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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.
- Papatheodorou, A. (2008) The Impact of Civil Aviation Regimes on Leisure Market. In Graham, A., Papatheodorou, A. and Forsyth, P. (ed) *Aviation and Tourism: Implications for Leisure Travel*, Aldershot: Ashgate, 49-57.
- Skycontrol (2007) *easyJet welcomes European Commission's decision to limit PSO abuse in Italy*. 23rd April. Available from: http://www.skycontrol.net/airlines/easyjet-welcomes-european-commissions-decision-to-limit-pso-abuse-in-italy/ (accessed on 22/08/2008).

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Conference Reports should be between 1,000 and 1,500 words. They should provide factual information (e.g. conference venue, details of the conference organizers), present the various programme sessions and summarize the key research findings.

Book Reviews should be between 1,000 and 1,500 words. They should provide factual information (e.g. book publisher, number of pages and ISBN, price on the publisher's website) and critically discuss the contents of a book mainly in terms of its strengths and weaknesses.

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practices. With that MSG-3 was born. MSG-3 is the current standard for risk management in aviation (McLoughlin, 2006). In 2006, ICAO released a new initiative known as Safety Management Systems (ICAO, SMM, 2006). All domains within aviation will be required to implement a safety management system that complies with ICAO's guidelines set forth by member states within their own regulations. This is the SSP or State Safety Program. The goal is to provide support for continued evolution of a proactive strategy to improve safety performance (ICAO Safety Management, n.d.). Aviation safety is key, but it is certainly not a new goal. The purpose of this paper is to compare the two programs, MSG-3 and SMS. The study reveals similarities and differences of organizational structures and procedures required to carry out the programs. By identifying growth areas for expertise and personnel, this analysis may be of interest to those starting the journey into SMS.

At least seven of the indicators of market inefficiencies and/or failure are visible in the airline industry. These have been triggered by national, multi-national or supranational governments' (NMSGs') interventions trying to resolve political, social or environmental problems. These seven interventions (many lacking preliminary economic analysis) have been aimed at resolving lack of competition, filling missing markets, and neutralising the presence of negative externalities, free riders, social inequalities and moral panic. Desk research showed that just one of these NMSGs' interventions was beneficial since it encouraged competition while the other six unintentionally triggered market inefficiencies or failures. Furthermore, it is possible that some of the interventions could eventually make advanced world airlines subsidise their advancing world competitors.

Selected articles from the 20th ATRS World Conference, Rhodes, 2016

Gianmaria Martini and Davide Scotti

The 20th Air Transport Research Society (ATRS) World Conference was held in Rhodes from June 23rd to June 26th, 2016. The conference attracted about 180 papers, four of which are collected in this special issue of the Journal of Air Transport Studies. These papers cover some of the topics discussed at the conference. More specifically, the issues tackled are (i) passengers with reduced mobility (PRMs) travel experience, (ii) customer loyalty in the airline industry, (iii) aviation safety management systems, and (iv) issues related to governments' interventions in airlines' markets.

In the first paper, **Sara Zorro, Rosário Macário, and Jorge Silva** deal with the emerging relevant issue, for the aviation industry, of PRMs. The authors analyze needs, constraints, air rights, and the perception of air travel of such passengers. Information is gathered through an online survey and shows that there is still room for both airports and airlines to improve the travel experience of this category of travelers.

In the second paper, **Nuriye Güreş, Hilal İnan, and Seda Arslan** investigate the determinants of customer loyalty in the airline industry. Their study is based on questionnaires submitted to the passengers traveling on LCCs' flights at the Turkish airports of Hatay and Adana. Their analysis, based on structural equation modelling, reveals the relevance of perceived value and trust as determinants of passenger loyalty.

The third paper, written by **Lisa Whittaker**, provides a comparative analysis between Safety Management Systems (SMS) and Maintenance Steering Group version 3 (MSG-3). The author identifies similar strengths, but also differences and identify best practices to apply to SMS as the initiative develops.

Deborah Ancell, in the fourth paper, identifies indicators of unsuccessful governments' interventions in the airline industry. Next to the positive intervention related to the

liberalization process, the author highlights policy initiatives, such as the regulation for PRM and CO_2, that unintentionally brought some inefficiency to the airlines.

We would like to extend our thanks to the authors and to the participants to the conference for their contribution to this ATRS special issue of Journal of Air Transport Studies. We believe that these studies may be of interest and we hope that they will prompt practitioners and academics to further research on the topics analyzed by the papers of this special issue.

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AIR TRANSPORTATION: PERCEPTION AND IMPACT OF PASSENGERS WITH REDUCED MOBILITY

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ABSTRACT

Air transport has many restrictions for persons with reduced mobility (PRM). This study aims to better understand the needs of PRMs and the main constraints they face within airports and aircraft. The passengers' air rights and how they are being met for PRMs were analysed. An online survey was used to gather information about accessibility constraints and PRMs' perception of air travel. The specific regulations for these passengers are not being properly complied with. There is still room for both airports and airlines to improve PRM experience during air travel.

KEYWORDS

accessibility, persons with reduced mobility, passenger rights, airport barriers, aircraft barriers, PRM perception.

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1. INTRODUCTION

Air transport has many restrictions for PRMs. The difficulties in accessibility and all the logistics required for PRMs to get around the airport and board an aircraft is more than a few. The increasing demand for reduced mobility services is becoming a major challenge for both airports and airlines in terms of human and material resources, and operational logistics. Therefore, new strategies need to be adopted to ensure that PRMs can enjoy the air travel experience like any other passengers.

Besides the slight evolution in some airport infrastructure and services regarding this subject, the overall objective of this research is the improvement of the accessibility of air transport. For this, we must first address the main obstacles inherent to air transport. As such, this paper aims to better understand the needs of PRMs and the main constraints they face within airports and aircraft. It will first focus on thoroughly researching the passengers' air rights and how they are being met for PRMs. Then go on to finding out the main constraints that PRMs face within airports and aircraft. Therefore, to understand the poor accessibility and PRMs' perception of air travel we prepared a survey instrument in the form of an online questionnaire. Finally, the results are analysed and discussed.

2. LITERATURE REVIEW

About 80 million Europe citizens currently suffer from mobility impairments (European Commission, 2010), and by 2050 the European population aged 65 and over is expected to reach 25.1% (OECD, 2015). Around the world there are about 900 million people aged 60 years and over, of whom 125 million are more than 79 years old (United Nations, 2014). This means that in a few years the percentage of the population with reduced mobility (children, pregnant women, people with disabilities, older persons, the obese, etc.) will be even more significant and an urgent but wise investment by airlines and airports industry is therefore justified.

According to the World Health Organization (WHO), approximately 15% of the population lives with some type of disability – 20% in developed countries and 80% in developing countries (World Health Organization, 2011). Due to the "(…) greater vulnerability of modern daily life to various dangers such as industrial and natural disasters, diseases, traffic accidents, addiction to drugs and/or alcohol, violence, and pollution, combined with (…)" (Lee, Agarwal, & Kim, 2012) population growth, medical advances and aging process the percentage of disabled population is expected to increase.

The increasing reduced mobility population also offers opportunities, such as new developments in technology and innovation; and market approaches to retrofit existing infrastructures and vehicles allowing PRM to maintain or regain their autonomy. More autonomy for PRM can also be seen as the result of socio-economic conditions that make it possible to live inclusively and more productive lives, and as something that provides opportunities for growth (OECD, 2015).

A reduced mobility society intensifies the need to address inequality, which compromises socio-economic resilience. Transportation policies can have a key role in empowering PRM and building resilience in the economy and societies.

2.1 Passenger Rights

In 2006, the United Nations adopted the International Convention about the Rights of Persons with Disabilities that expressly prohibits all forms of discrimination based on disability. Discrimination by any form – attitudinal, behavioural and/or institutional – violates the human rights. Participation in society is a right of all human beings. Thus, the definition and implementation of strategies and policies to minimize the physical and attitudinal barriers is a responsibility of the entire community (Jonh & Rajé, 2007). As a worldwide mode of transportation, airlines must respect and follow the regulations in force in the operation countries – bilateral agreements.

In the European Union (EU), Regulation (EC) No. 1107/2006 reinforces the rights of passengers with disabilities and reduced mobility on air transport. It states that in the EU all the airports should be comparable in mobility in terms of accessibility to these passengers. PRM must have the same opportunities for air travel as the other citizens. As such, "(…) assistance to meet their particular needs should be provided at the airport as well as on board aircraft, by employing the necessary staff and equipment. In the interests of social inclusion, the persons concerned should receive this assistance without additional charge."(The European Parliament and the Council of Union European, 2006). The measures proposed in regulation No. 1107/2006 are considered by the European Commission of Transport as an effectively response to the needs of a growing sector of the population. Yet, it admits that the transport of PRM can be denied for justified reasons as security.

The Air Carrier Access Acct (ACAA) of the US demands that all the US and foreign airlines that fly to and from the US must have aircraft with accessible services for PRM. The ACAA applies to all flights to and from the US, and also prohibits the discrimination and denial of transportation of these passengers by the airlines. (*Air Carrier Access Act (ACAA, 49 U.S.C. 41705)*, 1986). The Department of Transportation (DOT), in interpreting and implementing

the ACAA - Regulation 14 CFR Part 382 -, defined a rule with standard services that airports and airlines are expected to provide to PRM; for example, airport and airlines employees should be fully prepared and trained to assist PRM within the airport and the aircraft, and both lavatories, in the airport and in the aircraft, should be fully accessible to PRM, and equipped with grab bars and extensible wide doors (U.S Department of Transportation, 2003), (FAA, 2015). However, these recommendations are not fully followed by airports and airlines. Regulation 14 CFR Part 382 maintains that an airline can legally require to a disabled passenger that needs physical help to travel with a safety assistant. The boarding/deplaning assistance should be provided considering the passenger safety and needs, and using adequate and prepared attendants and equipment (U.S Department of Transportation, 2003). The Air Travel Consumer Report of the US Department of Transportation revealed that the disability complaints are up, approximately, 14 per cent year on year (Castiglioni, 2015). European countries have no legal obligation to record complaints; however, the European Commission revealed that complaints related to travel disability were up to 148% in 2012, expecting to increase in the next years. Two of the largest airports in the EU receive more than 100 complaints related to PRM rights per month. This situation reveals that the Regulation (EC) 1107/2006 is not being applied as it should. Therefore, complaints register by airports and airlines should become obligatory in the EU countries and immediate actions should take place to monitor and ensure these passengers rights according to the current regulation (Castiglioni, 2014). However, the report from the Commission to the European Parliament and the Council "(…) concluded that Regulation (EC) No 1107/2006 has brought advantages to disabled persons and persons with reduced mobility (PRM); (…)", (European Commission, 2011). Some difficulties in applying the regulation were also indicated, namely:

- Insufficient quality of service provided and inadequate adaption to PRM's individual needs;
- Insufficient in-flight assistance by the air carriers, particularly in moving to toilet facilities;
- Disparities in the implementation of the regulation between EU countries.

Therefore, to improve the existing framework the interpretation of the regulation must be uniformed; improve how the regulatory instruments work in practice; strengthen the efficacy of the penalties ant its supervision by national authorities; and make obligatory in the EU countries the register of passengers complaints by airports and airlines(European Commission, 2011), (Castiglioni, 2014), (European Commission, 2011).

In summary, all the mentioned regulations, directly or indirectly, require private and public agencies to implement reasonable actions to improve the social inclusion of disabled people. In result, some progressive change has been noticed in social attitude towards disability; the

society "(…) focuses less on disability per se as a factor which determines full participation in all aspects of life, and more upon the constraints imposed by society as a whole."(Lee et al., 2012).

2.2 Accessibility Constraints

Personality, lifestyle, socio-economic and cultural characteristics are the main common factors that influence everyone's decision when choosing a transportation mode. For PRM, the accessibility is the most important factor to consider when planning a trip. Being aware about these passengers needs and having the ability to communicate with them effectively is an important step to overcome physical and psychological barriers. People involved in the design, management and special services provision need to be aware and understand the mobility impairment concept, to develop accessible infrastructures and, consequently, ensure that persons with reduced mobility will be able to move along the airport like any other non-disabled passenger.

Disabled travelers present significantly different travel experiences, and air transportation industry is pointed as a possible responsible since it has not yet fully responded to the PRM needs. Passengers with different impairment levels have different perceptions about importance and satisfaction of barrier-free accessibility. The seat arrangement and lavatories on the aircraft are considered by the disabled passengers the least satisfactory attributes (Y. C. Chang & Chen, 2011).

Depending on nature and the severity of the disability, people refer different fears and risk levels. For instance, passengers with visual impairments feel vulnerable in new and unfamiliar environments and fear for their safety; and spinal cord injuries passengers are concerned about the urinary control and the possibility of airlines losing their "legs" (wheelchair) (Yau, McKercher, & Packer, 2004).

Lack of disability awareness training and attitudinal barriers are also an important issue. Attitudes of airport and airlines staff can be changed. Repeated exposure and practical knowledge about disabled persons would enhance knowledge and behaviors of service personnel with such individuals. Operators and service providers need to embrace a more holistic perception about the importance of attitudinal modification to provide a good travel experience for all passengers equally. The internalization of a more positive attitude towards PRM would improve the social inclusion and, consequently, all civil society (Daruwalla & Darcy, 2005).

2.2.1 Airport Barriers

Several factors inhibit PRM from using airport infrastructures; such as, the environment itself, including the attitudinal, architectural and ecological barriers; interactive and communication barriers; and intrinsic barriers that represent the greatest obstacle since they depend on the physical, psychological or/and cognitive functioning of each person (McKercher, Packer, Yau, & Lam, 2003).

Cultural and social attitudes about PRM - quite different among countries and people - represent one of the most difficult obstacles to overcome. Negative and discriminatory attitudes can influence and change someone's perception of himself/herself as a person with equal rights to live in society (Yau et al., 2004). The main items regarding the PRM's satisfaction in air transport are the attitudinal behaviour of the airport/airlines staff during the embarking and disembarking phases, and at the check-in counters (Y. C. Chang & Chen, 2011).

Important travel information for PRM is on airports and airlines websites; however, specialized services and regulations are different between them. A flight reservation for a PRM can be quite time and patience consuming, and sometimes the lack of information obligates the passenger to physically go to the airport to buy the ticket (Y.-C. Chang & Chen, 2012).

