

9/11 Effect as Economic Consequence of Pandemic Covid-19

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Abstract

The aviation market is particularly influenced by the world situation, from an economic, strategic, political, and social and health point of view. Several crisis analyses that had an impact on the air transport market provided interesting studies about the consequences and possible recovery strategies. This research aims to analyze the Covid-19 pandemic, and explain in depth, retracing similar situations in the past of air transport. The analysis will highlight the 9/11 effect, which can be used to understand the situation of the aviation in 2020 and the market responses.

Keywords: Aviation, aviation management, organizational strategies, aviation economics. Covid-19 pandemic, 9/11 effect

Introduction

The aviation industry has always been subject to economic cycles of supply and demand. The complexity and size of the industry also make it closely related to global economics. From the very first moment, the spread of Covid-19 proved to be destined to cause the biggest civil aviation meltdown. Analyzing crises in the sector during previous times, can help to define, in fact, the situation of difficulties that is facing the aviation in 2020 and investigate possible future recovery scenarios, which require long time and multilateral and multidisciplinary strategies, just like the different aspects that affect the air transport market.

Air transport is closely linked to the economy, but at the same time it is also strictly connected with the psychological and social aspects of its main actors, i.e. the travelers. What happened after the attacks in 2001 shows how the safety and security aspects play a key role in the perception of air transport in a situation of emergency, such as the current global health situation, and at the same time how these could generate a fall of demand and a consequent drop in supply.

On the other hand, carriers also respond to global crises with reductions in supply that generate less demand for transports. All these elements can be summarized in an effect (9/11 effect) that occurs on air transport during crisis situations such as the Covid-19 pandemic. This article traces the outbreak of the virus in China, its spread to the rest of the world and then analyzes the effect on air transport. Therefore, the reactions of the aviation market will then be analyzed and previous, almost similar, situations will be considered in order in order to understand the possible impact and the timing required for a complete restart of air transport sector.

Aviation scenario under global health crisis

Covid-19, an acronym of Coronavirus Disease 19, represents an acute respiratory infectious disease.

Synthetically, this virus mainly affects the lower respiratory tract and causes a series of symptoms described as flu-like, such as fever, cough, shortness of breath, conjunctivitis, muscle pain, fatigue and gastrointestinal disturbances; in the most severe cases, pneumonia, acute respiratory distress syndrome, sepsis and septic shock can occur and even death.

The disease was first identified in China in early 2020 by the health authorities of the city of Wuhan (about 11 million inhabitants), capital of Hubei Province, among patients who had developed pneumonia without a clear cause. Around mid-December 2019, in fact, the Wuhan health authorities found the first cases of patients showing symptoms of "pneumonia of unknown cause" and almost immediately it was assumed that it was a new coronavirus, deriving probably from an animal source. Due to the easy spread of the contagion, the number of infected people rose rapidly, crossing the boundaries of the Chinese city and reaching various cities in the country and also, quickly, other countries, directly connected with the city of Wuhan.

The movement of people globally, opens new roads to epidemics and China represents the largest market for global aviation after the United States. The city of Wuhan is in fact served by the new Tianhe International Airport, opened in 1995, replacing the old Hankou Wangjiadun Airport and Nanhu Airport.

The airport, which is located about 26 km north of Wuhan city centre, in 2016 served 20,772,000 passengers in 2016, making it China's fourteenth largest passenger traffic airport. Since January 23, 2020, the airport has been closed temporarily and all flights have been cancelled in response to the spread of

epidemic. This is part of the 2020 Hubei lockdowns, as a response to the outbreak. Observing the map of the airlines' destinations served from Wuhan, we find in fact that the first international "victims", i.e. the first countries that had cases of infection, correspond to destinations flown from that airport.

Figure 1 – Map of Wuhan Airport destinations



Figure 2 – Map tracking the spread of Covid-19 from Wuhan



The first reactions of the air carriers have been the suspensions and reductions of flights to/from Chinese airports. These early flight cuts, the resulting drop in demand and the reduction in capacity, mainly, initially, affected carriers of China, Hong Kong, Malaysia, Singapore and South Korea.

