

Competition in the airline industry: the overcoming of *the hub-and-spoke model*.

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Abstract

The aviation market is experiencing an unprecedented crisis, where the economic and health impacts are having consequences that were not even remotely imaginable.

Air transport market, over the years, has been victim of several crises, that have provided interesting studies on possible response strategies, but the current situation is opening scenes for which it seems necessary to rethink the transport system in general.

This research, based on the studies on competitiveness and innovation, would demonstrate that the transport system imagined and organized with a logic conveying flights to major hubs, could be outdated and unsuitable to support the recovery of the sector at the end of the Covid- 19 pandemic.

The analysis will highlight the need to re-study the air transport system, in order to find in new innovative and compatible strategies, a valid instrument to overcome the economic crisis that nowadays, as never before, is affecting aviation.

Keywords: *Aviation, competitiveness, organizational strategies, aviation economics, Covid-19 pandemic.*

Introduction

The complex structure of aviation requires the continuous need for innovative strategies, favoring profits and competitiveness.

Normally people are able to choose between different airlines and different flights, depending on what are their needs, using a time-conscious and cost-conscious evaluation. That means that a person going somewhere has to possibility to decide among different options.

The choice that has to be made will depend on many factors starting from the price of the flight, time of the departure and arrival, additional costs, benefits included in the ticket and many more.

Other than the consumer's point of view, there is the company's point of view. As a matter of fact, airline firms must incur in some issues when deciding about which strategy to use. Airlines need to manage to lower costs in order to higher their profit. Companies certainly need to understand what the client will want, and in doing so, they will understand how to connect cities in their route map in the best way.

The current situation in the sector, however, is leading to an overcoming of all these premises.

Companies, due to the current Covid-19 pandemic, must already structure themselves on a proactive and effective logic for the future, through a deeper analysis about all the market strategic options, structured on the size of the airplanes, the route of the flights, their profits and some others.

Having made these considerations, in this research we will therefore define how the possible innovative strategies see in a return to point to point logic a tool that could be useful to imagine future market logic in air transport.

Instruments of competitiveness

Compared to other economic sectors affected by the Covid-19 pandemic, aviation suffers double damage.

The first, comes from the fear of contagion, since no other economic activity depends so much on the possibility of placing a customer in close contact with a stranger for hours while transporting potentially infected individuals from one continent to another.

The second damage, less direct, is instead linked to the consequences of economic activity. Air transports in fact ,are strongly connected to the general economic sector and are influenced by market trends.

During a descending phase of the economic cycles, aviation has, in fact, the lowest rate of expansion, while in an ascending phases, it has the highest rate. An increase in economic activity, indeed, requires a greater demand for transport, while a recession or an economic crisis, can lead to a very important downturn in this sector, since greater availability of money induces individuals to travel more.

A further aspect to be considered, in the analysis of the impact of the pandemic on the aviation sector, is that of the simultaneous combination of the two factors: economic and health.

In previous health crises, such as SARS or MERS, there has been a strong reduction in flights, but this has been regionalized to the affected areas. As a result, there was a risk of travelling in a phase that was not a crisis for the global economy.

The Covid-19 pandemic, for the first time in the history of civil aviation, is instead showing economic and health problems that are occurring simultaneously.

Airlines are therefore facing an unprecedented situation, to which to respond is becoming very difficult.

Economic revenues are shrinking sharply but the real obstacle is finding an answer to the question of whether individuals will ever return to fly regularly or whether it will be necessary to respond to new habits and new behaviors.

From this situation emerge two questions to which it is necessary to find answers:

-What will become competitive in such an uncertain market?

-How will airlines be able to survive in the aviation market and return to establish a competitive advantage?

Nowadays the competencies to keep a competitive advantage must be constantly adjusted and upgraded, there is no time for those firms that want to postpone the development.

In this case only who evolves rapidly and finds the right paths can achieve a sustainability in the market, such a sustainability is aimed at the survival of the firm.

Indeed, firms can compete on various levels and each level has its own rules that must be respected. Taking as the perfect storm the Energy renewable market, the transition from non-renewable fuels (such as coal and oil) to renewable energy resources is felt needed for endless reasons. However, now the market is facing difficulties in this transition since there are individuals who are large incumbent firms that tend to be older and have a relatively high market share, i.e. "*Goliaths*". The counterpart can be considered the so called " *Davids*" which are defined as small firms that tend to be recently founded and have a relatively small market share (Hockerts & Wüstenhagen, 2010).

