Abstract
This paper examines the pressure on airport retail in carbon-constrained world, and puts forwards a research agenda for transformative business models in this new corporate environment.

Government responses to the climate threat and the consequences of climate change itself will have implications for every sector of the economy. These challenges will give rise to new infrastructure, technologies, operational practices and business models causing sectors or individual organisations that are unable to adapt to decline or disappear.

Aviation is particularly exposed (politically and commercially) because of its reliance upon carbon fuels, the limited potential for technological change and the fact that aircraft emissions will rise at a time when Governments seek huge reductions in CO$_2$ emissions across the economy.

CO$_2$ emissions associated with airport retail represent a small proportion of those from the industry, but growing environmental pressures, and limited efficiency improvements for aircraft mean that the sector is still likely to come under scrutiny. This is important due to the significant revenue created from airport concessions for airport operators. Growing environmental constraints will force retailers to innovate new ways of doing business that will enable them to remain profitable in a carbon constrained world.
How organisations can succeed in a resource-limited and carbon constrained world. A case study in the Airport Retail Industry.

Aviation and Sustainability; Global Issues
Despite the economic downturn, the threat of terrorism and global disease outbreaks such as SARS and Avian influenza, the aviation industry has continued a trend of strong growth since the Second World War. Scheduled traffic growth between 1992 and 2005 grew at an annual average rate of 5.2%, in terms of revenue passenger kilometres (Lee et al., 2009), and growth is predicted to average 4.8% globally to 2030 (ICAO, 2010), with much higher rates predicted in the developing nations (Owen et al., 2010).

Such growth is associated with significant environmental impact. The combined radiative forcing from aviation sources contributes some 4.9% of all anthropogenic forcing globally (Lee et al., 2009), with Carbon Dioxide (CO₂), accounting for 2.5% of global emissions in 2007 (ITF, 2010). Such a scale of emissions are relatively small compared to other sectors, however the problem for aviation lies in the inability of emissions reductions to keep pace with sectorial growth, with 1.5% per annum efficiency improvements from aircraft design and operations achieved between 1959-1995 lagging someway behind aforementioned growth.

The potential implications of climate change for aviation, and the wider issues of the limits to economic growth (see Meadows et al., 1972, 2002; Hawkden et al., 1999) are significant. The potential impacts on society from climate change (see Hooper and Thomas, 2013), pose a significant threat to the worlds societies and the national security of many nations. In response, a number of political and regulatory responses have been made by the governments on both a national and international level. The United Nations Framework Convention on Climate Change (UNFCCC) at Copenhagen in December 2009 for example set a global commitment to limit global warming to no more than 2°C degrees more than pre-industrial levels (UNFCC, 2009). On the national scale, the UK the Government set out in the Climate Change Bill to achieve an 80% reduction in carbon emissions between 1990 and 2050 (UK Government, 2008).

Such ambitions targets place pressure on organisations to reduce their emissions either through voluntary uptake, or through enforced legislation such as carbon taxation, which, when combined with rising energy costs, can represent a significant increase in bottom line costs. Similarly, the changing weather patterns resulting from climate change are likely to have a significant impact on airport and airline operations, coupled with associated costs of infrastructural damage, delays and cancellations (DEFRA, 2009). Dwindling oil supplies also pressure the industry with rising fuel prices (Chapman, 2013).
The combination of sector growth, limiting factors on efficiency improvements, and the growing pressures of climate change suggest that aviation’s carbon emissions are likely to remain in the political spotlight for many years to come. The result is that all actors within the aviation sector may eventually be required to act for the good of the whole sector. This is important both in terms of overall industry profitability, but also in terms of the wider socio-economic benefits of aviation which have provided jobs, seen the growth of the World’s economies, enabled cultural exchange on a global level and effectively ushered in the ‘global society’ (Caves, 2003).