Subsequently, several countries have imposed restrictions to flights from all over China, forcing the companies to reduce their operations or to close all Chinese routes, leading to the almost total isolation of mainland China. The first estimation of air traffic, made by the International Air Transport Association (IATA) at the beginning of March 2020, predicted a very negative situation, almost similar for aviation to the impact of the post-March 2020 crisis. However, these IATA forecasts indicated an overall drop in global air transport demand of -4.7%, which would cancel out the growth forecast for 2020, causing \$29.3 billion in lost revenue from global passenger traffic.

The first estimated consequences, however, were only of interest to Asian carriers, or rather all those carriers that are exposed to Asian markets. In reality, however, the latest estimates state that the Covid-19 pandemic will have a \$252 billion less revenue impact on the global airline industry (almost -44% compared to 2019). In other words, a scenario of deep crisis in the sector referable to the decrease in capacity, the passengers drop and finally, to the almost total grounding of many fleets. The Covid-19 has a much wider geographical impact. Data, in fact, tell us that in 2020, imagining a world emergency end in 2 or 3 months, considering China's necessary time, there will be a decline of world passengers of about 40%, worldwide and not only as in previous cases of airlines particularly exposed on a market.

To date, countries, or rather markets with severe traffic restrictions cover more than 90% of revenues of the total global passengers' number. But the crisis is more severe in the second quarter of the year: IATA estimates a 65% reduction in airlines' capacity global, compared to the same period last year.

Flight cuts will be at most in Europe, with an expected -90% capacity drop. Followed by the Middle East and Latin America (-80%), then Africa (-60%), Asia-Pacific and North America (-50%). In the third quarter

of the years, then the IATA estimates an overall capacity reduction of 33%, with the most serious situation in Europe, -45%.

For the fourth quarter is currently estimated a reduce capacity of -10% for all geographical areas. On the basis of these data, a return to pre Covid-19 full capacity, is estimated to take much longer than in 2001, a similar or worse scenario, when the drop in world passengers' number was between -20% and -25%. Assessing also the recovery, which will take place gradually, we can state that at the end of the health emergency countries will certainly begin to reopen to air traffic, but everything will happen slowly, in terms of time, and gradually in terms of traffic flows.

The world aviation will face all this for at least one and a half years from the end of the pandemic. In the past, other crises have been linked to health emergencies, but analyzing them in depth, it emerges that they had occurred in areas precisely located, and consequently with a more limited effect on aviation market. For example, SARS in 2003, due to increased transmission difficulties, remained located in the Asia-Pacific zone. The consequences on aviation was a sharp drop in traffic, with 35% less RPK – revenue, number of passengers transported per km flown, involving however, only companies mainly exposed on the "East" market. After SARS, the return to normal traffic flows - prior to the outbreak - took nine months.

Or the case of MERS, an simile SARS influence which, however, only in the Middle East. The effect on aviation was quite strong, (about 12% of losses). The economic damages to the companies, the drop in revenues, occurred in a particularly circumscribed geographical area, marking only marking only the airlines present in this market, and the recovery needed only months. Starting from these analyses of similar situations, we can easily realize that we are facing something different. On the contrary, The Covid-19 scenario is very similar - even worse - to the one that occurred in 2001, following the terrorist attacks of September 11.

The market reaction to crises

Retracing briefly the history of civil aviation, we can examine some moments in which strong economic crises have generated profound strategies of change in the air transport market.

In 1973, in fact, the world faced a deep energy crisis, due to the sharp rise in the price of petroleum and its derivatives, due to the Kippur War (October 6-25, 1973).

On the day of Yom Kippur (October 6), Egypt and Syria attacked Israel. The Arab countries associated with Organization of the Petroleum Exporting Countries (OPEC) decided to support the action of Egypt and Syria through a robust increase in the price of the barrel of oil and the embargo against the most pro-Israeli countries. OPEC's measures led to a sudden price increase and a consequent interruption in the flow of oil supplies to importing nations. The consequences of the energy crisis did not take long to manifest themselves also on the industrial system, which due to the austerity policies applied since those years in many countries no longer knew the growth rates recorded in the previous decades.

The effects were also particularly visible on the civil aviation market, which showed an increase in fuel costs and inflation and a reduction in the number of passengers and the load factor (the ratio of the average or actual amount of some quantity and the maximum possible or permissible). At these considerable losses for the airlines. the response of governments was initially trying to protect national companies, limiting competition, and then the idea of a liberalization (deregulation) of air transports. The liberalization has therefore established reduction or elimination of government power in a particular industry, usually enacted to create more competition within the industry.

