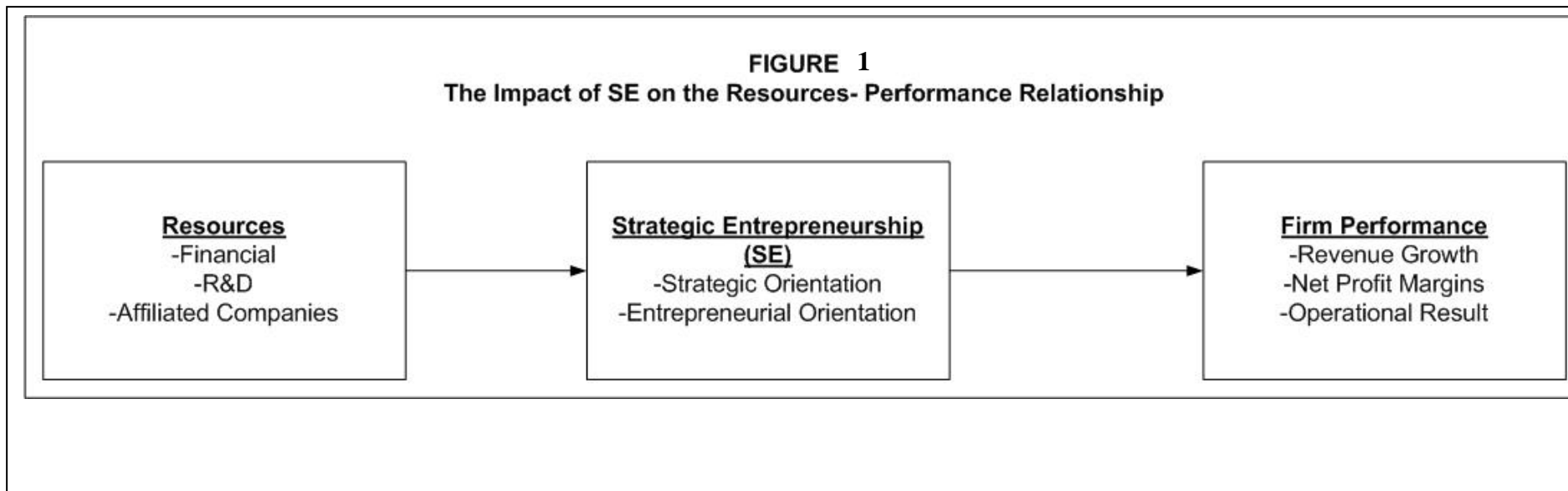
The adaptation and implementation of a particular strategy type constitutes a key challenge for the majority of organizations. Traditionally, external adoption or orientation has constituted the focus of the strategy process research (Borch et al., 1999). However, limited attention has been paid to internal resources of the firm (Landström & Huse, 1995) and their association to strategy and entrepreneurial orientation (Ireland et al, 2003). This has been further highlighted by contributors such as Sirmon et al. (2007) and Monsen and Boss (2009), who have characterized the firm as a "*black box*", in that scarce attention has been paid to internal firm resources and conditions that might lead it to increased wealth and firm performance. In today's competitive environments, firms need to adapt novel strategic approaches within a timely fashion, to successfully compete against rivalry and obtain superior earnings. To this end, non-imitable and non-substitutable resources have been recognized as a key parameter of inter-firm growth differentials (e.g. Barney, 1991; Dosi, Nelson and Winter, 2000; Wernerfelt, 1984).

Ireland et al. (2003) have only pointed to an eliminated number of resource categories, such as social, human, and financial resources as key towards the successful application of entrepreneurial and strategic activities leading to wealth. However, other categories of firm resources exist that have been highlighted in literature as critical towards increased performance and competitive advantage, such as R&D expenditure, new production methods and technologies, which are hard for competitors to adapt or imitate (e.g. Amit & Shoemaker, 1993). Diecrickx and Cool (1989) argue that the core of a firm's competitive advantage does not necessarily lie in the content of a firm's strategic approach per se, but mainly in firm resources. An important superior performance indicator in firms, beyond revenue indicators, pertains to the degree to which these firms can innovate and successfully commercialize new products and services (Markman et al., 2004). The airline industry is affected by the above perspective, since airlines' ability to develop patents to protect their innovations proves an important organizational process (Miller and Chen, 1996).



However, solely possessing inimitable and valuable resources is not sufficient for the above condition to be realized. The RBV requires further elaboration to explain the linkage between the possession of resources and the beneficial impact that such actions can exert on firm performance. To better comprehend this linkage, the effects of a firm's strategically entrepreneurial practices on managing resources and achieving increased firm performance needs to be examined (Bettis and Hitt, 1995), since RBV research is in essence silent about these effects (Sirmon et al., 2007). The above discussion leads to the conceptual framework analyzed in the following, which draws upon the above motivation: examining the combined effect of strategic and entrepreneurial activities on the linkage between firm resources and performance.

**FIGURE 1**  
**The Impact of SE on the Resources- Performance Relationship**



### **3.2 HYPOTHESES**

Our analysis of entrepreneurial activities on the relation between firm resources and firm performance demonstrates that such activities are associated to innovation and search, which aids firms to face uncertainty and transform the identified opportunities from the outer environment into profitable solutions. In this way, firms are in better position to generate new value and increase their performance. Research findings, for instance, reveal that there is a direct, positive linkage between innovativeness and business performance (e.g. Bayus et al., 2003; Damanpour and Evan, 1984), while a firm's innovativeness capacity has repeatedly been associated to increased profits (Li and Atuahene-Gima, 2001). The former analysis provides argumentation that entrepreneurial activities may exert a positive influence on business performance.

Likewise, strategic activities are associated to well-planned actions, which enhance decision-making, facilitate organizations to make accurate resource investment decisions, and translate abstract objectives into specific actions with as certain outcomes as possible. As such, firms mediate the potential effect of failure and speed up their product development processes that will potentially foster growth. Nonetheless, excessive implementation of strategic practices can be criticized for creating extremely standardized and formal conditions that may hamper firms' efforts towards the quick adaptation of change (Delmar & Shane, 2003; DeSimeone et al., 1995). Such an approach, however, might seem insufficient for firms' behaviours in today's volatile and turbulent environments, where firms need to continuously seek new opportunities rather than focusing on a specific position (e.g. Leonard-Barton, 1992), independently of their constraints.

The RBV suggests that resources need to become rare, hard to imitate and non-substitutable in order to constitute sources of competitive advantage (Penrose, 1959; Wernerfelt, 1984; Barney, 1991). This is the outcome of the combined effect of entrepreneurial and strategic activities in that they can transform firm resources into competitive assets against competitors. By solving problems or exploiting new opportunities, companies build positive feedback mechanisms since they become more innovative and effective, therefore attracting more customers, who value the outcome of firms' innovation efforts (Borgatti & Foster, 2003; Uzzi, 1996). This embeddedness helps companies to improve their performance.

Such efforts might appear particularly critical for the airline industry, where the external unforeseen environmental factors, such as terrorism and recession have immense impact on airline revenues. A balanced implementation of entrepreneurial and strategic orientations, thus, aids firms in the particular industry to rapidly respond to this turbulent and risky setting.

Drawing on the above, the simultaneous implementation of strategic and entrepreneurial actions contributes to increased firm performance, based on resources and capabilities, in several ways. Firms can adapt novel technologies and change their resource base, in order to adapt to new environmental opportunities (Karim and Mitchell, 2000). Through the introduction of technologically superior products they can enhance their current market performance through improvements of existing products. Thus, entrepreneurial activities allow firms to be exposed to new knowledge, foster new product development, become more flexible, capture the benefits of uncertainty thus, directly enhancing their performance outcomes. In the meantime, a strategic orientation enables firms to improve their current products, services and business practices, thus reinforcing their value creation to their existing customers. It further enables firms to ameliorate their existing resources, contributing to their short term survival (Lee et al., 2001), while ensuring long term success, thus positively affecting firm performance. Based on the above analysis, we posit the following:

*Hypothesis 1: The relationship between firm resources and firm performance is mediated by the parallel implementation of strategic and entrepreneurial activities.*

In several studies within the airline industry, the impact of environmental factors on firm performance, like economic recession, for instance, have been considered to exert a negative impact on airline firms' performance (Miller and Chen, 1996). For instance, a set of country-specific variables have been considered to control for time varying influences related to carriers' domestic markets, which are likely to influence their performance, like the country's per capita GDP, GDP percent growth (GDP Growth), and population. The negative impact of economic turmoil is presented in several academic studies and in all industry reports of the most known investment analysts/banks (for example see Mergents's Industry Report of the Aviation Industry).

In this study, we assume the negative relationship that environmental factors such that economic recession will impose on firm performance and we hypothesize that the simultaneous interplay between entrepreneurial and strategic actions will decrease this negative effect on the above relationship.

It has frequently been argued within literature that the environmental context (economic recession) significantly affects firms' strategy formation and their resource base construction (e.g. Sirmon et al., 2007). For instance, Miller and Shamsie (1996), argue that "property based resources are more valuable in certain environments than are knowledge based resources". Aragon-Correa and Sharma

(2003) argue that a firm's context influences the potential of its resources in developing natural environment strategies.

The simultaneous implementation of strategic and entrepreneurial actions aids firms to acquire resources and increase their range of viable response to environmental change in the form of opportunities and threats (McGrath & Nerker, 2004). Firms' inability to respond to environmental conditions might allow competitors to exploit emerging opportunities firms. High environmental uncertainty forces firms to leverage their capacity to achieve temporary competitive advantages (Eisenhardt, 1999). Because of environmental impacts, organizations need to continuously redesign their resources and integrate them into new configurations, since firms' competencies might lose their value due to marked and customer needs' changes. Thus, even increases in performance are rarely sustainable in environments like those surrounding the airline industry. However, the parallel implementation of strategic and entrepreneurial activities aids firms to overcome this danger, by constantly screening the environment, creating distinctive competencies for a long time and thus achieve long term performance increases. This parallel implementation also aids firms to integrate previously unrelated matrices of information and knowledge, also referred to as bisociation (Smith and DiGregorio, 2002), which helps the firm to provide rapid solutions under abrupt and emerging environmental conditions. The above discussion leads us to the following Hypothesis.

*Hypothesis 2: The parallel implementation of strategic and entrepreneurial activities diminishes the negative impact of economic recession on performance by mediating their relationship.*

#### **4. METHODOLOGY**

In the following, the statistical methodology followed in the current study is presented. For the purposes of the study, cross-sectional data analysis was employed.

##### **4.1 SAMPLE SELECTION**

Regarding the empirical setting for hypothesis testing, we have considered a number of alternative industries such as the banking industry, the energy trading industry and the automobile industry. The airline industry was finally chosen because of its competitiveness, its well documented diversity of competitive tactics (Chen, Smith & Grimm 1992) and its tendency to be affected by the economic environment (Chen et al., 1996). The industry also includes firms for which there is abundant public information with respect to their decisions and whose business activities focus on a single industry (Miller & Chen, 1996). Prior research suggests a great deal of publicly available information exists on

the firms in the sample (Quasney, 2003). Finally, over 80% of the research in competitive dynamics published in top management journals used the airline industry as the empirical setting.

The research sample comprises 30 major international air carriers which are included in the Top 100 Ranking of Airline Business magazine, providing scheduled passenger service on the Atlantic routes from January 1, 2000 through December 31, 2006. The sample does not include passenger charter carriers, such as Tower Air, or all-cargo carriers, such as FedEx.

Data on firm actions were drawn from the aviation industry newsletter Aviation Daily. Smith, et al. (1992) and Chen (1988) previously validated the use of this source of action information and about 90% of the studies in competitive dynamics in airline industry use this magazine. As Quasney noted: "as an industry newsletter, Aviation Daily provides the most thorough coverage of the U.S. and international airline industries" and "the journal covers essentially all aspects of the industry: the air carriers (large and small; foreign and domestic), airports and airways, acquisitions and mergers, government activity and salient nonmarket activities". Therefore, this magazine is suitable for the data collection for our sample- international air carriers).

#### **4.2 RESEARCH METHOD**

The data collection method employed to test the aforementioned hypothesized relationships as presented in Figure 1 among international air carriers is "*structured content analysis*" (Jauch, Osborn & Martin, 1980), which has been used by Chen (1988), Smith, Grimm & Gamon (1992), and Ferrier, Smith & Grimm (1996) and Shaffer, et al. (2000) to study competitive dynamics.

Different approaches, theoretical frameworks, methods, and analytical methodologies have been labeled as content analysis (Denzin & Lincoln, 1994; Miles & Huberman, 1994). Shapiro and Markoff (1997) reviewed six major definitions from various sources in the social sciences (see also Kabanoff, 1995, for complementary perspectives). These scholars proposed a minimal and encompassing definition that we also adopted: "*any methodological measurement applied to text (or other symbolic materials) for social science purposes*" (Shapiro & Markoff, 1997, p. 14). We believe that the Shapiro Markoff definition provides an acceptable conceptual grounding. Content analysis, at its most basic form, is the word frequency as an indicator of cognitive centrality (Huff, 1990) or importance (Abrahamson & Hambrick, 1997). Herein, we use a more fine-grained but qualitative approach by manually reading the concordance lists of our keywords.

## **4.3 MEASURES**

### **4.3.1 DEPENDENT VARIABLES: FIRM PERFORMANCE**

There is agreement in the strategy discipline that performance is a complex phenomenon involving organizational inputs and outputs variously viewed and assessed (e.g., Bhargava, Dubelaar, and Ramaswami, 1994; Chakravarthy, 1986). Thus, by default, performance is a multidimensional construct (e.g. Katsikeas et al., 2004). Performance is therefore perceived as a multidimensional, higher-order construct comprised of three dimensions: financial performance, assessing profitability as a percentage of sales, return on investment, and profit growth, sales performance, measured in terms of sales volume, sales growth, and new product sales and customer performance, pertaining to customer satisfaction and customer retention.

Our intention was to use three different indicators of firm performance (Operations Results, Revenue Growth and Net Margins) but their high correlation with each other lead us to use only the Operations profits/ losses. Thus, firm performance was measured by the Operations profits/ losses as presented in the Top 100 Ranking of the Airline Business magazine.

### **4.3.2 INDEPENDENT VARIABLES**

#### **4.3.2.1 STRATEGIC AND ENTREPRENEURIAL ACTIVITY**

We used categorization of competitive moves as presented by Yu (2007). Consistently with previous research in competitive dynamics (Chen, 1988; Ferrier et al., 1999; Smith et al., 1992; Young et al., 1996), an action is defined as “a specific and detectable competitive move, such as a price cut or new product introduction, initiated by an MNE to defend or improve its relative competitive position in a given country market” (e.g. Norman et al., 2007).

We split actions in two sub- categories: Strategic and entrepreneurial activities. Strategic activities entail a commitment to particular resources that are hard to implement and reverse; a major change in the definition of a business is an example (e.g. Galbraith & Kazanjian, 1986). Entrepreneurial activities, on the other hand, are more oriented towards proactiveness, risk-taking and innovative approaches (e.g. Lumpkin and Dess, 1996) that enhance the process of opportunity identification in the outer environment and create the conditions for the proper exploitation of identified opportunities.

To this end, we divided the number of strategic actions to the number of entrepreneurial actions of the focal firm. If this result is close to 1, the company successfully implements these two sets of activities in parallel. If this number is far less or far greater than 1, this means that the firm implements a strategic orientation or an entrepreneurial orientation respectively. In our sample, there is no airline company which implements a purely entrepreneurial orientation/set of activities. This is attributed to the size of these companies and the regulations which they have to oblige.

#### **4.3.2.2 FIRM RESOURCES**

We measured three types of resources: financial capital, human capital and technological resources, inspired by Ireland et al.'s (2003) work. We measured financial capital by the fleet number, number of affiliated companies and the ownership of proprietary hotels. Data about Fleet number were collected by Airline Business magazines' "Top 100 Ranking of Air- passenger carriers". We use IATA's "World Air Transport Statistics" to find number of affiliated companies and ownership of hotels. We measure human capital by the experience of pilots as presented on IATA's "World Air Transport Statistics". Finally, we measure technological resources by the R&D expenditures and Fleet age. R&D expenses were measured by Datastream's Fundamentals Database and Fleet age was measured by IATA's "World Air- Transport Statistics".

#### **4.3.2.3 ECONOMIC- ENVIRONMENTAL FACTOR**

We measured Economic Recession by a dummy variable which was valued with 0 if there was a growth at GDP in the country where the headquarters of the airline is and with 1 if there was no growth at GDP in the companies' home- country. We collected the data for GDP growth by the Penn World Tables (Real GDP in year 1- Real GDP in year 0).

#### **4.4 DATA ANALYSIS**

Our intention was to use panel data to analyze this longitudinal dataset but, due to inherent constrains, we finally employed more conventional cross-sectional analysis- Ordinary Least Squares, OLS.

##### **4.4.1 PEARSON CORRELATION COEFFICIENTS**

First, correlation analyses were carried out to evaluate the strength of the relationship and collinearity between the predictor variables. Summary statistics and the Pearson correlations for the primary variables of interest are consolidated in Appendix (Table 1).



The strongest relationship between primary variable of interest, Strategic Entrepreneurship was between the variables financial capital and technological resources. Specifically, SE is negatively correlated with all financial capital items (Fleet number  $r = -0.41$ , Number of Affiliated companies  $r = -0.47$  and ownership of hotels  $r = -0.52$ ). In contrast, strategic orientation is highly positively related to financial resources (Fleet number  $r = 0.52$ , Number of Affiliated companies  $r = 0.47$  and ownership of hotels  $r = 0.28$ ). This correlation was expected to emerge, since bigger and wealthier companies are usually prone to strategic integration.

An additional interesting conclusion, however, pertains to the variable Number of affiliated companies is positively correlated with ownership of hotels ( $r = 0.39$ ). This number was also expected because the ownership of hotel suggests the existence of affiliated companies. This correlation is significant important and we considered it in the measurement of financial capital variable. The correlation between resources and performance is not easy to explain. There is some correlation between firm financial resources and performance.

#### **4.4.2 PARALLEL IMPLEMENTATION OF STRATEGIC AND ENTREPRENEURIAL ACTIVITIES AS A MEDIATOR**

Based on Baron and Kenny (1986), we created three models for regression analysis. We first tested the relation between firm resources and performance. A significant important relationship between these two constructs was identified. This relationship proved to have a positive coefficient for technology assets, but a negative coefficient for financial assets. Human capital coefficient was partially significant with a positive coefficient. There was also a significant relationship between resources and Strategic entrepreneurship (Model 4 in Appendix -Table 2).