The Importance of Airport Retailing

An increasingly important part of the airport is airport retailing, also known as concessions. Today, retail outlets are ubiquitous with the setting of an airport, with a number of different categories of concessionaire existing that may drive revenue within the airport (Kim and Shin, 2011). Such outlets include all commercial activities that sell goods and services in the airport (Doganis, 1992), whilst Kim and Shin (2011) define such concessions as a “commercial facility belonging to one of three categories; duty free, retail and convenience stores, and food and beverage services”. Today, airports are often seen as high end retailing destinations in their own right, selling a range of luxury products often unavailable on the high street (Hobson, 2000). The result is that duty free retail today represents a key revenue stream for airports across the globe with total retail sales in 2011 of some US$32.6 billion (Research and Markets, 2013). In 2012 Heathrow Airport alone made £257.3m revenues from airside and landside retail (Heathrow Limited, 2013).

Airports are able to generate such huge profits as they are in a position to charge retailers high leasing rates for operating within the airport, and often will request a share of the profits from each sale (Freathy, 2004). Retailers are more than willing to accept such conditions due to the unique setting they are given access to. Airports provide a captive, often wealthy audience, with much ‘dwell time’ and an excitable psychological state of mind that is willing to purchase (Bia, 1996; Freathy, 2004; Graham, 2009b; Kim and Shin, 2001; Newman et al, 1994). As well as appeasing the demands of shareholders, such profits allow to sector to provide a large number of jobs globally, and enhance the experience of travelling for the passenger, whilst providing access to goods for that may otherwise be unavailable (Freathy, 2004).

Perhaps more importantly however is the fact that the revenues created by airport retail for airport operators helps to keep the entire aviation industry in business. At a time when traditional aeronautical charges have actually fallen in inflation terms, such revenue streams are vital for airports to remain profitable. Traditional revenue streams such as landing fees are regulated by the Civil Aviation Authority, however newer revenue sources such as car parking fees and airport retailing empower airports to maximise revenue on a grand scale. As an example, the importance of airport retailing to Heathrow Airport, where retailing makes up some 23% of total airport revenue, can be seen in Table 1.
Table 1: Illustrating the sources of revenue for Heathrow Airport (Graham, 2009a)

<table>
<thead>
<tr>
<th>Revenue Type</th>
<th>Percentage of Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airport Charges</td>
<td>61%</td>
</tr>
<tr>
<td>Retail</td>
<td>23%</td>
</tr>
<tr>
<td>Car Parking</td>
<td>7%</td>
</tr>
<tr>
<td>Car Rental</td>
<td>1%</td>
</tr>
<tr>
<td>Terminal</td>
<td>5%</td>
</tr>
<tr>
<td>Property Advertising</td>
<td>3%</td>
</tr>
</tbody>
</table>

The Challenge for Retailers

As a key part of the aviation sector, airports will be required to act on the climate change challenge. In recent years this has seen a number of airports sign up to the ACI Airports Carbon Accreditation scheme, with 63 airports listed as registered in the scheme’s 2011-12 annual report (ACA, 2012). With decarbonisation a growing requirement in airport business plans, it is reasonable that airport concessionaires, as part of the aerodrome, should also conform to such ambitions, indeed the ACI Certification for Concessions Management training module states that this should be a key priority of an airports Concessions management when planning a site’s retail offer to passengers (ACI, 2012).

There is also a growing business case too for concessionaires to understand and address the challenge posed to them through climate change. This could include impacts on retailer supply chains that might see certain products become unavailable (Gledhill et al, 2012, WRI, 2008), through rising energy costs that may impact on the bottom line (Accenture, 2012), or through the wider issues surrounding aviation such as potential airport closures as a result of climate change (Hooper and Thomas, 2013).

As with all organisations, airport retailers are associated with a number of direct and indirect contributions to climate change. Based on the GHG Protocol (WBCSD and WRI, 2004), definitions of these impacts, specific to airports have been developed, placing them into three broad scopes (ACI, 2009):

- Scope 1 are GHG emissions from sources that are owned or controlled by the airport operator.
- Scope 2 are GHG emissions from the off-site generation of electricity (and heating or cooling) purchased by the airport operator.
- Scope 3 are the GHG emissions from airport-related activities from sources not owned or controlled by the airport operator. These are broken down into the following sub categories;
Scope 3A are the Scope 3 emissions which an airport operator can influence, even though it does not control the sources.