Through the US Deregulation Act (1978), considering aviation as a market capable of self-regulation. Benefits for consumer were generated, such as reduction of fares, increased efficiency due to greater competitiveness, opening of new connections between cities and strengthened presence of American carriers on international routes. The US deregulation, and the consequent major competitiveness, allowed concentrating the offer on the most profitable segments and therefore to reduce costs. The effects on the aviation market were positive and the structure of world transport was changing. New players appeared in the market, such low-cost and regional carriers, which joined the existing national carriers (flag carriers), increasing the competitive pressure. A second effect was the increase of the number of routes and flights offered that, consequently allowed the upturn of the of passengers number, attracted by the greater offer and lower fares.

The large national carriers, correspondingly, had to lower their fares and no more government subsidies to fly on unprofitable route were granted, overcoming the logic point-to-point in favor of a hub-and-spoke vision.

Specifically a point-to-point network is a route where the origin and destination traffic is only focused on by an airline, while A hub-and-spoke network represents a route where an airline not only transports passengers between two points but also connects the passengers of distant points via its hub. Following what happened in the US, a gradual process of deregulation of the sector also took place in European aviation, characterized, till then, by the monopolistic presence of flag carriers owned or controlled by the states. Since the second half of the 1980s, a real process of political and structural change in the sector developed. In 1987, the Single European Act considered air transport as an integral part of the European internal market. In Europe, therefore, the freedom of supply and tariffs began to increase until the beginning of the 1990s, when the sector was completely deregulated, with the consequence of new airlines, new routes, new fares and, finally more passengers. The 1973 crisis had therefore a strong impact on the aviation sector in terms of fall in demand and supply, decrease in traffic flows and reduction of profits.

The response was ultra-effective and generated an air transport revolution strategy. In fact, on one side there was the growth of many private airlines, while on the other, the network of national airlines was rationalized, concentrating the traffic through a system of hubs and spokes. We can state that to a crisis in the air transport market there is always a response that changes the market strategy. A further case is represented by what happened after the terrorist attacks of 11 September, 2001. The aviation market, in fact, had an incredible slowdown and many companies went into crisis. The crisis significantly hit the American companies but also the European ones suffered a bad impact and it took more than a year to return to pre-September 11 traffic levels, with the result that several companies recurred to Chapter 11 and others closed. Even in this case there was a reaction with new market strategies, as happened, in the case previously investigated, when there were a redefinition of the business, new competitive strategies, new marketing and segmentation choices, new network logics as a reaction to the threats presented in the macro-environment and competitive environment. However, the effects on supply/demand numbers and the consequences of the events of 2001 were more serious and more critical. Thus, it is necessary, for the purposes of this research, to investigate more deeply what happened, at that time, to the air transport market.

9/11 aviation crisis

The events of 11 September particularly affected one of the main air transport markets, that to and from the United States, with profound consequences for all companies exposed to the North American market. The transatlantic route suffered the greatest losses; the aviation market had an incredible slowdown, many companies went into crisis.

The crisis significantly affected American carriers but also European and Asian airlines. In the United States, support measures for airlines were launched, but despite the injection of money and loan guarantees, the desired results were not achieved.

In the United States, American Airlines reduced capacity, cut personnel and cancelled routes, but the losses in the first quarter of 2002 alone exceeded billions of dollars. Us Airways - since 2015 part of American airlines - risked bankruptcy due to a drop in passengers, around - 17%, despite the company lowered the average ticket price by 14%. There were \$269 million in losses. America West, announced losses of more than \$300 million in the first fiscal quarter as a result of the crisis, from which it never actually recovered, arriving in 2005 at the merger with Us Airways. Also Boeing was affected by the industry downturn and already closed down the first quarter of the fiscal year with losses of \$1.25 billion.

In Europe there were the bankruptcies of the Belgian company Sabena and the Swiss flag carrier Swissair, while other airlines such as British Airways, Lufthansa, Iberia, trying to cope with a drop in revenues of more than 10%, implemented cost-cutting measures, with the reduction of employees, cuts of routes, closing of less profitable flights. Again, also in this case, the market reacted to events. It was therefore necessary to adopt - in response to significant losses and decreases in revenues, staff and routes cuts, capacity reductions, increase in fares on non-competitive routes – strategies' adaptations and changes able to sustain the crisis.