Elderly, a particular part of the PRM population, are often not familiar with the airport facilities when they book a flight. Their ability to understand, read and listen the information and instructions given at the airport is hampered by the lack of vision and hearing, as well as the decreased cognitive abilities. Therefore, airports should also provide clear and easy to understand information about emergency exits, directions at the airport terminal, and transport means to get in and out of the airport. The importance of special services provided by airlines and airports increases with increasing age of the passenger.

Passengers with reduced mobility are usually slower and unstable; as such, one of the main priorities is to assure the full airport floor conditions to prevent falls. Ramps and elevators accesses and respective support equipment (wheelchairs) must always be unimpeded and available for use (Y. C. Chang & Chen, 2011).

The wheelchair transport is also a common problem reported by disabled passengers. Airport operators and air carriers receive several complaints about damaged wheelchairs, delays in baggage claiming or even about wheelchairs that don't arrive at all (Lee et al., 2012). Restaurants, shops, restrooms, bathrooms and lounges totally accessible are also difficult to find at the gate areas in airports (Y.-C. C. Chang & Chen, 2012).

Besides all the physical barriers, PRM also have to be prepared to deal with unexpected situations. A common delay or flight cancellation can be a huge discomfort for all passengers but especially for passengers with disabilities whose resistance to deal with unpredictable situations is limited (Ray & Ryder, 2003).

All the mentioned factors have a dissuasive effect on PRM. The travel experience is essential to make the passenger, being him/her abled or disabled, wish to travel again. Therefore, airport and aircraft accessibility barriers need to be eliminated to improve passenger's willingness to fly and, consequently, increase the number of passengers with reduced mobility (Sara, Rosário, & Jorge, 2015).

2.2.2 Air-Ground Interface Barriers

The physical transfers and the lack of specialized and trained personal are important alienating factors. For PRMs, the obstacles are many, with additional devices being needed for boarding and disembarking; standard wheelchairs, rollers, strollers are too wide to fit the aircraft aisle; and the aircraft lavatories are too small even for an adapted wheelchair. However, in terms of aircraft cabin configuration, hardly any devices or solutions have been applied, improved or re-designed in decades.

Different types of disability require different stages of transference. Usually, a disabled passenger is transferred from on seat or device to another at least four times during a flight trip. The whole transference process involves four types of devices, typically provided by the airport or the airline carrier:

- Standard airport wheelchairs;
- Boarding or aisle chairs;
- Standard aircraft seat;
- Wheelchair for mobility within the aircraft.

Due to lack of comfort and functionality, especially for passengers with severe conditioned mobility, the aisle chair or boarding chair is one of the most feared devices within the travel experience.

For boarding and deplaning of PRM, the standard procedures demand the assistance of at least two specialized attendants. However, the physical transfers present some liability issues once in some cases the attending personal are not adequately prepared for this situations, "International passenger-service workers (…) 60% said they had not been formally trained in how to lift an immobile passenger."(Lollis, 2008). Besides, the physical contact between the passenger and the helpers during the transfers to and within the aircraft has also to be authorized. According to worldwide regulations, airlines must provide special services for PRM;

and on the ground, there must be specialized passenger attendants prepared for ground physical assistance and transfers. Besides assistance within the cabin – in moving to and from seats, in preparation for eating, with the use of the on-board wheelchair to enable the person to move to and from a lavatory (not involving lifting or carrying the person) and in loading and retrieving carry-on items – be also required, airlines are not required to provide extensive special assistance in personal services as assistance within the lavatories (U.S Department of Transportation, 2003).

Injuries during the physical transfer process are a major concern; several occurrences have been reported during dependent transfers between a wheelchair/boarding chair and aircraft seat (U.S Department of Transportation, 2015). These transfers usually require two persons, one to hold the arms and the other hold beneath the passenger knees; together the transferors lift the passenger and shift him to the respective seat (Pelosi, 1988). This method puts both the passenger and the attendant personal at risk of injuries from being roughly handed or dropped and of a disabling back injury, respectively (Higginson, Welsh, & Pavol, 2007).

2.2.3 Aircraft Barriers

Airlines face a growing number of passengers that can't walk, and, therefore, presumably a growing number of complaints as a result of the compensation economy. Currently, there are around 100 complaints about seating and around 50 inquiries about special needs a year in the UK (Aircraft Interiors International, 2014). However, nowadays few solutions have been employed to improve the accommodation of these passengers. Boarding and disembarking phases are preoccupant issues, both physically and emotionally, as well as the seats, seatbelts, tray tables, lavatories, aisles and overhead storage compartments. All these factors result in an unpleasant flight experience.

According with Regulation 14 CFR Part 382, new aircraft with 30 or more seats must have movable aisle armrests on half the aisle seats; airlines are required to allocate accessible lavatories only on aircraft with more than one aisle; new aircraft with 100 or more seats must have priority space for storing a passenger's folding wheelchair in the cabin; and aircraft with more than 60 seats and an accessible lavatory must have an on-board wheelchair (U.S Department of Transportation, 2003). Unfortunately, in EU it is not part of the Regulation (EC) No. 1107/2006 the obligation of having accessible lavatories regarding the type of aircraft; and how the airlines should implement the assistance in moving passengers to toilet facilities - it is only claimed that "Assistance in moving to toilet facilities is required." (The European Parliament and the Council of Union European, 2006).

Due to the lack of uniformed worldwide regulations, several travel guides for PRM recommend wearing diapers, since some aircraft might not have accessible lavatories or on-board wheelchairs, and, in case they have, the transfer process into the toilet can be both problematic and discomforting. In some situations, the on-board wheelchair is not able to carry the passenger, or it doesn't fit into the lavatory. In those cases, assistance is required during the transfers. As such, PRM are often assigned middle seats away from any lavatory as a mean to dissuade them to use it, ask for assistance and/or disturb the other passengers (Law F., 2012).

3. CONTRIBUTIONS

This study aims to better understand the needs of PRMs and the main constraints they face within airports and aircraft. Therefore, an online survey was used to gather reliable information about accessibility constraints and PRMs' perception of air travel.

3.1 Survey Design and Data Collection

A survey instrument in the form of an online questionnaire to collect PRMs' perception of the accessibility of air transport was prepared. The 25 items used were defined based on the literature review, and include the respondent's personal and demographic characteristics, as well as travel-related characteristics. An email was sent to several national institutions, explaining the purpose of the study and asking about their willingness to take part in the survey. The link to the enquiry was included in the email. The survey was delivered via an open source web-based platform (Google Forms)[1], and it has been online since July 2015.

3.2 Results

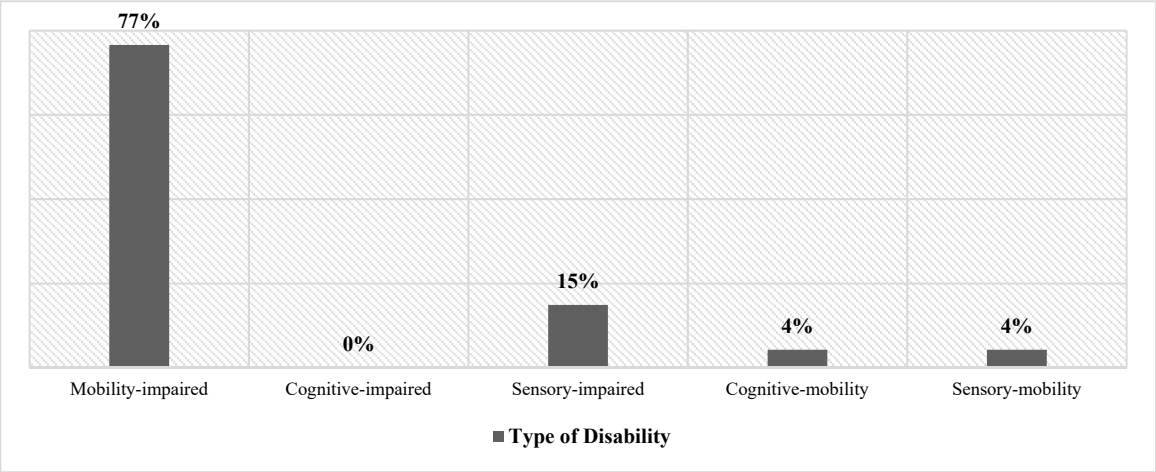
The results obtained have undergone a first analysis and interpretation. The target population of this study was people with disabilities and people who have accompanied PRMs on an air trip. Of the valid 119 responses collected, only 50 mentioned any type of reduced mobility. For analysis purposes only this group of respondents was considered, since the objective of the study is the PRMs' perception of air travel. The statistical analysis was performed using SPSS Statistics 23® for Microsoft Windows®.

[1] https://docs.google.com/forms/d/1yP6t3U3GAqk3LpJTbz8oLfX8Z1LE8chy_xB5PWEG3UI/viewform

3.2.1. Socio-demographic profile of respondents

The results showed that with respect to the socio-demographic profile of the PRM respondents males predominated in the sample, 33 to 17. Mean age was 43.3 yrs (min=14 yrs, max=85 yrs, SD=18.4). Concerning the disabilities suffered by the respondents, most were mobility-impaired (77%), followed by those with sensory (15%) disabilities. About 4% mentioned both cognitive and mobility impairments, and 4% referred both sensory and mobility difficulties (Figure 1).

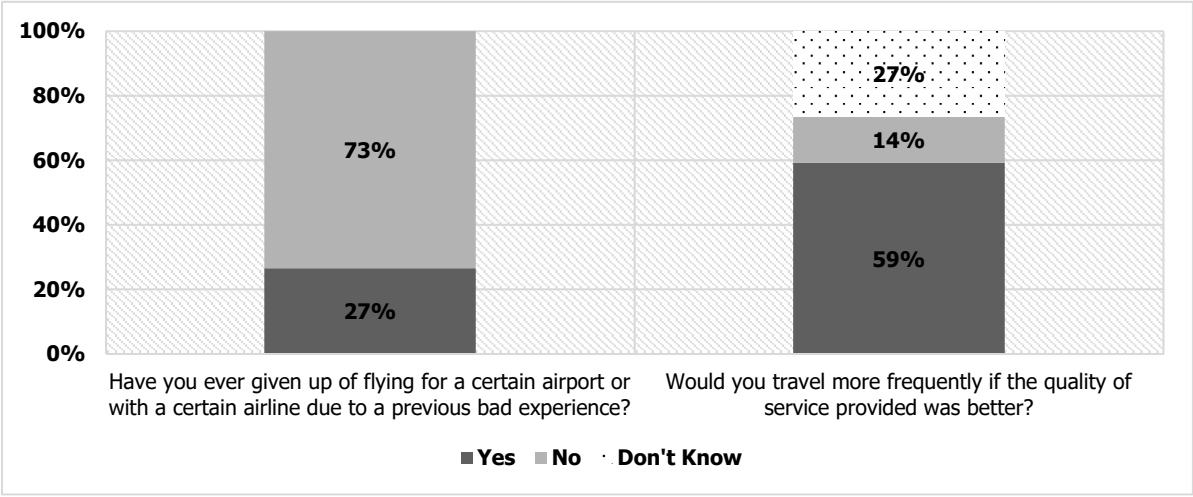
Figure 1 – Type of disability exhibited by the sample



3.2.2 PRM Perception about Air Transportation

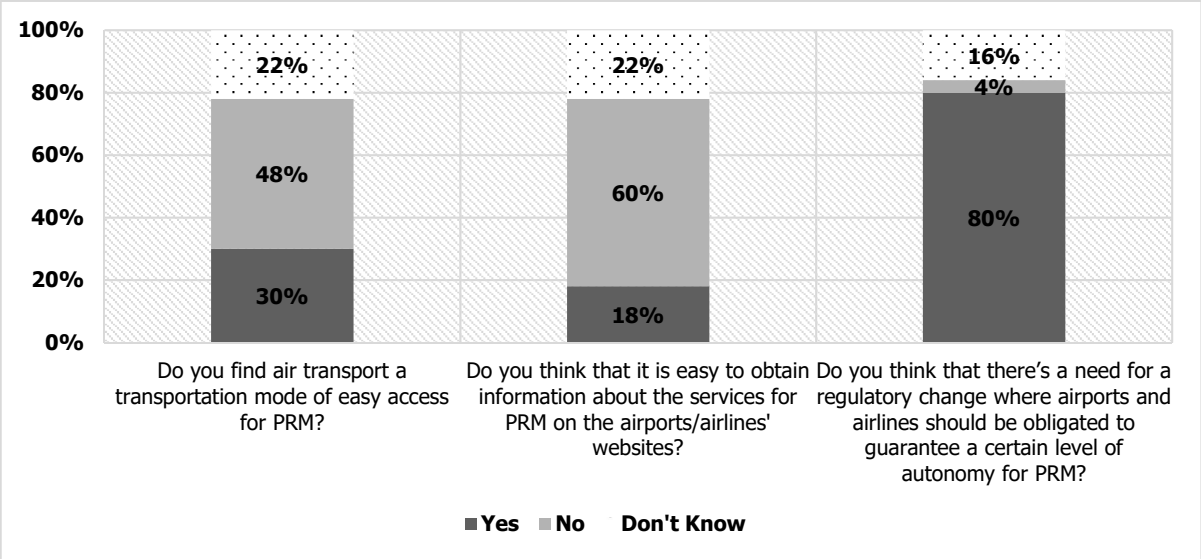
27% of the sample reported that had already given up of flying due to a bad experience. It is also clear that an improvement in the quality of the assistance service provided could attract more PRMs to air transport (59%) (Figure 2).

Figure 2 – Percentage of responses about the flight experience and the quality of the service provided



48% believe that air transport isn't an easy mode of transportation. However, 22% didn't have an opinion about it. The respondents were also clear about the difficulties in getting information about PRM assistance services (60%), and even more expressive about the need for mandatory regulation (80%) (Figure 3).

Figure 3 – Respondents perception about accessibility, information and regulation of air transport



3.2.3 Airport Constraints

Regarding airport constraints, it is clear that the baggage claim (45%), the lack of specialized and trained personal (44%) and the transfers at the airport terminal (39%) are very important barriers for these passengers. Information about the emergency exits is another subject that clearly preoccupies PRMs (36%). The less important issues, identified as somewhat important and not at all important, were the lavatories (43%) and the waiting areas (40%) (Figure 4).

