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THE IMPACT OF COVID-19 VACCINE PASSPORT ON AIR TRAVELERS' BOOKING DECISION AND COMPANIES' FINANCIAL VALUE

HIGHLIGHTS

- Vaccine passport is a critical policy for the recovery of airline travel demand
- The implementation of vaccine passports is positively evaluated by airline investors
- Vaccine passports reduce perceived health risk and influence decision-making

ABSTRACT

The ongoing debate about vaccine passport policies for dealing with COVID-19 has necessitated analyzing its effectiveness in the airline and tourism industry. This study was purposed to analyze how vaccine passports are evaluated by multiple stakeholders, such as airline investors and passengers for leisure/vacation purposes. The findings of the first study show that the implementation of vaccine passports is positively evaluated by airline investors. The results of the second study highlight the role of vaccine passports in reducing perceived health risks, which is integral to leisure travelers' decision-making. This study offers a theoretical lens to understand the value of vaccine passports and provides guidance for airline companies and tourism marketers in deciding whether to implement a vaccine passport policy.

Keywords: COVID-19; Vaccine Passport; Immunity Certificate; Perceived Health Risk; Airline Industry; Risk Reduction Strategy.

INTRODUCTION

The tourism industry is facing an unprecedented crisis since the outbreak of the coronavirus (COVID-19) pandemic in 2019. Advances in vaccine development, improved therapeutics, and continued strengthening of public-health responses are undoubtedly going to contribute toward restoring at least some public confidence in travel. In addition – and central to the arguments developed in this research - the concept of a ‘vaccine (immunity) passport’ policy has been considered in some countries (e.g., Germany, United Kingdom, etc.) and tourism companies as a means to reduce the uncertainty surrounding the COVID-19 pandemic (Voo et al., 2021).

A handful of major airline companies have announced that they are considering adopting vaccine passport policy as a risk reduction and recovery strategy that enables safe travel of air passengers during and after the pandemic (Vergara, Sarmiento, and Lagman, 2021). While travelers can reduce risks based on epistemic uncertainty by acquiring further knowledge during decision-making, a specific type of risk based on aleatory uncertainty, such as perceived health risk, is not reducible with knowledge; rather, a specific risk reduction measure should be implemented (Shin and Kang, 2020). While vaccine passports can be a risk reduction measure to minimize aleatory uncertainty of perceived health risk, its adoption remains a contentious issue within the airline industry as well as in government circles because more theoretical and empirical evidence on its effectiveness is needed. The hospitality and tourism scholarship has devoted considerable attention to examining the effectiveness of preventative risk reduction measures (e.g., cleaning, disinfection, social distancing, etc.) (e.g., Hao, Xiao, and Chon, 2020). However, there is a notable paucity of research on the impact of vaccine passports on airline stakeholders. This study attempts to contribute to the theory of perceived health risk and its risk reduction mechanism by analyzing the

impact of vaccine passports on prospective air travelers' perceived health risk and destination visit behavior and air investors' investment decision. Looking at these two main stakeholders involved allows us to better capture two critical perspectives of the same issue from different angles that in a way complement each other.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Vaccine passports (also called “health passport” or “immunity passport”) constitute a form of digital or physical immunity certificates (licenses) that incentivizes people who have antibodies to COVID-19 to return to daily life and travel without restrictions. Vaccine passports are not a new concept - similar immunity certification requirements were implemented to facilitate the international movement of those with demonstrated evidence of yellow fever, rubella, and cholera immunization (Kofler and Baylis, 2020). Along with vaccination programs, many countries (e.g., Germany, UK, USA, etc.) are already requiring a proof of immunization for the entry of international travelers (Voo et al., 2021).

Importantly, vaccine passports are regarded as a fundamental strategy for reducing health risk that serves to protect not only travelers, but also local residents at destinations (Chen, Freedman, and Visser, 2020). Many airline companies too have expressed support for the idea, such as Qantas, British Airways, American Airlines and United Airlines. Some recent studies (e.g., Sharma and Nicolau, 2020; Sharma, Shin, Santa-María, and Nicolau, 2021) found that travel companies' market value as reflected in stock market valuations changes during the pandemic (Sharma and Nicolau, 2020; Sharma, Shin, Santa-María, and Nicolau, 2021). Building on them,

this study proposes to test how airline companies' press releases about vaccine passports can restore investor concerns relating to the impact of the pandemic on airline operations.

Hypothesis 1: Airlines' announcements about vaccine passport policy has a positive impact on airline performance, as reflected in market value.