As demonstrated in Model 3 (Appendix -Table 2), there is a complete mediation of strategic and entrepreneurial activities between financial resources and performance because in Model 3 coefficient of financial assets are non-significant. Firms that possess strong financial resources, demonstrate the capacity to develop slack, which aids them in their opportunity exploitation activities. Yet, in order for this slack to become a mechanism towards competitive advantage, the application of a strategically entrepreneurial approach is completely required as the simultaneous implementation of strategic and entrepreneurial activities in our model completely mediates the relation between financial resources and firm performance.

However, it seems that technological and human capital resources are partially mediated by strategic and entrepreneurial activities. One explanation for this partial mediation might be that these resources inherently contain more value than financial resources, in that they are more complex and as such cannot be acquired with the same simplicity and ease by other firms as can financial resources. Thus, they exert a direct impact on performance and the impact of the simultaneous implementation of strategic and entrepreneurial activities becomes less significant. This means that Hypothesis 1 is partially supported. There is a mediation effect of strategic and entrepreneurial activities on financial resources, but there is partial or no mediation effect on human and technological resources.

With regard to Hypothesis 2, there is again partial mediation of strategic and entrepreneurial activities, since even with the existence of SE in the regression model, economic recession has a significant coefficient. However, this result was expected and is in accordance with our initial premise. Economic recession exerts a strong negative impact on performance in the airline industry because, as previous researchers demonstrate (e.g. Norman et al., 2007), passenger mobility and cargo transportation diminish causing a parallel revenue decrease for airlines. The simultaneous implementation of strategic and entrepreneurial efforts partially alleviates this phenomenon, creating a dual effect, whereby strategic activities foster efficiency, while entrepreneurial activities enhance opportunity exploration and exploitation.

Please see Appendix – Table 3 for coefficients for economic recession with dependent variable: operations results.

## **5. LIMITATIONS AND FUTURE RESEARCH**

In this study, we attempted to investigate the relationship between firm resources and firm performance, testing whether the parallel implementation of strategic and entrepreneurial actions can cause performance differentials and influence the above relationship.

Since SE is in its infancy, we attempted to operationalize it using content analysis and present a case of building an argument on why the logic of SE (opportunity and advantage-seeking) creates balance and its components might in tandem with this positively affect performance. There are several research efforts that need to be taken to strengthen the reliability of this construct since we did not check for inter-rater reliability. We performed this research in the particular context of the airline industry. In future, similar studies should take place within other setting as well, so that

results are more generalizable. Due to the existence of longitudinal dataset at different levels of aggregation, it would be feasible to use generalized least squares (FGLS)—as an important method to analyze panel data— to test the hypotheses generated. However, the current study did not provide this analysis, which should be acknowledged as a limitation and provide avenues for future research.

In addition, in this research our sample size consisted of 30 firms with 300 observations. Although this number is sufficient for the purposes of OLS analysis, a larger sample size would undoubtedly produce more durable results. Furthermore, our dataset includes multi national airline firms across the world, so country specific variables might affect the model's results. In the current research, however, we did not control for this effect. Finally, in this study, we only examined the effect of a limited number of firm resources on firm performance. It would be worth to examine the effect of additional firm resources and capabilities in the above relationships. The use of the dynamic capability theory (e.g. Teece et al., 1997; Zollo and Winter, 2002; Zott, 2003) is one of the theoretical streams that could serve as a platform towards this direction.

Finally, it becomes evident that the successful implementation of strategic and entrepreneurial activities is facilitated by certain firm specific resources. As such, there is need to explore the mechanisms through which such resources are turned into competitive advantages, with the potential to increase firm performance. Although in the current study there is some reference to the important role of firm resources towards this direction, a lot of space for examination remains as to the appropriate bundling and leveraging of different firm resource types (e.g. Sirmon et al., 2007) towards the above direction. Further identification, and exploration, both theoretically and empirically, of other categories of firm resources will provide insight on the ways in which the parallel practice of entrepreneurial and strategic activities is implemented to improve firm performance and wealth creation.

## REFERENCES

- Abrahamson, E. (1997), The Emergence and Prevalence of Employee Management Rhetorics: The effects of long waves, labor. *Academy of Management Journal*, 40(3): 491.
- Amit, R., Shoemaker, P.J. (1993), Strategic assets and organizational rent. *Strategic Management Journal*, 14(1): 3-46.
- Aragon-Correa, J. A., & Sharma, S. (2003), A contingent resource-based view of proactive corporate environmental strategy. *Academy Of Management Review*, 28(1): 71-88.

- Atuahene-Gima, K., & Li, H. Y. (2004), Strategic decision comprehensiveness and new product development outcomes in new technology ventures. *Academy Of Management Journal*, 47(4): 583-597.
- Barney, J.B. (1991), Firm resources and sustained competitive advantage. *Journal of Management* , 17(1): 99-120.
- Barney, J.B., Arian, A.M. (2001), The resource-based view: Origins and implications. In: M.A. Hitt, R.E. Freeman and J.S. Harrison (eds.), *Handbook of Strategic Management*. Oxford: Blackwell.
- Barney, J. B. (1996), The Resource-Based Theory of the Firm. *Organization Science*, 7(5): 469-469.
- Bayus, B. L., Erickson, G., & Jacobson, R. (2003), The Financial Rewards of New Product Introductions in the Personal Computer Industry. *Management Science*, 49 (2): 197-210.
- Baron, R. M., & Kenny, D. A. (1986), The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6): 1173-1182.
- Bettis, R. A., & Hitt, M. A. (1995), The New Competitive Landscape. *Strategic Management Journal*, 16: 7-19.
- Bird, B. (1988), Implementing entrepreneurial ideas: The case for intention. *Academy of Management Review* 13(3): 442-453.
- Birkinshaw, J., & Gibson, C. (2004), Building ambidexterity into an organization. *MIT Sloan Management Review*, 45: 47-55.
- Borgatti, S. P., & Cross, R. (2003), A relational view of information seeking and learning in social networks. *Management Science*, 49: 432– 446.
- Chen, M.-J. (1988), *Competitive strategic interaction: A study of competitive actions and responses*. Unpublished dissertation submitted in fulfillment of the requirements for a Doctor of Philosophy degree in Business Administration. University of Maryland at College Park.
- Conner, K. R. (1991), A Historical Comparison of Resource-Based Theory and Five Schools of Thought Within Industrial Organization Economics: Do We Have a New Theory of the Firm? *Journal of Management*, 17(1): 121
- Cornelius, B., Landström, H., Persson, O. (2006), Entrepreneurial studies: The dynamic research front of developing social science. *Entrepreneurship Theory and Practice* 30(3): 375-398.
- Covin, J.G., Slevin, D.P.(1989), Strategic management of small firms in hostile and benign environments. *Strategic Management Journal* , 10(1): 75-87.
- Damanpour, F., & Evan, W. M. (1984), Organizational Innovation and Performance: The Problem of "Organizational Lag. *Administrative Science Quarterly*, 29(3): 392-409

- Dierickx, I., & Cool, K. (1989), Asset Stock Accumulation and Sustainability of Competitive Advantage, *Management Science*. 35: 1504-1511
- Denzin, N. K., & Lincoln, Y. S. (1994), *Handbook of Qualitative Research*. Thousand Oaks, CA: Sage Publications
- Dosi, G., Nelson, R.R., Winter, S.G. (2000), *The nature and dynamics of organizational capabilities*. Oxford: Oxford University Press.
- Eisenhardt, K. M., Martin, J. K. (2000), Dynamic capabilities: What are they? *Strategic Management Journal* , 21: 1105-1121.
- Eisenhardt, K. M., Brown, S., Neck, H. (2000), Competing on the entrepreneurial edge. In: G. Meyer and K. Heppard (eds.), *Entrepreneurship as Strategy*. California: Sage Publications Inc.
- Eisenhardt, K. M. (1999), Strategy as decision making. *Sloan Management Review*, Spring.
- Ferrier, W., Smith, K. G. and Grimm, C. (1999), The role of competitive action in market share erosion and industry dethronement: a study of industry leaders and challengers. *Academy of Management Journal*, 42, 372-388.
- Galbraith, J. R., & Kazanjian, R. K. (1986), *Strategy implementation: structure, systems, and process*. West Publishing.
- Gibson, C. B., & Birkinshaw, J. (2004), The antecedents, consequences, and mediating role of organizational ambidexterity. *The Academy of Management Journal*: 209-226.
- Grant, R. M. (1996), Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17(10): 109-122.
- Grant, R.M. (1991), The resource-based theory of competitive advantage: implications for strategy formulation. *California Management Review*, 33(3): 114-134.
- Gregoire, D.A., Noel, M.X., Dery R., Bechard J-P. (2006), Is there conceptual convergence in entrepreneurship research? A co-citation analysis of the Frontiers of Entrepreneurship Research, 1981-2004. *Entrepreneurship Theory and Practice*, 30(3): 333-373.
- Gronhaug, K., & Tropp, P. (1988), Perceived social class appeals of branded goods. *Journal of Consumer Marketing*, 2(4): 25-30.
- Hitt, M.A., Ireland, R.D., Camp, S.M., Sexton, D.L. (2001), Strategic entrepreneurship: Entrepreneurial strategies for wealth creation. *Strategic Management Journal*, 22(Special Issue): 479-491.
- Hitt, M.A., Ireland, R.D., Camp, S.M., Sexton, D.L. (2002), Strategic entrepreneurship: Integrating entrepreneurial and strategic management perspectives. In: M. A. Hitt, R. D. Ireland, S.M. Camp and D.L. Sexton (eds.). *Strategic Entrepreneurship: Creating a New Mindset*, Oxford: Blackwell Publishers.
- Hofer, C.W., Schendel, D. (1978), *Strategy Formulation: Analytical Concepts*. West Publishing.

- Huff, A. (1990), *Management Thought Structures and Competitive Positioning*, New York: Wiley.
- Ireland R.D., Hitt, M.A., Sirmon, D.G. (2003), A model of strategic entrepreneurship: the construct and its dimensions. *Journal of Management* , 29(6): 963-989.
- Jauch, L. R., Osborn, R. N., & Martin, T. N. (1980), Structured content analysis of cases: A complementary method for organizational research. *Academy of Management Review*, 5: 517-526.
- Kabanoff, B., Waldersee, R., & Cohen, M. (1995), Espoused values and organizational change themes. *Academy of Management Journal*, 38: 1075-1104.
- Kassirjian, H. H. (1977), Content analysis in consumer research. *Journal of Consumer Research*, 4, 8–18.
- Kirzner, I., (1979), *Perception, Opportunity and Profit: Studies in the Theory of Entrepreneurship*. Chicago: The University Press of Chicago.
- Katsikeas, C. S., Robson, M. J., & Hulbert, J. M. (2004), In search of relevance and rigour for research in marketing. *Marketing Intelligence & Planning*, 22(5): 568-578.
- Kogut, B., & Zander, U. (1992), Knowledge Of The Firm, Combinative Capabilities, And The Replication Of Technology. *Organization Science*, 3(3): 383-397.
- Lee, C., Lee, K., Pennings, J.M. (2001), Internal capabilities, external networks, and performance: a study on technology-based ventures. *Strategic Management Journal* 22(6/7): 615-40.
- Leonard-Barton, D. (1992), Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal* , 13(Special Issue): 111-125.
- Li, H., & Atuahene-Gima, K. (2001). Product Innovation Strategy and the Performance of New Technology Ventures in China. *The Academy of Management Journal*, 44(6): 1123-1134.
- Lumpkin, G.T., Dess, G.G. (1996), Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review* , 21(1): 135-172.
- Mahoney, J. and Pandian, R. (1992), The resource-based view within the conversation of strategic management. *Academy of management review*, 13: 363-380.
- March, J.G. (1991), Exploration and exploitation in organizational learning. *Organizational Science* 2: 71-87.
- Markman, G.D., Espina, M.I., Phan P.H. (2004). Patents as surrogates for inimitable and non-substitutable resources. *Journal of Management* , 30(4): 529-544.
- Maijoor, S., & VanWitteloostuijn, A. (1996), An empirical test of the resource-based theory: Strategic regulation in the Dutch audit industry. *Strategic Management Journal*, 17(7): 549-569.
- McGrath, R.G., MacMillan, I.C. (2000), *The Entrepreneurial Mindset: Strategies for Continuously Creating Opportunity in an Age of Uncertainty*. Boston: Harvard Business School Press.

- McGrath, R. G., Venkataraman, S., & MacMillan, I. C. (1994). The advantage chain: Antecedents to rents from internal corporate ventures. *Journal of Business Venturing*, 9(5): 351-369.
- Meyer A., Tsui, A., Hinings, C. (1993). Configurational approaches to organizational analysis. *Academy of Management Journal*, 36(6): 1175-1195.
- Miller, D., & Chen, M.-J. (1996). The simplicity of competitive repertoires: An empirical analysis. *Strategic Management Journal*, 17(6): 419-439.
- Miles, M. B., & Huberman, A. M. (1994), *Data management and analysis methods. Handbook of Qualitative Research*: 428-444.
- Miller, D., & Chen, M. J. (1996), The simplicity of competitive repertoires: An empirical analysis. *Strategic Management Journal*, 17(6): 419-439
- Mintzberg, H. (1973), Strategy making in three modes. *California Management Review*, 16(2): 44-53.
- Mintzberg, H., Waters, J. (1982), Tracking strategy in an entrepreneurial firm. *Academy of Management Journal* (25): 465-99.
- Morris, M. (1998), *Entrepreneurial Intensity*. London: Quorum Books.
- Nelson, R. R., & Winter, S. G. (1982), *An evolutionary theory of economic change*: Belknap Press
- Norman, P. M., Artz, K. W., & Martinez, R. J. (2007), Does it pay to be different? Competitive non-conformity under different regulatory regimes. *Journal of Business Research*, 60(11): 1135-1143.
- Penrose, E.T. (1959), *The Theory of the Growth of the Firm*. New York: Wiley.
- Pinchot, G. (1985), *Intrapreneuring*. New York: Harper & Row.
- Porter, M.E. (1980), *Competitive strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press.
- Priem, R. L., Butler, J. E. (2001), Is the resource-based theory a useful perspective for strategic management research? *Academy of Management Review*, 26(1): 22-40.
- Rumelt, P. P. (1984), Towards a Strategic Theory of the Firm. *Competitive Strategic Management*, Engelwood Cliffs, NJ: Prentice-Hall.
- Schumpeter, J.A. (1934), *The Theory of Economic Development*. Cambridge, MA: Harvard University Press.
- Selznick, P. (1957), *Leadership in Administration: A Sociological Perspective*. New York.
- Sexton, D., Bowman-Upton, N.B. (1991), *Entrepreneurship: Creativity and Growth*. New York: Macmillan.
- Shaffer, B., & Hillman, A. J. (2000), The development of business-government strategies by diversified firms. *Strategic Management Journal*, 21(2): 175-190.



- Shane, S. and Venkataraman, S. (2000), The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1): 217-226.
- Sharma, P., Chrisman, J.J. (1999), Towards a reconciliation of the definitional issues in the field of corporate entrepreneurship. *Entrepreneurship Theory and Practice*, 23(3): 11-27.
- Sirmon, D.G., Hitt, M.A. and Ireland, R.D. (2007), Managing Resources: Linking unique resources, management and wealth creation in family firms. *Academy of Management Review*, 22(1): 273-292.
- Smith, K. G., Grimm, C. M., & Gannon, M. (1992), *Dynamics of Competitive Strategy*. Newbury Park, CA: Sage Publications.
- Spanos, Y. E., & Lioukas, S. (2001), An examination into the causal logic of rent generation: Contrasting Porter's competitive strategy framework and the resource-based perspective. *Strategic Management Journal*, 22(10): 907-934.
- Stevenson, H., Gumpert, D. (1985), The heart of entrepreneurship. *Harvard Business Review* 63(2): 85-94.
- Stevenson, H.H., Jarillo, J.C. (1990), A paradigm of entrepreneurship: Entrepreneurial management. *Strategic Management Journal*, 11: 17-27.
- Stopford J. (2001), Should strategy makers become dream weavers? *Harvard Business Review* 79(1): 165-169.
- Teece, D. J., Pisano C., Shuen, A. (1997), Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7): 509-533.
- Wernerfelt, B. (1984), A resource-based view of the firm. *Strategic Management Journal*, 5: 171-180.
- Winter, S.G. (2003), Understanding dynamic capabilities. *Strategic Management Journal*, 24: 991-995.
- Wolfenden, P., Welch, D.E. (2000), Business architecture: A holistic approach to defining the organization necessary to deliver a strategy. *Knowledge and Process Management*, 7(2): 96-106.
- Woodrum, E. (1984). "Mainstreaming" content analysis in the social science: Methodological advantages, obstacles, and solutions. *Social Science Research*, 13, 1-19.
- Young, G., Smith, K. G., & Grimm, C. M. (1996), "Austrian" and industrial organization perspectives on firm-level competitive activity and performance. *Organization Science*, 7(3): 243-254.
- Yu, T. (2007). Rivalry between Multinational Enterprises: An Event History Approach. *Academy of Management Journal*, 50(3): 665-686.



## APPENDIX

Table 1: Correlations

		Economic_Resseccion	Op_Profit	SE	Financial_assets	technology_assets
Economic_Resseccion	Pearson Correlation	1	-.384(**)	-.063	.000	-.098
	Sig. (2-tailed)		.000	.543	.999	.344
	N	95	93	95	95	95
Operations_Results	Pearson Correlation	-.384(**)	1	.331(**)	-.173	.121
	Sig. (2-tailed)	.000		.001	.098	.249
	N	93	93	93	93	93
SE	Pearson Correlation	-.063	.631(**)	1	-.627(**)	-.596(**)
	Sig. (2-tailed)	.543	.001		.000	.000
	N	95	93	95	95	95
Financial_assets	Pearson Correlation	.000	-.173	-.627(**)	1	.717(**)
	Sig. (2-tailed)	.999	.098	.000		.000
	N	95	93	95	95	95
technology_assets	Pearson Correlation	-.098	.121	-.596(**)	.717(**)	1
	Sig. (2-tailed)	.344	.249	.000	.000	
	N	95	93	95	95	95

\*\* Correlation is significant at the 0.01 level (2-tailed).