3.2.4 Aircraft constraints

Regarding the aircraft constraints, the lavatories (51%), the space between seats (43%), the seat transfers (41%), the boarding/disembarking transfers (37%), and the mobility inside the aircraft (32%) were considered as very important obstacles. The less important issues, identified as somewhat important and not at all important, were the seat-belt (66%) and the accommodation of the carry-on baggage (48%) (Figure 5).

Figure 4 – Importance scale of the different airport constraints

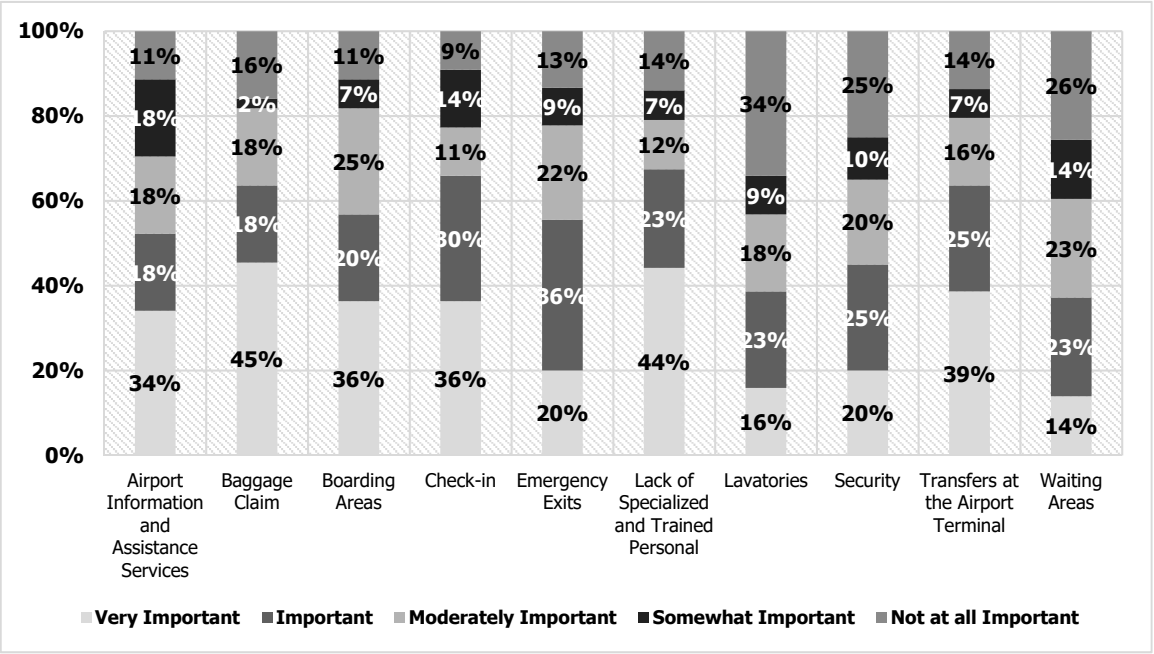
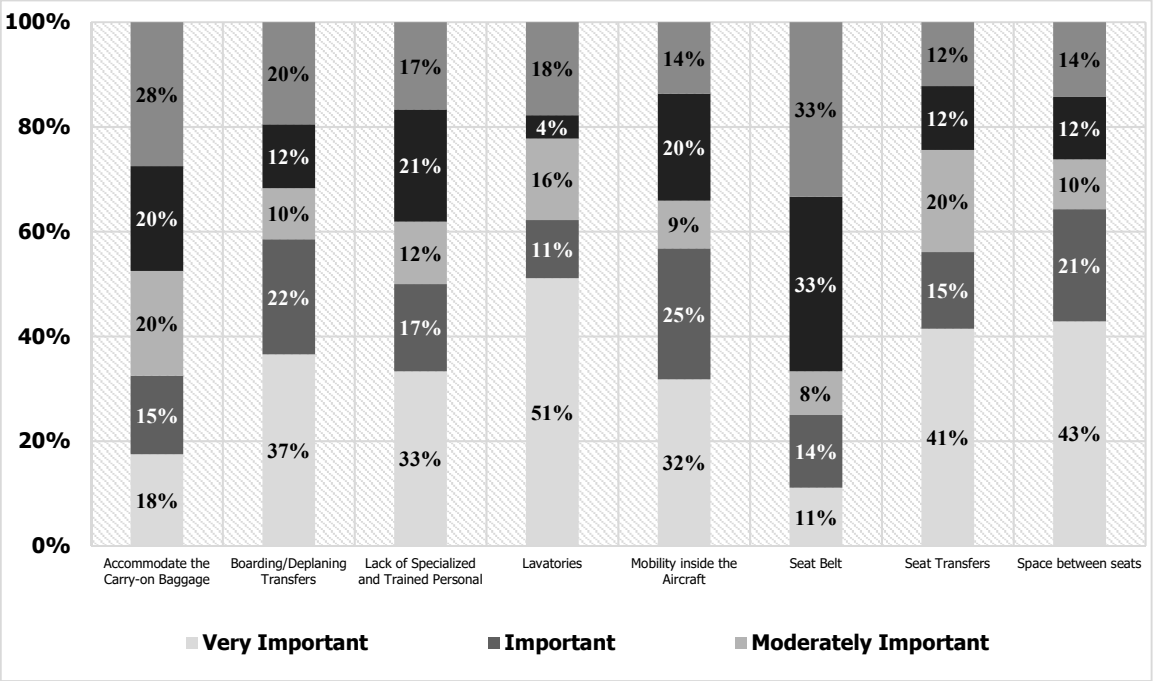


Figure 5 - Importance scale of the different aircraft constraints



3.3. Discussion

Mobility impairments are the most common disabilities suffered by PRMs (77%), and this may be why 27% of the sample reported that had already given up of flying due to a bad experience. It is also clear that an improvement in the quality of the assistance service provided could attract more PRMs to air transport (59%). However, a certain uncertainty can be seen, since 27% were not sure if those improvements would make them travel more.

When questioned about the accessibility of air transport, a large proportion of the respondents answered No (48%), which leads us to believe that there is still room for improvement.
The respondents were also clear about the difficulties in getting information about PRM assistance services (60%), and even more expressive about the need for mandatory regulation (80%). This proves that these passengers feel excluded and encounter some difficulties in finding out about their rights amid the airport/airline's world of information. It is a fact that there are specific regulations for these passengers, but are they being properly complied with? Well, these results show that in this sample's perception they are not, or at least it does not feel that they are.

Regarding airport constraints, the lack of specialized and trained personal (67%), the check-in (66%), the transfers at the airport terminal (64%), the baggage claim (63%), the boarding areas (56%) and the emergency exits (56%) are important barriers for these passengers. Therefore, these issues could be a focus area for airports to improve PRM experience during air travel.

Regarding aircraft constraints, the most problematic issues were deemed to be the space between seats (64%), the lavatories (62%), boarding/deplaning transfers (59%), mobility inside the aircraft (57%) and seat transfers (56%). Airlines must invest in more comfortable seats (economy class) and ways of transferring a PRM into and within the aircraft. Several solutions have been developed to minimize physical transfers, however, very few have been applied, although, some aircraft models have already implemented more spacious lavatories.

4. CONCLUSION

Persons with reduced mobility comprise a passenger category that is increasing in air transport. Therefore, airports and airlines need to improve their strategies to better serve all types of passengers. This must happen not just because of equal rights but also because reduced mobility is something that in the short or long run will affect almost every single person. A full and complete perception of this imminent reality is therefore both urgent and necessary to better cope with the upcoming issues, where both airports/airlines and passengers can be the beneficiaries.

We argue that analysing PRMs' perception of air transport barriers will allow us to better tackle the issues regarding accessibility. Therefore, we need to identify the main issues regarding PRM services and its influence on accessibility and operations logistics. Then, propose solutions to minimize those barriers; and alert airports/airlines to the existent problems and help them find ways to better manage the PRM needs.

It is our belief that to overcome the current and future issues airports and airlines need to adopt strategies that are cross-cut all stages of the chain of processes, from the moment the passenger arrives at the airport until the moment he/she is seated in the aircraft. Thus, solutions that work on both constraints and operational logistics optimization are believed to be the best future strategy for airports and airlines.

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DETERMINANTS OF CUSTOMER LOYALTY: A FIELD RESEARCH IN AVIATION INDUSTRY

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ABSTRACT

The encouragements of Turkish government for aviation industry in 2003 have paved the way for private airlines to enter the market. Through the increasing number of airlines and the rivalry between them, especially low-cost carriers have started to give transportation service with cheaper ticket prices. According to The International Air Transportation Association (IATA) estimates, the number of passengers travelling with airlines around the world will reach to 3.8 billion passengers in 2020 and low-cost carriers' flight networks and numbers especially in developing countries as Turkey will continue to gain momentum. When considering the increased passenger traffic in Turkish travel industry, providing the passenger loyalty for Turkish low-cost carriers has also become obligatory for these companies' survival in the long-run. In this study, determinants of passengers' loyalty as perceived value and trust have been searched. For this purpose, 350 questionnaires were applied to the passengers travelling with low-cost carriers at Hatay and Adana Airports in Turkey, 311 of which were analyzed after eliminating invalid ones. Structural equation modelling was applied for data analysis. According to the analysis results, perceived value and trust were identified as the important determinants of passenger loyalty.

KEYWORDS

Airline Marketing, Low-Cost Carriers, Perceived Value, Trust, Passenger Loyalty, Turkish Aviation Industry.

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1. INTRODUCTION

In recent years, there has been important progress in Turkish Aviation Industry. The Turkish Government has been giving more support to the airlines performing in the sector since 2003. By this way, the liberalization in this market has increased and new airlines have entered the sector. Thus, both domestic and international airlines have put in an appearance in Turkish Airline Market and the competition among them has also gone up. Because of the increasing intense competition in the industry, some airlines have preferred to put a new business model to use named Low-cost carriers (LCC).

LCC includes airlines that use aggressive, competitive mind-sets to gain competitive advantages and better returns than their counterparts "traditional airlines" (Akamavi et al., 2015; Graf, 2005; Kangis & O'Reilly, 2003; Kumar, 2006; McLay & Reynolds-Feighan, 2006; Porter, 1996). Also, Low cost carriers (LCCs) can be defined as the airlines which offer lower fares to attract passengers by reducing their service costs by means such as reducing free in-flight services, standardizing airplane fleet and cabins, increasing luggage restrictions, benefiting from direct distribution channels (internet, smart phones, social media, etc…) and using secondary airports (Chang & Hung, 2013).

In international aviation industry, there are many airlines using this competitive strategy such as Southwest Airlines in the USA, Rynair, Easyjet, Germanwings in Europe and Pegasus in Turkey. Along with rising number of LCC, traditional airlines have been adding new and different service qualifications (flying chef, in-flight entertainment service cost free, wider spaces between the seats, etc…) to overcome the competition with LCC. Thus, providing passenger loyalty has become more important for LCC.

At the same time, the LCC has become an interesting research area and it has attracted the attention of numerous scholars worldwide (Barrett, 2004; Zou et al. 2014; Akamavi et al, 2015; Chang & Hung, 2013; Chiou & Chen, 2010; Forgas et al, 2010; Han et al, 2014; Han, 2013; Mikulić & Prebežac, 2011; Yang et al., 2012; Diggines, 2010; Pan & Truong, 2018; Taumoepeau et al., 2017; Zuidberg & de Wit, 2016; Lu, 2017; Bachwich & Wittman, 2017; Rajaguru, 2016; Koklic et al., 2017).

Despite the growing importance of the subject in international literature, the studies made in this field are relatively limited in Turkey. There are a few studies related to the passenger loyalty in aviation (Mutlu & Polat Seslikoyuncu, 2015; Atalık, 2005; Atalık, 2006; Çalışır et al., 2015), but there isn't any study about Turkish passengers' loyalty with LCC. For this reason in this study, Turkish passengers' loyalty towards LCC and the factors as perceived value and trust that may effect the loyalty were searched.

2. LITERATURE REVIEW

2.1. Customer Loyalty

Customer loyalty is defined as "a deeply held commitment to rebuy or repatronize a preferred product / service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior." (Oliver, 1999).

Customer loyalty may provide positive word-of-mouth and word-of-mouse (Severt et al, 2007), reduces marketing costs abd turnover expenses, increases cross-selling (Caruana, 2004; Griffin, 1995; Reichheld & Sasser, 1990; Yang and Liu, 2003). Besides the costs of winning a new customer are six times greater than the costs of maintaining an existing customer (Akamavi et al, 2015).

Customer loyalty is important to airline companies, too. Because passenger loyalty is one of the key indicators that influence competitive advantage in the global airline market (Cooil et al., 2007; Mägi, 2003; Wirtz et al, 2007; Akamavi e .al, 2015). If airlines want a sustainable market share, they should provide passenger loyalty (Chang & Hung, 2013; Kumar & Shah, 2004). According to Binggeli, Gupta, and de Pommes (2002) passenger loyalty may increase airlines' revenue by as much as 2.4% per year.

2.2. Perceived Value

Perceived value is a very important concept in marketing because according to researches, one of the important determinants of customer satisfaction is perceived value (Cronin et al., 2000; Chen, 2008; Oh, 1999). Also, improved customer satisfaction and high product value offers are the important factors of developing loyalty (Yang and Peterson, 2004). According to Zeithaml (1988), perceived value is "consumers' overall assessments of the utility of a product based on perceptions of what is received (volume, high quality or convenience) and what is given (money, time or effort)". Based on the equity theory, perceived value concept can be explained through comparing benefits and sacrifices associated with the offering. (Yang and Peterson, 2004). Perceived benefits can be explained as a combination of different product attributes available in relation to a particular buy and use situation (Snoj et al.,2004). The overall cost or sacrifice made by the customer includes both monetary (such as price of the product) and nonmonetary costs (such as time, effort and search) (Sánchez-Fernández and Iniesta-Bonillo, 2007; Lovelock and Wirtz, 2011).

2.3. Trust

Trust is a key factor in successful marketing (Urban et al., 2000), especially in building and continuing long-term relationships (Akbar and Parvez, 2009). According to Gundlach and Murphy (1993), trust is the most universally accepted factor in any human interaction or exchange. Bhattacharya, Devinney and Pillutla (1998) define trust as "an expectancy of positive outcomes that one can receive based on the expected action of another party in an interaction characterized by uncertainty".

