Journal of Geotechnical and Transportation Engineering
Volume 1 | Issue 2
Environmental Responsibility as a Factor in Gaining Competitive Advantage in the Aviation Industry
Baumeister

Received 10/29/2015 Accepted 11/19/2015
Published 12/15/2015
Corresponding Author:
S.Baumeister; stefan.c.baumeister@ucla.edu

Environmental Responsibility as a Factor in Gaining Competitive Advantage in the Aviation Industry

Stefan Baumeister
University of Jyväskylä/School of Business and Economics, Jyväskylä, Finland
University of California, Los Angeles/Institute of the Environment and Sustainability, Los Angeles, USA
Email: stefan.c.baumeister@ucla.edu

Abstract

In recent years there has been increasing interest in the environmental impacts of aviation, and some airlines have begun to address this issue more seriously. At the same time, competition in the aviation industry has become much tougher. This study focuses on the question of whether showing proactive environmental behavior could work as a differentiation strategy for airlines that are acting more responsibly, and thus help them to improve their competitiveness. This paper presents the results of a questionnaire conducted among 148 air travelers on their opinions and attitudes towards environmental aspects of flying, such as a modern and fuel-efficient fleet, direct flights, and carbon offset. The results showed that indeed there are air passengers who consider the environment when booking a flight, although they were not in the majority. The study also found that the participants saw additional value in a modern fleet, direct flights, and carbon offset, however, not all of them showed a willingness to pay a premium for those aspects.

Keywords: environment, aviation, competition, differentiation

1. Introduction

Air transport has become an essential part of our everyday life. It brings people to business, products to their markets, tourists to their holiday destinations, and it unites families and friends all over the planet. So air transport has made the global village a reality, but it has also, like the entire transportation sector, had a large impact on our environment. According to Green [1], the three main impacts of aviation on the environment are noise, air pollution around airports, and influences on climate change. Hereby the contribution to climate change is seen as the impact with the greatest significance.

Aviation currently accounts for only 2% of the global carbon dioxide emissions [2], but the industry is growing at a fast rate. In the past, the growth rate has been about 4.4% per annum [3]. For the future an even larger rate is predicted [4, 5]. This growth has also had an impact on the emissions released by aircraft. For example, between 1991 and 2003, aviation's carbon dioxide emissions grew by 87% [6]. At the same time, however, competition in the aviation industry has also increased tremendously due to liberalization and the opening of markets, changes which have resulted in falling airfares and caused huge changes to the established airlines, state carriers in particular [7]. Interest in the environmental impacts of the aviation industry has increased in recent years and in response several airlines have started to address this issue more seriously [8, 9]. In addition, these airlines have tried to use their pro-environmental approach to build up a positive corporate image [10]. As Liou and Chuang [11] found in their study, when the importance of corporate image in the aviation industry is evaluated, that image can be a strong tool for stimulating purchases and to differentiate an airline from its competitors. So far, a lot of research has been done on how businesses could use their environmental responsibility as a differentiation factor in order to gain competitive advantage [12, 13] but no single study has focused on the aviation industry. One research paper was found that answered at least the question of what motivates airlines to act in an environmentally responsible manner. In their case study of Scandinavian Airlines, Lynes and Dredge [14] found that one motivational factor for an airline to act environmentally responsibly is competitive advantage. Our paper aims to bring together the two subjects of environmental responsibility and competitive advantage within the aviation industry, which so far has received little attention.

The basic aim of this study is to determine whether showing proactive environmental behavior could work as a differentiation strategy for airlines that are acting more responsibly and thereby help them to improve their competitiveness. In order to measure how the air traveler perceives this pro-environmental behavior an online questionnaire among 148 air travelers was conducted. The basic research question of this study is: Do air travelers see value in airline's environmental responsibility initiatives. To answer this question three environmental aspects were chosen and tested. These aspects included a modern and fuel efficient fleet, direct flights, and carbon offset. The participants were asked about their attitudes towards these aspects and whether they see value in them. Together with the theory presented, the participant's answers were analyzed and conclusions were drawn as to whether and how airlines could gain competitive advantage by showing pro-environmental behavior.