Table 2: Coefficients for resources with dependent variable: operations result

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	207.289	75.891		2.731	.008
	Financial_assets	-180.453	48.711	-.506	-3.705	.000
	Human capital	136.692	37.375	.309	4.045	.000
	Technology_assets	250.516	71.958	.476	3.481	.001
2	(Constant)	-684.735	222.638		-3.076	.003
	Financial_assets	-107.231	47.967	-.301	-1.836	.098
	Human capital	206.522	42.179	.412	1.918	.059
	Technology_assets	319.696	68.063	.607	4.697	.010
	SE	1222.611	289.824	.490	4.218	.000

Table 3: Coefficients for economic recession with dependent variable: operations\_results

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	394.413	88.727		4.445	.000
	Economic_Recession	-665.390	167.808	-.384	-3.965	.000
2	(Constant)	-138.200	194.022		-.712	.478
	Economic_Recession	-600.243	162.035	-.346	-3.704	.040
	SE	712.457	233.351	.285	3.053	.003

# **The Impact of Deregulation and Liberalization in the Nigerian Air Transport Industry: An Overview**

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## **Abstract**

The effect of globalization is fast showing its attendant effects on the Nigerian aviation industry leading to an increase in passengers' traffic movement in Nigeria's airports. More importantly, there seems to be a paradigm shift which affects ownership and administration of operation in the Nigerian aviation industry. This study examines among others the impact of deregulation and liberalization in the Nigerian air transport industry; the effects of the latter on operation and control changes that affect operational efficiency in the airline business; and the impacts of liberalization on attracting foreign direct investment and foreign airline participation in the Nigerian aviation industry. The methodology used for this study is documentary research, which entails search of existing published and unpublished documents and databases of stakeholders in the Nigerian aviation industry and external sources with affinity to the sector. The results of this study reveal that an unprecedented growth has been recorded in Nigeria. It includes among others: healthy competition needed for growth and development; increased participation in the industry by foreign airlines; increased foreign direct investment in the airline business and airport infrastructure development.

**Keywords:** Deregulation, Globalization, Foreign Direct Investment, Nigerian Air Transport, Infrastructure, Economic Growth

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## 1. INTRODUCTION

Globalization impacts are fast revealing their significance in all fabrics of developing economies. The Nigerian air transport, no doubt benefited from the global economic new order of business transaction and promotion. Globalization brought complex network involving flows of information, commodities, parts and finished goods have been set, which in turn demands a high level of command of logistics and freight distribution (Rodrigue et al, 2006). According to Janelle and Beuthe (1997:199), 'In its simplest form, globalization refers to the increasing geographical scale of economic, social and political interactions. These include the expanding mobility of capital and investment transactions and the growth of tourism, global conferences and sporting event'.

Also, the major dividends of globalization reflect more a new paradigm of economic intervention to consolidate the globalist idea. The Nigerian aviation sector is a beneficiary of the retooling of the global economic structure. Its impact on the aviation sector is enormous. The benefits range from increased passenger traffic to, inter alia, foreign direct investment, institution development and airport development etc.

Furthermore, globalization is anticipated to cause substantial increase in international passengers and freight movements and low cost communication. Transport networks have suddenly became a veritable instrument in the global manufacturing and marketing enterprise (Adeniji, 2000). Nigeria can take advantage of the opportunities to upturn the woes of its economy.

The cumulative effect of globalization, liberalization, deregulation and privatization of air transport in Africa, and specifically Nigeria, was initiated in 1988 under the Yamoussoukro Declaration. This declaration called for the liberalization and integration of air services to pave the way for the African Continent to actively participate in the globalization process and regional development.

Similarly, Janelle and Beuthe (1997) point to the spatial implications of globalization for tourism and the transport link that relates to improved accessibility for tourism economies. In this light, its impact resulting from deregulation, liberalization of critical sector such aviation sector in a developing economy is needful. The deregulation of the air transportation in Nigeria has brought gains. Therefore, such impacts need to be stressed

and examined. In this light this paper examined the impacts of deregulation in the Nigerian air transport sector. The methodology employed for writing this paper is documentary searches, which entails search of existing published and unpublished document and databases of stakeholders in the Nigerian aviation industry, and external sources in affinity with the sector.

This paper is divided into five sections. Section one is the introduction, and section two deals with the aviation industry in Nigeria. Section three examines air transport deregulation impact on economic, infrastructural, social and tourism development. Section four examines the changes in ownership structure, institutions, infrastructure control and foreign direct investment attraction. Also, it examines the increased interest of domestic and foreign airline to participate in Nigeria aviation sector. Last, section five is the conclusion.

## **2 THE NIGERIAN AVIATION INDUSTRY – AN OVERVIEW**

### **2.1 NIGERIAN HISTORICAL DEVELOPMENT OF AIR TRANSPORT**

The development of air transport in Nigeria had been dated back to the colonial period administration in Nigeria. The first flight into Nigeria was a British Royal Air Force (RAF) fighter that landed on a polo ground in Kano in 1925. After the maiden flight into Nigeria, the RAF began yearly flight to Kano and Maiduguri from Sudan, relying solely on available intelligence reports and navigational aids on the aircraft (Ajulo, 2002).

The commercial aviation started in Nigeria when Imperial Airlines commenced regular flights between UK and Nigeria in 1935. The development of one aerodrome was enhanced in start of the Second World War. By 1940, all the airports proposed for Nigeria had been completed.

At the end of the Second World War, the British Overseas Airways Corporation operated passenger and mail services between Lagos, Port-Harcourt, Enugu, and Jos. During this period, services were largely restricted to government business. The services then also linked Nigeria with the British West African colonies (Gold Coast now Ghana and Sierra Leone).

The West African Airways Corporation (WAAC) was established on May 15<sup>th</sup>, 1946, starting commercial air transport in the West African region. The West African Airways Corporation

(WAAC) broke up in 1957 when Ghana gained independence to form its own airline. As a result, the assets of WAAC were shared and Nigeria inherited some aircraft and landing properties which were eventually transferred to the newly formed company called the West African Airways Corporation (Nig) Limited. The new company was incorporated by the Federal Government in partnership with BOAC and Elder Dempster Limited on 23<sup>rd</sup> August 1958, with the Certificate of Incorporation No 1740 (Filani 1978:339).

By 1961, WAAC was re-registered and renamed Nigerian Airways Limited (NAL), after the government's acquisition of the combined interest of BOAC and Elder Dempster Lines. During this period, airline operations were only within the enclave of Nigerian Airways, which had the monopoly of operating scheduled services, and a number of private companies that later obtained licenses to operate charter flights.

Before 1970, Nigeria had two airports; the 1970-74 Second National Development Plan envisaged the development and construction of seventeen modern airports with up – to – date facilities (Filani, 1978:346).

## **2.2 NIGERIAN AIR TRANSPORT INSTITUTIONS**

The Nigerian aviation industry witnessed rapid growth from the oil boom period of the early 1970's till the era of military exploitation. During the pre–military era, the industry was transformed into a multifaceted, profit driven sector of the national economy. There was tremendous growth in the number of operators, airports and passenger traffic. The industry, however, witnessed serious decline mainly due to growing cost, poor management, bad policies and unfriendly investment environment during past military administrations.

Upon the restoration of democratic ideals, genuine demonstration on the part of Government to deregulate the economy attracted investor confidence in the aviation sector. Until January 2007, the policymaking institution for the aviation sector in Nigeria was the Federal Ministry of Aviation. The Ministry was restructured in late 2006, for better coordination of all transportation modes through the creation of the Federal Ministry of Transportation, having segment for modal integration as land transport – road and rail, water transport – maritime and air transport – aviation. The Ministry is headed by the Minister of Transportation who is the chief minister and supported by two Ministers of State for water and air transport respectively (Report on the FEC weekly meeting, Dec 2006).

The Federal Ministry of Transportation (Air Transport), since then, assumes the role of the most important policymaker for the country's aviation industry. The functions and responsibilities of the Ministry include:

- i. Formulation and implementation of policies and programs to provide a superior aviation environment in line with the conventions of international agreement;
- ii. Overall supervision and regulation of the civil aviation industry, including airport development and management, manpower development, etc;
- iii. Development and management of airports;
- iv. Provision of air safety and other aeronautical services in all airports within Nigeria;
- v. Provision of meteorological facilities and overseeing of training in the field of aviation meteorological services.

The Ministry has 6 Departments, 3 units, 5 parastatals and a permanent Representative in Montreal, Canada. The six Departments are:

- i. Department of Air Transport Management (DATM);
- ii. Department of Safety and Technical Policy;
- iii. Department of Accident Investigation and Prevention;
- iv. Department of Planning, Research and Statistics;
- v. Department of Finance and Supplies;
- vi. The Department of Personnel Management.

The three units are:

- i. The Legal Unit;
- ii. The Press Unit;
- iii. The Internal Audit Unit.

The Parastatals are:

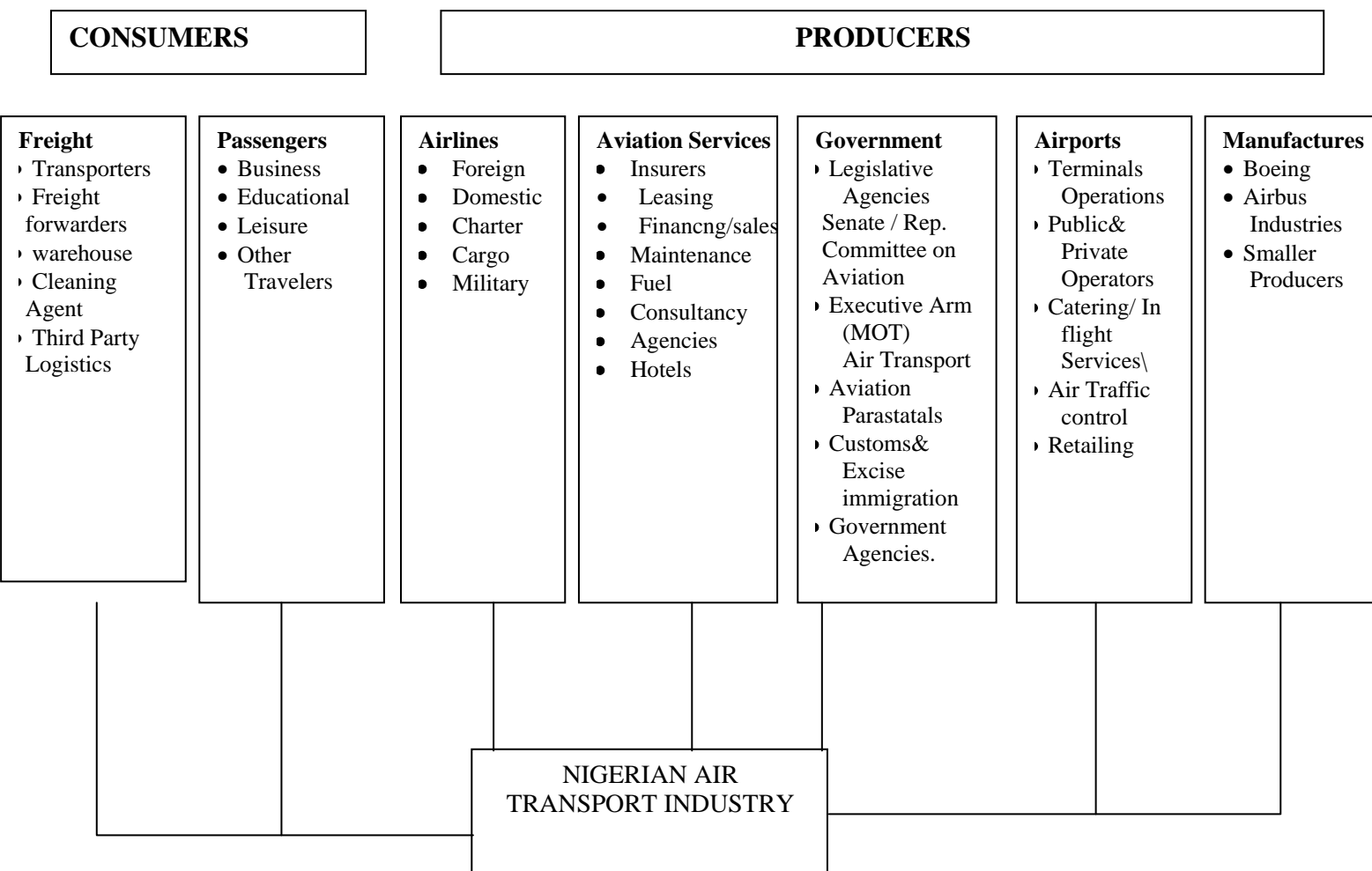
- i. The Nigeria Civil Aviation Authority (NCAA);
- ii. The Federal Airports Authority of Nigeria (FAAN);
- iii. The Nigerian Airspace Management Agency (NAMA);
- iv. The Nigerian Meteorological Agency (NIMET);
- v. The Nigeria College of Aviation Technology (NCAT);

Source: (<http://www.ministryofaviationng.org>)

The Nigeria Bureau of Public Enterprise is the government institution charged with the privatization of public sector owned enterprises in Nigeria and the National Privatization Council (NCP) provides the enabling environment for the investor's participation in the privatization of government owned enterprises (Federal Government of Nigeria 2008).

In the Nigerian aviation industry, aside the government functionaries are the stakeholders that include: the airlines, aviation services, airports, manufacturers etc. Figure 1 shows the structure of the Nigerian air transport sector, its constituent parts, producers and consumers. In fact, the air transport industry in Nigeria is fast reaping the gains of globalization and deregulation.

**Figure 1: Nigerian Air Transport Industry**



Source: Author's adaptation from (ATAG, 2000)



### 3. DEREGULATION IN THE NIGERIAN AIR TRANSPORT INDUSTRY

The major distinctive feature of globalization is deregulation. Deregulation, privatization and liberalization are seen as gains of retooling the economic system to favour expansion, economic growth, capital flight and foreign direct investment. (Page, 2005) asserts that globalization inevitably produces 'Winners and Losers' in the pursuit of business, and recognize deregulation as one of the distinctive process associated with it.

The Nigerian air transport industry has no doubt benefited from the policy innovation gains intrinsic and outside the deregulation policy framework. Few attempts have been made from mid-1980s towards commercialization and privatization in Nigeria aviation. It was first documented in the report of T.C.P.C (Technical Committee of Privatization and Commercialization), which classified the then Nigerian Airport Authority for partial commercialization in 1985, and subsequently classified NAA for full commercialization in 1989 (OECD 2006 Report on Nigeria, African Express Outlook).

However, this period characterized a blur picture in the Nigeria aviation history because of the political instability. During this period, investment in the Nigeria aviation industry is considered too risky and not viable. Passenger traffic and other activities at the airport dwindled tremendously. The industry witnessed serious decline mainly due to growing cost, poor management, bad policy and unfriendly investment environment during past military administrations.

The Yamoussoukro declaration seems the advent of a new African Civil Aviation policy adopted on 7<sup>th</sup> October 1988. This declaration called for the liberalization and integration of air services to pave the way for the continent's to actively participate in the globalization process and regional development (Idrisu, 2004). In line with this declaration, the government policy in the late 1980s and early 1990s were directed in the direction of liberalization and limited or guided deregulation of the air transport market.

Prior to 1989, the regulation of the aviation industry as well as provision of air traffic services were carried out by the Civil Aviation Department (CAD) of the Federal Ministry of Aviation. Further to the adoption of the National Policy on Civil Aviation of 1988 by the Federal Government, the Federal Civil Aviation Authority (FCAA) was established under decree 8 of 1990 as an aviation regulatory body and took over the function of CAD.

This period mark the advent of liberalization and deregulation of the Nigerian aviation industry. The national flag carrier, Nigeria Airways, was beset by administrative and financial difficulties (its fleet declined from 28 to 4 aircraft between 1978 and 1988 and 2 in 1999, while its debt portfolio rose to nine – figure level (Momodu, 1993 cited in Idrisu, 2004) . Also some of its fleet was confiscated abroad because it could not offset debt portfolio owned abroad. To meet the growing demand for air services with the shrinking performance of Nigerian Airways, the government removed market restrictions and allowed a number of private companies to operate air transport services.

The inconsistency in policy direction afterwards, caused major flaws which acted against healthy competition and the ability to attract foreign direct investment. The Nigeria Airport Authority (NAA) which had earlier been carved out of the CAD in 1979 to manage Nigerian Airports was an example. Towards the end of 1995, the government undertook a re-organization of some government agencies in the aviation industry; as a result, the FCAA was scrapped. New Directorates of Safety Regulation and Monitoring (DSRAM) and Economic Regulatory and Monitoring (DERAM) were established in the Federal Ministry of Aviation, to replace the safety and economic regulatory function of the defunct FCAA while Air Traffic Service (ATS) and Airport Department were merged with the former NAA to form Federal Airports Authority of Nigeria (FAAN).

This re-organization of government agencies left a vacuum because of the inefficacy of the new arrangements to activate the needed competition and provide a reliable, effectual regulatory framework to stimulate competition among the new operators. In addition, because of the political instability that characterized this period, investor confidence in Nigeria aviation sector dwindled. The operators licensed to operate during this period often had their fleet phased out and depended on aged aircraft, thus experienced increasing costs, risk, erratic air service schedule, passenger delay and ineffectual service delivery. In conclusion, the military era with sterile institution and misconception of needed policy direction characterized a first but failed attempt to liberalize and deregulate the Nigerian air transport industry.

### **3.1 POST MILITARY ERA**

The restoration of democratic ideals on May 29<sup>th</sup>, 1999, was the beginning of innovation in governance. There was genuine demonstration on the part of Government to deregulate the

economy and growing investor confidence in the nation. The stage is set for vibrant and profitable aviation sector.

There was a remarkable paradigm shift and attention of government to ideally deregulate the sectors of the economy. Aviation is one of the earmarked sectors to benefit from the dividend of democratic ideals. It was conceived to allow the country to also benefit from the deregulation experience of US in 1978 and later Europe and Australia. (Debbage, 2004) argues that deregulation in North America was also a springboard for aviation strategies later adopted in Australia and those planned for the EU.

Immediately, the government set up institutions that would oversee the privatization of the sectors of the Nigerian economy. The Bureau of Public Enterprise was charged with this responsibility. Also, the restructuring of the Aviation agencies was carried out. Indeed, it can be said that between the periods 1999 – 2007, there was a remarkable restructuring of agency and institutions for the deregulation of the aviation sector after the failed attempt during the military era.

The Department of Safety Regulation, Monitoring and Economic Regulatory (DSRAM) of Federal Ministry of Aviation was carved out into NCAA, which is the economic and technical regulator of the aviation industry. It consists on local and international legal status. NCAA was established according to the decree 49/1999, and among others, refers to the statutory responsibilities of regulation, monitoring and promoting of the safety, security and reliability of air navigation in the Nigerian Civil Aviation sub-sector in line with the International Civil Aviation Organization (ICAO) standards and recommended practices (SARPS). The Authority effectively commenced its operations on 1<sup>st</sup> of January, 2000. This is the responsible body for setting the standards of the International Civil Aviation Organization (ICAO) activities and ensuring that states fulfill the obligations provided in the convention of International Civil Aviation.