Many studies mentioned the relationship between trust and loyalty (Sirdeshmukh et al., 2002; Kassim and Abdullah 2010; Ndubisi, 2007). According to Reichheld and Schefter (2000), gaining the trust of the right customers generate loyalty. Also according to Ndubisi (2007), trust is an important factor of firm-customer relationships and so in generating the loyalty. In their research Akbar and Parvez (2009) found out that both "trust and customer satisfaction are significantly and positively related to customer loyalty" and they mentioned trust as an important antecedent of customer loyalty.

3. METHODOLOGY

Considering the literature and the survey purpose, hypotheses were defined as follows:

H1: The value perceived by a user in respect of an airline directly and positively influences the user's trust in the airline

H2: The value perceived by a user in respect of an airline directly and positively influences the user's loyalty to the airline

H3: A user's trust in an airline directly and positively influences the user's loyalty to the airline

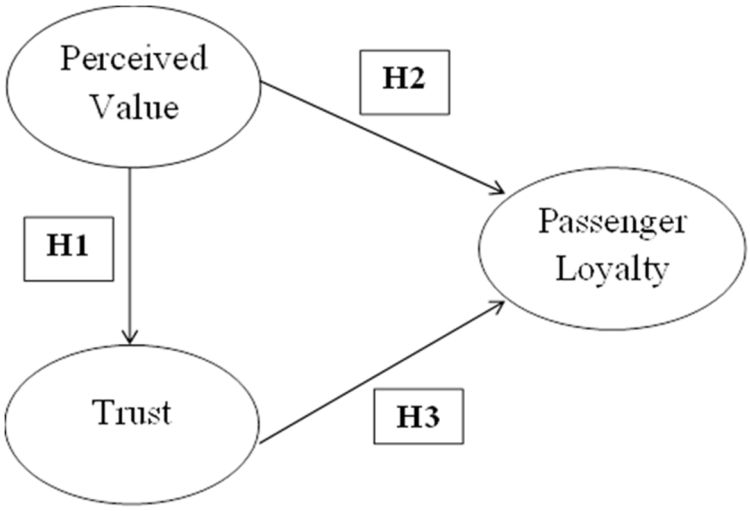
The proposed research model can be seen in Figure 1.

3.1. Measures of the Constructs

The survey questionnaire consisted of four sections. The first three sections were designed to obtain each respondent's perceived value (9-item), trust (4-item) and loyalty (4-item) towards LCC. All these scales were measured using the scale developed by Forgas et al (2010), but perceived value was adapted to our study. Respondents were asked to indicate their agreement level of each item of the first three sections on the 5-point Likert scale organized by "strongly disagree (=1)" to "strongly agree (=5)". Survey questionnaires were translated into Turkish and then implemented to Turkish passengers preferred LCC. The last section reported the respondents' demographic and flight information as; gender, age, education

level, average monthly income, airline decision, flight type, flight purpose, flight frequency and the reason for selecting this airline via a categorical scale.

Figure 1: Research Model



3.2 Data Collection and Sample Design

A self-administered questionnaire survey was conducted at Hatay and Adana airports in Turkey. In this study, convenience sampling was used as the sampling method. Respondents were first asked whether they experienced LCC before. If they replied positively, then they were invited to participate in the survey. For each question, respondents were asked to give an answer which best describes their degree of agreement. The data was collected from 311 Turkish passengers experienced LCC before.

The demographic characteristics of the respondents were as follows; 57.2 percent of them were male and 42.8 percent were female. The great majority of the respondents were aged between 20 and 29 years old (69.1 percent), had a university degree or higher educational level (93.9 percent) and domestic passengers (88 percent) as flight type. Respondents' average monthly income was mostly ranged between 1000–3000 TL (61.1 percent). Most of the respondents had a flight for vacation purposes (40.5 percent) and visiting friends/relatives purposes (23.5 percent), they had made the airline decision themselves (72.7 percent) and their flight frequency was once a quarter were 41.2%. Price was found as the most important reason for selecting airlines (62.1 %) compared to other factors as experience (20.3 %), advertising (4.8 %), recommendation (9.3 %) and others (3.5 %).

3.3 Data Analysis

In order to analyze the data, confirmatory factor analysis (CFA) and structural equation modeling (SEM) analysis were applied by using LISREL. Thus, it was aimed to check construct validity, the goodness-of-fit indices for the measurement and structural models and examine the relationship among constructs. In addition, frequency analysis was implemented to

analyze the demographic variables by using SPSS. The Cronbach alpha reliability scores of the scales were found as α=0,85 for perceived value, α=0,78 for trust and α=0,89 for loyalty.

4. RESULTS

4.1 Measurement Model

A confirmatory factor analysis using LISREL 8.5.1 was conducted to test the measurement model. The goodness-of-fit indices were used to assess the overall model fit. According to the results of the study, the fit indices for the measurement model were acceptable level as; the ratio of the Chi-square value to degrees of freedom (x2/d.f. = 2.93) is less than 3 and other indices such as normalized fit index (NFI=0.91), goodness of fit index (GFI=0.92) and comparative fit index (CFI=0.92) are greater than the recommended value of 0.9. The root mean – square error of approximation (RMSEA) is 0.081, which is less than 0.10. (Hair et al., 2006). The goodness-of-fit indices from confirmatory factor analysis demonstrated that the measurement model had a good fit with the data collected.

As seen in Table 1, the average variance extracted (AVE) was used to assess convergent validity. AVE of each measure ranges from 0.68 to 0.83, which was more than 50 percent of the variance as suggested by Bagozzi & Yi (1988) and indicated that the convergent validity was appropriate. Discriminant validity was assessed by comparing the AVE with the squared correlation between constructs (Fornell & Larcker, 1981). The squared correlations between pairs of constructs were less than the AVE, confirming discriminant validity. Moreover, a descriptive analysis was run on each construct to measure their means: perceived value (3.61), trust (3.79), and loyalty (3.89).

Perceived value, the independent latent variable, has consisted of nine items and all of the items have got positive coefficients. The highests of these observed variables is PV4 (0.76) and PV9 (0.72). This means that if social value (PV4) of the airline company and the professionalism of the personnel (PV9) increase, perceived value of the passengers may increase positively too. Similarly, trust, latent variable, has comprised of four items and all of them have got positive coefficients. T2 (0.76) and T3 (0.76) observed variables have got the highest values. From this viewpoint, it can be said that if the airline companies fulfil their responsibilities truly and meet the needs of passengers effectively, trust level of passengers can be concluded positively towards the airline company.

Table 1: Confirmatory factor analysis results

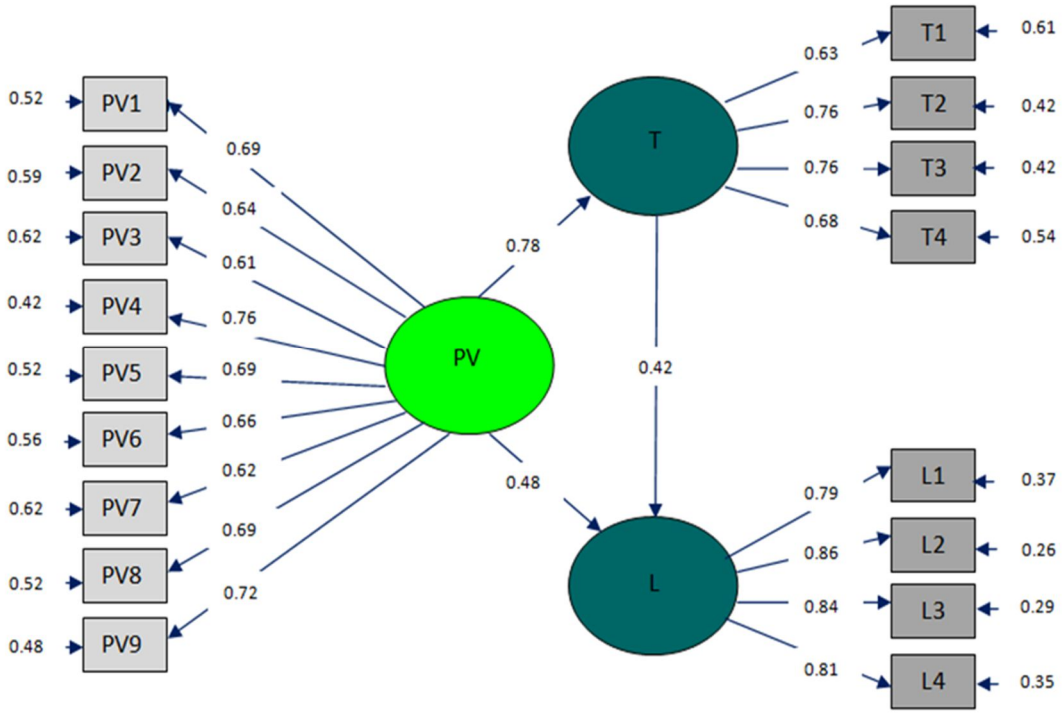
Indicator		Standardized Factor Loading	t value	Average variance extracted (AVE)
Perceived Value	PV1	0.69	13.21	0.68
	PV2	0.64	12.25	
	PV3	0.61	11.33	
	PV4	0.76	15.13	
	PV5	0.69	13.22	
	PV6	0.66	12.64	
	PV7	0.62	11.47	
	PV8	0.69	13.22	
	PV9	0.72	14.00	
Trust	T1	0.63	8.69	0.72
	T2	0.76	10.49	
	T3	0.76	10.49	
	T4	0.68	9.67	
Loyalty	L1	0.79	15.12	0.83
	L2	0.86	16.83	
	L3	0.84	16.44	
	L4	0.81	15.51	

4.2 Structural Model and Test of Hypotheses

A similar set of fit indices was used to examine the structural model. The results with their corresponding recommended values, provided evidence of a good model fit (x2/d.f. = 2.97, NFI = 0.92, GFI = 0.91, CFI = 0.91, RMSEA = 0.085). Regarding the hypothesis tests, perceived value hasa positive effect on trust (γ1 = 0.53, t-value = 9.69). Thus, H1 was supported. Furthermore, perceived value was found to have a significant positive effect on passenger loyalty (γ2 = 0.53, t-value = 5.46), supporting hypothesis H2. The relationship coefficient between perceived value and trust was 0.78 (PV → T), perceived value and passenger loyalty as 0.48 (PV → L) were found. So, it's been seen that a rise in perceived

value per unit has a relatively high effect on trust with 0.78 increase rate, but medium-level effect (0.48) on passenger loyalty. The coefficients are positive and found statistically significant with 5 % significance level. It can be stated that as the level of passengers' perceived value goes up, the level of passengers' trust and loyalty towards the airline company go up, too or vice versa.

Figure 2: Final Model



Finally, trust has been found as a significant determinant of passenger loyalty (γ3 = 1.02, t-value = 0.49), supporting H3. The relationship coefficient between trust and passenger loyalty was found as 0.42 (T → L). So, it's been seen that rise in trust per unit has less than a half effect on passenger loyalty.

5. DISCUSSION AND CONCLUSION

Having loyal customers is essential for the success of any company. In aviation industry too, loyalty of passengers especially for the LCC, serving basic service, that compete with traditional airlines, serving full service to their passengers, has become more important in today's competitive market. So, in this study, passenger loyalty has been studied and the results of this study have provided useful insights into the behaviours of LCC passengers.

Findings of this study revealed that LCC should have a positive social value and the personnel should be working professionally in order to increase the positive perceived value of the passengers. Social value includes the increase of airline image, having a better image than competitors and having preferred by many passengers. So, LCC should make an effort to differentiate themselves from their competitors. Furthermore, LCC should employ qualified

personnel and they should train and motivate them in the best way. The personnel should have the necessary knowledge and abilities, brush up their job knowledge, be ready to help and behave politely to the passengers (Forgas, et al. 2010).

Besides, LCC should fulfil their responsibilities and concern passengers' needs properly. They have to offer their services right first time and with a continuous improvement to increase trust level of passengers. Also, LCC have to search and understand the needs and requests of passengers very well, listen to them, consider their complaints and customize their services according to the feedback they got from passengers (Forgas et al., 2010; Chang & Hung, 2010).

In this study, perceived value was found as an important antecedent of trust (Forgas et al, 2010). So, in order to increase the trust level of passengers, LCC should have a good brand image than other airlines and the personnel should serve professionally to the whole passengers. Also, it's concluded that perceived value has a positive effect on passenger loyalty as consistent with other researhers' study (Forgas et al, 2010; Al-Refaie et al, 2013). Therefore, LCC should try to give better services by using online / mobile check-in, boarding systems and providing better baggage service. Furthermore, they should have modern, safe aircrafts, be on time, efficient flights with suitable times and frequencies. Besides, they should handle passengers' complaints and solve their problems immediately. All those services may be costly for LCC at first, but in the long run, it may pay for itself and also passenger loyalty of LCC and profits may be increased.

In addition, it's been found that there is a positive relationship between trust and loyalty similar to previous studies (Akamavi et al, 2015; Forgas et al, 2010; Han, 2013). Offering sincere and honest information to the passengers, fulfilling their commitments, meeting passengers' needs and having enough resources and experience to do their job well are very important for LCC to have a good trust level of passengers. Thus they may be able to maintain passenger loyalty. If passengers become loyal to the airline, they may repurchase the services of the same airline and provide positive word-of-mouth communication (Nadiri et al., 2008, Gures et al, 2014). Finally, price was found as the most important reason for selecting LCC as found in previous studies (Gures et al, 2014; Digginess, 2010; Mikulić & Prebežac, 2011; O'connell & Williams, 2005; Chiou & Chen, 2010; Pan & Truong, 2018). So LCC should give service at a cheaper price than competitors to attract more customers, provide and keep loyal passengers.

Although this study contributes to airline marketing literature, it has several limitations too. In this study, the relationship among perceived value, trust and passenger loyalty were searched. As it is seen from this study, perceived value and trust have a relatively lower effect on passenger loyalty. So, some other variables should be included into the model to see their effects on passenger loyalty. Potential independent variables that can be studied in further studies are switching cost, customization, social media and some other variables.