The comparison between the aviation industry and the energy renewable sector, allows us to imagine possible new strategies to be adapted in response to the actual situation.

In this way we can tackle the competition which has raised over the years, especially considering the recent coming of low-cost carriers following the *deregulation* of the airspace and of the whole aviation industry (Burghouwt & Hakfoort, 2001).

When considering the newcomers entering the market, we cannot exclude the presence of governments, wherever possible markets must be set free.

Following the suggestions of the literature in the field, we can quote literates defining various economic strategies options:

-*Fight*, therefore, it will be tried to resist the change;

-*Flight*, hence, either there is too much competition, or the market is too *savage* then the firm will decide to leave it;

-*Follow*, what the market decides, just play along and follow the changes;

-*Fit*, change to meet the challenge.

Such approaches, as we will analyze, can benefit from useful theories as indicated:

-Transaction cost theory

-Theory of competitive advantage

-Theory of the first mover advantage

-Theory of non-market strategy

-Theory of international business

-Theory of business diversification

-Resource-based theory of the firm

-Theory of organizational behavior

-Innovation theory

-Theory of incumbency

-Theory of core competencies

Analyzing more specifically the theories indicated, we can state that the *Fight strategy* may benefit from the *theory of competitive advantage* and of the *theory of non-market strategy*

This theory can be traced back to Porter regarding the competitive advantage with his article he defined the five forces influencing the market profitability: threat of new entrants; bargaining power of buyers; competitive rivalry; bargaining power of suppliers and threat of substitutes.

The theories belonging to Porter (*theory of competitive advantage*) and the one belonging to Baron (*non-market strategy*) will turn out to be useful in order to analyze the market phenomena.

In Porter's theory, five forces are taken into consideration. Therefore, Oster, taking Porter's theory of competitive advantage, draws conclusions with the statement "Government actions affect the competitive advantage of firms and industries and can therefore increase or decrease industry profitability. Various are the economists that follow one another arguing on the matter. Baron's with his theory of non-market strategy points out the important differences between Porter and Oster's forces: voluntarily engage with Porter's five market forces, and forced to interact with Oster's non-market.

Non-market forces are considered to be broader than government, indeed the market can be expressed by social, political, and legal arrangements that structure the firm's interactions with the market itself. Interactions that are intermediated by stakeholders and government are included (Baron, 1995). Finally, it is possible to conclude that the firm must position itself against non-market forces (Bonardi et al., 2006).

Therefore, according to Bonardi (2006) three non-market tools are developed, based on the concept that political market attractiveness, nonmarket performance is influenced by the characteristics of a firm's regulatory and political environment, stressing that rivalry among interest groups or politicians can enable a firm to mitigate political transaction costs.

Finally, three non-market tools are found (Hillman & Hitt, 2006):

- Financial incentives (Political contributions, Economic leverage, Political consulting aid Office personnel);
- Constituency building (Stakeholder coalitions, Advocacy advertising, Public relations, Legal challenges);
- Information strategy (Government lobbying, communication).

Nevertheless, the objective of a non-market strategy can vary (Oliver & Holzinger, 2008):

- Value maintaining strategies (defensive strategies);
- Value creating strategies (proactive strategies).

Analyzing the *Flight strategy*, we can realize that represents a resource-based view of the firm, beneficiary of *theory of diversification*, *theory of international business*.

This strategy has different aspects and types of market exit: geographic market exit, and product market exit.

When evaluating the *Flight strategy*, it is widely recognized that different facets must be considered: the resource-based view of the firm, the theory of diversification, and the theory of international business.

It is suggested that competitive advantage is provided by the "bundle of resources" that the firm owns and controls (Barney, 1986; Wernerfelt, 1984). For resources are meant all the factors that are owned or controlled by the firm (tangible: physical, financial or human) or intangible (intellectual and technological resources, reputation, culture, knowledge and brands).

Therefore, it is necessary to distinguish company's resources and company's capabilities.

Resources are thing that the company owns, whereas capabilities are the things that the company can do with what the company owns.

It is possible for companies to shape their business and market role by complying with their strategic position, or by strategic investments. The market makes demands, and companies must respond, sometimes exiting the market by diversifying or internationalizing the products.