2. Environmental competitive advantage

Over the past decades many studies have focused on the question of whether environmental responsibility could bring competitive advantage to companies and in which way it could deliver it. The question of "Does it pay to be green" has been raised many times. Shrivastava [15], for example, found that the use of environmental technology (e.g., pollution control equipment or waste management practices) has the potential to be a strong source of competitive advantage. Russo and Fouts [16], who focused on high-growth industries and their environmental responsibility strategies, came up with similar results. King and Lenox [17] conducted a longitudinal study among 652 manufacturing firms in the United States and they found that environmental responsibility can bring competitive advantage to companies.

According to Orsato [18], in general there are two major approaches in the current literature regarding sources of competitive advantage: the first is resource-based and the second is the positioning school. In the resource-based approach, a company gains competitive advantage based on its ability to use existing resources in a more deliberate way than its competing entities [19]. Resources for competitive advantage could be technical capabilities, organizational structure and culture, or the way how resources are acquired and managed [18]. The second approach, the positioning school, on which this study will focus on, follows the model presented by Michael Porter. According to Porter [20], competitive advantage can be defined as the value a company creates for its customers that exceeds the company's costs of producing it. Therefore, to achieve more value and competitive advantage a company should offer a product that either has the same advantages as a competitor's product but with a lower price (cost leadership) or they should offer a product with more advantages that justifies a higher sales price (differentiation).

Within the aviation industry, many examples of these two strategies can be found. The business model of low-cost carriers is a good example of a successful cost leadership strategy. Other airlines instead have chosen the differentiation strategy. For instance, Finnair, the cooperation partner of this research, intends to become the leading airline in terms of environmental responsibility. This goal clearly indicates an environmental product differentiation strategy.

According to Schaltegger et al. [21], environmental product differentiation is based on the idea that a company creates a product that provides either greater environmental benefits or has a smaller environmental impact. In addition to these benefits, or alternatively, the creation of the product or service might be carried out in a way that is less environmentally harmful than the production processes of the company's competitors [22]. One example of this approach is operating a modern and fuel- efficient fleet that produces fewer emissions during the flight.

However, according to Porter [20], a differentiation strategy can only lead to competitive advantage when the company succeeds in offering a unique product based on attributes that produce what is known as buyer value. These attributes can be anything that is part of the company's product, such as the product itself, the way it is delivered, the marketing approach as well as a broad range of other factors that differentiate the product from the competitors' products [20].

To understand what is valuable for buyers we have to look into the buyer's value chain. Any product or service purchased by buyers becomes an input in their value chain. These inputs determine the buyers' needs and the way they use the product in their value chains [20]. Only if the product adds value to the buyer it can generate a willingness within the buyer to pay a premium for it [23]. According to Porter [20], there are two ways a company can provide value to its buyers through differentiation, either by lowering the buyer costs or by raising the buyer performance. Lowering buyer costs means offering a product that helps buyers save costs.

In environmental product differentiation, examples of lowering buyer costs include products that consume less fuel, products that fulfill certain environmental requirements and standards, and products that help buyers reduce their carbon footprint. The second approach, raising buyer performance, could be achieved through products that bring additional environmental benefits to buyers. These benefits include organic food products that are better for the health or products that help improve buyers' image or status by using them [22].

In their study of environmental responsibility in small to medium enterprises, Simpson et al. [13] clearly established links between a firm's environmental performance and competitive advantage. They found that for some of the companies in their study, activities related to environmental responsibility had become a major selling point because these activities added additional value to their customers.

3. Environmental aspects of aviation

As discussed above, environmental product differentiation can be achieved by offering a product that provides either greater environmental benefits or a product that has a smaller environmental impact. In the aviation industry many initiatives or aspects can be identified that are beneficial for or have less impact on the environment: operating a modern fleet, offering direct flights, high load factors, reduced take-off trust, using electric vehicles for ground services, using biofuels, making aircrafts lighter or offering carbon offset. These three aspects have been chosen because this study focuses on air travelers' attitudes towards environmental aspects of flying, and these three aspects are considered to be the most visible for the air traveler.