Moreover, in this study only quantitative analysis was used. In the following studies, qualitative analysis should also be used to have better results. In addition, this study was applied to the passengers in two airports of Turkey. There are more airports in this country, so surveys should be applied in these airports too. Also in future studies, the number of passengers should be increased to reflect the population and get favourable results about passenger loyalty.

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APPENDIX

Trust

T1 The information offered by the company is sincere and honest

T2 In general the company fulfils its commitments

T3 The company is concerned for its customers' needs

T4 The company has the resources and experience to do its job well

Perceived Value

PV1 Airport installations seem well organized

PV2 The aircraft seem modern, comfortable and safe

PV3 The personnel know their job well

PV4 This company's planes arrive and leave punctually

PV5 The service is good for the price paid

PV6 The queues to check-in are reasonable

PV7 It is no problem that the airport is far from the city of origin/destination

PV8 I feel happy with the service

PV9 This company has a very good image

Passenger Loyalty

L1 I like flying with this company

L2 I believe it is a good company

L3 I will continue to travel with this company

L4 I will continue to recommend this company

AVIATION SAFETY MANAGEMENT SYSTEMS: A COMPARATIVE ANALYSIS BETWEEN SAFETY MANAGEMENT SYSTEMS (SMS) AND MAINTENANCE STEERING GROUP VERSION 3 (MSG-3)

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ABSTRACT

Improving safety was the goal when Maintenance Steering Group (MSG) was first introduced for the Boeing 747 in 1968. The goal was to develop a system of evaluation for scheduled maintenance by using decision logic. This was MSG-1. As theory evolved, MSG-2 brought process orientation and failure modes analysis. Then in 1978, United Airlines, commissioned by the Department of Defense, developed a methodology based on tested and proven airline practices. With that MSG-3 was born. MSG-3 is the current standard for risk management in aviation (McLoughlin, 2006). In 2006, ICAO released a new initiative known as Safety Management Systems (ICAO, SMM, 2006). All domains within aviation will be required to implement a safety management system that complies with ICAO's guidelines set forth by member states within their own regulations. This is the SSP or State Safety Program. The goal is to provide support for continued evolution of a proactive strategy to improve safety performance (ICAO Safety Management, n.d.). Aviation safety is key, but it is certainly not a new goal. The purpose of this paper is to compare the two programs, MSG-3 and SMS. The study reveals similarities and differences of organizational structures and procedures required to carry out the programs. By identifying growth areas for expertise and personnel, this analysis may be of interest to those starting the journey into SMS.

KEYWORDS

Safety Management Systems; MSG-3; evaluation.

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1. INTRODUCTION

The International Civil Aviation Organization has created a world-wide initiative, called SMS (Safety Management Systems), with the goal of enhancing safety through risk reduction for aviation organizational systems. While SMS is a relatively new initiative, it is not the only aviation safety program. MSG (Maintenance Steering Group) addresses engineering and maintenance technology system safety in aviation. Both programs address system safety in aviation operations. Significant parallels exist between these two major aviation safety methodologies.

The paper is organized into several sections. Section 1 is the abstract of the comparative analysis of these two safety systems. Section 2 is the Introduction. Section 3 is the literature review. Sections 4 and 5 provide overviews of origin, evolution, purpose and methodologies for MSG and SMS respectively. Then Section 6 compares MSG and SMS directly by describing the safety systems aligned with the four SMS pillars: Safety Policy; Safety Risk Management; Safety Assurance and Safety Promotion. These pillars are general enough to cover the most relevant material of both programs. Section 7 discusses the issues related to data reporting. Section 8 is the conclusion which highlights the key points revealed within the comparative study.

This comparative study identifies similar strengths that include: the mission of safety in aviation; the methodology of identification of hazards and analysis of risk; constituent participation (team work); and accountability and oversight. Differences are revealed as weaknesses in the area of personnel and their level of expertise. However, MSG has a long history in performing these analyses using well defined data systems and technical knowledge. By analyzing the similarities and differences, best practices can be identified. These practices can be applied to SMS as the program develops.

2. LITERATURE REVIEW

This comparative analysis relates to two major aviation safety systems, MSG-3 (Maintenance Steering Committee, version 3) and ICAO's, SMS (Safety Management Systems). These two safety systems have a significant impact on the entire aviation industry. However, MSG-3 was introduced approximately 40 years prior to SMS. MSG-3 has a more specific focus on technology for aircraft design, but both MSG-3 and SMS are relevant to operations. Valuable resources are available for both systems. Documentation of the purpose, processes and outcomes come from manufacturers, government entities, journal articles and even from personal experience of this paper's author.

Sources for MSG-3 include an original training manual from Douglas Aircraft Company, Boeing publications, Aviation Today, and the Federal Aviation Administration. This MSG-3 training manual (1992) from Douglas Aircraft Company was used to prepare engineering and operational personnel, within transport category manufacturing and airlines, for the rigorous analysis of hazard identification, risk analysis, design and also maintenance and operations requirements. This manual provides detailed information that enable a comparative analysis with the methods required of SMS.

Articles provide clear explanations of the MSG-3 process (Adams, 2009; McLoughlin, 2006). These sources cover the key aspects of the MSG-3 program. The FAA issued mandatory requirements for data gathering and analysis (FAA, 2013). Articles related to Just Culture are valuable for reinforcing the need for reporting as an important but controversial safety issue (A Just Culture, n.d.; Delmas, 2012). Safety reporting is an important issue that should be addressed within the framework of SMS.

Locating sources for SMS was not difficult since SMS is a current and popular topic. Publications are readily available and extensive. The ICAO issued SMS as a Standard and Recommended Practice for all 190 member-states (ICAO Annex 19, 2013; ICAO SMM, 2013). The initiative is so widespread that the member states are still in the process of mandating SMS for the various aviation domains. In the United States, the FAA mandated SMS for the airlines first (FAA, 2015) and then for certificated airports (FAA Federal Register, 2016). It is not known when more FAA SMS directives will be released for other aviation entities.

A steep learning curve currently exists, since many personnel within these organizations are not familiar or comfortable with the rigorous analytical requirements of SMS; hazard identification and risk assessment. In order to facilitate the process of incorporating SMS, the FAA issued Advisory Circular AC 120-92B (2015) as guidance for air operators. The ACRP (Airports Council Research Program) issued several reports that clearly explain SMS procedures for their constituents (ACRP, 2007) (ACRP, 2009) (ACRP Synthesis, 2012). This material provides the necessary guidance for airports. However, guidelines alone are not enough. FAA regional offices offer direct assistance for their jurisdiction (Taira, 2014). Experience will provide a rich environment for fine-tuning SMS policies and methodologies.

MSG-3 has proven to be an effective safety management program over time. It will be years before SMS is fully integrated within the aviation industry. The expected outlook is for improved safety through improved reporting of safety issues (Howell, 2016), implementation of risk analysis, comprehensive data analysis and continuous monitoring of corrective actions.

This comparative analysis of these two major aviation safety programs reveals lessons learned and best practices.

3. SAFETY THROUGH STANDARDIZATION: MSG-3 OVERVIEW

The MSG-3 methodology has been used in aviation for decades. It officially began in 1968 with Boeing and United Airlines who put together the first version of MSG for the Boeing 747. MSG evolved over the years to its present version of MSG-3 (McLoughlin, 2006). The evolution of safety in aircraft design went from reacting to failures (catastrophic accidents) to proactively replacing parts prior to failure or providing a back-up part, system or load path for the potential failure; to prevention of failures through advanced design and inspection. This evolution transpired over 60 years of experience. The changes are tied to advances in design philosophy. Accidents have driven the design standards from safe-life to fail-safe to damage tolerance. Damage tolerance was one of the reasons for MSG-3 development (MSG-3 Training Manual, 1992).

The earliest maintenance programs were developed by experienced maintenance technicians from the operators along with the aircraft manufacturer's engineers. Together they reviewed maintenance issues and determined maintenance procedures and intervals that established the maintenance program. This resulted in a rather conservative program to pre-empt failures due to metal fatigue (MSG-3 Training Manual, 1992).

The purpose of MSG-3 is to design airplanes with the highest possible level of reliability for safety and economic reasons. United was the first airline in 1968 to utilize MSG. Since then, MSG became the standard for the development of airline's maintenance programs. MSG yields hard time inspection and on-condition maintenance requirements that airlines will use (McLoughlin, 2006).

There is empirical evidence that shows that the type of risk analysis done for MSG-3 yields higher safety levels. MSG-3 uses failure data of systems, structures and components to determine the respective faults. That information is used to determine if there is a need for an engineered design change or a change to maintenance or operations procedures.

The baseline MSG program for any aircraft type is available to all operators. Operators can customize the program to fit their unique operating needs. For example, an airline that operates between the Hawaiian Islands, a hot, salty environment that is conducive to corrosion, and typically has a higher number of cycles and compared to flight hours, would have different inspection requirements than an airline that operates over arid land or has long routes.

MSG-3 is task oriented approach to maintenance that analyzes system failure modes from a system perspective. A common term for the analytical methodology is Failure Modes and Effects Analysis, commonly known as FMEA.

This method is used to develop the manufacturer's initial maintenance schedule, as part of the work toward aircraft certification, and is beyond the ken of many in the hands-on maintenance world. "It is often a multi-year process, involving the application of rigorous logic, the analysis of reams of data and the interaction of multiple administrative bodies" (Adams, 2009).

The analytical work of MSG-3 with Industry Steering Committee (ISG) working groups starts before an aircraft enters service when there is no in-service operational data, and it continues through the life of the aircraft type (Adams, 2009). During the design phase of a new aircraft, working groups are formed with engineers for the manufacturers, airlines and regulators for each system on the aircraft. These MSG-3 practitioners make up the ISC working Groups. Working group members do the detailed analysis and generate proposed scheduled maintenance tasks by evaluating data from the manufacturers. The working group members, representatives of the manufacturer and operators, present their results to the ISC, which approves it. The final output is the Maintenance Review Board Report (MRBR) that must be approved by the MRB chairman, a representative from the FAA (for the United States) (Adams, 2009).

Major airlines, such as American and United, have large centers for engineering and maintenance. They employ a staff of engineers dedicated full time to addressing maintenance issues, including inspections, repair and replacement. Reliability engineers evaluate the failures of components. Airline engineers are in close contact with the aircraft and supplier manufacturers' product support and engineering personnel. Data from all technical issues is recorded and shared between manufacturer, operators and the FAA. Major airline operators share authority to determine their maintenance and inspection intervals because huge fleets yield huge amount of information. They are the experts in maintenance operations since it is the airlines, not the manufacturers, who are responsible for all airliner maintenance.

Small airlines typically do not have the resources for staffing support staff like the majors nor can they produce huge amount of data since their fleets are so much smaller. So they rely more heavily on recommendations from the manufacturer.

Each airline must have a maintenance program in order to get an FAA approved operating certificate under FAR Part 121. That maintenance program becomes ATA Chapter 5 of the maintenance manual.

Operators have access to each other's findings. Aircraft manufacturers host conferences and invite all operators to share technical engineering and maintenance information (Whittaker, n.d.).

The crux of MSG-3 lies with its vast amount of in-service reliability data. Reliability is determined by Mean Time between Failures (MTBF). Air carrier certificate holders and certificated domestic and foreign repair stations are required to submit reports on failures, malfunctions and defects of aircraft, aircraft engines, systems and components (FAA, 2000, p. 56192).

These reports are submitted to the FAA in the form of Service Difficulty Reports (SDR's) per section FAR part 121.703. The reports provide the FAA, and other aviation constituents, statistical data necessary for planning, directing, controlling and evaluating certain assigned safety-related programs. The data can be used to alert appropriate segments of aviation of safety issues; to support safety inspections and investigations for accidents and incidents and as data for aviation safety/accident prevention programs (FAA, 2000, p. 56192).

The FAA organizes the information by aircraft type and structure, system or component. They send that information to the respective aircraft manufacturer to determine corrective action. This failure data, empirical evidence, also provides reliability data for new aircraft MSG-3 analysis, since most systems and components are not new designs, even for new aircraft models. Most structures, systems and components have been in service on older models and have a documented reliability. These are often used in a new aircraft type if they meet the desired design criteria (Whittaker, n.d.).

4. SAFETY MANAGEMENT SYSTEMS (SMS) OVERVIEW

Standardization is the foundation of safety. ICAO is the pinnacle of aviation safety standards world-wide. All 191 member-states have agreed to abide by ICAO's Standards and Recommended Policies (SARPs). The United States has been a member since ICAO since 1946. ICAO spearheaded the SMS initiative. Their definition of SMS is that it is an organized approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures. The goals are to address safety risks proactively, manage and support strategic regulatory and infrastructure developments; re-enforce the role played by the State in managing safety at the State level in coordination with service providers; and stress the concept of overall safety performance in all domains (ICAO, Annex 19, 2013).

Safety programs have evolved over time. Changes in rulemaking were considered reactive, in that safety actions were taken only after an accident. Safety organizations realized that moving from reactive to preventive would decrease accidents and save lives. Most recently, safety has evolved to being predictive (Ferguson & Nelson, 2014, p. 83).

From the 1950s into the 1970s, the focus of safety improvement was in designing better airplanes. Today's airplanes are designed with numerous improved safety features through engineering / automation. From the 1970s to the 1990s, safety research focused on human factors. CRM was developed in this era. The most current efforts are to view safety issues from a human error perspective. Rather than blame the end user (the pilot), the organization is evaluated for any and all factors that can ultimately affect the safe outcome of a mission (ICAO SMM, 2013, p. 2-2; Sudarshan, 2011).

Reason's model is well known for its method of "error trapping". Organizational factors are the first of four layers, followed by unsafe supervision, preconditions for unsafe acts and unsafe acts. Any industry can apply this model, and it is common within the aviation industry.

In 2006, ICAO released a new initiative, Safety Management Systems (SMS) with the issuance of the Safety Management Manual, Document 9859 (ICAO SMM, 2013). All domains within aviation will be required to implement a safety management system that complies with ICAO's guidelines set forth in regulations enforced by the Federal Aviation Administration.

Enhancing overall safety in the most efficient manner requires the adoption of a systems approach to safety management. Every segment and level of an organization must become part of a safety culture that promotes and practices risk reduction (ACRP, 2007).

Considering the span of time that MSG-3 has been in existence (40 years) and that SMS began within this decade; a comparison of these two worldwide aviation safety programs will increase our understanding of complex aviation safety systems.