The body, according to its conditions, requires all member states to establish a suitable state organization to be known as civil aviation authority charged with necessary powers to ensure compliance with air navigation regulations promulgated by the state. Nigeria as a signatory to the convention and desirous to maintain its ICAO membership had to fulfill this obligation. In this framework and responding to the requirements of the aviation industry

stakeholders, the Federal Military Government, prior to its fall, enacted Decree 49 of 1999 establishing the NCAA.

Moreover, in the same period, the Act No 48 established the Nigerian Air Management Agency (NAMA) on 26 May 1999, as a body to corporate with perpetual succession and common seal. The Agency operates under Nigerian laws, rules and regulations based on the framework established in the Chicago convention, which regulates International Civil Aviation. The statutory function of the agency is to provide a safe, secure, efficient and economic air navigation service according to the international standards.

Remarkably, on 16th May, 2001, the Federal Executive Council (FEC) approved the transformation of the Department of Meteorological services of the Federal Ministry of Aviation into the Nigerian Meteorological Agency (NIMET). The bill for the establishment of NIMET was passed into law by the National Assembly in June 2003. The establishment of NIMET as an autonomous Agency, which had been elusive for nearly 20 years, remains one of the landmark achievements of advent of democratic government in Nigeria towards the deregulation of Nigeria air transport industry.

Taking into account the abovementioned, the Federal Airport Authority of Nigeria (FAAN) was established in August 1995, in order to carry out the functions of two erstwhile organizations -The Nigerian Airport Authority (NAA) and Federal Civil Aviation Authority (FCAA). The Federal Airport Authority of Nigeria (FAAN) maintains and manages the 22 Airports of the country on behalf of the Federal Government – who is the owner of these facilities. The Bureau of Public Enterprise classified FAAN for privatization in 2001. By 2007, FAAN has begun to assume a landlord model with a concessionaire, under a BOT partnership arrangement to build, operate and transfer the Muritala Mohammed Terminal II (MMA 2) after 35 years. Indeed, this is one of the dividends of deregulation.

#### **4 THE IMPACT OF DEREGULATION AND LIBERALIZATION IN NIGERIAN AIR TRANSPORT**

The positive impact of deregulation and liberalization is obvious in the Nigerian air transport industry. Thus, this section tends to highlight and discuss the impact of deregulation and liberalization in Nigerian air transport industry.

One of the major advantages of deregulation in the Nigerian air transport industry is the entry of new operators, which injected fresh capital into the sector. The total amount of fund injected is estimated for about US \$5 billion in the next three years. The Boeing Company reported orders that Nigerian airline, namely Arik Air, has ordered 15 new planes with list price of \$1.8 billion. (Allafrica, 2008)

**Table 1:** Number of Arik Air present and ordered fleet (at March 2008).

AIRCRAFT	TOTAL	ROUTE	NOTES
Boeing 737-322	2	Domestic and Regional Routes	
Boeing 737-700	4	Domestic and Regional Routes	6 on order.
Boeing 737-800/900	0		17 on order.
Boeing 777-200LR	0		2 on order (delivery 2011).
Boeing 787-300ER	0		3 on order (delivery 2011).
Boeing 787-9	0		7 on order (delivery 2011).
Bombardier CRJ-900ER	4	Domestic and Regional Routes	3 on order
Bombardier Dash 8 Q300	3	Domestic Routes	Lease from Denim Air.
Bombardier Dash 8 Q400	0		4 on order
Hawker Executive Jets 800XP	2		

**SOURCE:** The 2008 Arik Air Press Releases

Similarly, Virgin Nigeria has made an investment that worth over \$250 million dollars, which includes the initial equity contribution made by the investors of the establishment of Virgin Nigeria (Virgin News, 21 February 2008). In the past two years, Virgin Nigeria has built up a

global staff of over 1,200 personnel, operating a fleet of 10 aircraft. In addition, it has recently ordered 24 Embraer aircraft as part of its expansion program.

The significant impact of deregulation in the case of air transport, freight tonnage and passenger traffic, is the increase of 54 percent and 9.4 percent per annum, respectively, during the period 2000 to 2004.

**TABLE 2: SHOWING NIGERIAN AIR TRANSPORT BASIC DATA 2001-2005.**

DESCRIPTION AIR TRANSPORT.	2001	2002	2003	2004	2005
Loaded Freight (000 tonnes)	6.06	7.53	13.28	21.91	48.31
Unloaded Freight (000 tonnes)	50.46	47.94	57.70	62.53	78.17
Passengers Departing (Numbers)	2,633,173	3,074,893	3,607,190	4,124,027	4,207,503
Transiting passengers(Number)	139,503	91,944	166,581	57,480	215,173
Arriving passengers (Number)	2,590,982	2,978,625	3,526,398	4,016,061	4,104,303
Aircraft Landing (Number)	62,572	70,613	85,764	99,385	92,830
Aircraft Take Off	62,506	70,050	85,731	99,118	93,006.

**SOURCE:** The 2006 Annual Report of Federal Ministry of Aviation, Nigeria

The statistics from Federal Ministry of Aviation in Table 2 substantiate the statistics from OECD 2006, African Economic Outlook report on Nigeria. The route development in both domestic and international network has been so far encouraged. Major airlines such as Arik Airline, Virgin Nigeria, Bellview and Aero contractors have expanded their regional network and regarding International routes they are now linked with countries such as USA, UK and other African countries. This is a significant development step because it would further attract more investments portfolio into the operation and expansion of these airlines. The

Table 3 shows the Virgin Nigeria fleet as at March 2008 and number of orders from the major aircraft manufacturers and air leasing company.

**TABLE 3:** Showing Virgin Nigeria Airways Fleet (At March 2008).

AIRCRAFT	TOTAL	PASSENGERS (BUSINESS/ECONOMY)	ROUTE	NOTES
Boeing 737-300	5	116(16/100)	Short and Medium Haul route	Leased from GECAS.
Boeing 767-300	2	213(25/188)	Medium and Long haul route	Leased from Latcharter.
Embraer 170	(7orders)	67(7/60)	Short haul Region service	Entry into service:2008 Deliveries:2008-2011
Embraer 190	(3orders)  (6options)	(12/84)	Short haul Regional service	Entry into service: 2008 Deliveries 2008-2011 8 purchase right.
Fokker	2	50(0/50)	Short haul Domestic services.	Leased from Denim Air

**SOURCE:** The 2008 Virgin Nigeria Press Releases

The deregulation has provoked spatial effect similarly to the spatial structure in air travel that had emerged in the USA. Thus, creating hubs, a cost solution for airlines is given (Chou, 1993; Shaw, 1993; O'Kelly, 1983) (cited in Page, 2005). Such spatial patterns are beginning to emerge in Nigerian airspace leading to formulation of hub and spoke airline

operation structure as to strategies for organizing airlines operation. Thus, a geographical concentration of airline hubs in few Nigerian cities was created.

This is laid down in the deregulation regime and the position the aviation sector in proper perspective of financial solvency. And to avert further air mishap in the country due to the incessant mishap between the periods of 2002-2006, which had provoked the lost of many lives, the Federal Government of Nigeria, through its supervisory agency requests the operating airlines to recapitalize. The policy actually would help to phase out weak airlines and to adopt strategic planning options as the acquisition in the case of NICON airways purchases equity of EAS Airlines and Virgin Nigeria purchasing equity in Nigerian Airways. Ancillary activities involve development in different options among airline operators in Nigeria. Some airlines now offer scheduled flights to tourism destinations in Nigeria. The Wings Aviation that operates daily flights to Obudu Cattle Ranch, a foremost tourist site in southern part of Nigeria, is an example.

The following airlines were approved by the NCAA after the recapitalization exercise on the 1<sup>st</sup> of May, 2007:

1. Aero contractors – <http://www.flyaero.com>
2. Afrijet Airlines – <http://www.afrijet.com>
3. Allied Airlines – <http://www.alliedaircargo.com>
4. Associated Airlines – <http://www.associationaviationlimited.com>
5. Bellview Airline – <http://www.flybellviewair.com>
6. Chanchangi Airlines – <http://www.chanchngi.com>
7. Dornier Aviation Nigeria Limited – [no website]
8. NICON Airways – <http://www.niconairways.com>
9. IRS Airlines - <http://www.irs-airlines.com> or <http://www.irsairlines.net>
10. Overland Airways – <http://www.overland.aero>
11. Air Midwest – [New entrant]
12. Arik Air – <http://www.arikair.com>
13. Virgin Nigeria – <http://www.virginnigeria.com>

The following airlines didn't meet the requirements:

1. ADC – <http://www.adcairlines.com>
2. Sosoliso Airlines – <http://www.sosolisoairline.com>
3. Fresh Airlines – <http://www.freshairlines.com>



4. Albarka Airlines
5. Dasab Airlines
6. Space World Airlines.

The fate of some other charter companies still unknown:

1. Kabo Air – <http://www.kaboair.com>
2. Wings Aviation
3. King Airlines – <http://www.kingairlines>

It is worth mentioning that the impact of deregulation of air transport in Nigeria caused the establishment of MMA 2, which is a perfect example of Public Private Partnership. The new terminal building in Muritala Mohammed Airport which can process over five million passengers per annum, far in excess of the current volume. The MMA 2 was an arrangement between the Bi – Courtney on Build, Operate and Transfer (BOT) and the government. The domestic passenger volume for the Lagos airport reached 1.6 million (Odunlami, 2008). The new terminal building in Muritala Mohammed Airport can process over five million passengers per annum, far in excess of the current volume.

The investment in hanger operations by one of the operating airlines in Nigeria is a significant and noteworthy advantage of deregulation in Nigerian air transport Industry. The Afrijet Airlines invested in the construction of private hanger operation in order to be used by the domestic and foreign airline operators in Nigeria. The investment amount was above US \$1.5 million and has significantly contributed to the airline operations in Nigeria.

In addition to the positive impact of deregulation, the Nigerian Civil Aviation Authority gave license to small operators outside the regular schedule service in the domestic and regional operations, to private companies with many fixed wings aircraft and helicopters servicing the oil fields as well as an increasing number of corporate and private aircraft (Idrisu, 2004). He went further to stress that some multinational oil companies have constructed their own airport to enhance the movement of both materials and workers in their onshore and offshore operations. An example is the Osubi Airport in Warri, Nigeria, owned and managed by Shell Petroleum Development Company.

## **5 OWNERSHIP AND INSTITUTIONAL CHANGES IN NIGERIAN AIR TRANSPORT**

It is important to note the ownership structure, institutional changes in Nigerian air transport, infrastructure control, foreign direct investment, increased interest of domestic and foreign airline participation in Nigerian aviation industry.

The last Administration, 1999 to 2007, made an effort to liberalize and deregulate the Nigerian economy. Some institutions were established to monitor the full liberalization of the economy. The Bureau of Public Enterprise and the National Council of Privatization were established to be charged with this responsibility. The Nigeria aviation industry was marked as one of the critical sectors for ownership and institutional changes, as well as to create open access for infrastructural development. In year 2000, the Nigerian Airways were noted for merger, before it was finally merged in year 2004. The partnership investor was Virgin Atlantic who acquired the 49% of the airline and the Nigeria investor of different corporate sub-sector acquired the 51% in the new deal. The merger gave birth to Virgin Nigeria which started operation on the 24<sup>th</sup> September, 2004.

The NCAA was created from the Directorates of Safety Regulation and Monitoring of the Federal Ministry of Aviation. This was done to conform to ICAO recommendation, as well as to provide a framework for the deregulation and liberalization agenda of the Federal Government of Nigeria. Also, the NAMA, the Nigerian Airspace Management Authority (NAMA), was responsible for the provision of seamless Air Traffic Management Services for the local and International airline operators. The Nigerian Meteorological Agency (NIMET) bill was signed into law by the National Assembly in June 2003, full autonomy granted to provide accuracy, timely weather/climatic data to enhance airline operations, maritime navigation and urban development.

The private sector involvement in the Airport development in Nigeria was a reality. In 2002, the MMA 2 was conceded to Bi-Courtney Ltd; it was the first PPP project for Airport development in the history of Nigeria. Part of the Muritala Mohammed terminal was leased to an investor for a period of thirty five years. This arrangement led to the massive investment of Bi-Courtney in the airport terminal development, the construction of four -star hotel and a conference hall close to the new terminal. (Graham, 2001) (Cited in Page, 2005:280) says the "Airport are an essential part of the air transport system. They provide the entire infrastructure needed to enable passengers and freight to transfer from surface to

air modes of transport and to allow airlines to take off and land. The basic infrastructure consists of runways, taxiways, apron space, gates, passenger and freight terminals and ground transport interchanges”.

The institutional and ownership changes attracted foreign direct investment. The total estimated foreign direct investment portfolio in the sector both now and in the next five years is estimated for about US \$10 billion. This has been made possible by the institutional re-arrangement to facilitate injection of new funds into the sector. Also increased foreign airline participation, such as Delta Airlines, Qatar Airways, South African Airways, Air France, Turkish Airlines etc enhanced the air transport sector in Nigeria.

## **6. CONCLUSIONS**

The impact of deregulation and liberalization in the Nigerian air transport industry is positive. The sector is growing continuously, expanding market and investment opportunities and an aura of investment opportunities. In this way, it will significantly contribute to the enhancement of the Nigerian economic development.

The sector, since deregulation, has attracted new entrants, increased foreign direct investment, increased domestic and foreign airline participation, private sector participation in airports and infrastructural development, increased investment portfolio in airline business etc.

Also, the effect of deregulation and liberalization in the Nigerian aviation industry has provoked a spatial pattern and structure. Formulation of hub and spoke structure of airline operations is obvious in airline operations in Nigeria. The geographical concentration of airline operations in Murtala Mohammed international airport , Lagos and Nnamdi Azikiwe international airport, Abuja as the operational hubs for most airlines of the country for national, regional and international flights. This is a remarkable effect of deregulation and liberalization of the Nigerian aviation Industry.

Lastly, the institutional framework and operational capacity have been enhanced. The policy formulation framework has been strengthened towards innovations and competitive régime, thereby inducing effectiveness, efficiency and reliability in the operations and management of airline business in Nigeria.

## REFERENCES

- Adeniji K (2000), Transport Challenges in Nigeria in the Next two decades, *Nigeria Institute of Social and Economic Research (NISER) Transport Studies Unit*.
- Ajulo S.B. (2002), *Aviation Handbook*, Volume 1, Vantage Publishers Limited, Ibadan, Nigeria.
- AllAfrica (2008), *Airlines in Ambitious Fleet Modernisation Plans*, Available from: <http://www.allafrica.com/stories/200801141788.html> (accessed on 18/6/2008)
- ATAG (2000), *The Economic Benefits of Air Transport*, Brussels: ATAG.
- Debbage, K. (2004), Airlines, airports and International aviation, in L. Pender and R. Sharply (eds.) *The Management of Tourism*, London: Sage.
- FEC (2006), *Report on Federal Executive Council weekly meetings*, Abuja, Nigeria, Dec. 2006. Federal Ministry of Aviation (2006) *The 2006 Annual Report of Federal Ministry of Aviation, Nigeria* from: [http://www.ministryofaviation.org/annual\\_report](http://www.ministryofaviation.org/annual_report) (accessed 24/3/08)
- Filani M.O. (1978), Air Transport, In: J.S Oguntiyinbo (ed). *Geography of Nigeria, Ibadan, Heinemann*
- Idrisu D.I (2004), *Air Transport Liberalization and Open Skies Agreements in Africa – The Regulatory and Commercial Implication for Nigeria*. Unpublished PhD thesis, St. Clements University
- Janelle, D. and Beuthe, M. (1997), Globalization and research issues in transportation, *Journal of Transport Geography*, 5(3): 199 – 206.
- Page S .J (2005), *Transport and Tourism, Global Perspectives (2<sup>nd</sup> edition)*, Harlow: Pearson Education.
- Odunlami N (2008), Thoughts on MMA2, *The News, Vol 30, No 15, April 21, 2008*
- OECD Report (2006), *African Economic Outlook on Nigeria*, Organization for Economic Cooperation and Development (OECD), Paris.
- Rodrigue P.T., Comtois, C. and Slack B. (2006), *The Geography of Transportation Systems*, Oxford: Routledge.
- Virgin Nigeria (2008), *Virgin Nigeria's Nigerian Shareholders Statement on the Relocation order by the Federal Government of Nigeria*, In: VNA Press Release, 21 February 2008.
- Virgin Nigeria (2008), *Virgin Nigeria's Airways Press Releases*, Virgin Nigeria 2008 online Reports [www.virginnigeria.com](http://www.virginnigeria.com) (accessed 19/6/2008)
- Arik Air (2008), *Arik Air Airways Press Releases*, Arik Air 2008 online Report, [www.arikair.com](http://www.arikair.com) (accessed 19/6/2008).

- Federal Government of Nigeria (2008), *Privatization and liberalization of Government enterprise* , available from: <http://www.nigeria.gov.ng/privatisation> (accessed 20/3/2008)
- NCAA (2008), *Number of Airline after recapitalization*, available from: <http://www.ncaa.gov.ng/airline/recap> (accessed 8/4/2008).

# The Viability of Long-Haul, Low Cost Business Models

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## Abstract

Recent events have confirmed the concerns that many within the aviation industry have held about the viability of the low cost business model for long-haul operations. This paper begins by reviewing the operating cost differences between low cost carriers (LCC) and legacy airlines in different regions of the world. This is followed by a summary of the various cost advantages of low cost carriers operating in short-haul markets. The main focus of the work, however, is a cost simulation involving the use of a Boeing 767-300 by both a LCC and a legacy carrier under varying operating assumptions. The research demonstrates that in none of the cases cited is the LCC cost advantage greater than 10%.