Operating a modern fleet has a significant impact on cutting down carbon dioxide emissions. Increased efficiency leads to a reduction of fuel consumption and to fewer emissions, which results in a lower impact on the environment [24]. In recent decades, the achievements in efficiency have been tremendous. When the first commercial jet airliners designed in the mid-1950s are compared with the most advanced jet aircrafts currently available on the market, engine fuel consumption has dropped by more than 40%. When consumption is translated into fuel burn per seat, the drop reaches even 70% [25].

According to Hileman et al. [26], the most efficient way to get from point A to point B is to use the shortest distance, which is also known as the great-circle distance. Any diversion from the great-circle distance decreases the productivity of the flight. This diversion might lead to additional fuel consumption and more emissions, especially in cases of bad weather or air space restrictions. These negative effects may also apply in the routing of a flight connection, particularly when it is not a direct flight but has stopovers between origin and final destination [27]. The inefficiency increases even more when the flight is routed via a major airport due to the higher traffic volume and often limited runway capacity, making it often necessary for airplanes to fly holding patterns before finally approaching the runway [28].

Following the polluter pays principle, individuals, companies, and governments can purchase offsets on the carbon market to mitigate their own carbon dioxide emissions [29]. Surveys conducted by van Birgelen et al. [30] as well as Brouwer et al.

[29] showed that there is a high willingness among air passengers to pay for carbon offset. Only around 15% of the respondents did not show any willingness to pay for carbon offset. Brouwer et al. [29] found that the motivation among air travelers to pay for carbon offset comes not from existing values such as giving to good causes or charity but from the primarily motive to take responsibility by paying for one's contribution to climate change. The motivation could be explained more as a moral obligation paired with concerns about our environment and future generations.

4. Methods

This research is based on a quantitative survey in which 148 air travelers took part. For a period of two months, the questionnaire was accessible online through a link on Finnair's international webpage in English. It was conducted with the help of a web-based interview program and the questions were developed in close cooperation with Finnair. After a pilot test with 10 participants in which the functionalities of the questionnaire were tested, the link became accessible on Finnair's webpage in March 2011. The link was clicked 512 times during the two-month period. Altogether 148 participants completed the questionnaire successfully and answered all the questions, yielding a response rate of 28.9%. The questionnaire also collected socio-demographic data and information about the participant's travel history.

The participants rated first the importance of the following aspects when booking a flight: ticket price, non-stop flight option, total flight time (including transfers) and suitable departure/arrival time. For the second question, they stated if they take any environmental aspects into consideration when booking a flight. If the answer was yes, they specified what kinds of aspects they consider. The respondents then answered various questions concerning their opinions about the three environmental aspects of aviation presented above. They stated if they saw value in them and whether they would show willingness to pay a premium for them. For these questions, a five-point Likert scale was used, where 1 means fully agree and 5 means fully disagree. In the questions concerning the modern fleet, they stated whether they think operating a modern fleet is better for the environment and whether they are ready to pay more for a flight that produces fewer emissions. For the questions about direct flights, the participants' reported how important they rate direct flights among other aspects. In a second question they said if they would accept stopovers on their way to their final destination if the airfare were lower. In terms of carbon offset, the participants gave their opinion on whether paying for carbon offset has a positive effect on the environment or not and in the following question they stated whether they have ever paid for carbon offset. Finally using Finnair as a concrete example, the participants were asked whether they think Finnair has a leading role in terms of environmental responsibility or not.

5. Results and discussion

The survey found that only 30% of the participants take aspects related to the environment into consideration when booking a flight. No significant difference was detected between male and female participants ($p > 0.05$) or different age groups ($p > 0.05$). These results confirm what similar studies have found [29, 31, 32], the amount of air travelers who consider environmental aspects of flying are in general quite low.

To understand which environmental aspects are important for the participants who consider the environment when booking a flight, they were asked to give concrete examples. Aspects related to a modern and fuel-efficient fleet as well as direct flights were mentioned the most. Many participants stated that they actively search for alternatives to flying or even consider not making the trip at all. Several participants also said that they look for flight options that include the possibility to carbon offset. Beside that participants mentioned aspects related to the airline's environmental practices regarding waste handling, the reduced use of paper as well as the use of metal cutlery and reusable dinnerware. Other participants also stated that they prefer flying with airlines that show strong environmental initiatives.