ICAO is spearheading implementation of SMS through their Standards and Recommended Practices (SARPs). SARPs exist to help member states in managing aviation safety risks associated with the expectations for doubling the air traffic within the next 15 years (ICAO Annex 19, 2013). In an increasingly complex global air transportation system, the safety management system provides support for continued evolution of a proactive strategy to improve safety performance. All ICAO member states will have to comply with the SMS guidelines.

The safety management SARP is contained in a new annex, Annex 19 (ICAO Annex 19, 2013) for all domains. Each member state is responsible for issuing and enforcing the program through new regulation. The foundation of the plan lies within the pillars and elements that require specific planning and documentation of safety features.

The specific methodology is the creation of a safety system that is responsible for being proactive by identifying risks, including latent risks, and analyzing the probability and severity of an accident or incident occurrence.

Per the FAA's 2015 issue of SMS regulation for air carriers, credit can be given for an air carriers existing safety system structures. Large air carriers already have an established team of management personnel that have authority and responsibility for safety systems and communicate with an accountable executive. Medium size air carriers have decision making and information sharing with support from a Director of Safety. Small carriers may handle safety situations by convening an ad hoc committee (FAA Federal Register, 2015, page 1310).

SMS is not yet a regulation for organizations other than air carriers and certificated airports. But once required, there are few, if any, personnel who are trained or experienced to conduct the risk assessment analyses. Also complicating the issues is that many smaller companies do not have the personnel to cover the additional workload required of SMS. The methodology is provided in the form of guidelines (ACRP, 2009). Experience will be built upon the largest aviation organizations, such as major airlines and hub airports. The FAA has offered support through their regional offices for SMS program development (Taira, 2014).

While airlines have been reporting failures through the SDR system that benefit MSG-3, they now have to shift to the SMS program requirements of reporting hazards and assessing risk for airline operations. However, given the depth of experience with reporting, data collection and analysis, they have an advantage over other aviation organizations, such as airports.

Most airport organizations possess an insufficient background data collection of hazards and other information system elements. Data collection and management is the backbone of any SMS (ACRP, 2009). SMS relies on the hands-on maintenance and operations world to conduct assessments with rigorous logic but without the benefit of reams of hazard or failure data.

With SMS, data collection is voluntary (but encouraged) and can be confidential. That is actually a cornerstone of SMS (ACRP, 2007). Safety issues can be reported to the aviation organization (airlines or airports), the FAA or even to the NTSB.

The FAA' web-based application tool (WBAT) was originally developed as an ASAP and incident-reporting tool. It has since evolved to support risk management and assurance functions (Broderick, 2015). There are emerging SMS programs by for-profit software vendors, such as SMSPro and Pro DIGIQ. Plus, this is a service that is offered by a company, at a cost. The industry (airlines nor airports) has not agreed to collect aggregate industry safety issue data for SMS.

5. MSG-3 AND SMS COMPARISON BY PILLARS

Significant similarities and differences exist between two major aviation safety programs; MSG-3 and SMS. SMS could benefit from implementing some of the best practices established by MSG-3. The SMS program is arranged with four pillars. Safety Policy and Objectives, Safety Risk Management, Safety Assurance and Safety Promotion. To illustrate key points both programs are compared within each pillar.

Pillar 1 - Safety Policy

MSG-3 is handled within groups, hence as the name suggests. The working groups include the project manager, design engineers, system safety, reliability, certification, technical publications, marketing and product support, along with key maintenance and engineers from the airline operators. MSG-3 practitioners are the Industry Steering Committee (ISC) working groups. The ISC group members are specialists in various aircraft systems and they interact with the manufacturer's design group. The working group members do the detailed analysis and generate the product, maintenance tasks and schedules. They present their work to the ISC for approval (MSG-3 training manual, 1992).

SMS safety policy details management's responsibility and accountability for safety. It also outlines the methods and tools for achieving desired safety outcomes (FAA, 2013, p. 113-1). An accountable executive must be identified who has ultimate responsibility and accountability. Key safety personnel must be appointed, including a safety manager as a focal point for SMS.

Pillar 2 - Safety Risk Management

Both MSG-3 and SMS have common risk evaluation processes. MSG-3 bases its analysis on the failure modes and effects analysis (FMEA). The elements of SRM analysis are hazard identification and risk assessment. Both failures and hazards require a survey of systems. Any system component that could result in serious malfunction must be mitigated.

The causal sequence illustrated in Reason's model for management of safety events addresses "latent" failures, a common thread for both MSG-3 and SMS. Both programs must consider what failures can possibly happen within each "layer" of activity that might ultimately cause a

safety issue" (Ferguson & Nelson, 2014, p. 146). The severity of failure has corresponding risk probability. For example, catastrophic failure is categorized as a condition that would prevent the continued safe flight of the airplane. Probability of such failure must be shown to be extremely improbable, such as 1×10^{-9} or less (MSG-3 Training Manual, 1992). That means that they must not be a great chance of failure or risk than that, and if there is that infinitesimal chance of occurrence, a change is required to reduce the risk. Probability for the analysis of risk is not as detailed for SMS.

Data collection is a significant difference. MSG-3 obtains in reliability data from many sources including manufacturing testing and airline operations. The SDR (Service Difficulty Report) system provides all failure data. This data is required by the FAA (FAA, 2000). All operators contribute, which provides an aggregate and complete database. Data collection for SMS is an issue. Hazard reporting is encouraged but not required. The collection systems range from drop box submissions from line workers to comprehensive database programs. Currently, the SMS data base of hazards and risk assessments are not shared among like organizations, such as airliners, airports, flight schools, etc. There can even be fear of retaliation and for exposure of liability (Howell, 2016).

Another significant difference is *who* is responsible for conducting the analyses. For MSG-3, the working groups are made up with engineering / maintenance personnel, technical subject matter experts within engineering and operations. For SMS, the personnel must be assigned by each organization. It is possible that there are engineers in safety systems, engineering or reliability departments who could be assigned to do the safety risk assessment for SMS. Large airlines are staffed with employees with that sort of technical expertise. However, this can be a serious challenge for organizations, like airports, who are new to risk analysis. The size of the organization could also limit the number of available and qualified personnel. Training or subcontracting for the task will be needed.

Pillar 3 – Safety Assurance

Safety performance monitoring system for MSG-3 is well established. The Service Difficulty Reports submitted by operation provide reliability data. That data is managed by NASA and disseminated to the manufacturers. Trends identified through data analysis raise red flags that alert the manufacturers and airlines to determine if and what corrective action is needed.

Safety performance monitoring for SMS is identified as safety studies, audits and investigations. Organizations must be proactively engaged by identifying changes within the organization that may affect established processes and services and to minimize risk.

Continuous improvement is common to both MSG-3 and SMS. The review process is required to assure that any corrective action does mitigate or eliminate the issue.

Pillar 4 – Safety Promotion

Safety promotion has little commonality between MSG-3 and SMS.

MSG-3 utilizes subject matter experts and industry working groups. These experts have the ability to conduct the analysis and determine design and maintenance requirements to meet the established safety performance indicators. Reliability data reporting is required.

SMS is still in the development phase. Working groups, reporting and accessible data are not yet defined. Training and education must be provided throughout the aviation organization. The increase awareness of safety is the goal for all employees within an aviation organization. Safety communication processes must be established. Designated employees will have more specific responsibilities in carrying out safety actions (Ferguson & Nelson, 2014, p. 87).

6. DISCUSSION

Safety reporting is controversial for SMS. The data collection process has not been as well defined as that of the MSG-3 program. In order to obtain as much safety data as possible through reporting, the liability issues for individuals and organizations must be addressed.

The Aviation Safety Reporting System (ASRS) is well established in the airline segment, but not without similar concerns. The ASRS program belongs to the FAA and is administered by NASA. Pilots, mechanics, air traffic controllers and others report errors and deficiencies without fear of reprisal. The ASRS dissociates the reporter from the report and promises excusal from penalty if the reported incident results in administrative action. ASRS is the strongest protected reporting system in the US aviation system (A Just Culture, n.d.).

In an aviation safety letter for Transport Canada, Arnaud Delmas also discussed "Just Culture". "To achieve progress in the field of safety, it is much more effective to analyze the errors made by those who were lucky enough to escape and who are willing to talk about it, rather than to try to get the wrecks and the witnesses to give up their secrets when those involved in the tragedy are dead (Delmas, 2012). He goes on to say that flight safety is based on transparency and on the sharing of information. Indeed, to be effective, all feedback systems rely on each person's willingness to provide essential safety information, which often means being prepared to report one's own mistakes and errors. It is essential to establish a "Just Culture" in order to create a climate of trust that encourages and facilitates communication and the sharing of information (Delmas, 2012).

The FAA even encourages the use of ASRS data in Safety Risk Management (SRM). According to the FAA, "risk analyses in operational contexts are often based on expertise and expert judgment, but they should also use data from the carrier's own experience or those of others in the industry where available. Review of accident statistics, failure data, error data (e.g., runway incursion reports or information from the NASA (National Aeronautics and Space Administration) ASRS (Aviation Safety Reporting System) or equipment reliability data may help in determining likelihood" (FAA AC 120-92B, 2015, p. 23).

Customized SMS software systems are emerging. FAA has provided software via WBAT. Hazards can be documented; risk analysis can be conducted. SMSP software is available for a fee. It is a comprehensive, user friendly program that easily produces reports. One issue identified by Christopher Howell, CEO of SMSPro, is that company managers prefer that the content is held confidentially. With any luck, a parent organization will utilize the software program throughout its subsidiaries. Aggregate data collection is not possible at this time. Feedback from managers is that they fear exposing their own liability. And, nationwide reporting is not required. So, how is one single organization to calculate real risk when the sample size is limited to one?

7. CONCLUSION

Safety management systems are not new. Safety has always been a high-level priority in the aviation industry. The MSG-3 program set the precedent for SMS in terms of standardizing safety reporting and risk analysis of aviation technology. Efforts to improve safety through detailed analysis using real world data have been proven to be successful. That information enables predicting failures prior to aircraft being seriously damaged or people being hurt.

ICAO's initiative for safety management provides a formal process for documentation and analysis of aviation operations. The methodology for mitigating risk is similar to MSG-3. Most important is that sharing safety information among similar organizations (large airlines, hub airports) provides a broader and deeper understanding of the likelihood and severity of safety related issues (ACRP Synthesis 37, 2012). The more information that is collected, the better.

In order to conduct the SMS safety analysis for aviation operations, more expertise is required within all aviation domains. Dedicated SMS experts could form a network of industry working groups to evaluate safety issues, identify serious trends and recommend corrective actions. Barriers to safety information sharing must be addressed. As the "Just Culture" explains, transparency is necessary. Communication is key. Organizations must have access to SMS consultants and also train existing employees. Either way, human and financial resources must be allocated to improving safety.

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INEFFICIENCIES CAUSED BY GOVERNMENTS' INTERVENTIONS IN AIRLINES' MARKETS

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ABSTRACT

At least seven of the indicators of market inefficiencies and/or failure are visible in the airline industry. These have been triggered by national, multi-national or supranational governments' (NMSGs') interventions trying to resolve political, social or environmental problems. These seven interventions (many lacking preliminary economic analysis) have been aimed at resolving lack of competition, filling missing markets, and neutralising the presence of negative externalities, free riders, social inequalities and moral panic. Desk research showed that just one of these NMSGs' interventions was beneficial since it encouraged competition while the other six unintentionally triggered market inefficiencies or failures. Furthermore, it is possible that some of the interventions could eventually make advanced world airlines subsidise their advancing world competitors.

KEYWORDS

airlines, competition, market interventions, failure, inefficiency

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1. INTRODUCTION TO PUBLIC PROVISION AND PRIVATE MARKETS

Sometimes Governments' market interventions work to the detriment of an industry. Consequently and unfortunately, much Government intervention in markets – the space where buyers and suppliers meet – triggers imperfect working, inflates costs and creates distortions (Coase, 1988). To support their interventions, Governments write laws however, the economic function of law is not to prevent all harm but to minimise costs or maximise benefits (Veljanovski, 2006). This intention is sometimes lost when national, multi-national and supranational governments (NMSGs) or their institutions focus on political, social or environmental aims and ignore the economics which are fundamental to market functions.

Markets are not always free to behave as they would wish and are adjusted by producers supplying, consumers purchasing and by NMSG regulators intervening to ensure that trade functions as intended. Efficient markets try to produce a general equilibrium where supply and demand are in balance and where what is produced from fully-used resources is completely consumed. However, market inefficiency or failure can result in oversupply or undersupply. Inefficient (or failing) markets have multiple theories to describe their underlying conditions. Using desk research, seven theories are examined in Section 2 and in Section 3 they are matched to NMSGs' interventions in the airline industry. The potential of the theories to restrain international airline competition is covered in Section 4.

2. SEVEN THEORIES OF ALLEGED MARKET INEFFICIENCY OR FAILURE

2.1 Lack of Competition

Lack of competition can lead to market inefficiency or failure. It occurs in many ways including where there are few suppliers (oligopolists) selling homogenous products or a single supplier (monopolist) supplying a product with no close substitutes. Both could block new entrants into their markets and set their own prices – activities which are detrimental for consumers. Any industry which lacks competition could also have high barriers to market entry due to regulations or excessive costs. Furthermore, lack of competition can lead to a concentration of firms which governments might feel obliged to break up in order to give the consumers more choice and free the market. Barriers to market entry also include high start-up and other costs caused by government intervention (including industry regulations or special tax advantages awarded to existing firms). Further costs can be incurred where governments own the business and wish to maintain the status quo. Contestable markets encourage entrepreneurs with their product and service innovations, competitive pricing and lower costs – all of which benefit consumers (Doganis, 2010).

2.2 Missing Markets

'Missing' markets occur where no real market for the products or services has previously existed usually because no one has recognised that a market is needed. These markets are often in aspects of life which are taken for granted and assumed to continue into perpetuity such as landscape views, silence, public broadcasts, light from lighthouses, air quality, the Courts system and global positioning signals (Graves, 2013). However, when identified, these 'missing' markets become eligible to have property rights ascribed. These establish legal ownership which enables trading to commence. Furthermore, markets can only function if they have clear ownership of contents otherwise there would be continual disputes and trade would be impossible. When NMSGs discover a 'missing' market which would benefit their citizenry, they can intervene by regulating, taxing, issuing permits, requiring compensatory payments or mandating provisions on privately-owned organisations to supply (the latter amounts to confiscation of property). Once a market has been discovered, its continuance can depend on the State or on competitive forces to keep it filled.