The low-cost carriers, already particularly developed with deregulation, were able to operate according to the principles of economy (cost-effectiveness) by using innovative strategies in the organization of the

company and in flight planning, while the flag companies began to challenge these airlines, on the short-haul routes and attracted passengers on their long-distance routes - with complete and more lucrative services. This strategy, which was launched in 2001, found the total implementation in the years of the global economic crisis between 2007-2013. Flag companies started to change their product/service "short-haul flights" in a drastic way: more efficient economy classes, introduction of online booking, elimination of travel agents' commissions, strong limitation or elimination of the free catering offered, approaching the operation system of budget airlines.

9/11 effect

What exactly happened after the terrorist attacks helps to understand what is occurring with the Covid-19 pandemic.

We are faced, in fact, with something that can be defined as a 9/11 effect, that is, several important consequences on aviation, deriving from social, psychological and economic conditions. In this research, in order to better understand the nature of this effect, it is necessary to introduce the concept of risk, namely the potential chosen action or activity - including the choice of not acting - that can lead to a loss or to an unwanted event, i.e. the possibility of undergoing damage, associated to a condition more or less predictable. There is, however, a difference between objective and subjective risk.

We can state that an objective risk is a quantifiable concept and it could be calculated using mathematical calculations. This scientific calculation is given by the severity of the damage and to the possibility of occurrence, thus the objective risk becomes quantifiable, calculating the objective probability of occurrence, and the magnitude, i.e. the impact of the consequences. On the contrary, the risk becomes subjective when there are events that are not only classified by the objective probability but are instead related to subjective probability, in the forms of individual "degree of belief". In this case, then the risk expresses the perception that individuals have, changing aspects of the environment, since they do not have access to complete information and should develop hypotheses and associate each of them to a chance of occurrence by using probability theory.

The subjective risk coincides with the perception of a possible danger that does not correspond to something mathematically calculable but it relies on other parameters, related to the characteristics, to the experiences and to the environment of the individuals. The subjective risk is different for each individual; in fact someone may perceive the same risk as negligible, others as acceptable, and others as tolerable or completely unacceptable. The studies about the risks are centered on social psychology and perception of risk and on the voluntary exposure to a risk.

Table 1 - Graphic clarification of risk perception

MAJOR RISK PERCEPTION	MINOR RISK PERCEPTION	EXAMPLE
INVOLUNTARY EXPOSURE	VOLUNTARY EXPOSURE	Those who do not use a mobile phone perceive exposure to radio frequencies as a high risk
INABILITY TO CONTROL	ABILITY TO CONTROL	Plane crash, for a pilot or a passenger
UNFAMILIARITY	FAMILIARITY	Familiarity with environment (e.g. pilot)
RECENT EXPERIENCE	LACK OF EXPERIENCE	Similar previous experience
DRAMATIC RISK	NON DRAMATIC RISK	Terrorist attack or car accident
DISPARITY	EQUITY	When you are exposed to a risk (electric fields) but have no benefits

Analyzing table 1, we can state that a risk may be accepted or rejected depending on several factor, in fact, the involuntary exposure to a risk, an inability to keep it under control, the unfamiliarity with the situation or the environment or an analogous recent experience, will amplify the perception of a given risk; while the confidence with the environment, the idea that exposure to the risk is voluntary, an advantage that may occur, or the idea that risk could be controlled, decreases this perception.

What happened after the attacks, it was also a problem of risk perception?