As stated above for those participants who consider the environment when booking a flight, a modern fleet was seen as the most important aspect. This view was confirmed by the next question, in which almost 90% of the respondents agreed that operating a modern and fuel efficient fleet is better for the environment. The mean was 1.61 and the standard deviation was .686. Only a small percentage (11.0%) did not have an answer to this question. No participant disagreed with this statement. A significant difference was identified between male and female respondents in regard to whether they perceived a modern and fuel efficient fleet as better for the environment or not ($p < 0.01$), with male participants more strongly agreeing with this statement. One possible explanation for this difference could be that males more often have a technical orientation than females. The male participants may be applying the knowledge that using the latest technology has helped to reduce fuel consumption of vehicles to the aviation industry. However, no significant difference in the respondents' views on this issue could be found regarding their age ($p > 0.05$). The results showed that the participants see value in a modern and fuel efficient fleet and that they think that operating such a fleet is better for the environment. Other studies also came up with similar findings. Wittmer and Wegelin [9], for example, found that air passengers believe that, when it is compared to other environmental initiatives, operating a modern fleet can be seen as the strongest commitment an environmentally aware airline can show.

However, when the participants were asked whether they would be ready to pay a premium for flying on a modern fleet the results looked different. Only 6% fully agreed that they would be willing to pay more and 28% showed some willingness to pay, but almost 40% were not ready to pay a premium for a less polluting flight. When looking at the demographics, the data gave the impression that female passengers and the age group of 40-59 year olds showed more willingness to pay a premium. Several studies have found that females are more environmentally concerned [33] and it is also commonly known that the 40-59 age group has access to the highest income. Regardless of this observation, no significant difference could been found between male and female participants ($p > 0.05$) or different age groups ($p > 0.05$).

These results suggest that an airline could gain competitive advantage by operating a modern fleet, because this aspect is perceived positively by air travelers. A modern fleet can help air travelers to reduce the environmental impacts of their flying as well as lower their environmental costs, thereby adding value to their value chain. But even though the participants saw value in a modern fleet, airlines might face difficulties in asking a premium price based on this aspect because in this case the willingness to pay a premium didn't appear to be high. However some air travelers might also prefer a modern fleet for other reasons (e.g., safety, convenience, or cleanness), so there might be some willingness that is not only ecologically driven to pay more for a flight operated with modern aircraft.

Direct flights were mentioned the second most by those participants who consider the environment when booking a flight. The survey however found that the ticket price seemed to be more important for the majority of participants than a direct flight. While 66% of the respondents considered the ticket price as a very important factor when booking a flight, only 27% saw non-stop flights to the final destination as a very important factor. Still, 36% of the respondents described direct flights as an important factor but the remaining 37% of the participants considered non-stop flights as less important or not important at all when making a booking decision. The fact that air travelers are highly price sensitive, as found in this study, confirmed what previous studies had discovered [34]. The survey also found that almost three-quarters of the participants (73.0%) would accept stopovers on their way to their final destination if the flight were cheaper. Only 5% fully disagreed with this statement. The mean here was 2.20 and the standard deviation was 1.245.

The results of the questionnaire showed that the respondents see a certain value in direct flights and many of them were aware of the environmental impacts of connecting flights and unnecessary take-off and landing cycles. Nevertheless, the results of the survey also showed that ticket price is still the major criterion when choosing a flight and there was not much willingness among the respondents to pay more for a direct flight. An airline might be able to gain competitive advantage by offering a direct flight on a certain route, but it won't find much willingness to pay an environmental premium for that among air travelers. However, when combined with other non-environmental aspects direct flights could be considered as positive inputs to the buyer's value chain and might even attract air traveler's willingness to pay more. In addition to the environmental aspect, direct flights also offer other advantages, such as the convenience of arriving more quickly to the final destination or by avoiding stopovers at larger airports with the risk of missing the connecting flight, losing luggage, or longer layoffs.