2.3 Externalities

Externalities are those issues which are the unintended consequences of an economic activity for which the costs and benefits were not considered with the production decision. The presence of externalities is not always perceived as a sign of market failure but rather could indicate a 'missing' market which can be identified by assigning well-defined, enforceable, tradeable property rights (Coase, 1960). Externalities can be positive (when the social benefits exceed the private benefits such as the light from a lighthouse guarding ocean rocks) or negative (when the private costs are less than the social costs such as when noise from one aeroplane disturbs the sleep of an entire neighbourhood). Negative externalities can result "in non-optimal levels of private goods production and consumption" (Graves, 2013) and because the real costs of production are not charged to consumers there can be overproduction (an indication of economic inefficiency). Under-production or over-production leads to inefficient resource allocation. The greater are the externalities, the greater is the likelihood of market inefficiency or failure.

2.4 Free Riders

A free rider is "a person or firm that uses a good for free while it has been provided to others at a cost. In this way, the other users have the incentive to act likewise and thus not pay. Free riders take advantage of the non-excludability of public goods making it inefficient for a private supplier to make them available. In this way, public goods are a cause of market failure directly because of free-riders." (Prentice and Prokop, 2015: 289). Once a good or service is provided, then non-excludability means that no one can be forced to pay for consumption or that the cost of enforcing the payment is too high to justify the pursuit i.e.

the 'free rider' problem (Samuelson, 1954). Because free riders who receive the benefit from provision have no incentive to pay for it, the market underprovides. In fact, individuals can increase their personal welfare by not paying for the goods or services. Even though demand can be high, free goods are under produced or not produced at all and the lack of revenue from those who wish to consume without paying means that the private market cannot support production (Ancell, 2017).

2.5 Government Provision

If NMSGs feel that markets will not provide the goods or services they believe are necessary for their citizens, the State can provide them as public goods and services (using taxpayer provided funds). Alternatively the State could subsidise them to provide a market or regulate them in which case taxpayers will fund. Public goods are non-rivalrous (i.e. one person's consumption does not affect another's) and non-excludable (i.e. nonpayers are not excluded) (Samuelson, 1954). In contrast, private goods and services are excludable and rivalrous: one person's consumption prevents another from consuming. The non-excludability of pure public goods explains why such goods are not profitable for entrepreneurs to supply privately (Graves, 2013). Public goods are often overused because what is considered to be 'free' is often not valued especially by those who have not contributed to the provision i.e. 'free riders'. Furthermore "economic theory holds that public goods, such as national security, cannot be delivered efficiently by free market forces because of the free-rider problem" (Prentice, 2015: 52).

2.6 Inequalities

Social inequalities can take many forms including reduced opportunities, income and consumption. This can mean that some consumers access fewer goods and services than others because they sustain higher base expenditure or reduced income. Where Governments believe that universal provision is in the interests of the nation they will legislate by either providing what they consider necessary (i.e. public goods) or by subsidising the facilities, programmes or even the consumers directly so that consumption is not based only on the ability to pay. Included in these provisions are free State-provided education, public vaccination programmes and health care which, in the United Kingdom (UK), is provided by the free-at-point-of-use National Health Service (NHS) (Ancell, 2017).

2.7 Moral Panic

'Moral panic' describes the exaggerated fear of a social phenomenon despite a lack of evidence. "Moral panics have to create, focus on and sustain powerfully persuasive images of folk devils that can serve as the heart of moral fears" (Ben-Yehuda, 2009: 1-2). They are characterised by "…speeches, sermons, preaching, negotiations, arguments, debates,

legislation, law enforcement priorities, agenda setting and the like, all focussed on moral issues" (ibid: 2). Such issues are whipped up by the media as presenting a threat to society which justifies a legitimate basis for NGO creation and influence, and ultimately regulation. In turn this leads to a chain reaction with a disproportionate effect on a wider population (Ancell, 2017).

3. DISCUSSION

3.1 Lack of Competition

Around the 1970s, when many governments recognised that they could no longer afford the costs of their growing aviation industry, they liberated it thereby eliminating the State support needed to invest and develop the services. In doing so they unleashed the power of the market (Doganis, 2010). This led to the democratisation of air travel and the creation of new industries through the outsourcing of many formerly in-house activities such as aircraft washing, fuelling and catering. Deregulation freed the airlines to compete internationally, forge new markets and develop innovative operating models the most notable of which were the low-cost carriers (Williams and Baláz, 2009). Their entrepreneurs offered consumers "higher frequencies on existing or new routes, new point-to-point connections and cheaper fares" (*ibid*: 681). This was a major welfare improvement often linking previously unconnected or poorly connected regions as well as providing services to "major and secondary airports in the leading economic regions." (*ibid*: 682). This NMSG intervention was socially and economically beneficial to the industry and to its consumers.

3.2 Missing Markets

Governments have supported the identification of many formerly missing airline markets and used many of the tools in the economic tool kit to do so. These include regulating (as is now applied to airline security and air traffic control), taxing (as exampled by the UK's Air Passenger Duty (APD), issuing permits (such as those required for waste disposal), requiring compensatory payments to cover negative externalities (often used to regulate aircraft emissions and noise) and mandating provisions (such as those provided for the assistance of passengers with reduced mobility (PRMs)). Missing market 'corrections' are often covered by unfunded mandates and boondoggles (i.e. wasteful projects which will continue because of vested, asymmetrical (partisan), political and economic influences (Ancell, 2017)). Both of these options are tantamount to confiscation of shareholder's dividends and/or employee's rewards. They could also place additional costs on passengers.

Any proposal should be appraised in terms of costs and benefits as well as strengths and weaknesses. However, one of the problems with government mandating has often been the lack of preliminary economic assessment. The supranational government, the European

Union (EU) (comprising 28 countries with different monetary, fiscal and welfare policies) requires an impact analysis before regulating to evaluate the "potential economic, social and environmental impacts" (European Union, 2014a). If conducted this would ensure that decision-makers were fully informed and able to assess alternatives before considering implementing legislation, regulations and policies. Unfortunately for the airline industry, the EU has not always adhered to its own policies. As a result, it has produced boondoggles which are often implemented without preliminary economic impact analysis (Ancell, 2017) or any post-implementation evaluation. This is exampled by two regulations which create previously unidentified (i.e. missing) airline markets i.e. the carriage of PRMs and compensation for delayed passengers.

3.2.1 Carriage of PRMs

When disabled passengers were once a small minority represented by just a few wheelchair travellers, many NMSGs were keen to ensure these citizens participated in barrier-free economic life. NMSGs worldwide recognised that disabled travellers were a missing market and that the airlines would not provide for them on the same terms as able-bodied passengers unless they were mandated to do so. Consequently, PRMs were protected by legislation in many jurisdictions. In Europe PRMs are protected by Regulation EC 1107/2006 "concerning the rights of disabled persons and persons with reduced mobility when travelling by air" (European Union, 2006). However, what was originally developed to support a small number of wheelchair passengers has now expanded to include ageing, obese, sick and unentitled PRMs claiming disability in order to be able to access the mandated and complimentary services. These include transport to and from aircraft and carriage of PRMs' mobility aids, some of which can weigh 175kg and require specialist packaging and separation in the cargo hold. PRMs now include those travelling for surgical operations and other medical requirements (often reimbursed by the NHS). Included in their treatments are organ transplants, bariatric surgery, orthopaedic replacement of assorted body joints (Hanefeld *et al.,* 2013; Lunt *et al*., 2013) and reproductive travel (Culley *et al*., 2013) which could result in multiple pregnancies (McKelvey *et al.,* 2009) placing the mother and babies at high risk with the potential for flight diversion. The requirements from these passenger groups place an economic burden on the air carrier with the risk of aircraft diversion, disruption and delay (Ancell, 2017). No economic impact assessment was conducted before social regulation EC 1107/2006 was implemented and the costs are only now being assessed as increasing numbers of PRMs travel for life saving and enhancing treatments as well as leisure (Ancell and Graham, 2016; Ancell, 2017). Perversely, airlines' costs incurred assisting NHS patients are an uncalculated hidden subsidy from private suppliers to assist the State.

3.2.2 Delayed passengers in Europe

Passengers delayed in Europe are now protected by another social regulation – EC 261/2004 (European Union, 2014b) – which established common rules on how airlines are required to compensate passengers in the event of denied boarding, cancelled flights or long delays (European Union, 2004) unless circumstances were 'extraordinary' as defined by the EU. 'Extraordinary' includes "political instability, meteorological conditions incompatible with the operation of the flight concerned, security risks unexpected flight safety shortcomings and strikes that affect the operation of an operating carrier" (*ibid*). This social regulation means that passengers do not need to purchase travel insurance because other passengers will pay a surcharge to cover uninsured risks and compensation. This increases uninsured passengers' welfare and allows them a free ride – a socially detrimental outcome. Both these regulations increase airlines' costs and passengers' prices.

3.3 Externalities

Positive externalities in aviation include the speed of international shipping of time-sensitive goods and potential for tourism with all its opportunities to increase employment and national prosperity (Ancell, 2017). The reduced travel costs resulting from increased competition have opened new regions. They have increased accessibility for employment (e.g. long-distance commuting and widening labour markets), inward investment, consumers' mobility, business connectivity and travel, and expanded market opportunities (Williams and Baláz, 2009). Further positive externalities are derived from the opening of completely new (formerly missing) markets including those for healthcare such as fly-to-dentists (Williams and Baláz, 2009) all of which increase national prosperity as they innovatively expand trade.

Unfortunately, aviation also has negative externalities which are often the subject of government intervention to regulate, issue permits, apply quotas or decree eligible for 'sin' taxes. Two of the most recognised are congestion and delay. They affect the entire aviation supply chain. At airports they might limit airline growth which in turn restricts revenues for the operators and authorities while increasing costs; business travellers can lose productivity; the tourist industry can lose inbound and outbound business; labour markets will provide fewer jobs; governments' tax takes might be reduced and aircraft manufacturers could lose because of fewer orders (Janic, 1999).

Solutions include Government intervention in the form of a 'congestion tax' i.e. "pricing by time of day or the length of a queue, or to restrict traffic and assign property rights by selling ownership of scarce landing slots at congested airports." (Mayer and Sinai, 2002: 1).

Negative aviation externalities also include pollution from aircraft noise and emissions (although aircraft are now much quieter and cleaner than previous generations). Among the emissions is carbon dioxide (CO_2) which some advocates claim is a pollutant and dangerous gas causing the Earth to overheat. They want CO_2 production curtailed. The supranational EU agrees and has created the EU Environmental Trading Scheme (EU ETS) (Committee on Climate Change, 2008) which anointed CO_2 with property rights to enable trade. All aircraft within the EU will have to trade CO_2 emissions thus filling a formerly missing market. These trades are actually a tax on aircraft which the EU would apply to climate adaptation projects in developing nations. This would subsidise their social and environmental programmes and by reducing their national costs, affect the prices at which they could trade in international markets (such as aviation). In contrast, developed nations have a multitude of social and environmental regulations which are absent in the developing world – costs which have to be recovered from prices. In international markets, developed world carriers are often at a competitive disadvantage because of these costs which could eventually undermine their international competitiveness. [2]

Negative airline externalities are also derived from accidents (on the ground and in the air) for which the main causes are "hazardous weather, 'human' errors, mechanical failures, sabotages and military actions" (Janic, 1999: 174).

Many NMSG interventions to overcome negative externalities have made air travel safer (by reducing accidents) but others have made it more expensive for consumers as well as threatening the competitiveness of international aviation.

3.4 Free Riders

There are many examples of free ridership in aviation caused by regulations through which the NMSGs have deflected some of their social costs. The compassionate regulations for PRMs have created an economic problem. EU Regulation EC 1107/2006 (see '2.2 Missing markets') enables those who claim to have a disability to access the provisions such as complimentary buggy ride to the gate, swift clearance through Security, Customs and Immigration plus the free carriage of their equipment and (supposed) service animals. They are able to access these services because airlines are unable to challenge self-declared PRMs' requirements. Any unentitled 'PRM' increases his/her personal welfare at the expense of the airlines' stakeholders – its shareholders (receiving lower dividends), employees (earning smaller rewards) and passengers (paying increased prices) (Ancell and Graham, 2016). i.e.

[2] since this paper was first written, EU ETS implementation has been suspended pending the United Nations' finalising of its own programme – the Carbon Offset Scheme for International Aviation (CORSIA)

PRM provisions can become a free ride for unentitled (self-declared) PRMs. Since markets underprovide when free ridership is present, many entitled PRMs complain they have had to wait for the service to which they are entitled owing to the numbers of unentitled PRMs using the complimentary, regulated provisions (Airport Operators Association, 2009).

European Regulation EC 261/2004 established common rules on airline compensation for passengers who might have been denied boarding, whose flights were cancelled or who suffered long delays (provided the events were not considered 'extraordinary' i.e. external, unavoidable and unpredictable). The EU definition of 'extraordinary' (European Union, 2004) (see '3.2.3 Delayed passengers in Europe) could damage the competitiveness of airlines operating in Europe by increasing their prices to cover any compensation. In effect, this Regulation negates the responsibility for travel insurance by placing the burden of passengers' travelling misfortunes onto the airlines to solve. The airlines are therefore carrying additional risks. Risk has to be mitigated and mitigation has a price.

Further free rider examples abound. As well as unentitled passengers (who trigger additional PRM costs including the carriage of their 'service' animals), some NMSGs also take a free ride. Airlines do not receive reimbursement for all the States' requirements such as checking visas and passports, collecting passengers' and other taxes as well as medical services for sick NHS patients whose travel needs are ultimately subsidised by the airlines. It could be argued that this is a reasonable trade-off since airlines are able to purchase some materials (e.g. fuel) free of taxes under provisions in the Chicago Convention 1944 (ICAO, n.d.) but that is a concession which applies to all airlines – not a few selective carriers.

The presence of free riders is supported by the boondoggles and unfunded mandates placed upon the airline industry. They increase costs disproportionately for carriers which inadvertently attract a higher number of free riders because of their superior customer servicing.