Recent research found that travelers are likely to avoid travel during the pandemic due to perceived health risk (e.g., Shin and Kang, 2020; Zheng, Luo, and Ritchie, 2021). In particular, some cases of onboard transmission have been reported during flights and this can result in prospective air passengers being concerned about the potential for infection during air travel. Given the significant impact of health risk perception on travelers' decision-making during the COVID-19 pandemic, evidence that demonstrates reduced risk, such as a vaccine passport, can reassure people to travel again by lowering their perceived health risk.

Hypothesis 2: The adoption of vaccine passport policy has a positive impact on airline passengers' booking intention.

Airlines' risk reduction measures for enhanced cleaning and social distancing significantly reduce the rates of in-flight transmission. However, World Health Organization (WHO) has said that the risk cannot be ruled out completely as some potential flight-related infection cases have been identified (Nebhay, 2020). This indicates that air passengers will react differently to airlines' advanced risk reduction measures. Because these passports will only allow those who have COVID-19 antibodies and are considered to be at limited risk of transmission to board flights, prospective air passengers will perceive low levels of health risk irrespective of the existence of other risk reduction measures, which results in higher flight booking intentions. On the other hand,

when there is no vaccine passport requirement and no risk reduction measures, individuals will perceive high degrees of health risk and have low levels of flight purchasing intentions.

Hypothesis 3: There will be a moderating effect of risk reduction measures, such that vaccine passport policy has a positive impact on airline passengers' booking intention irrespective of the adoption of advanced risk reduction measures. However, when vaccine passport policy is not adopted, airline passengers' booking intention will only increase when advanced risk reduction measures are adopted.

STUDY 1

Methodological Steps

We apply a standard event study, wherein we first identify the airlines that made the announcement and the dates (events). We use the Factiva database to ascertain the dates when a vaccine passport requirement was first announced by an airline. The search yielded 10 airlines (e.g., British Airways, Qantas, American Airline, etc.) across the world that had announced COVID-19 vaccine passport requirements for passengers up to the date of data collection. The list includes publicly traded airlines.

As for the period surrounding each event, a short window that envelops the event day to include time before and after the event date is customary in this methodological strand of the literature. This allows for the detection of effects resulting from news leakages prior the event, and also permits some time for the dissemination of information across investors. For the current analysis, a relatively standard three-day window enveloping the date of each announcement is used.

Next, Sharpe's market model is used for purposes of estimation, as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

where for airline i on day t , R_{it} defines the daily returns and R_{mt} describes market portfolio's returns, which in the present study is defined by a primary market index associated with airline i . The parameter α_i represents the returns on the shares of airline i independent of the market. β_i captures the sensitivity of returns of i to market variations. ε_{it} refers to error term which for the present study follows the GARCH type autoregressive conditional heteroskedasticity model. A standard 150-day period is used for estimation purposes.

Abnormal returns, AR_{it} measure changes in market value derived from the announcement by airlines to implement vaccine passport requirements. Abnormal returns are described by:

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt}).$$

Once abnormal returns have been ascertained for each of the three days surrounding each event, they are tested for statistical significance using the cross-sectional test:

$$t = \frac{\frac{1}{N} \sum_{i=1}^N AR_i}{\sqrt{\frac{1}{N(N-1)} \sum_{i=1}^N \left(AR_i - \sum_{i=1}^N \frac{AR_i}{N} \right)^2}}$$

where N is the number of news items and AR_i is the abnormal return on each day of the event window.

Results

The main findings resulting from the analysis of announcements by airlines to implement COVID-19 vaccination passports are summarized in Table 1.

Table 1
Abnormal Returns in Days Enveloping Vaccination Passport
Announcements

Day	Valuation Change	Cross-section Test
Day prior to announcement	0.005484	0.572748
Announcement day	0.014038	2.059903*
Day following announcement	-0.005556	-1.264333

* denotes significance at .05

Notably, there is a significant increase in performance as reflected in market value on the day that airlines announce the decision to require vaccine passports for passengers. The analysis indicates that this increase corresponds to a more than 1.4%. The results support Hypothesis 1, and suggest that there is, in general, considerable confidence in airlines' decisions to require vaccine passports.

STUDY 2

Given that successful developments and implementations of policies should be based on the accurate evaluation of the policies from multiple stakeholders, the multi-stakeholder perspective based on mixed methods approach can provide a more comprehensive and robust empirical evidence on vaccine passport policy. Study 2 examines how the adoption of vaccine passports influences prospective air passengers' decision-making behavior.