Offsetting carbon emissions was another aspect mentioned by several participants as an environmental aspect they take into consideration when booking a flight. In the survey almost half of the participants (47.0%) stated that they think carbon offset has a positive effect on the environment while one-quarter (25.0%) disagreed. The mean here was 2.74 and the standard deviation was 1.127. These results confirm what earlier studies have found [30, 29] that many air travelers have a positive attitude towards carbon offset and many participants in these studies also expressed their willingness to pay for carbon offset. However, the studies presented above did not ask the participants whether they had ever paid for carbon offset. In this study the participants were directly asked if they had paid for carbon offset before, but only 20% stated that they had and the remaining 80% stated that they had not. It was interesting to see that so many participants considered carbon offset as having a positive effect on the environment but so few had ever paid for it. A similar study of departing passengers at Zurich Airport came up with an even lower result. In it, less than 4% of the participants had offset the carbon emissions for the flight they were going to take, but a large number of them perceived carbon offset as something positive for the environment [9]. One might assume that those participants who paid for carbon offset before are also among those who think it has a positive effect on the environment. Surprisingly, no significance could be detected ($p > 0.05$) between those participants who had paid for carbon offset and those ones who think that carbon offset is better for the environment.

Offering carbon offset could certainly lead to competitive advantage for an airline. Many air travelers see value in it because they perceive it as something positive for the environment, even though only a few might really go for this voluntary option. The airlines would not gain any additional revenues from offering carbon offset, but the practice would certainly strengthen their environmental image among those customers who care about environmental aspects of flying and see value in carbon offset.

Having shown that some air travelers do take environmental aspects into consideration when booking a flight and that a certain percentage of participants see value in a modern fleet, direct flights and carbon offset, the question remains: do they also see these aspects in relation to particular airlines? This survey was conducted among Finnair's customers and Finnair can certainly be considered as a leading airline in terms of environmental responsibility. Therefore the participants were asked how they evaluate the environmental performance of Finnair in comparison to other airlines. In the survey, 59% of the participants neither agreed nor disagreed with the question of whether they think Finnair has a leading role when it comes to environmental responsibility. The majority of participants did not have an opinion on this question. The remaining participants mainly agreed (34.0%), with only 7% disagreeing. The mean was 2.66 and the standard deviation was .779.

Even though a considerable amount of participants have stated that they consider the environment when booking a flight and many more also see value in the presented aspects of environmental differentiation, most of them could not distinguish Finnair's environmental performance from its competitors'. Differentiation only works, however, if the customer perceives the additional value the product or service really provides. If the customers are not aware of the environmental work an airline performs, it will be difficult for that particular airline to gain competitive advantage based on such work. Interesting was also that no significance ($p > 0.05$) was detected between those participants who consider the environment when booking a flight and those who think that Finnair has a leading role in terms of environmental responsibility. This result again confirms that environmentally conscious participants did not necessarily see Finnair's environmental performance as anything remarkable when it was compared to other airlines.

6. Conclusion

Within the aviation industry, competition has become much tougher in the recent years and at the same time the interest in the environmental impacts of aviation has increased. This research has elaborated on the question of whether showing pro-active environmental behavior could work as a differentiation strategy for airlines and help them gain competitive advantage.

The results of the study showed that air travelers see value in the environmental responsibility initiatives of airlines. All three environmental aspects presented to the participants were perceived as positive and valuable. The strongest agreement was found regarding the modern fleet. However, the results also showed that these environmental aspects can only bring competitive advantage to a particular airline when the air travelers are aware that this airline is actually offering these benefits. As we saw in the case of Finnair, even though all these aspects are offered by Finnair, the same participants (here Finnair customers) who saw value in these aspects did not necessarily see Finnair as an airline which has a leading role when it comes to environmental responsibility. Airlines must therefore communicate these environmental aspects clearly, otherwise they may have difficulty gaining competitive advantage based on environmental product differentiation.