3.5 Government Provision

Governments' direct provision in airline services has reduced significantly since industry deregulation. Many governments used airlines to equalise opportunities in society and instead of public provision, have mandated industries to provide (such as the airlines' provisions for PRMs). In contrast, many governments provide a permit system for ground transport users (local buses, railways and coaches – many of which are State-subsidised). This enables welfare beneficiaries to access transport concessions. Airlines are prevented from using the same filter system and in any event, to run a parallel scheme for international

aviation would be prohibitively expensive. In the meantime, airlines support the NMSGs' social objectives providing public, social equality-enabling services without reimbursement.

However, many States still provide aviation services such as Immigration, Emigration, Customs and Police recognising that these are public services. Other States require airlines to check passports and visas and quiz passengers with the security questions – actions which subsidise the State provision and for which no reimbursement is paid. However, if airlines make an error such as allowing an incorrect visa to pass, fines are likely to follow (such as under the UK's Carriers' Liability Regulations 2002). Airlines also subsidise the UK NHS (a government provision) by transporting patients (on publicly-funded journeys) who need additional privately-provided assistance such as wheelchair pushes and complimentary carriage of mobility equipment (see 3.2.1). These are direct costs which are unrecoverable from the passengers who incur them. They are covered by either a surcharge on other passengers or by reducing shareholders' dividends and/or employees' rewards.

Aviation security is a necessary, expensive public good (non-rivalrous and non-excludable) often provided privately and which can lead to congestion, delays and inefficiencies. "No person can be excluded from the security… and no person's enjoyment of this protection weakens that of another person's protection." (Prentice, 2015: 55). The benefits of airport security may also extend to non-travellers and their families occupying high-rise buildings and anyone who occupies a structure which could become a terrorist target (i.e. effectively free-riders). Other forms of transport do not have either the same security restrictions or costs as aviation. Effective security is a positive externality which will also reduce theft, drug smuggling, human trafficking and tariff evasion and will facilitate trade and allow monitoring of export controls (Prentice, 2015).

State provision of airport security is inconsistent. Mexico, for example, recognises aviation security as a public good and does not impose taxes on passengers to pay for it (Prentice, 2015). Mexican airport security is funded out of general revenues and since they are government-owned and operated they are paid by the airport administrations (*ibid*). In contrast, in Canada, the Government has privatised the provision of a public good (*ibid*). Airport and police security responsibility was shifted to the Canadian Airport Authorities until 2002 when it was commercialised and became, in effect, another tax on an airline ticket. The increased costs gives Canadian travellers a reason to cross into the USA where they can fly from less expensive airports. This is an intervention in the airline passenger market which is detrimental to Canadian carriers. That presages a loss of other economic benefits such as cross-border shopping. Canadian airport costs are largely fixed (such as parking fees, landing fees and concession rents) but the revenues are variable and dependant on the number of

passengers flying. Reduced passenger numbers means those who are flying have to pay more thereby triggering a demand for passengers to drive across the border into the USA rather than fly. Overall it produces a reduction in real tax revenues. Furthermore, "…through its sovereign powers the Government of Canada has become an air transport security free-rider." (*ibid*: 58).

In the USA, airlines conducted the public screening at their own expense and subcontract the work to private security firms. This, however, was considered a weakness after the 2001 terrorist activities and the provision was transferred to public control using government employees. Funding was a mix of public and private revenues (*ibid*). Many of the security costs are now considered disproportionate to the threat but because hard-screening systems are in place, dismantling them worldwide will prove problematical since aviation security is an expensive business interwoven into the travel experience. The USA Transportation Security Agency (TSA) has approximately 60,000 employees and an annual budget of $7.4bn (TSA, 2016). There is considered to be much wasted expenditure with such security arrangements. Risk has a price and the "political realities supply an understandable excuse for expending money, but not a valid one. In particular, they do not relieve officials of the responsibility of seeking to expend public funds wisely" (Mueller and Stewart, 2011: 22). Currently airlines pay in excess of $US8.55 billion annually for aviation and border security (IATA, 2015).

Aviation is a contributor to national economies but instead of making public provision, many governments treat private airlines' services as public goods and tax them like a 'sin' (e.g. cigarettes). Taxes imposed include departure, Immigration, Customs, animal and plant health, and emissions from airports and aircraft. These all increase transactions, add to costs and therefore affect prices. "Aviation charges should be based on their real cost and not be used as a revenue generating activity for countries" (IATA, 2015: n.p.).

NMSGs' airline security requirements are aligned to protect the airline industry however inconsistencies in application and funding could eventually lead to excessive costs without any corresponding improved services.

3.6 Inequalities

Some members of society consume less than others because of lack of income and/or higher base expenditure. Deregulation of the airline market has led to lower fares enabling more lower-income citizens to travel. This democratisation of consumption reduces some of the social inequalities which can lead to some households consuming fewer goods and services (such as airline travel). Many NMSGs legislate and regulate "to bridge inequalities caused by age, disability, gender or gender reassignment, religion or belief, sexual orientation, race,

culture, language, marriage or civil partnership, pregnancy, maternity and/or paternity, intergenerational obligations, political persuasion or trade union membership" (Ancell, 2017). To this list could also be added opportunities for consumption, income, education, health improvement and a host of other criteria by which citizens are unequal. Governments attempt to equalise consumption in airline travel by applying higher taxes in premium cabins (HM Revenue and Customs, 2014) and enacting legislation such as EC 1107/2006 which enables consumption by entitled beneficiaries (and inadvertently, unentitled free riders), their service animals and complimentary carriage of mobility equipment. On the other hand, democratising consumption through the formation of no-frills, low-cost carriers has done much to equalise travel opportunities for lower-earners in the population. Some airlines offer reduced fares for specific socially or economically disadvantaged passenger groups (e.g. obese people are sometimes offered discounts for purchasing more than one seat).

In airline terms, governments have acted to reduce social inequalities by implementing unfunded mandates for the carriage of elderly, sick, disabled or medical passengers – services which are ultimately paid by reduced rewards for shareholders and/or employees or higher fares for other passengers.

3.7 Moral Panic

Perhaps the most obvious aviation moral panic supported by NMSG regulations is that of the purported threat posed by climate changing which has been partially attributed to the emissions from the fossil fuels which keep aircraft aloft. The climate has always changed but a moral panic has convinced legislators that the current climate changes are anthropogenic and dangerous. The advocates for this theory conclude that anthropogenic global warming (AGW) is harmful and have made the case for NMSG intervention in markets to restrict activities which emit CO_2 or its warming equivalents (CO_2e). They claim that there is a causal link between CO_2 concentrations and global temperature rise which, if more than 2^oC (Intergovernmental Panel on Climate Change (IPCC) 1995) will be the point where Earth will experience runaway warming. This has never happened in millions of years although CO_2 has been much higher than current readings (de Freitas, 2002). The overheating theory has been given credence by the supranational United Nations (UN) Intergovernmental Panel on Climate Change (IPCC). The IPCC mandate is to focus on "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the atmosphere, and which is in addition to natural climate variability." (IPCC, 2013: 1450). The assumption is that humankind is responsible for changes in the climate and provides justification for the IPCC's founding despite the fact that humans might not be responsible for any warming (or even cooling) changes. Even the IPCC (1990: xii) has acknowledged the existence of natural climate warming: *"Global-mean surface air temperature has increased by 0.3°C to 0.6°C over*

the last 100 years … These increases have not been smooth with time, nor uniform over the globe. The size of this warming is broadly consistent with predictions of climate models, but it is also of the same magnitude as natural climate variability. Thus, the observed increase could be largely due to this natural variability…". In fact, the climate has warmed and cooled many times throughout many centuries the causes of which are unclear (de Freitas, 2002). Furthermore, only some of the documents on which the IPCC bases its output are actually scientifically peer reviewed (Bell, 2015).

The IPCC relies heavily on computer models for its evidence and yet models are not evidence. Furthermore, using the concept of "average temperature is meaningless … temperature only means something locally, because the thermodynamic conditions vary from point to point" (Essex and McKitrick, 2007: 112). Multiple computer models have convinced NMSGs that bi-products from industrial processes including aviation will be responsible for any damaging global warming. There is however, no way to distinguish between anthropogenic or natural increases in either CO_2 (Segalstad, 2009) or temperature (Tol, 2005), or to measure a 'global' temperature. However, aside from CO_2, the most potent atmospheric gas is water (H_2O) in various forms i.e. clouds, rain, humidity and evaporation.

Governments have a duty to protect human rights to life, liberty and happiness but "this duty must not be discharged by government regulation of market processes" (Dawson, 2011: 2). This contrasts with Stern (2006) who, in writing the UK's examination of the economics of climate change, argued that AGW-is-harmful "is the greatest example of market failure we have ever seen." (Stern, 2006:1). However, not all are in agreement and others argue that "it is not markets that have failed but governments … [and] far from being the greatest market failure, the AGW hypothesis may rather be the greatest moral panic the world has seen." (Dawson, 2011: 2). There is no scientific basis for current climate policies which include taxes levied on fossil fuel energy emissions and the creation of markets for naturally occurring gases such as CO_2. Governments lack sufficient knowledge to operate effective climate policies and consequently "all existing climate policy instruments including taxes, subsidies, regulations and emissions trading should therefore be swept away" (*ibid*: 2). In order to assuage the AGW-is-harmful proponents, NMSGs have acted on the precautionary principle "when there are reasonable grounds for concern that potential hazards may affect the environment or human, animal or plant health, and when at the same time the available data preclude a detailed risk evaluation, the precautionary basis has been politically accepted as a risk management strategy" (Commission of the European Communities, 2000: 8) (NB: "politically" accepted not "economically" accepted). For as long as the scientific data is inconclusive and the risks remain unacceptable, the EU rationalises that the precautions must

continue and yet the scientific data on which this relies is derived from computer modelling which has been proven to be unreliable until such time as the predicted events occur.

NMSG's spend heavily on pro-AGW climate research. The US Government spent over $US185bn between 2003 and 2010 on climate change items (Bell, 2015) (Table 1). Similarly, the EU has agreed that at least 20% of its budget for 2014 to 2020 "as much as €180bn [£stg127bn or $US196bn] should be spent on climate change-related action." (European Union, n.d.). Furthermore, the EU intends to integrate mitigation and adaptations into "all major EU spending programmes, in particular cohesion policy, regional development, energy, transport, research and innovation and the Common Agricultural Policy." (European Union, n.d.).

Table 1: Assorted Spending for Climate Change Research (Ancell, 2017: 268)

Approximate year	Source of donation	Value	Source
1998 to 2015	The National Oceanic and Atmospheric Administration (USA)	$US3 billion	Peterson and Wood, (2015)
1998 to 2015	National Science Foundation (USA)	$US1.7 billion	Peterson and Wood (2015)
2001-2015	Environmental Protection Agency (USA)	$US393 million	Peterson and Wood, (2015)
2003-2010	US Government	$US185 billion	Bell (2015)
2011	National Institute of Health (USA)	$US608 million	Peterson and Wood, (2015)
2014-2020	EU to spend 20% of its total budget on climate projects	€180 billion	European Union (n.d.)
2014-2015	EU (to spend in developing countries – included in €180 billion above)	€1.7 billion	European Union (n.d.)
2015-2020	EU (to spend in developing countries)	€14 billion	European Union (n.d.)

Policies should only be made on impartial, full information and data – and not reliant on computer modelling. The EU policies will be focussed on supporting "public authorities, NGOs and private actors, especially small and medium-sized enterprises, in implementing small-scale low-carbon and adaptation technologies and new approaches and methodologies *[sic]*."

(European Union, n.d.)[3] The proposed spend in advancing countries for projects purported to prevent climate change will be approximately €1.7bn (£stg1.24bn or $US1.92bn) between 2014 and 2015, and €14bn (£Stg10.25bn or $US15.84bn) between 2014 and 2020. No equivalent NMSG funding is allocated to support contrary views to challenge the computer modelling. Such significant and partisan investment, which can never be matched by private funds, stretches the precautionary principle. The consequence for such funding imbalance (i.e. €14bn vs €0) is wasted taxpayers' resources.

Despite the lack of evidence, this moral panic has spawned massive costs and many new formerly-missing industries to justify investment in prevention rather than the alternatives i.e. adaptive or mitigating measures. "As for other major natural disasters [e.g. tsunami or earthquake], the appropriate preparation for extreme climate events is to mitigate and manage the negative effects when they occur, and especially so for dangerous cooling. Attempting instead to 'stop climate change' by reducing human carbon dioxide emissions is a costly exercise of utter futility. Rational climate policies must be based on adaptation to dangerous change as and when it occurs, and irrespective of its sign or causation." (Carter, 2007: 4). The monies taken for energy taxes eventually become payments which are used to subsidise social and environmental programmes in advancing nations – many of which will have airlines with lower overheads owing to reduced social and labour costs. Subsidising their nations in this way hampers a competitive international airline market and is tantamount to airlines in the advanced world subsidising their advancing world competitors.

The airlines' response has been to install various voluntary emissions offset schemes for passengers who wish to monetise the negative externality of their flight emissions. However, the take-up of these offers has been minimal at approximately 3% of flyers (Kahya, 2009). Airlines' costs of the NMSGs' social and environmental regulations can only be met economically – either by reducing shareholders' dividends or employees' rewards, or by increasing prices for passengers and/or freight.

4. CONCLUSION

Many of the NMSGs' airline market interventions appear politically motivated and targeted at social or environmental causes rather than airline economic problems. Furthermore, many would appear to have been implemented without considering the economic impact on airlines. With the exception of opening the airline market to competition, NMSG interventions contribute to higher costs and customers' prices. Developing spurious missing markets, monetising negative externalities, requiring compulsory provisions, tolerating free riders and

[3] 'Methodology' is the study of methods.

equalising inequalities all add to costs. Furthermore, the international airline market could be distorted by payments to developing nations where their carriers could obtain an economic advantage by virtue of their already lower social and environmental costs. This could trigger unfair international competition resulting in market inefficiency or even failure. Airlines and their passengers benefit from fair competition with light touch economic regulation. In order to keep the market functioning fairly, future NMSG interventions should be pre-empted by economic impact assessments followed by post implementation evaluations. This would protect the aviation market from any unfair, anti-competitive regulations which could trigger inefficiencies or failures.

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