Analysis of Barriers Negatively Influencing Entry of Startup Airlines into Aviation Industry using ISM Methodology

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ABSTRACT

Aviation is a catalyst for growth, a vital conduit for world trade and a major global employer. But getting an airline off the ground has become a lot more treacherous. High oil prices these days mean carriers must fly full planes to turn a profit, and smaller airports just do not provide enough passenger traffic. At the same time, the major domestic carriers are more entrenched than ever in their own hub airports, making it harder for a new entrant to wrangle gates there. And investors have become more cautious about lending to just any airline project. Mergers have also created a handful of major carriers that control powerful hub airports in large cities, making it generally tougher for a new airline to break in. This paper proposes an analysis on the barriers for an entry level airline into the aviation industry using Interpretive Structural Modelling (ISM) approach. It has been also found that the major barriers are fuel prices, competitors in the market, etc.

Keywords: *Aviation Industry, Competitors, ISM, Start-up Airlines.*

1. INTRODUCTION

Air transport is one of the most important industries in the world. Its development and technical service achievements make it one of the large contributors to the development of modern industry. The growth in the aviation sector cannot be compared to any other major form of transport due to its technicality and new innovations that is going on in the part. The above has helped very much in economic development of the nations in the globe. Demand for air transport services has increased the influence of air transport in the community and global economy, thereby enabling rapid movement of passengers, goods and services to the world market. This in turn helped to obtain larger revenue to the economy by way of quick in and out flow of goods and services. The aviation zone plays an important part in the aspect of work and leisure to people around the world. This sector helped to improve quality of life, living standards of people within the nation. All this helps to generate economic growth and poverty mitigation by way of providing employment space, increasing revenues from taxes. The job opportunities would be created through supply chain transformation from the airports. Air transportation is a large industry in its own right and it also provides crucial inputs into broad economic, political, and social processes. The need for its services, as with most transport, is a derived one that is driven by the needs and carving to obtain some other final aim. Air transport can ease, for

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example, in the economic development of a peculiar industry like tourism, but there has to be an underlying demand for the goods and services donated by a region or by an industry. Absence of air transport, as with any other input into the system, can avoid active development. At same time goof or surplus in supply are useless. Air transport is one of the most important industry in the world. Its development and technical service achievements make it one of the large contributors to the development of modern industry. The growth in the aviation sector cannot be compared to any other major form of transport due to its technicality and new innovations that is going on in the part. The above has helped very much in economic development of the nations in the globe. Demand for air transport services has increased the influence of air transport in the community and global economy, thereby enabling rapid movement of passengers, goods and services to the world market. This in turn helped to obtain larger revenue to the economy by way of quick in and out flow of goods and services. The aviation zone plays an important part in the aspect of work and leisure to people around the world. This sector helped to improve quality of life, living standards of people within the nation. All this helps to generate economic growth and poverty mitigation by way of providing employment space, increasing revenues from taxes. The job opportunities would be created through supply chain transformation from the airports. Air transportation is a large industry in its own right and it also provides crucial inputs into broad economic, political, and social processes. The need for its services, as with most transport, is a derived one that is driven by the needs and carving to obtain some other final aim. Air transport can ease, for example, in the economic development of a peculiar industry like tourism, but there has to be an underlying demand for the goods and services donated by a region or by an industry. Absence of air transport, as with any other input into the system, can avoid active development. At same time goof or surplus in supply are useless.

2. LITERATURE REVIEW

There is no universal definition for barriers to entry. The idea of specific factors was imported by limiting companies to enter advanced markets where bindings are already present [1]. This stream of the literature argues that barriers to entry are set up by absolute cost advantages, economies of scale, product differentiation and the degree of firm concentration [2]. This view, however, is rather inhibiting in that its interpretation focuses on costs only (without considering sunk costs) and in that it presumes a steady state without any dynamics [3]. In more late years, entry limits have been seen in a broader definition, which disputes that they are supposed to be any mechanism, which delay companies to get in a market [4]. This broader view seems to be more applicable, as there are clearly other factors than just cost that could block market entry or exit. These can be classified into innocent or strategic barriers and also into exogenous (legitimate mechanisms that are inherent to the market and are out of control for any of its participants, such as regulatory or infrastructural defects) and endogenous, strategically erected barriers.

Airlines that want to enter congested airports are confronted with a situation where most of the economically viable slots are already allocated to incumbent [5]. It is still the prevalent system in Europe, however, incumbent airlines will lose their right for these slots if they do not use them for a minimum of 80% of the time. Although slot allocation and auctioning could reduce the impact of airport congestion, [6] results suggest that the effectiveness of secondary slot markets in reducing congestion and easing entry into the market is generally limited. A slot distribution regime [7] could be a more effective approach, but overall it is still a common view that entry to chocked airport base remains severe.