Even though these environmental aspects are appealing to air travelers and they see value in them, this study found that price sensitivity among air travelers is high. So even if airlines successfully pursue an environmental product differentiation strategy, they will face difficulties finding willingness among air travelers to pay an environmental premium for the products. For two-thirds of the participants, ticket price was the most important criterion when booking a flight. Beside this price-consciousness, the results also detected that seeing value in an aspect does not necessarily lead to a willingness to pay for it. This attitude was revealed by the example of carbon offset. Those participants who considered carbon offset as positive for the environment were not the same ones who had also paid for carbon offset earlier.

Nevertheless, the study found that there is a small but considerable share of air travelers who consider the environment when booking a flight. For those airlines which show more commitment to environmental responsibility, this share should not be underestimated. Airlines should work to identify this specific customer segment, so it could be served with a unique product based on the customer's environmental needs using a product differentiation strategy. When airlines make the additional value and the input to their value chain more visible to these customers, more willingness to pay a premium may emerge. For the remaining air travelers who do not prioritize or even consider the environment when booking a flight, environmental product differentiation could still work as a selling point. For these customers, ticket price may remain the major selling point and aspects such as a modern fleet might stand more for safety and direct flights more for convenience, but the environmental aspect could still add some value for these customers.

For the future, further studies could be conducted on the question of how this specific customer segment, which considers the environment when booking a flight, could be identified and what would be the most efficient way to communicate environmental product differentiation to them. Further investigation could also look at what factors affect the willingness to pay a premium among air travelers and the question of how much more they would be ready to pay for a flight that has less impact on the environment.

Acknowledgement

The author wish to thank Finnair for providing valuable space on their website for the link to the online questionnaire as well as Kati Ihamäki and Laura Kantanen for all their assistance and support in the production of this paper. This work was supported in part by a Fulbright Graduate Grant.

References

[1] Green, J. "Civil aviation and the environmental challenge". The Aeronautical Journal, vol. 107, pp: 281–299, 2003.

[2] International Air Transportation Association. (2015, October 28). *Fact sheet: Climate change (June 2015)*. Available: https://www.iata.org/policy/environment/Documents/iata-factsheet-climatechange.pdf

[3] International Civil Aviation Organization. (2015, October 28). *Environmental Report 2010*. Available: http://www.icao.int/environmentalprotection/Documents/EnvironmentReport-2010/ENV_Report_2010.pdf

[4] Button, K. "Airlines: Sustainable development in a transatlantic context", In Rietveld, P., Stough, R. Institutions and sustainable transport: Regulatory reform in advanced economies. Cheltenham, UK: Edward Elgar, 2007, pp. 155–187.

[5] Gössling, S., Peeters, P. "It does not harm the environment! An analysis of industry discourses on tourism, air travel and the environment". Journal of Sustainable Tourism, vol. 15, pp: 402–417, 2007.

[6] Rothengatter, W. "Climate change and the contribution of transport: Basic facts and the role of aviation". Transportation Research Part D, vol. 15, pp: 5–13, 2010.

[7] Sowawattanakul, P., Wongsurawat, W. "Domestic airline networks and passenger demand in Thailand after deregulation". International Journal of Aviation Management, vol. 2, pp: 35–53, 2013.

[8] Chapman, L. "Transport and climate change: a review". Journal of Transport Geography, vol. 15, pp: 354–367, 2007.

[9] Wittmer, A., Wegelin, L. "Influence of Airlines' environmental activities on passengers". Journal of Air Transport Studies, vol. 3, pp: 73–99, 2012.

[10] Mayer, R., Ryley, T., Gillingwater, D. "Passenger perception of the green image associated with airlines". Journal of Transport Geography, vol. 22, pp: 179–186, 2012.

[11] Liou, J., Chuang, M. "Evaluating corporate image and reputation using fuzzy MCDM approach in airline market". Quality and Quantity, vol. 44, pp: 1079–1091, 2009.

[12] López-Gamero, M., Molina-Azorin, J., Claver-Cortés, E. "The whole relationship between environmental variables and firm performance: Competitive advantage and firm resources as mediator variables". Journal of Environmental Management, vol. 90, pp: 3110–3121, 2009.