**Keywords:** long-haul, low cost carrier; operating cost simulation; legacy carrier; LCC business model.

## 1. INTRODUCTION

The concept of long-haul, low cost carriers (LCC) goes as far back as 1977, when UK based Skytrain commenced services between London and New York, subsequently adding Los Angeles and Miami. It used DC-10s and pioneered some of the low cost carrier characteristics that are evident today, such as: a single class seating configuration featuring 345 seats; operated only on a point-to-point basis; while the in-flight catering was purchased. Unfortunately, Skytrain was out-priced by the competition. In 1983 a US based

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low cost carrier known as People Express started international operations from New York to London Gatwick, later adding Montreal and Brussels. It sold premium class seats and charged US\$3 for checked baggage, a practice that has resurfaced today. However, over-expansion and management problems led to its demise in 1987. Francis et al. (2006) provided some insight into the reasons for the demise of the long-haul, low cost carriers and explained that the regulatory constraints of international markets had impacted their competitiveness. In addition, some features that are associated with short-haul, low cost operations are less compatible with the low cost, long-haul business model, such as: seat pitch of 29", no meals, and no in-flight entertainment system. Only charter airlines and hybrid leisure companies operating a mix of scheduled and charter services have been able to operate long-haul services profitably over many years. Charter airline long-haul services have up to now been restricted to leisure destinations. These are sometimes operated for a limited number of months (seasonal) and generally with low frequencies (often only once a week). They also offer a premium class with more comfortable seating and enhanced in-flight service. Almost 80% of UK long-haul charter traffic in 2007 was destined for holiday destinations in either North America (mainly Florida) or the Caribbean.

Low cost carriers have flourished on short haul markets throughout the world as their low costs give them a significant competitive advantage over the legacy carriers. This has allowed them to offer low fares, which in turn has persuaded passengers to switch from full service airlines, while at the same time stimulating new passengers who otherwise might not have travelled. Dunn (2009) reports that low cost carriers have captured 44.8% of the European market, 30.6% of the North American market, 15.4% of the Asia Pacific market and 7.2% of the South American market in 2008. Ito and Lee (2003) argued that LCC were no longer a niche segment restricted to particular geographic regions, which indicates that the next phase of their business model might be the transition into long-haul operations. Dobruszkes (2009) stated that European low cost carriers have undergone a recent evolution towards greater geographical diversification and evidence of this can be seen from Norwegian as it now serves Dubai, Turkey, Egypt and Morocco from its base at Oslo.

Many variations of the low cost carrier model exist and subsequently there are distinct differences between these carriers in areas such as: flight products, stage length, productivity, unit cost and marketing agreements. Indeed, the variety of carriers that regard themselves as LCC is now so broad, it makes categorisation extremely difficult. Some airlines in Europe for example which promote themselves as LCC, such as Air Berlin and Flybe, have

many attributes of traditional legacy carriers, while others, such as Monarch and TUIfly, have evolved into leisure hybrids undertaking significant charter operations and growing short-haul scheduled networks. There also exist some marketing differences between LCC. In the US for example, JetBlue offers its passengers leather seats and a sophisticated in-flight entertainment system that features live TV coupled with broadband connection. Southwest and Air Trans now offer seamless connectivity via a hub, while in Brazil Gol carries freight on its aircraft. While there is relatively little difference in the average seating capacity of the aircraft used by LCC around the world, there is some variation in the sectors flown. In Europe routes operated by LCC average around 1,000 kms, while in the US the equivalent figures for Southwest and JetBlue are 1,013 and 1820 kms respectively (Table 1). The equivalent figure for Air Asia in South East Asia is 1,200 kms and for GOL in South America 913 kms.

As a result of their different operating environments and business models, LCC experience differing levels of unit cost reduction over their legacy carrier rivals. Binggeli and Pompeo (2002) calculated the unit costs of a network airline and a low cost carrier operating on intra-European routes and concluded that in 2001 there was a 63% difference. Table 2 reveals a similar unit cost difference in 2007 when BA is compared with Ryanair, while Air Asia has a comparable cost advantage over Malaysian Airlines. In the US, flight crew costs of LCC are similar to those incurred by incumbents, which reduces the cost difference for North American low cost carriers. Research by Boguslaski et al. (2004) revealed that Southwest's unit costs were some 28–51% lower than the US major airlines in 2001. In South America, GOL's unit costs are only around 22% lower than the legacy carriers in the region.

**Table 1:** Operating characteristics and unit cost differences by region

2007 data	Average sector (km)	Average Aircraft Capacity	Unit cost (US cents/ASK)
<i>North America</i>			
US Airways	1487	156	9.15
Southwest	1013	136	5.65
JetBlue	1821	145	5.17
<i>Europe</i>			
BA	2345	238	10.60
easyJet	1030	150	8.53
Ryanair	1053	189	4.67
<i>Asia</i>			
Malaysian	2248	238	7.19
Thai	2644	310	6.89
Air Asia	1200	169	3.16
<i>South America</i>			
TAM	1057	177	9.38
LAN	1687	173	8.76
GOL	913	148	7.33

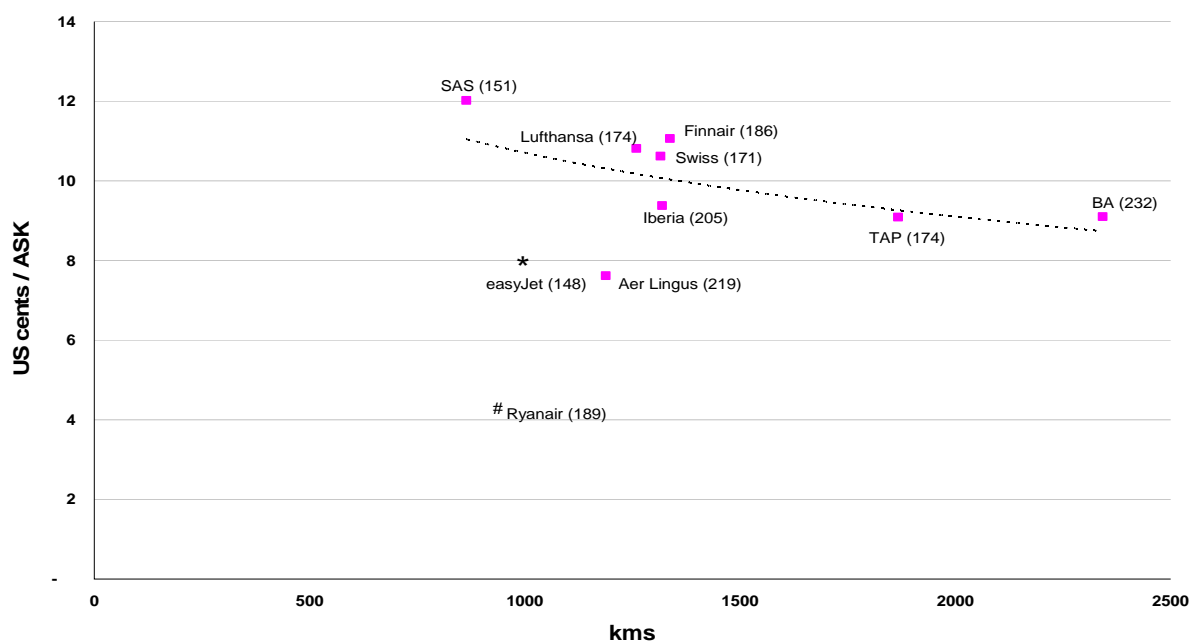


**Table 2:** Unit cost advantages of LCC by region

2007 data	Unit cost (US cents/ASK)	Unit cost Index
US Airways	9.15	100
Southwest	5.65	62
JetBlue	5.17	57
BA	10.60	100
easyJet	8.53	80
Ryanair	4.67	44
Malaysian	7.19	100
Thai	6.89	96
Air Asia	3.16	44
TAM	9.38	100
LAN	8.76	93
GOL	7.33	78

In short-haul markets it is clear that low cost carriers can achieve unit cost levels of between 30% and 60% lower than those of legacy carriers operating similar route distances, with adjustments having been made for the differences in average stage length of each carrier. Figure 1 plots a trend line of the various unit costs for selected incumbent and low cost carriers against their average stage lengths and pegs Ryanair at around 60% below the trend line, with easyJet at 25% below. EasyJet has incorporated elements such as: serving primary airports, GDS fees and transition from Boeing to Airbus aircraft, which has altered its cost structure.

**Figure 1:** Influence of Stage Length on the Unit Cost of European Carriers (2006)



## 2. SOURCES OF COST ADVANTAGE FOR LCC

Many authors, including Button and Ison (2008), Dennis (2007), O'Connell and Williams (2005), Williams and Mason (2004), Lawton (2002), and Doganis (2001) have analysed the factors that create cost and revenue advantages for LCC and these include:

- Provision of a different range of services than legacy carriers, such as: unbundling of the flight product, serving secondary airports, etc.
- Enhanced efficiency through high aircraft utilisation and high labour productivity
- Common fleets
- Lower salaries
- Outsourcing
- Ancillary revenues
- Effective negotiations
- Single class of service
- Internet bookings and a focused website that includes third party suppliers
- Low administration costs

In Asia, aside from the cheaper labour force, further cost advantages are achieved as the region allows flights to be operated at night. This has positively impacted the operating cost of Air Asia with it recording the world's lowest unit cost per ASK in 2008 of just 2.25 US cents (Thomas, 2009). Porter (1983) was well justified in arguing that cost leadership will strategically position a company to compete very effectively.

Unit costs vary depending on the stage length flown and the number of passengers carried. There are also some elements of the cost mix that are fixed. It is therefore the case that the sources and scale of cost advantage for a LCC operating long-haul services will be different from those experienced by a LCC operating short-haul sectors. There are only a very small number of LCC operating long-haul sectors compared to the total number of LCC in operation, but the transference of the generic sources of cost advantage from short to long-haul is not a trivial task. The UK CAA also examined the scope for long-haul, no-frills LCC cost saving compared to network carriers and found that only 15% of operating costs per seat had a 'high' potential for saving, with a further 45% having 'medium' potential (CAA, 2007). Both Van der Bruggen (2008) and Francis et al. (2007) have concluded that a low cost, long-haul operation could only achieve around a 20% cost advantage over network carriers and therefore are unlikely to be able to offer fares that are more than 15% - 20% on average lower those charged by the legacy carriers.

In principle, the sources of cost advantage for LCC derive from the indirect elements of the cost mix and from service simplification. These may include: overhead related costs, cabin crew (a smaller number allocated), catering, distribution and passenger handling; while other important reductions in unit fixed costs may stem from the adoption of high seat density configuration. In addition, flight crews and maintenance personnel who are not members of a trade union may be paid lower salaries. Table 3 provides an indication of the likely strength of the sources of cost advantage for LCC operating short, medium and long-haul sectors.<sup>3</sup>

**Table 3:** Influence of stage length on the sources of LCC Cost Advantage

LCC Cost Advantages	Short-haul	Medium haul	Long-haul
Aircraft utilisation	✓✓	✓	
Single class seating	✓✓	✓	
Catering	✓✓	✓	✓
Load factor	✓✓	✓	✓
Distribution	✓✓	✓✓	✓
Secondary airports	✓✓	✓	
Cabin crew	✓✓	✓✓	✓
Flight crew	✓	✓	
Maintenance	✓✓	✓	✓
Overheads	✓✓	✓✓	✓

(✓✓ indicates substantial cost advantage and ✓ moderate cost saving)

Higher aircraft utilisation cannot be assumed as an attribute of LCC on long-haul sectors because, in most cases, schedules have to be compatible with traffic waves at origin and destination airports and in the case of east – west journeys time zones place a limit on departure and arrival times. Wensveen and Leick (2009) studied the long-haul, low cost business model and confirmed that high frequency connectivity to short-haul markets becomes more critical with long-haul operations since many passengers connect at one or both ends of their long-haul flights. Long-haul passenger flows therefore mostly depend heavily on traffic feed, which introduces important rigidities in the scheduling of flights.

<sup>3</sup> Short-haul is defined here as up to 1,500 kms, medium-haul between 1,501 and 3,000 kms, and long-haul > 3,000 kms.

One of the principle difficulties facing many of the low cost carriers however, is that they do not have feed traffic. Some carriers have modified their business model with, for example, Southwest already interlining its own traffic through its hubs. It is also actively seeking cross-border code share and interline partners, signalling a change of emphasis over its still short-haul network (Morrell, 2008). Indeed, many LCC are now beginning to code share and these partnerships will boost feed traffic. Sobie (2009) stated that Gol, JetBlue, Jetstar, Virgin Blue and Vueling have active code share agreements in place, with Virgin Blue code sharing with Delta Air Lines, Skywest Airlines and Virgin Atlantic. Bipartisan partnerships, such as the JetBlue/Aer Lingus linkup, allows the partners to sell combination tickets that funnel two flights into a single itinerary – a strategy that has been very successful as JetBlue has received thousands of bookings through the Aer Lingus website (Ezard, 2009). Morrell (2008) stated that 25% of Oasis Hong Kong's passengers had indicated their intent to 'self connect' to and from other LCC and that it had been trying to negotiate interline agreements with these carriers before it went out of business. The potential to feed traffic to a long-haul, low cost carrier is therefore possible.

It may be the case, however, that in certain aspects LCC will incur higher unit costs than full service carriers. The higher load factors generated by LCC will directly impact the amount of fuel used per trip making this element of cost higher than that of a legacy carrier. Airport costs also may rise as passenger fees and handling become more expensive since there would be fewer flights per day over which to spread the fixed costs. In addition, smaller LCC with weaker brands will have less bargaining power with suppliers, resulting in higher costs.

### **3. COST SIMULATION**

To analyse the elements of cost that vary with stage length, a simulation model involving the operation of a Boeing 767-300ER has been developed using 2007 data from the US. The assumptions adopted here are based on Boeing's Opcost Model US International rules for legacy carriers, with appropriate modifications made to take into account the operating characteristics of a typical long-haul, low cost carrier. These are as follows:

- Depreciation – 20 years to 10% residual value
- Spares investment – 4% of airframe, 16% of engine price
- Interest – 9% interest rate, 20 year loan, 100% debt financing
- Hull insurance – 0.25% of aircraft price

- Airplane price – study price of US\$ 94 million for a Boeing 767-300ER
- Flight crew - 11% lower for LCC
- Cabin crew – 15% less for LCC on account of fewer cabin crew and improved productivity
- Fuel – based on respective load factors and fuel price at \$2.13 per gallon
- Maintenance – labour hourly rate of \$ 27.50 for legacy carriers and \$25.00 for LCC
- Maintenance overheads – 225% of direct labour costs for legacy carriers, 175% for LCC
- Landing fees – same for both types of carrier
- Control & Communications – same for both types of carrier
- Aircraft ground handling – 11% higher for LCC
- Seating capacity – 269 seats (24+245) in a dual class layout for a Boeing 767-300ER
- Cargo load factor – 60% for containers, 25% for bulk hold
- Food costs – 40% to 60% lower for LCC
- Passenger handling – 15% lower for LCC
- Revenue – passenger yields 15% lower for LCC

Three simulations of the model were undertaken.

i) The base case (A) which assumes that passenger load factors of legacy carriers is set at 77% and low cost carriers at 75%. The reason for the lower load factor in the LCC case is that, by improving utilisation, LCC tend to operate out of hub waves, thereby reducing connection opportunities. On the other hand, by offering more seats at lower prices, LCC tend to attract more point-to-point traffic than legacy carriers. The result indicates a slight advantage in favour of the legacy carrier.

ii) Case (B), was run assuming a LCC passenger load factor of 80%, on the basis that the legacy carrier advantage would not prevail, with demand anticipated to be more sensitive to price than in the base case. The load factor of the legacy carrier was set at 77%.

iii) Case (C) was also run, on the assumption that demand would be even more sensitive to price than in the second case, driving the LCC load factor up to 85%. Again the load factor of the legacy carrier remained at 77%.

In all three cases, the yield of the LCC was assumed to be 15% lower than that of the legacy carrier. The cost and revenue data used to construct all of the graphs below is shown in Tables 4 and 5.

**TABLE 4**

Cash Airplane Related Operating Costs - US\$ cents per ASNM								
	2000	2500	3000	3500	4000	4500	5000	5500
Legacy	5.90	5.81	5.74	5.76	5.82	5.89	5.98	6.08
LCC 75%	5.54	5.46	5.40	5.42	5.47	5.54	5.62	5.71
LCC 80%	5.56	5.48	5.42	5.44	5.49	5.56	5.64	5.74
LCC 85%	5.58	5.50	5.44	5.46	5.52	5.58	5.67	5.76

Airplane Related Operating Costs - US\$ cents per ASNM								
	2000	2500	3000	3500	4000	4500	5000	5500
Legacy	8.36	8.08	7.89	7.80	7.76	7.75	7.78	7.83
LCC 75%	7.82	7.58	7.42	7.36	7.37	7.36	7.38	7.43
LCC 80%	7.84	7.60	7.45	7.38	7.39	7.38	7.41	7.45
LCC 85%	7.86	7.62	7.47	7.41	7.41	7.40	7.43	7.48

Total Operating Costs - US\$ cents per ASNM								
	2000	2500	3000	3500	4000	4500	5000	5500
Legacy	11.37	10.79	10.38	10.13	9.98	9.87	9.82	9.80
LCC 75%	10.33	9.84	9.52	9.34	9.26	9.18	9.14	9.13
LCC 80%	10.45	9.95	9.63	9.44	9.35	9.27	9.23	9.22
LCC 85%	10.58	10.07	9.73	9.54	9.45	9.36	9.32	9.30

Revenue Per Available Seat-N.M. (RASM) - US\$ cents								
	2000	2500	3000	3500	4000	4500	5000	5500
Legacy	12.45	11.84	11.40	11.06	10.77	10.53	10.31	10.12
LCC 75%	10.58	10.06	9.68	9.38	9.14	8.94	8.75	8.59
LCC 80%	11.14	10.59	10.20	9.89	9.63	9.42	9.22	9.05
LCC 85%	11.77	11.19	10.77	10.45	10.18	9.95	9.75	9.56

Profitability Comparison - Legacy vs. Long-haul Low Cost carriers - Net profit (Loss) per Trip - US Dollars								
	2000	2500	3000	3500	4000	4500	5000	5500
Legacy	5,792.00	7,079.00	8,237.00	8,684.00	8,563.00	7,950.00	6,653.00	4,739.00
LCC 75%	1,372.00	1,453.00	1,251.00	398.00	(1,237.00)	(2,952.00)	(5,226.00)	(8,080.00)
LCC 80%	3,715.00	4,302.00	4,590.00	4,215.00	3,041.00	1,774.00	(63.00)	(2,495.00)
LCC 85%	6,400.00	7,558.00	8,401.00	8,565.00	7,914.00	7,153.00	5,811.00	3,857.00

TABLE 5

Cash Airplane Related Operating Costs per ASNM - Legacy carrier = 100,0								
	2000	2500	3000	3500	4000	4500	5000	5500
Legacy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
LCC 75%	94.0	94.0	94.1	94.1	94.0	94.1	94.0	93.9
LCC 80%	94.3	94.3	94.4	94.4	94.4	94.4	94.4	94.3
LCC 85%	94.6	94.7	94.8	94.8	94.8	94.8	94.8	94.7