Each individual, in fact, is exposed to information of a different nature and, through the cognitive process, the individual processes this information, building his own representation of reality. The perception of risk is

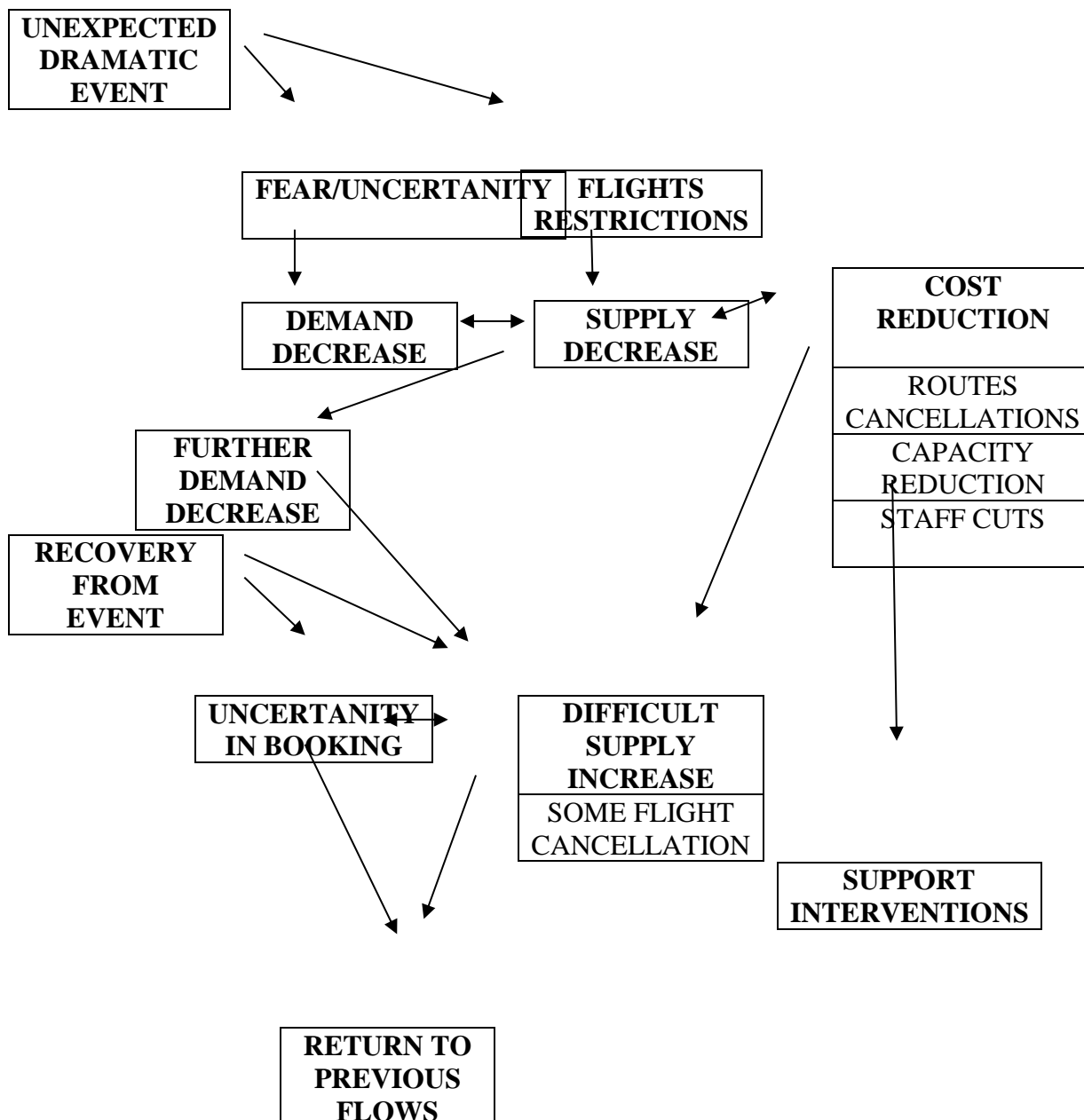
therefore a cognitive process involved in various daily activities and orients people's behavior when faced with decisions involving potential risks.

We can state that there is a discrepancy between subjective perception of risk and objective assessment.

The perception of risk involves different dimensions such as, for example, both immediate and future consequences and their implications, both on a rational and objective level and on an emotional and subjective level. It happens, in fact, that people sometimes fear activities that are not actually dangerous and are not afraid of activities that could have very dramatic consequences. The fear, the idea of not being able to control the event, the uncertainty of safety, the doubt that such events could happen again or could involve them, led to the first reduction in the drop in demand for air travels.

The psychological-social dimension has been added to the real risk dimension, which has seen an increase in security measures and flight restrictions.

Table 2 – 9/11 effect matrix



What is happening during the Covid-19 pandemic can be easily explained with the 9/11 effect matrix (Table 2).