Scope 3B are the Scope 3 emissions which an airport operator cannot influence to any reasonable extent.

By combining these definitions with the fact that 95% of the aviation industry’s emissions come from flights (ACA, 2009), it can be clearly seen that from an airport perspective, its Scope 3 emissions are the most significant contribution to climate change, despite it having little influence over such emissions – this responsibility would fall to the airport operators.

For airport retailers a similar picture exists. Similar to typical high street retail, airport concessionaires are likely to have Scope 1 impacts as a result of the ground transportation of goods from distribution centres to individual outlets, employee business travel, and waste disposal, whilst Scope 2 impacts are likely to arise from in-store energy use, such as lighting, heating and water.

Scope 3 impacts are also similar in that they will typically include the emissions resulting from passenger transportation, however unlike high street retail, that may accrue ground transportation over typically short distances, goods sold through airport retail will almost always be immediately carried by passengers on flights to their destination, followed by additional ground transport to point of use. This has potentially significant implications in terms of the science behind aircraft flight, in which the weight of an aircraft plays a vital role in the amount of fuel required for a given journey (ATAG, 2010). Simply put, the more retail products taken on board an aircraft, the more fuel is required for transport. Whilst the weight of such products may be small considering the weight of an aircraft, the potential benefits that this could accrue for the industry in terms of carbon savings can be seen through the range of methods being used to reduce aircraft weight by industry to date (see Mason, 2009).

In light of the magnitude of these impacts, which as of yet remain largely unknown, a number of challenges can be identified for airport retailers. They must look to first understand the environmental impacts that result from their operations and to identify ways to reduce such impacts, whilst maintaining profitability, creating, or at least retaining jobs, whilst meeting the expectations of what their customers want from their time spent in the airport.

Opportunity from threat?

The challenges posed by climate change will impact all sectors in society, requiring organisations to seek huge efficiency improvements and a reduction in carbon intensity. Those organisations who do not adapt may struggle or even disappear, whilst those who can innovate and react the fastest will be presented with
competitive advantage and be best placed to survive into the long term in a new ‘techno-ecological’ paradigm Elzen et al. (2004). This is in line with Kondratiev’s theory of economic long waves (see Freeman 1984), and Schumpeter’s theory of creative destruction (Schumpeter 1939), which state that cycles of economic productivity are intrinsically linked to innovation. When innovation stagnates so does the global economy, however innovation can also create new opportunities for firms to gain competitive advantage and this can lead to new technological paradigms that may go on to dominate global economies for many decades.

Through being aware of the world they are operating in, which as large multi-national they should be able to do, airport retailers have the opportunity to anticipate the threat posed by climate change to their business and to innovate away from this threat. This could include simple process innovations such that may reduce bottom line utility costs associated with in store operations, to business model innovations that may see such organisations begin to move into new areas and to address their very ‘reason for being’. Do they exist to sell products, or do they exist to maximise shareholder returns and to create employment, and if so could they move into other fields that have a reduced environmental impact?

Accordingly, this research project sets out to understand how resilient airport retailer business models are to the threat of global climate change, and how such models may need to adapt in order to survive this threat. It will do this through case study analysis of World Duty Free Group (WDFG), a leading airport retailer, seeking to understand their business fully, to identify the carbon impact of their operations, and identify potential new business models that may ensure the businesses survival in a carbon constrained world. In doing so the research will look to understand the ability of organisations to change in general, and specifically to meet the climate challenge, in the process looking to identify what sort of information is required for firms to change, how should this information be presented, and to whom within a given company. Accordingly the paper will directly influence the strategy and development of WDFG, and potentially of all airport retailers, as such having great academic and commercial value.
Bibliography


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