Airplane Related Operating Costs per ASNM - Legacy carrier = 100,0								
	2000	2500	3000	3500	4000	4500	5000	5500
Legacy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
LCC 75%	93.6	93.8	94.1	94.4	95.0	94.9	94.9	94.9
LCC 80%	93.8	94.0	94.4	94.7	95.2	95.2	95.2	95.2
LCC 85%	94.0	94.2	94.7	95.0	95.5	95.5	95.5	95.5

Total Operating Costs per ASNM - Legacy carrier = 100,0								
	2000	2500	3000	3500	4000	4500	5000	5500
Legacy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
LCC 75%	90.8	91.2	91.7	92.2	92.8	93.0	93.1	93.2
LCC 80%	91.9	92.3	92.8	93.2	93.7	93.9	94.0	94.1
LCC 85%	93.0	93.3	93.8	94.1	94.7	94.8	94.9	94.9

Revenue Per Available Seat-N.M. (RASM) - Legacy carrier = 100,0								
	2000	2500	3000	3500	4000	4500	5000	5500
Legacy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
LCC 75%	85.0	85.0	84.9	84.8	84.9	84.9	84.9	84.9
LCC 80%	89.5	89.4	89.5	89.4	89.4	89.5	89.4	89.4
LCC 85%	94.5	94.5	94.5	94.5	94.5	94.5	94.6	94.5

Profitability Comparison - Legacy vs. Long-haul Low Cost carriers - Net profit (Loss) per Trip - Legacy carrier = 100,0								
	2000	2500	3000	3500	4000	4500	5000	5500
Legacy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
LCC 75%	23.7	20.5	15.2	4.6	(14.4)	(37.1)	(78.6)	(170.5)
LCC 80%	64.1	60.8	55.7	48.5	35.5	22.3	(0.9)	(52.6)
LCC 85%	110.5	106.8	102.0	98.6	92.4	90.0	87.3	81.4

### 3.1 RESULTS OF THE BASE CASE (LCC LOAD FACTOR OF 75%)

One of the most important cost drivers for an airline is its aircraft utilisation rate. Although in short-haul operations LCC obtain higher utilisation rates than legacy carriers, their advantage tends to reduce as average stage length increases. For example, in Europe LCC easyJet achieved 11.1 hours daily utilisation in 2006 from its fleet of Airbus 319 aircraft, while the average obtained by BA for the same aircraft type in its fleet was 8.7 hours. The experience with long-haul aircraft reveals comparatively little difference however. While BA's fleet of 57 Boeing 747-400 aircraft averaged 13.1 flying hours daily in 2007, a long-haul, low cost carrier named Zoom UK obtained 14.8 hours from its one Boeing 767-300. The reasons

for this are that LCC have lower turnaround times due to their simplified loading and unloading processes, and fly mostly from uncongested secondary airports. However, as stage length increases, the proportion of time on the ground of total trip time reduces, making the ground time advantage progressively less relevant. In addition, long-haul operations, particularly east-west flights that cross many different time zones, are not constrained by the working day limitations evident in many short-haul markets.

Figure 2 results from the assumption that both legacy carriers and long-haul LCC are likely to operate from and to major hubs in North America and Europe, with similar operating time windows (curfew hours and departure/arrival times limited by time zone considerations) using wide-body aircraft but with a 15 minutes faster turnaround for LCC. While LCC are likely to achieve better utilization rates operating shorter trip lengths, this advantage is negated for longer trips, as is shown below.

**Figure 2: Aircraft Utilization Profile**

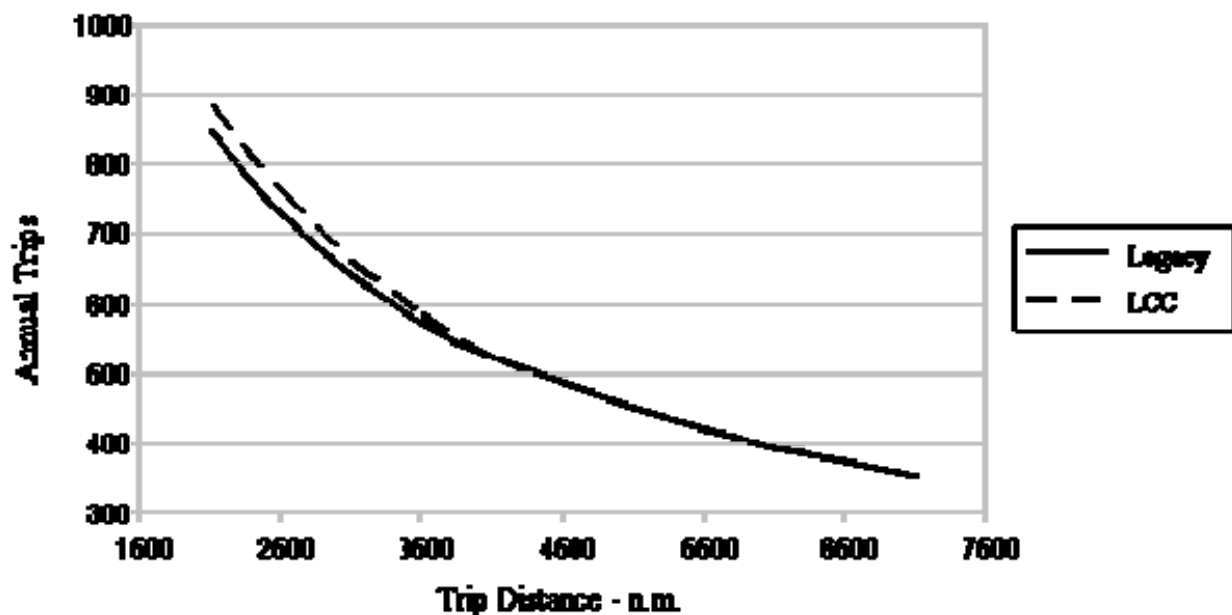


Figure 3 shows the aircraft related cash operating costs per Available Seat Mile (ASM) versus the trip distance for both legacy carriers and LCC. These are cash costs that are highly visible and are expenses that must be paid and include fuel, flight and cabin crew, maintenance, landing charges, ATC and communications, aircraft handling, ground property and equipment maintenance and overheads, and APU fuel burn on the ground. The ultimate distance where there are greatest economies of scale in relation to such costs is achieved at around 3,000 nautical miles.



Figure 3: Aircraft Related Cash Operating Costs per ASM

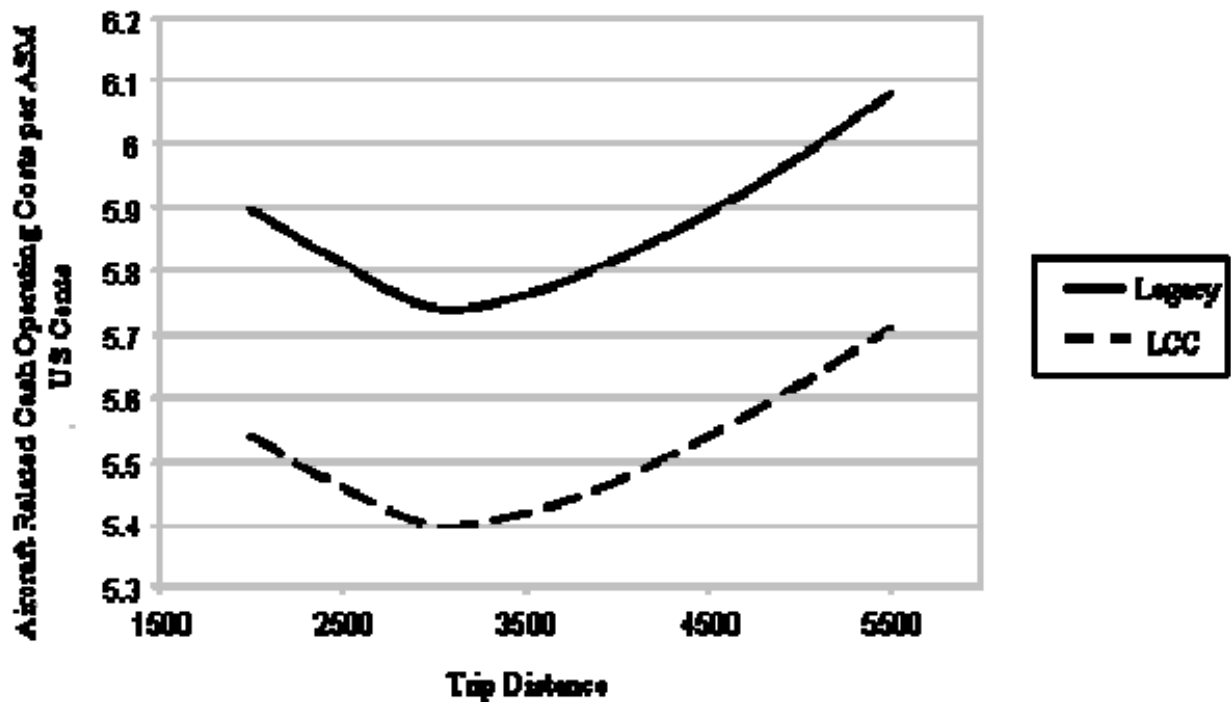


Figure 4 adds on other aircraft related operating costs that are not so visible and are estimated in the profit and loss account and include depreciation, interest and hull insurance, versus trip distance. Figure 4 includes the aircraft related cash operating costs calculated in Figure 3 above. As expected, the LCC curve is consistently below that of the legacy carrier.

Figure 4: Aircraft Related Operating Costs per ASM

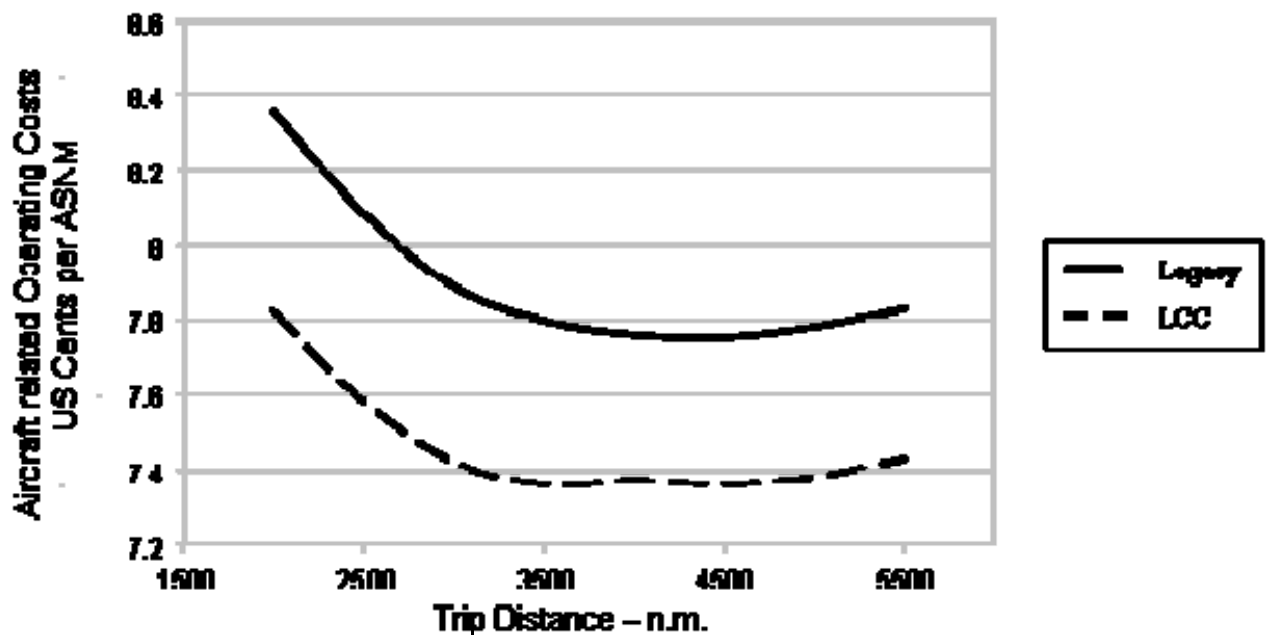
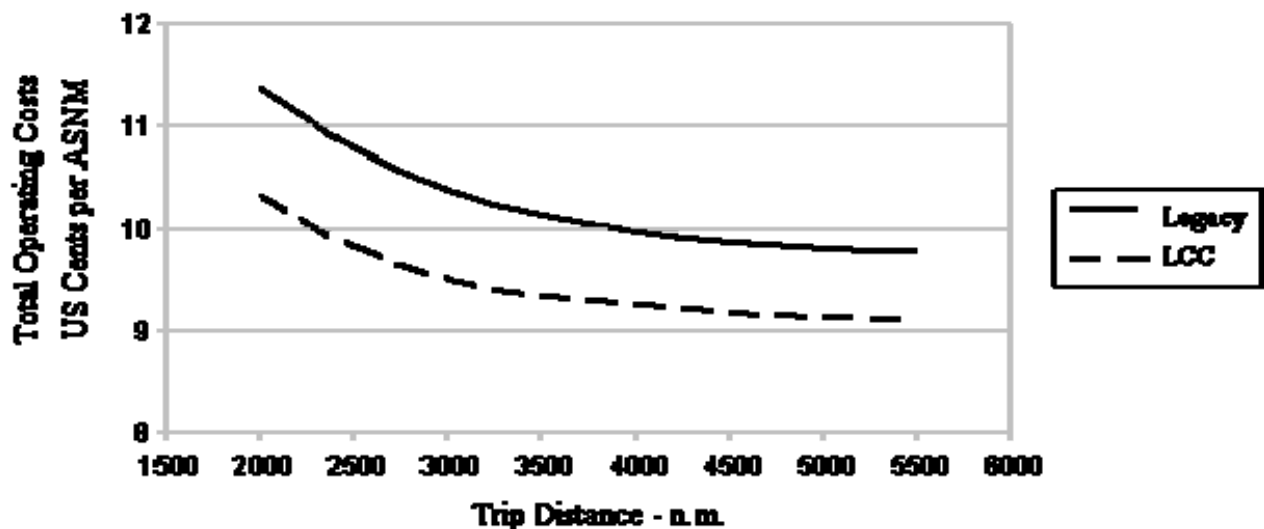


Figure 5 shows the total operating costs per ASM curves for the two carrier types. These costs include aircraft related operating costs plus passenger, cargo and system related elements. Once again, as expected, the LCC curve is consistently below that of the legacy carrier. Figure 6 shows the revenue per available seat-mile (RASM) versus trip distance for the two carrier types. As may be seen, under the base case assumptions, the legacy carrier curve is consistently above that of the LCC curve. The legacy carrier has a greater mix of high and low fare passengers as their in-flight products accommodate business class passengers and also carry cargo which increases the overall revenue per departure. This advantage of the legacy carrier does not prevail in every situation however, although the results shown here correspond to the general rule.

**Figure 5: Total Operating Costs per ASM**



Finally, Figure 7 provides a profitability comparison between the legacy airline and the long-haul low cost carrier, demonstrating that, under the above assumptions, the former exhibits a superior performance at any of the trip distances considered. This mostly results from the conservative assumption made in respect of the LCC's load factor. While the LCC's revenue is on average 15% below that of the legacy carrier, its corresponding costs are only around 9% lower. With a load factor of 75%, the long-haul, low cost carrier is only marginally profitable on sector lengths of around 3,500 nautical miles and beyond this distance, it quickly begins to financially underperform.

Figure 6: Revenue per ASM

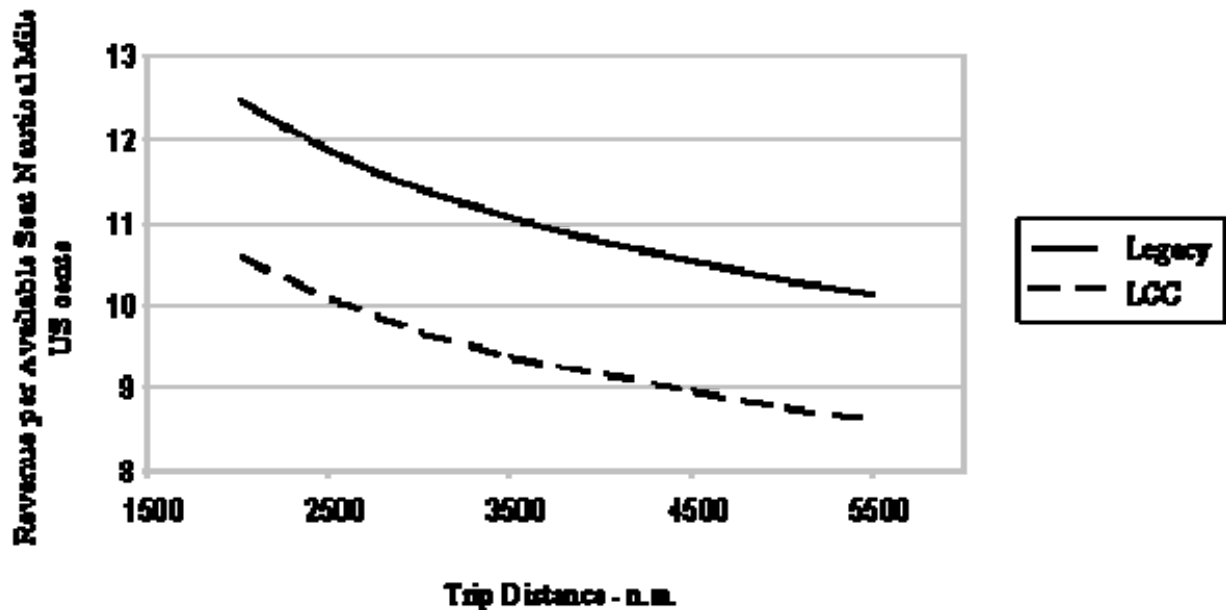
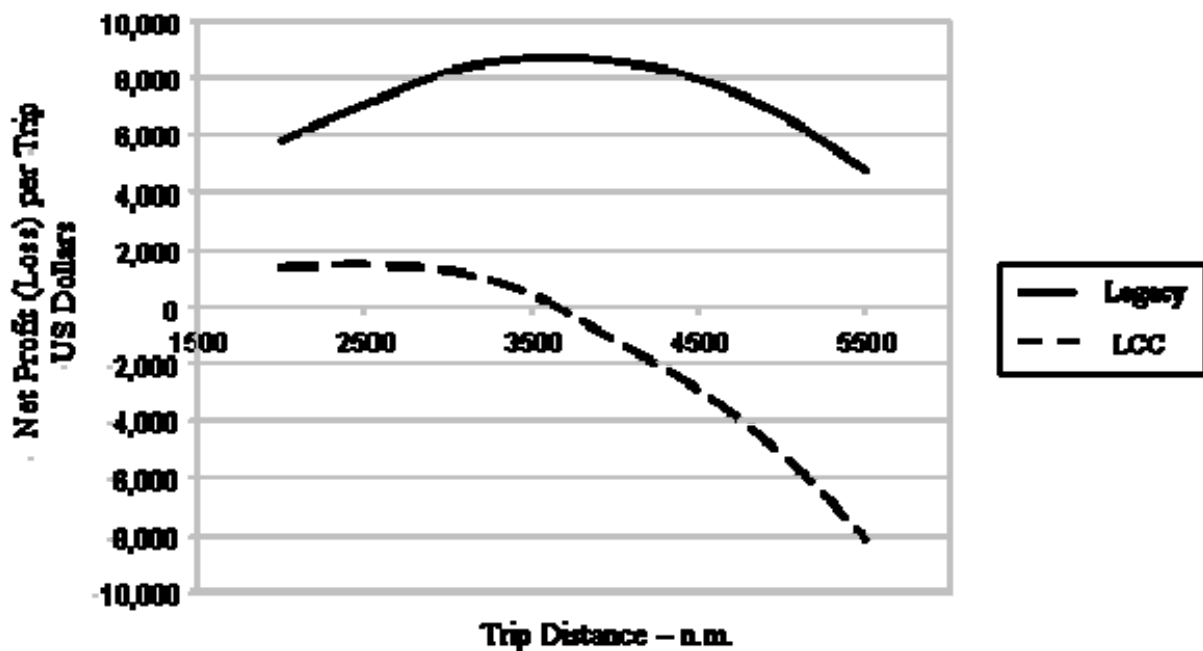


Figure 7: Profitability Comparison: Legacy carrier versus long-haul LCC



### 3.2 RESULTS OF CASE B (LCC LOAD FACTOR OF 80%)

This case was run on the assumption that demand would be more sensitive to price than was assumed in the base case. In this instance, with the LCC fare 15% below that of the legacy carrier, the former produces a load factor of 80% and the legacy carrier one of 77%. The aircraft utilisation profile is the same as in the base case. The resulting cost and

revenue curves are shown in Figures 8, 9, 10 and 11 below. As is apparent, the LCC's cost curves at 80% load factor are not exactly the same as those in the base case because, by transporting more passengers, costs will be higher, even though by a relatively small amount.