Diversification represents a possible strategy and can be defined as a risk-spreading strategy.

Diversified firms have fewer risks in any one market (Higgins & Schall, 1975; Lewellen, 1960; Shleifer & Vishny, 1992).

Moreover such a practice is thought to be value generator, since the diversified conglomerate structure can reduce earning variability (Lewellen, 1960), and the risk of bankruptcy (Higgins & Schall, 1975). On top of that, avoiding imperfections in the external capital market, while sustaining a higher level of leverage (Lewellen, 1960), can be obtained though diversification.

On the other hand, nothing comes for free and diversification has various costs:

- Increased control and coordination costs (Jones et al., 2020);
- Bargaining problems within the firm (Rajan, 2000);
- Bureaucratic rigidity (Shin & Stulz, 1998);
- Information asymmetries (Williamson, 1967);
- Production inefficiencies (Rust & Lancaster, 1992).

In the 1980s the costs of diversification have been found to outweigh the benefits. Therefore, since the 1980s, the advice has been to avoid diversifications, and instead to focus on the core business.

There is then the internationalization strategy, meant to be the process by which firms expand to other (international) markets.

The real issue for firms is to understand whether internationalizing is worth or not. Moving abroad can bring several advantages, such as: cost benefits, revenue benefits, learning benefits, and arbitrage benefits. However, there are three very critical costs that must be analyzed: the existence of a liability of foreignness, the existence of localization advantages, and the existence of location-bound advantages.

What should be realized by the firms is that exiting the market shall reduce the firm's competitive advantages, and it costs significant time and resources.

Proceeding with the analysis we can describe the *Follow strategy*, which has as tools the innovation theory, and the first mover advantage.

This strategy is can be briefly summarized by the strategy in which the firm follows the trends, mimics the entrants and matches its offering to the changing needs of the market.

The purpose of this strategy is to match the firm to the new market.

Companies through their strategic position or by strategic investment "Shape" themselves to the needs of the market (Barney, 1986). Moreover, the market is not stationary and as the market's needs change, so too do the value of the firm's advantages.

Two theories can be merged in this strategic move (follow): innovation theory and first mover advantage. Concerning the former, the following statement can be extracted: a competitive advantage in one era becomes a competitive disadvantage in the next.

This process, the process of "creative destruction", means that as a market evolves, the value of the firms competitive advantage change.

Usually, quiet periods, that are dominated by one type of firm, end with "shocks", that destroy the old firm and the old market, and create new firms and new opportunities.

It could be thought that a newcomer in the market is successful because it is smarter, and nimbler, while larger firms are bureaucratic and myopic.

In reality, incumbents have organizational difficulties dealing with new technologies. Incumbents over-allocate resources to incrementally improve their existing businesses, at the neglect of paradigm-shifting innovation needed to survive.

Two ways to explain why incumbent act like this: sunk cost and replacement effort, the incumbent has nothing to win by disrupting the market.

Secondly, concerning the first mover advantage can be understood as the advantage gained by the initial firm to occupy a specific market segment. The first-mover advantages can shape the market to the firm's competitive advantage and can limit competition by blocking additional market entry.

The last approach to investigate is *Fit strategy* in which the theory of core competencies can develop

It is a strategy in which the firm accepts the trends and looks to its core competencies to redefine its position within the new market.

The concept of core competencies was introduced by Prahalad and Hamel.

In the 1980s, Japanese entrants were consistently beating what had been the most successful western firms in the 1970s. The real difference between western firms and Japanese firms in the 1980s was that westerns had a portfolio of businesses, while Japanese had a portfolio of competencies. To better understand this difference first we need to define core competency; it is more than a single resource, it can be understood as a harmonized combination of resources and skills. In the scheme below the tree has its strength in the roots and not on the leaves.

A core competency to be identified should be valuable across multiple markets, add consumer value, and be difficult to imitate by competitors.

Competitiveness and overcoming the model *hub-and-spoke*

Which of these strategies can therefore provide us with the most useful approach to relaunch the competitiveness of the aviation sector, becomes the focus on which guiding the choices of airlines.

The sector in fact shows us objective difficulties derived from the timing. the opening of routes, the order of new airplanes and the training of personnel, all factors which takes time. It becomes difficult to plan and implement in moments of uncertainty on the direction that will take the sector in the future.