Methodological Steps

One hundred eighty-six Amazon Mechanical Turk users were recruited for this study in mid-February 2021. A small monetary reward was given to the participants. Among them, ninety-seven participants (52.2%) were male, and the majority of participants were in their 30s (38.7%) and 40s (23.7%). Based on existing practices on vaccine passports and advanced risk-reduction measures adopted by most airlines (Amankwah-Amoah, 2020), four scenarios were developed using online Qualtrics survey.

Reflecting that most countries have rolled out vaccination programs but still a majority of people are not vaccinated as of February 2021, study participants were instructed to imagine that they will get the COVID-19 vaccine soon and are planning on booking a flight ticket for their first vacation after vaccination. Before reading each scenario, participants read the definition of the COVID-19 pandemic and vaccine passports. In the vaccine passport scenarios, participants read that a hypothetical airline (“ABA Airline”) will demand all passengers provide a vaccine passport. Without the vaccine passport, boarding is not allowed. In the opposite scenarios, participants read the airline does not demand passengers to provide a vaccine passport. In the advanced risk-reduction measure scenarios, participants read the airline is implementing a range of measures to provide advanced levels of disinfection and support social distancing. The example of the hypothetical scenario is appeared in Appendix I.

After reading each scenario, participants answered for perceived health risk and the intention to book the flight ticket, and after that, some following up questions on demographic profile including frequency of using flights, gender, and age were provided. We found no significant effects of demographic factors on the study’s results. To detect careless responses, three attention check questions were included in the survey.

To measure perceived health risk and the intention to book the flight ticket, four items were developed for each construct adopting seven-point Likert scales. To analyze manipulation effects of vaccine passports and risk-reduction measures, participants answered four questions of perceived health risk, developed by slightly modifying existing scales from Quintal, Lee, and Soutar (2010) and Shin and Kang (2020) (e.g., “I feel uncomfortable using ABA airline because of my health safety”). In addition, four items were created by adopting Chan, Lam, Chow, Fong, and Law (2017) and Shin and Kang (2020) to measure flight booking intention (e.g., “I am willing to book a flight ticket at ABA airline”). All items for the two constructs were reliable (perceived health risk: $\alpha=0.97$, the intention to book the flight ticket: $\alpha=0.96$).

Results

The manipulation effects of perceived health risk were significant: vaccine passport ($M=3.25$, $SD=1.71$), no vaccine passport ($M=4.77$, $SD=1.65$); $F(1, 182)=36.47$, $p < 0.01$, $n_p^2 = 0.17$. Advanced risk-reduction measures ($M=3.51$, $SD=1.72$), no measures ($M=4.48$, $SD=1.71$); $F(1, 182)=15.46$, $p < 0.01$, $n_p^2 = 0.08$. Vaccine passports were found to have a significant impact on flight booking intentions: vaccine passport ($M=5.03$, $SD=1.46$), no vaccine passport ($M=3.62$, $SD=1.74$); $F(1, 182)=36.63$, $p < 0.01$, $n_p^2 = 0.17$. Thus, hypotheses 2 was supported. We also found a significant interaction effect between vaccine passports and advanced risk reduction measures on flight booking intention: $F(1, 182)=15.56$, $p < 0.01$, $n_p^2 = 0.08$. As shown in Figure 1, when the vaccine passport policy was implemented in the airline, no significant difference in flight booking intentions was found across scenarios: mean difference=0.22, $F(1, 92)=.88$, $p=0.35$. On the other hand, a significant difference in flight booking intentions was found when the vaccine passport policy was not implemented: mean difference=2.11, $F(1, 92)=35.77$, $p < 0.01$, $n_p^2 = 0.28$. Thus, hypothesis 3 was supported.