Figure 8: Aircraft Related Cash Operating Costs per ASM

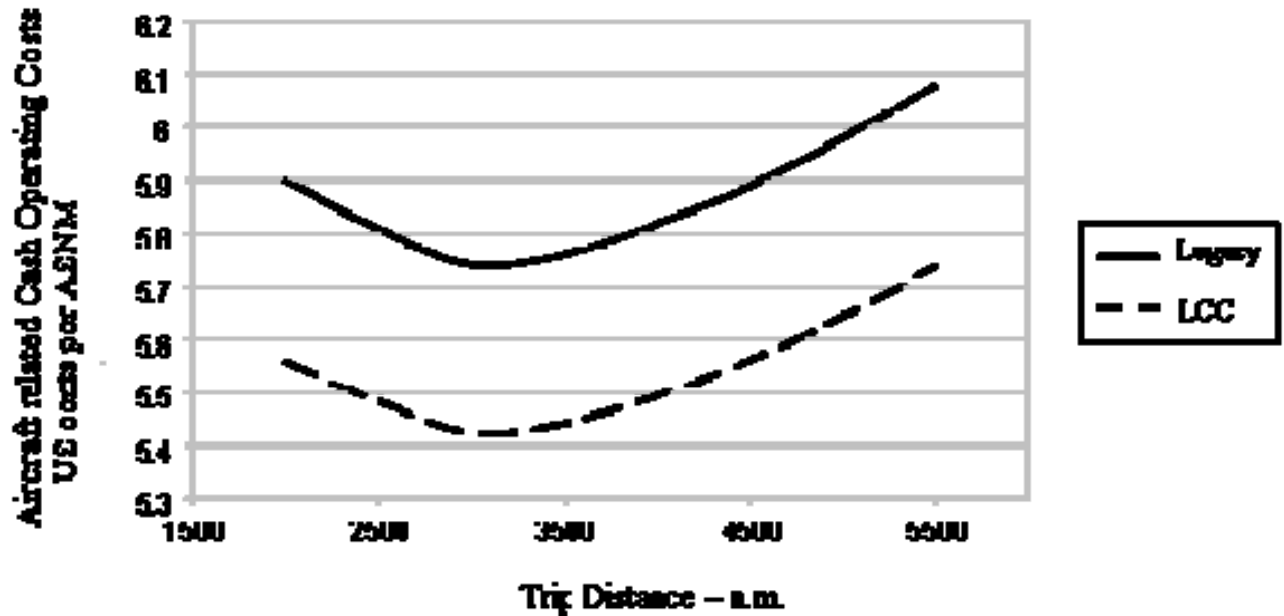


Figure 9: Aircraft Related Operating Costs per ASM

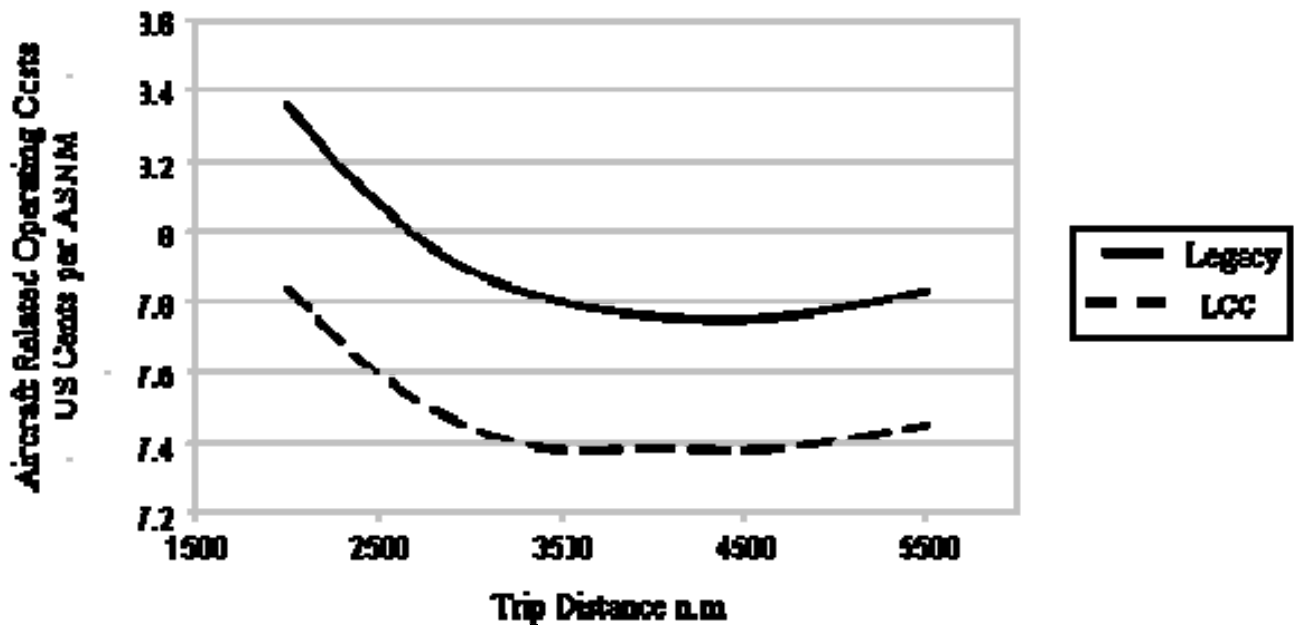


Figure 10: Total Operating Costs per ASM

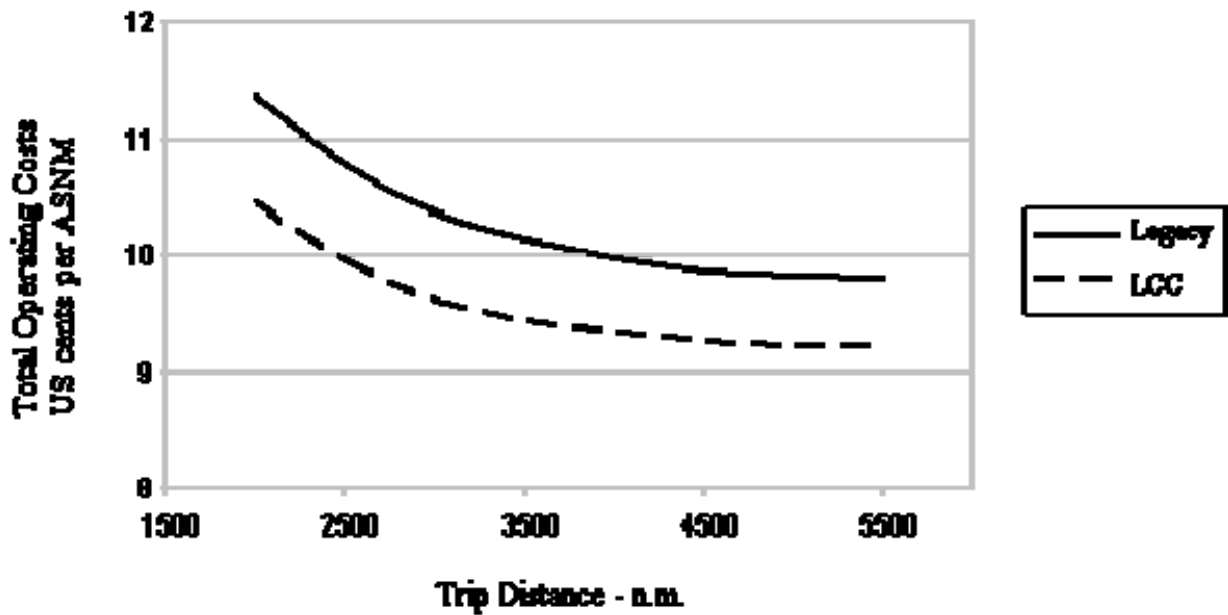
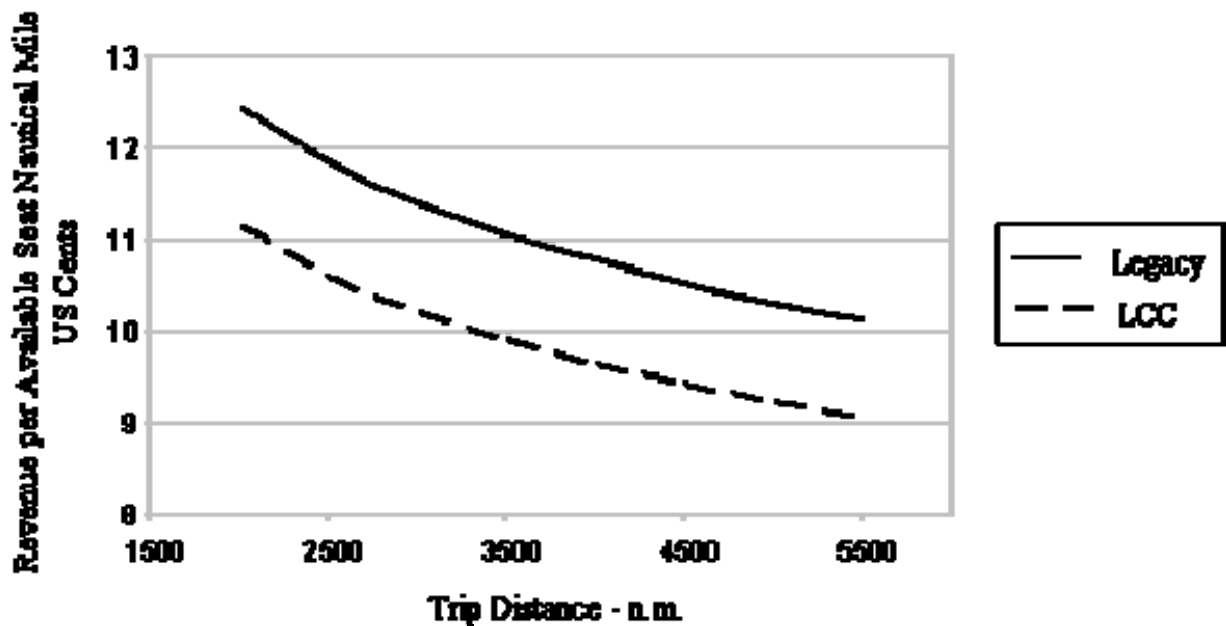


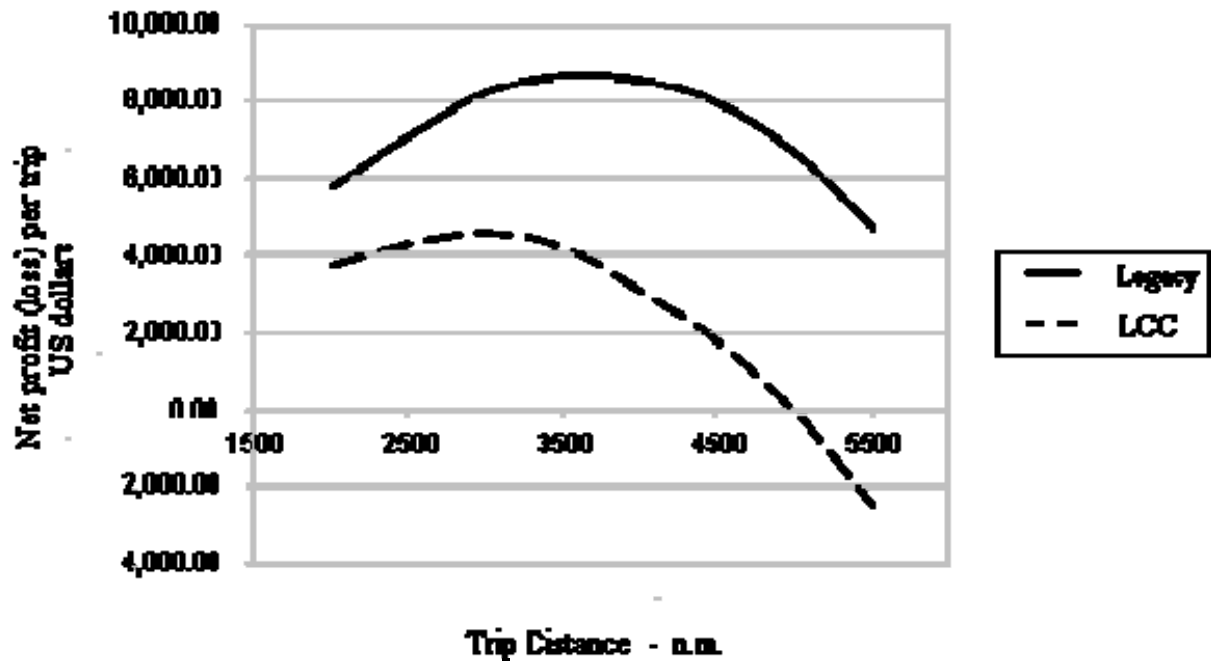
Figure 11: Revenue per ASM (RASM)



Although the above four graphs demonstrate basically the same behaviour in respect of costs and revenue as in the base case, Figure 12 reveals a different profitability outcome from that of the base case in which the legacy carrier showed a superior performance for all distances. However the financial performance of the long-haul low cost carrier has significantly improved when compared to the results obtained in (Figure 7). For sector lengths of up to 3,500 nautical miles, the LCC generates strong returns, but quickly falls if the flight is beyond this distance. However the simulation model reveals that the LCC's

profitability is higher than that of the legacy carrier for distances up to 1,000 nautical miles, which corresponds to a flight time of around three hours.

**Figure 12:** Profitability Comparison: Legacy versus Long-haul LCC



### 3.3 RESULTS OF CASE C (LCC LOAD FACTOR OF 85%)

This case assumes that demand would be even more sensitive to price than in the previous two cases. In this instance, with the LCC fare 15% below that of the legacy carrier, the former produces a load factor of 85% and the legacy carrier one of 77%. The aircraft utilisation profile is the same as in the other two cases. As is apparent, the LCC's cost curves at 85% load factor shown in Figures 13, 14 and 15 are not the same as those in the base case for the reasons explained above.

Figure 16 shows that the gap between the revenue per available seat-mile (RASM) of the two carrier types has closed significantly. Figure 17 reveals a sharp improvement in the LCC's profitability when this is compared to the results in the base case. In this instance the LCC demonstrates a superior profitability performance in distances up to 3000 nm, the equivalent to a flight time of around 7 hours. Clearly, if long-haul, low cost carriers can fill up to 85% of a widebody aircraft, then this business model has some potential.