[13] Simpson, M., Taylor, N., Barker, K. "Environmental responsibility in SMEs: does it deliver competitive advantage?" Business Strategy and the Environment, vol. 13, pp: 156–171, 2004.

[14] Lynes, J., Dredge, D. "Going Green: Motivations for Environmental Commitment in the Airline Industry. A Case Study of Scandinavian Airlines". Journal of Sustainable Tourism, vol. 14, pp: 116–138, 2006.

[15] Shrivastava, P. "Environmental Technologies and Competitive Advantage". Strategic Management Journal, vol. 16, pp: 183–200, 1995.

[16] Russo, M., Fouts, P. "A Resource-based Perspective on Corporate Environmental Performance and Profitability". Academy of Management Journal, vol. 40, pp: 534–554, 1997.

[17] King, A., Lenox, M. "Does it really Pay to be Green? An Empirical Study of Firm Environmental and Financial Performance". Journal of Industrial Ecology, vol. 5, pp: 105–116, 2002.

[18] Orsato, R. "Competitive Environmental Strategies: When Does it Pay to be Green?" California Management Review, vol. 48, pp: 127–143, 2006.

[19] Mintzberg, H., Ahlstrand, B., Lampel, J. "Strategy Safari – A Guided Tourthrough the Wilds of Strategic Management". New York: Free Press, 1998.

[20] Porter, M. "Competitive Advantage - Creating and Sustaining Superior Performance". New York: Free Press, 1998.

[21] Schaltegger, S., Burritt, R., Peterson, H. "An introduction to corporate environmental management". Sheffield, UK: Greenleaf, 2003.

[22] Reinhardt, F. "Environmental Product Differentiation: Implications for Corporate Strategy". California Management Review, vol. 40, pp: 43–73, 1998.

[23] Magretta, J. "Understanding Michael Porter". Boston: Harvard Business Review Press, 2012.

[24] Egelhofer, R., Marizy, C., Cros, C. "Climate impact of aircraft technology and design changes". Journal of Air Transportation, vol. 12, pp: 72–97, 2007.

[25] European Commission. (2015, October 28). *Fuel and air transport*. Available: http://ec.europa.eu/transport/air/doc/fuel_report_final.pdf

[26] Hileman, J., Katz, J., Mantilla, J., Fleming, G. "Payload fuel energy efficiency as a metric for aviation environmental performance" in 26th International Congress of the Aeronautical Sciences, Anchorage, Alaska, 2008, pp. 1-11.

[27] Hansen, M., Smirti, M., Zou, B. (2008). *A Comparative Evaluation of Greenhouse Gas Emission Reduction Strategies for the Maritime Shipping and Aviation Sectors*. Available FTP: scholarship.org Directory: uc/item/ File: 4j3573wm

[28] Reynolds, T., Gillingwater, D., Caves, R., Budd, L., "Climate Related Air Traffic Management Final Report," Loughborough University, 2009.

[29] Brouwer, R., Brander, L., Van Beukering, P. "A convenient truth: air travel passengers' willingness to pay to offset their CO_2 emissions". Climatic Change, vol. 90, pp: 299–313, 2008.

[30] van Birgelen, M., Semeijn, J., Behrens, P. "Explaining pro-environmental consumer behavior in air travel". Journal of Air Transport Management, vol. 17, pp: 125–128, 2011.

[31] Hares, A., Dickinson, J., Wilkes, K. "Climate change and the air travel decisions of UK tourists". Journal of Transport Geography, vol. 18, pp: 466–473, 2010.

[32] Miller, G., Rathouse, K., Scarles, C., Holmes, K., Tribe, J. "Public Understanding of Sustainable Tourism". Annals of Tourism Research, vol. 37, pp: 627–645, 2010.

[33] Thompson, D., Anderson, R., Hansen, E., Kahle, L. "Green segmentation and environmental certification: Insights from forest products". Business Strategy and the Environment, vol. 19, pp: 319–334, 2010.

[34] Bieger, T., Wittmer, A., Laesser, C. "What is driving the continued growth in demand for air travel? Customer value of air transport". Journal of Air Transport Management, vol. 13, pp: 31–36, 2007.