When the epidemic began to spread, the market response was to reduce flights and capacity (although limited to eastern markets) to compensate the decline in demand, also as a result of restrictions imposed by some governments.

Covid-19 has seriously disrupted the airline industry and, even if at first initially, only Asian carriers were mainly affected, the travelers' increased perception of risk has resulted in a consequent sharp drop in demand, with serious financial impacts on airlines (more significant for those particularly exposed to the Chinese market).

Thus, immediately appeared the need, for the airlines, to take difficult decisions of reducing and, in some cases, canceling routes the Chinese / Asian market.

in the same way, several countries have issued travel advisories, or outright bans, in order to restrict the spread of the virus, increasing further travelers' perception of risk.

As the number of new cases continues to surge in several parts of the world and numbers are beginning to decline in others as public health officials and governments tirelessly work to slow the contagion and reach of the virus.

This combination of trip cancellations and country-specific restrictions on international flights is continuing to cause losses to the market. Naturally, the economic impact on aviation has been immense. As indicated in 9/11 matrix, the direct consequence has been a drop in demand and in supply, a decrease in traffic flows and a reduction in profits. Following a following a major number of countries involved, further losses have determined and are determined by capacity reductions, returning (rescue) flights, route cancellations, fleets grounding and, finally, staff cuts.

Many airlines worldwide face the threat of bankruptcy in coming months, due to these continuing declining trends continue. The impact would depend on how long the epidemic lasts and could still be exacerbated by restrictive measures. Each day of prolonged suspension of the aviation industry causes a monthly loss of industrial added value., and billions in lost revenue already estimated for this year, with a severe economic, employment and social impact.

Moreover, we have to consider, that the main asset of a company are airplanes, in most cases (almost all) financed by loans of 20/25 years or leased from 12 to 15 years. At the moment, companies have no cash inflows, but these payments remain even when aircraft are grounded or carry fewer passengers or fly less.

Other cost for airlines, is the active maintenance of slots, i.e. the permission of the airport operator for an airline to land a plane (and then take off – each slot is effectively a landing/take off pair).

The standing IATA “80-20 rule” means airlines must operate at least 80% of their allocated slots; if they fail, the airline loses its right to that slot the next season. Finally, IATA welcomed the announcement by the European Commission granting the temporary suspension of the “80-20 - use it or lose it – rule” for airport slots. The decision reflects the unprecedented situation facing the airline industry and represent one of the support intervention, stated in the 9/11 matrix.

Conclusion

The pandemic, which has claimed thousands of lives across continents, has virtually brought the world economy to a standstill with millions of people placed under lockdown. The aviation industry, suffering from cut-throat competition, price wars and poor financial health, has been clobbered hardest by the pandemic, which has virtually ground air travel to a halt and threatens to bankrupt most Airlines.

Analyzing previous aviation crisis, allow us, even in this case, that there will be an answer, offered – like in the past – from aviation economics. There will be a recovery, there will be new market strategies, but using the 9/11 effect matrix, we could predict that the times will be longer than in the past. Supporting initiatives and new plans are fundamental, as allowing airlines to plan schedules and redeploy aircraft and crew to where demand is highest, improving economic and environmental sustainability by ensuring that flights for which there is no demand can be cancelled, facilitating airlines more flexibility to plan for the recovery phase and re-introduce capacity where and when needed and, finally, ensuring that the aviation industry could return to normal as quickly as possible once the crisis is over. Depending on the severity of the crisis, different action strategies can be put in place.

Any company could fall victim to a transportation crisis, so it became important how the manage and minimize consequents, without underestimating that the end of the emergency cannot be immediately translated into full recovery, without underestimating that the end of the emergency cannot but be translated into full recovery, since people are also delaying buying tickets for future travel, due to the uncertainty surrounding the outbreak.

Therefore, we can affirm that the uncertainty of the recovery, makes it necessary to move in two different directions, one for the present and one for the future, with extraordinary and multilateral measures.

It is necessary, in fact, to imagine support measures for the market, so that the companies involved can succeed in reaching the end of the emergency situation, it is also necessary to visualize new scenarios - as happened after the events of 1973 and 2001 - which will facilitate the rapid recovery of the sector.

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