Figure 13: Aircraft Related Cash Operating Costs per ASM

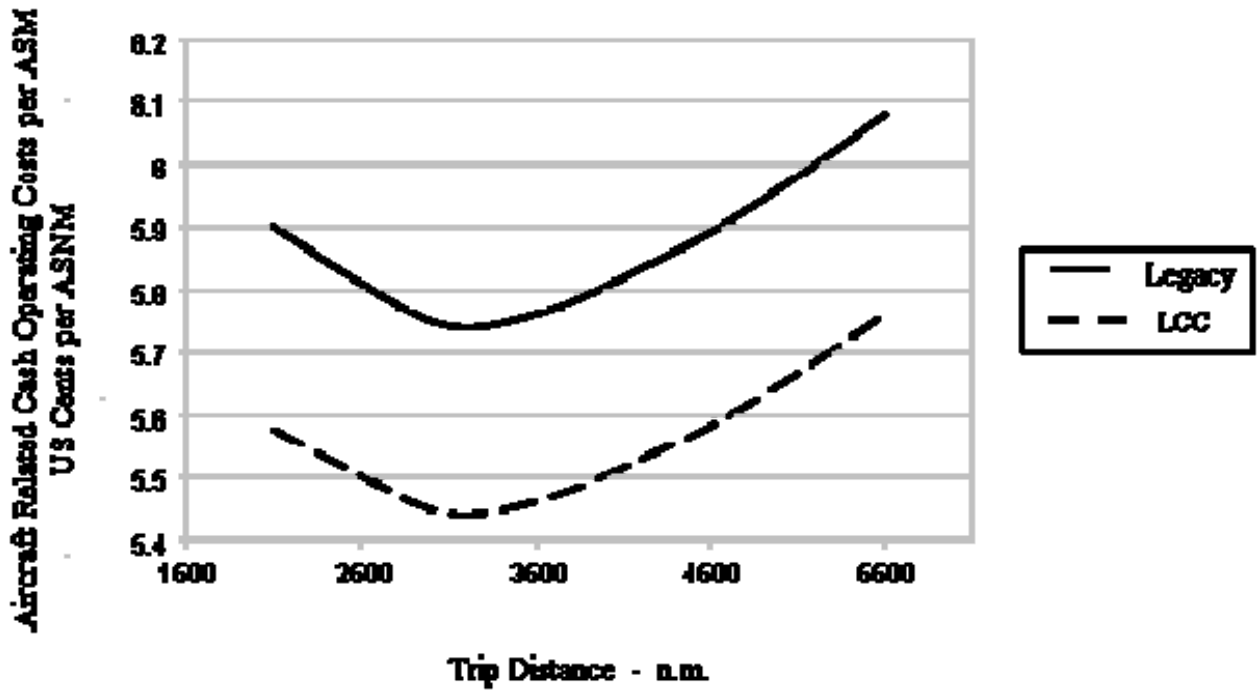


Figure 14: Aircraft Related Operating Costs per ASM

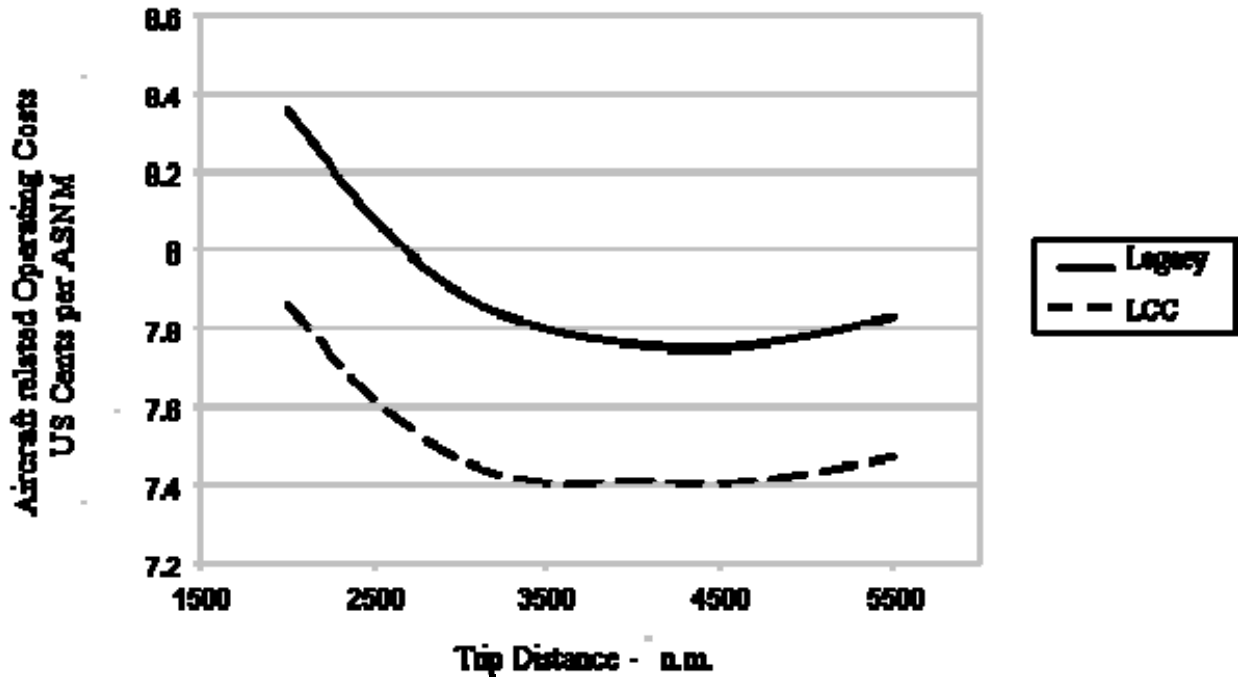


Figure 15: Total Operating Costs per ASM

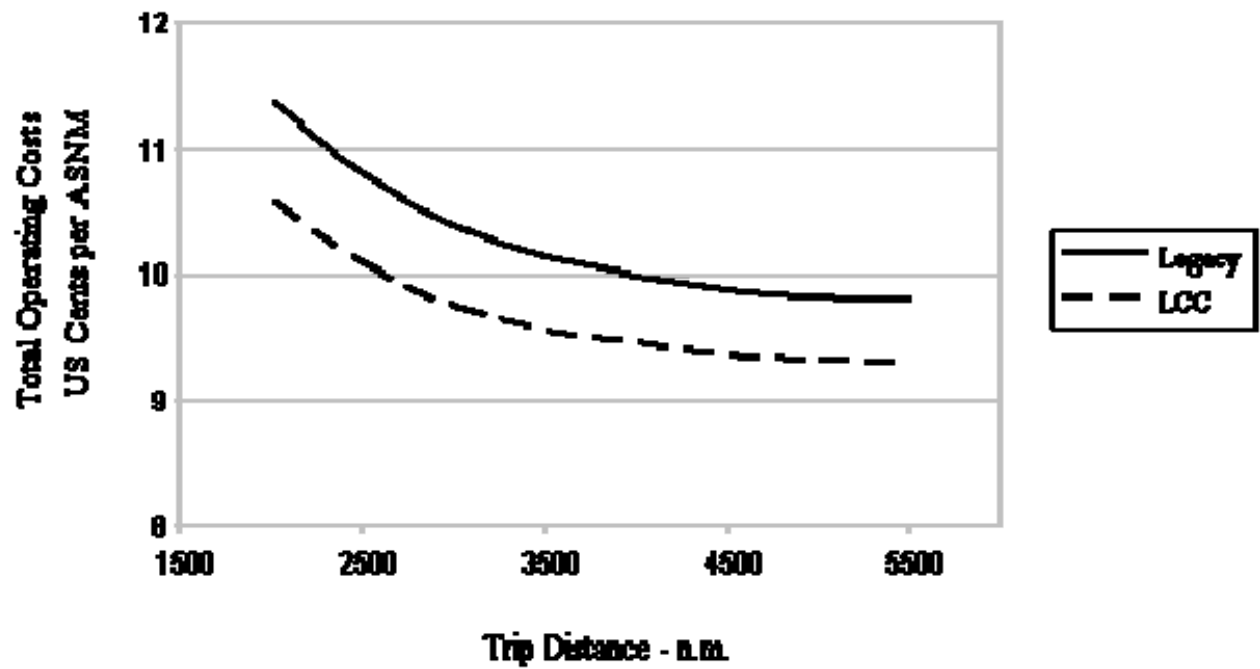
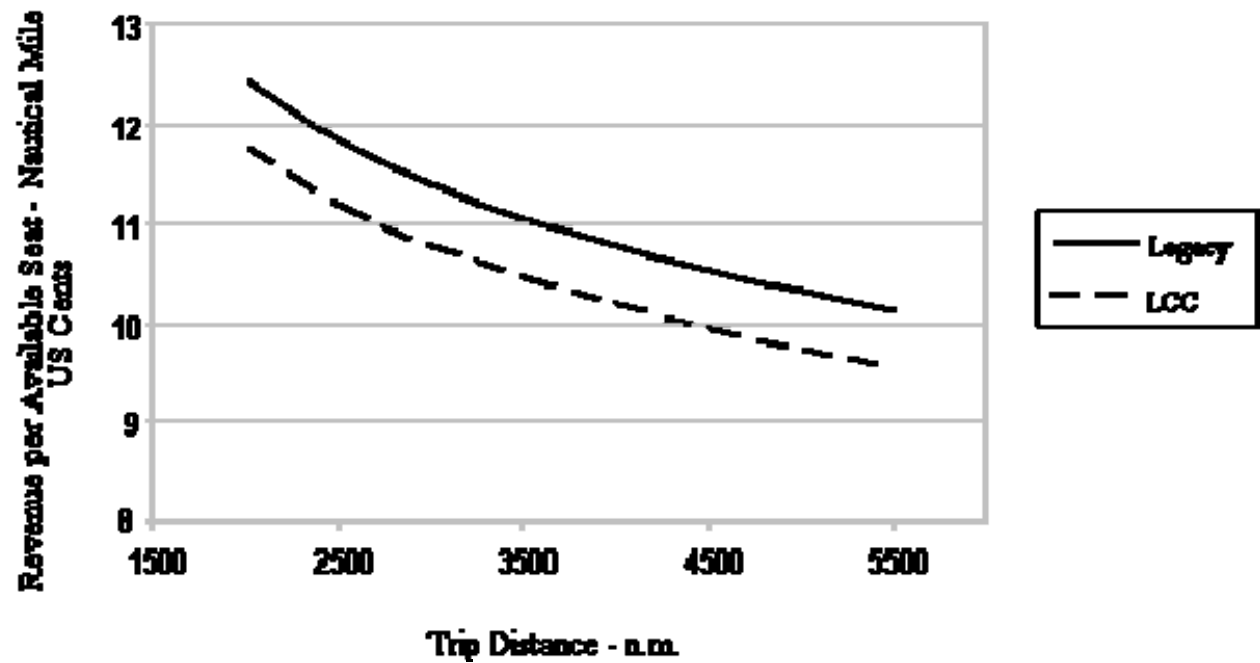
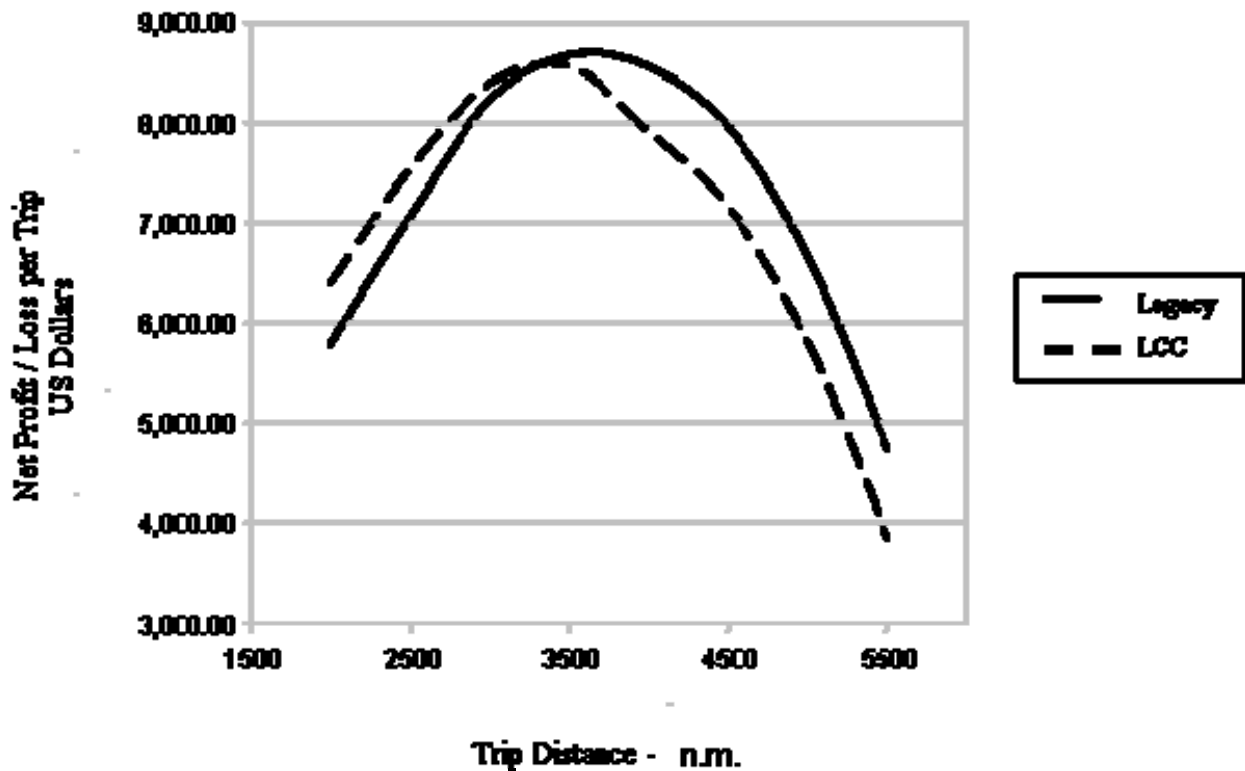


Figure 16: Revenue per ASM (RASM)





**Figure 17:** Profitability Comparison: Legacy versus Long-haul LCC



#### 4. SUSTAINABILITY OF THE LCC PROFITABILITY ADVANTAGE

Even though there is a clear profitability advantage in favour of the LCC in case C, a verification of how sustainable this advantage is must be made. If the cost difference between the LCC and the legacy carrier is very small, there is no guarantee that the profitability advantage of the former would prevail over time. It is possible that the legacy carrier would subsidise flights in direct competition with the LCC using profits generated in other markets. The LCC advantage would become sustainable when the cost gap is enough to dissuade the legacy carrier from matching the fares charged by the former. Experience in the US shows that the cost advantage of LCC has been consistently around 30 to 35% (see DOT's Bureau of Transportation Statistics site: <http://www.transtats.bts.gov>). This research conducted into the three cases has demonstrated that the LCC cost advantage is no greater than 10%, which implies that the viability of long-haul LCC operations must be highly questionable. This conclusion is supported by the poor experience to date of the low cost carriers that have provided long-haul services. Table 6 lists the low cost airlines that operate or have operated long-haul scheduled services since the turn of the century. Oasis Hong

Kong, Zoom (and its UK subsidiary) and FlyGlobespan have already gone out of business and of the three that remain in business, only two focus exclusively on operating long-haul flights, namely Air Asia X and Air Transat. Currently, the combined long-haul fleets of these three LCC amount to only 32 aircraft, with 45 on order, of which 30 are for Air Asia X. So aside from Air Asia X and Air Transat, at present the prospects of LCC playing a significant role in upsetting the long-haul status quo of the legacy carriers appears to be minimal. The ability of the latter to offer very low economy class fares in other than the highest periods of demand means that the ability of long-haul LCC to undercut their legacy rivals and capture the travelling public's attention with very low fares is very small. Aside from a comparatively small number of niche VFR and leisure orientated markets that are underserved by legacy carriers, the best prospects for a long-haul LCC is likely to exist in Asia. Cost and revenue data for the carriers shown in Table 6 is as yet unavailable and so it remains to be seen just how large a reduction in unit cost these LCC are able to deliver in comparison to their legacy rivals.

**Table 6:** Low Cost Long Haul Airlines

<b>Carrier</b>	<b>Base</b>	<b>Ops began</b>	<b>Aircraft Configuration</b>	<b>Comments</b>
Air Transat	Montreal	1987	A310 (20C, 229Y) A330-200 (21C, 322Y)	Charter/scheduled mix of services
Zoom A/I Inc.	Ottawa	2003	B767-300 (C24 YW60 Y162) B757-200 (C12 Y190)	Ceased ops in 2008
Flyglobespan	Edinburgh	2006	B767-300 (YW63 Y207) B757-200 (YW45 Y156)	Ceased ops in 2009
Jetstar	Melbourne	2006	A330-200 (C38 Y265)	Subsidiary of Qantas
Oasis	Hong Kong	2006	B747-400 (C81 Y278)	Ceased ops in 2008
Zoom A/I UK	London LGW	2007	B767-300 (YW63 Y207)	Ceased ops in 2008
Air Asia X	Kuala Lumpur	2007	A330-300 (YW28 Y364)	Subsidiary of Air Asia

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## References

- Binggeli, U., & Pompeo, L. (2002), Hyped hopes for Europe's low cost airlines, *McKinsey Quarterly*, 4.
- Boguslaski, R., Ito, H. and Lee, D. (2004), Entry patterns in the Southwest Airlines route system. *Review of Industrial Organization* 25 (3), p317–350.
- Button, K. and Ison, S. (2008), The economics of low cost airlines: Introduction, *Research in Transportation Economics*, 24 (1), p1-4.
- CAA (2007), Connecting the continents – long-haul passenger operations from the UK, *CAP 771, UK Civil Aviation Authority*, July.
- Dennis, N. (2007), End of the free lunch? The responses of traditional European airlines to the low cost carrier threat, *Journal of Air Transport Management*, 13(5), p311-321.
- Dobruszkes, F. (2009), New Europe, new low cost air services, *Journal of Transport Geography*, 17(6), p423-432.
- Doganis, R. (2001), *The Airline Business in the 21st Century*, Routledge, London.
- Dunn, G. (2009), Ready for Battle, *Airline Business*, 25(5), May, p54-62.
- Ezard, K. (2009), Pastures new, *Airline Business*, 25 (5), May, p64-66.
- Francis, G., Dennis, N., Ison, S. and Humphreys, I. (2007), The transferability of the low cost model to long-haul operations. *Tourism Management*, 28, p391-398.
- Francis, G., Humphreys, I., Ison, S. and Aicken, M. (2006), Where next for low cost airlines? A spatial and temporal comparative study, *Journal of Transport Geography*, 14(2), p83-94
- Ito, H., Lee, D. (2003), Market density and low cost carrier entries in the US airline industry: implications for future growth. Mimeo.
- Lawton, T. (2002), *Cleared for Take-Off - Structure and Strategy in the Low Fare Airline Business*, Ashgate, Aldershot.
- Porter, M. (1983), Industrial Organization and the Evolution of Concepts for Strategic Planning: The New Learning, in *Managerial and Decision Economics*, 4(3), p177.
- Thomas, G. (2009), Air Asia spots success, *Air Transport World*, 46 (9), p58-61.

- O'Connell, J.F. and Williams, G. (2005), Passengers' perceptions of low cost airlines and full service carriers: A case study involving Ryanair, Aer Lingus, Air Asia and Malaysia Airlines, *Journal of Air Transport Management*, 11(4), p259-272.
- Morrell, P. (2008), Can long-haul low cost airlines be successful?, *Research in Transportation Economics*, 24(1), p61-67.
- Sobie, B. (2009), Not such a big thing, *Airline Business*, 25 (9), September, p52-54.
- Van der Bruggen, J. (2008), Low cost Aiming for Long-Haul, Masters Thesis, University of Amsterdam.
- Wensveen, J. and Leick, R. (2009), The long-haul low cost carrier: A unique business model, *Journal of Air Transport Management*, 15(3), p127-133.
- Williams, G. and Mason, K. (2004), Market Analysis of Europe's Low Cost Airlines: An examination of trends in the economics and operating characteristics of Europe's charter and no-frills scheduled airlines, *Cranfield University Air Transport Group Research Report 9* (2<sup>nd</sup> edition).