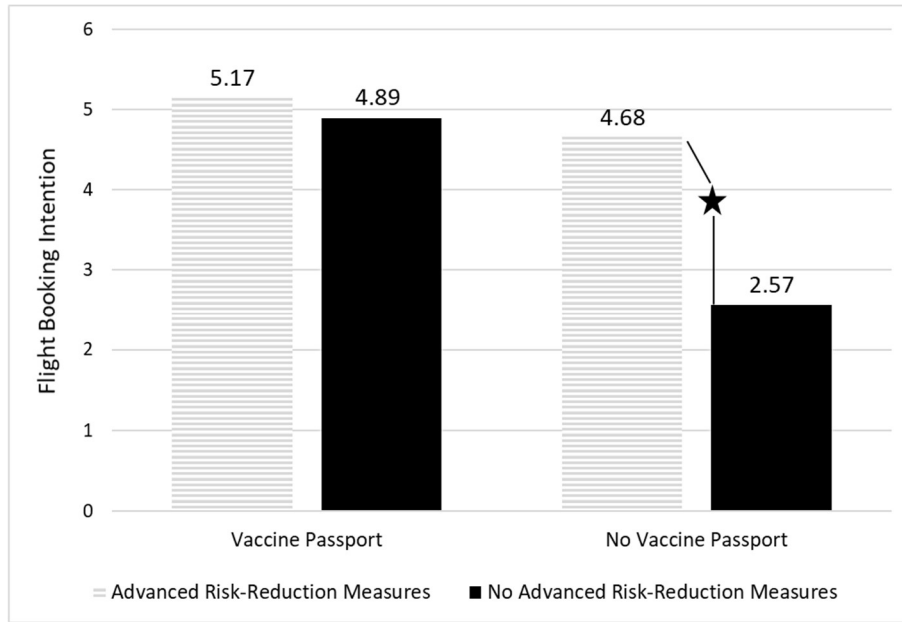


Figure 1. Interaction Plot

GENERAL DISCUSSION

This study contributes to the theory of perceived risk in consumer and tourism research by analyzing the role of vaccine passports and other COVID-19 mitigating measures adopted by airlines in reducing health risk perception during tourist decision-making processes. While general risks associated with consumer decision-making can be reduced when consumers make informed decisions (Shin and Kang, 2020), this study supports the view that health risk is based on unpredictable aleatory uncertainty at destination levels, which is only reduced by the adoption of specific risk-reduction measures. Building on existing studies (e.g., Foroudi et al., 2021; Shin and Kang, 2020), this study adds further theoretical and empirical knowledge on the linkage between health risk perception and travelers' decision-making behavior.

In addition, this study provides a theoretical lens to divide risk reduction strategies into fundamental and preventative measures depending on its impact on perceived health risk and buying behavior. The conceptual difference between objective risks and perceived risks is that perceived health risk is subjective and changes from person to person as opposed to absolute risk which refers to the objective assessment of risk (Adongo et al., 2021). In line with this, this study found that the reduction of perceived risk depends on the effectiveness of risk reduction measures. This result empirically confirms that vaccine passports can be a fundamental risk reduction strategy for airlines due to its overriding effects on flight booking intentions (Chen et al., 2020).

The findings suggest that airline management can more confidently implement vaccine passport requirement for passengers. The decision-makers' uncertainty of whether the requisite of a vaccine passport can bring up demand or can be a deterrent is reduced by the results obtained in the analysis of the market value. These passports appear to increase consumer confidence in air travel, and in turn also promise to provide a much-needed boost to airline performance. Tourism companies need to seriously consider adopting vaccine passports in their operations to facilitate the recovery of travel demand.

By looking at the two main stakeholders involved—customers and shareholders—we can better capture two complementary perspectives of the same situation, which, from a theoretical viewpoint helps draw more accurate conclusions. Customers act according to their risk perceptions and shareholders make their decisions according to their perception of the alluded customers' risk perceptions; thus, to know whether shareholders are correct we need to look at what customers perceive.

While this study initially provides empirical evidence on the effectiveness of vaccine passports from both customer and investor perspectives, as scientific knowledge on COVID-19

continues to accumulate, we recommend that future research further examine the impact of vaccine passport on individuals' health risk perception and decision-making behaviors once there is considerably more evidence relating to COVID-19 immunization and the evolution of variants. Also, as only public traded airlines are analyzed, generalizability is not guaranteed. In addition, while the current study focuses on the impact of vaccine passports in the airline industry and leisure travel contexts, future research need to examine how vaccine passports or immunity certificates influence travelers' decision making for business travels, international/domestic travels (or long vs. short travels), visiting destinations with different vaccination rates and tourism & hospitality businesses (e.g., hotels, restaurants, resorts, etc.).

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Appendix I

Scenario: Vaccine Passport – Mitigating Measure Scenario

Imagine that you will get the COVID-19 vaccine soon. After vaccination, you’re planning on booking a flight ticket for your next vacation. As you search for an appropriate flight ticket, you find below information about “ABA airline” from the website.

The “ABA airline” will demand all passengers provide a vaccine passport, as a proof of immunity that they have antibodies to COVID-19. Without the vaccine passport, boarding is not allowed. In addition, the airline is implementing a range of measures to provide advanced levels of disinfection and support social distancing by leaving middle seats open in all flights. In addition, all passengers and flight crews are required to wear face masks.