

# **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 (Ansell, 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 exemplified 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 (Ansell, 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 exemplified 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<sub>2</sub>) which some advocates claim is a pollutant and dangerous gas causing the Earth to overheat. They want CO<sub>2</sub> production curtailed. The supranational EU agrees and has created the EU Environmental Trading Scheme (EU ETS) (Committee on Climate Change, 2008) which anointed CO<sub>2</sub> with property rights to enable trade. All aircraft within the EU will have to trade CO<sub>2</sub> 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.<sup>2</sup>

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) (Ansell and Graham, 2016). i.e.

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<sup>2</sup> 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 (CORISIA)



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<sub>2</sub> or its warming equivalents (CO<sub>2</sub>e). They claim that there is a causal link between CO<sub>2</sub> concentrations and global temperature rise which, if more than 2°C (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<sub>2</sub> 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 McKittrick, 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<sub>2</sub> (Segalstad, 2009) or temperature (Tol, 2005), or to measure a 'global' temperature. However, aside from CO<sub>2</sub>, the most potent atmospheric gas is water (H<sub>2</sub>O) 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<sub>2</sub>. 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 (Ansell, 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.)<sup>3</sup> 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

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<sup>3</sup> '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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