Making decisions at this time must adopt strategies that are valid in the immediacy and in the long run.

The answer could therefore be to behave as " *Davids*", even if they are companies with a long history behind them.

The two levels on which to move, are represented by the challenges of short and long period.

In the first case, in fact, air transport organizations must overcome the logic of very long decision-making processes, since they need to quickly come to a decision to survive in the current situation. In fact, it may be necessary to rapidly reactivate disused routes or to organize flights, which generate incomes.

In the long period, however, it may be necessary to upset previous dynamics, such as *hub-and-spoke* logic, considered already outdated by the approach of low cost companies but still at the basis of the transport dynamics of traditional carriers.

The *hub-and-spoke* model, allowing passengers to fly from on airport into a hub airport and connect there for a flight to the final destination, was designed to benefit airlines and optimize network coverage, due to the fact that under this model an airline could fly more routes to connect more destinations, instead of offering *point-to-point* flights between several destinations, optimizing the network.

All transportation sectors have production networks characterized by economies of networks, generally called economies of scale, that for definition are cost advantages reached when production becomes efficient. They can be achieved by companies by increasing production and lowering costs because expenses are spread over a larger number of goods.

In aviation, economies of networks specifically are composed by all the routes available in which they can transport passengers or freight.

The transportation industry was exposed to various changes after the deregulation that lead to no controls on price and entrances in the market. Thus, there was an increase in hub-and-spoke network that was caused by the increase in competition.

Simply observed the model therefore allows airlines to connect passengers from airport of origin to final stop, via the *hub*.

This helped the companies to decrease their fares while increasing the number of passengers, destinations, and the number of flights departing from the single hub.

The mass displacement that took place with heavy aircraft versus *hub* airports, from where to continue with smaller aircraft, benefited - with the exception of short temporary crisis – of the fuel costs, considered negligible until the late 1990s.

Moving very large planes, using many small planes from *hubs* resulted in the consumption of large amounts of fuel, but the capacity and the occupancy exceeded the analysis of economic advantage.

Such logic, which proved its effectiveness in the past, may not be more convenient in a more modern analysis.

In more recent times, in fact, the *hub-and-spoke* model fell out of favor. But it still exists, particularly when it comes to international flights. Most airlines with both domestic and international operations will funnel passengers to key hubs to connect onto international flights.

Many international airlines have a single hub airport. In this case, the vast majority of their flights either arrives or departs from their hub.

The above analysis shows the need for innovation in airline strategies. The current situation, however, shows us the need also for traditional carriers to return to the point to point model, characteristic of low cost companies, connecting the travelers from the origin to destination with a non-stop flight.

The model defined also *O&D* (origin and destination), means that the passenger who wants to fly from a city (to another city), or vice versa, will be transported with a direct flight, operated with smaller aircrafts, without using a *hub*.

As already said, this is the principal network used by low cost carriers' companies. In point of fact, this system helps companies to cut costs by removing the stop at the hub and also all the costs deriving from it, such as the development of the connections, the fuel consumption on big aircrafts and the enormous airports slots price.

The most significant problem of this system is that it cannot reach destination located very far away from the city of origin since not every place in the world can be economically reached with direct flights.

The profitability becomes the driving force of this logic, but it can be transformed into something effective at a time when, in contrast with what has happened since the 1970s, air transport is once again becoming an elite phenomenon.

Conclusions

Research has shown that the ability to innovate represents an opportunity for companies to react quickly to market crises.

In aviation, the duty to face the economic and health crisis resulting from the Covid-19 pandemic is putting a strain on the actors, who have to imagine possible solutions for survival and development.

In the coming years, airlines will be wrenched in two different directions.

Their revenues will stay low and wobbly; IATA predicts that passenger numbers will return to pre-pandemic levels only by 2023, but others in the industry grimly cite 2024 or 2025. So what has been theorized so far in air transport seems to be no longer applicable and strategically effective.

The logics of large airplanes transporting large numbers of passengers to major city *hubs*, already passed by the point-to-point approach, typical of low cost airlines, seems to be the post option for the aviation market in the very near future.

Responding to the negative forecasts of traffic flows, recovery strategies and new strategies will therefore be adopted by the aviation sector, in order to create a more profitable network.

In order to ensure the sustainability of competitive advantage, overcoming the hub and spoke logic plays, in fact, a possible key role.

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