



Does it pay to reveal safety information? The effect of safety information on flight choice



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ABSTRACT

The case of flights safety lends itself as a natural case study for choice under of information asymmetry that involves dread risk and emotional factors. Specifically it allows one to experiment how the releasing of information will affect consumer choice. Previous studies, which followed the deregulation of commercial aviation, raised concerns about the corresponding potential for a marked deterioration in airline safety. Measures to prevent that decline were subsequently proposed. Specifically, it was argued that the public sector should establish and release flight safety indicators in addition to accidents' statistics, which are currently available. It was argued that such safety indicators will also enable airlines to diversify their safety offerings. Underlying this argument are the assumptions that consumers' flight safety preferences vary and that, provided with safety information, consumers will use it when making decisions. The present work, however, refutes the first assumption and sheds light on the second. It further investigates whether and how consumers react to and interpret safety information when choosing a flight, while accounting explicitly for a psychological trait. Employing an advanced experimental design and econometric approach, we find that: 1. When formal flight safety ratings are supplied, individuals abandoned their priors and rely on the information provided. 2. When it comes to "bad death" probabilities, people are not sensitive to the different shades of safety, and instead, they simply discern flights as either safe or unsafe. 3. Under a certain conditions disclosed information can alleviate fear and change the decision making of airline passengers.

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1. Introduction

Commonly, information on flight risk is not easily obtainable to those booking flights. This is due to multiple factors. First, publication of safety records is still a taboo in the aviation sector. In fact, airlines do not even allude to their safety records in their advertising and press statements (Savage, 2011). Second, private safety certification schemes are problematic. They suffer from methodological drawbacks that cast doubt on their reliability. Numerous web sites provide a variety of safety indicators. But, these are not consistent with each other and therefore add to the confusion in the public. Third, public sector bodies (in the EU and USA) limit themselves to periodical publication of black lists of unsafe airlines. Fourth, while statistics on fatal crashes are released by public and private agencies, accident frequency per se cannot be considered as a meaningful

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indicator of airline safety (Knorr, 1977) nor can it be used to compare the safety levels of flights (Czerwinski and Barnett, 2006; Liou et al., 2007). As result, although research has indicated that passengers are concerned about the safety levels of flights, currently, no meaningful indication of these is available to them (Rhoades and Waguespack, 1999). This situation differs significantly from other sectors, such as the automotive industry, in which standardized safety rating methods (e.g., NCAP and EuroNCAP) are used. Their results are published by public agencies and accepted by both manufacturers and the public. Car makers today consider these ratings as important features of their products and often refer to them in their marketing campaigns (NHTSA, 2007).

In light of this informational asymmetry and concerns regarding a possible deterioration in airline safety following the deregulation of the aviation industry, the resultant intensive competition, and the introduction of low-cost carriers, there has been an ongoing debate over whether safety indicators should be disclosed by the public sector. In this study, using a stated preference experiment, we analyze the effect of safety information on flight choice.

Many of the economic analyses of airline safety in the 1980s and early 1990s focused on the potential safety effects of deregulation and liberalization and the comparative safety performance of various industry segments (Borenstein and Zimmerman, 1988; Savage, 1999). Later studies pointed out the problems of data availability and interpretability and thus were mainly concerned with the proper methodology for measuring air travel safety (Czerwinski and Barnett, 2006; Liou et al., 2007). Savage (2011) examined the safety issue as a differentiating attribute and suggested that airlines can compete on the basis of safety characteristics. He showed that several safety levels may exist on the same route, hence profit-maximizing firms should seek to diversify their safety offerings. The underlying assumption in the aforementioned studies is that individuals can distinguish between different levels on a range of safety indicators. We attempt here to assess this assumption.

Despite the relatively large number of flight choice studies (e.g. Bliemer and Rose, 2011; Brey and Walker, 2011; Wen and Lai, 2010), the role of safety information and perception in the choice process has been largely overlooked, probably due to the fact that the airline industry suffers from safety information asymmetry. The issue of information asymmetry has been discussed generally in the literature. According to Akerlof's (1970) "lemons" model, airlines with high safety levels may not be able to extract profit from this advantage, since uninformed passengers cannot distinguish between airlines based on their safety levels. Therefore, airlines lack incentive to invest in measures that will improve their safety beyond the minimal requirements. In the extreme scenario, a "lemon" market will evolve in which all airlines provide the lowest safety level which is allowed by regulations. Disclosure of airline safety levels can mitigate information asymmetry by allowing passengers to identify safety differences among airlines and incentivize airlines to provide higher safety levels. Assuming that airline safety is a desired attribute, we expect that demand for airlines that provide high safety levels may then increase at the expense of airlines with low safety levels. This might eventually cause airlines to increase their investment in safety as long as the cost of raising safety levels is sufficiently valued by the market. In this study, we attempt to assess the change in demand for flights when information asymmetry is mitigated.

Flying involves emotional factors that can hinder rational decision-making. Dying in an airplane crash is considered a "bad death", i.e. a death preceded by unusual pain and suffering (Sunstein, 1997). Thus, individuals might estimate the risk associated with flying as being higher than the risk involved in other modes of transportation, despite the fact that aircraft accidents are extremely rare (Squalli and Saad, 2006). Another related emotional factor involved in air travel is fear of flying (FOF). Van Gerwen et al. (2004) asserted that FOF is a problem affecting approximately 30% of the adult population in developed countries.

It is well established in the literature that individuals' choices are not based solely on rational considerations of the likelihood and consequences of different events, but also influenced by emotional factors (Kahneman and Tversky, 2000). McFadden (1986) and Ben-Akiva et al. (2002) proposed a framework that incorporates emotional and psychological factors in choice models using latent variables, which can lead to a more behaviorally realistic representation of the choice process and consequently has better explanatory power. In the realm of transportation, Xu et al. (2011) proposed a general decision-making rule for commuters' route choice behavior accounting for psychological processes, personality, and risk attitude. Fleischer et al. (2012) found that passengers with high FOF levels differ in their choice of flights from passengers with low FOF levels, thus confirming that emotional factors should be considered when analyzing choice of flights. This previous study was based in the prevailing settings in which safety information is not explicitly presented to passengers. The current study uses similar questionnaires and factors to account for the effects of FOF, which were shown to be substantial. However, the focus in this paper is on the effect of safety information on the itinerary choice. The impacts of information on route-choice behavior and the sensitivity of travelers' response to information was mainly studied in relation to car drivers. It was shown that travel information was considered important when subjective risk was sufficiently high (Sun et al., 2012; Ben-Elia et al., 2013), especially when physical (subjective risk) was on stake (Zheng et al., 2015). The use of subjective risk perceptions and objective risk related indicators is another issue involved in air travel decision-making is. The literature suggests that in the presence of information asymmetry, passengers draw on their subjective perceptions of the airlines' safety. The subjective perceptions on the safety of a specific airline may be formed as a result of the number and severity of injuries in past accidents involving this airline, the size of the airline, and time proximity to the most recent accident (Borenstein and Zimmerman, 1988; Squalli, 2010). These perceptions may also depend on the financial condition of the airline (Rose, 1990) or on characteristics connected with being a flag carrier (Fleischer et al., 2012). In a different context, it was shown (Heiman and Lowengart, 2011) that when information about the health risks in meat consumption is not available, consumer decision-making regarding meat purchase depends on the perception of health risks. Nevertheless, when objective information

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