Since the free trade of many airline markets, large airlines have established hub-and-spoke networks [8] that help them to deliver many terminals with relatively large aircrafts and thus attain economies of scale, scope and density [9]. Whilst such strategies can conclude in generous money savings for the

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incumbent they mostly also involve extensive sunk costs. In addition to these sunk cost, it is also the basic pre entry amount in terms of marketing, the relationships with stakeholders around the airport and the allure of the incumbent airline to passengers as a conclusion of the larger variety of destinations [10] that make way for newcomers costly and thus less attractive. The effects of hub-and-spoke networks clash have been presented in case analysis, with Atlanta/Delta Airlines being the most outstanding [11], for regional airlines [12] and also for the airline market in general [13]. [14]has further shown that strategic alliances can have an impact on the competing situation of airline markets, with parallel alliances being more adequate in making market entrance barriers (particularly in inter-hub markets) compared to integral alliances.

3. RESEARCH METHODOLOGY

The paper is based on exploratory research techniques and systematic literature survey. The exploratory technique is used because there are less number of researches available in this field of study. The paper has been classified on the basis of the theme and further the most suitable findings, which is useful for this study has been chosen. In this research, questionnaire based survey has been employed to understand the barriers negatively influencing the entry of start-up airlines into aviation industry. The research on identification and ranking of barriers can be carried out in four stages:

STAGE1: Secondary Literature Survey to identify barriers.

STAGE 2: Expert Review to refine barriers.

STAGE 3: ISM methodology to find the levels of barriers.

STAGE 4: Framing of ISM model.

3.1 Stage 1 -Summary of Barriers identified through Secondary Literature Survey

The variables which impact on the start-up airlines can be divided into two sections. These are determinants of whether the entry of start-ups will be successful or not. Depending on their actions, these variables can either act as drivers promoting entry or as barriers causing challenges to its embedment within the organization. Those actions which produce a positive result will be denoted by the term drivers and conversely those producing a negative effect as barriers. The literature search revealed a collated set of drivers and barriers to entry. As the present study deals with only barrier assessment of startup entry, the various barriers identified are listed below in table 1:

Table1: Barriers Identified

Sl.No	Barrier For Entry
1.	Competitors
2.	Competitors provide Attractive offers and loyalty benefits.
3.	Competitors expand no. of flight
4.	Negligible Profits
5.	Government Regulations
6.	Staffing Difficulties
7.	Global Aspects
8.	Competitor offers Service in the same route
9.	Unavailability of attractive slots
10.	One competitor on the route is part of a larger airline group
11.	The route under consideration is already served by a high-speed rail link
12.	Fuel Aspects

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3.2 Stage 2 - Refining of Barriers through an Expert Review

The secondary literature survey resulted in identifying 12 barriers. These barriers were then refined through an expert review. The expert committee consisted of experts from aviation industry, PhD scholars and Engineering colleges. As per expert suggestion, few of the variables were removed. A questionnaire was then prepared based on the final list of barriers and circulated among various industry experts. The final list of 9 barriers after elimination & modification of variables are given below in table 2

Table2: Barriers Refined

Sl.No	Barrier For Entry
1.	Competitors
2.	Competitors provide Attractive offers and loyalty benefits.
3.	Competitors expand no. of flight
4.	Negligible Profits
5.	Government Regulations
6.	Staffing Difficulties
7.	Global Aspects
8.	Competitor offers Service in the same route
9.	Unavailability of attractive slots

3.3 Stage3- ISM Methodology to Find the Levels of Barriers

First proposed by J. Warfield in 1973, interpretive structural modelling (ISM) is an effective methodology for dealing with complex issues. It enables individuals or groups to develop a map of the complex relationships between the many elements involved in a complex situation. ISM is often used to provide fundamental understanding of complex situations, as well as to put together a course of action for solving a problem [7]. ISM is a combination of three modelling languages: words, digraphs and discrete mathematics, to offer a methodology for structuring complex issues. ISM is particularly useful and interpretive as judgment of working participants in a group for the study decides whether and how the variables are related [2]. The various steps, which lead to development of an ISM, are as follow [12]:

Step 1: identify issues/variables to be studied.

Step 2: then the contextual relationship among the variables identified in step 1, with respect to which pairs of variables are examined.

Step 3: to indicate pair wise relationship among variables, a structural self-interaction matrix (SSIM) is developed.

Step 4: from the SSIM a reachability matrix is developed. The matrix is checked for transitivity. The transitivity of the contextual relationships is a basic assumption made in ISM and it states that if variable X is related to variable Y and variable Y is related to variable Z, then variable X is necessarily related to variable Z.

Step 5: partitioning of levels is done of the reachability matrix obtained in Step 4.

Step 6: a directed graph is drawn based on the contextual relationships in the reachability matrix, and the transitive links are removed.

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3.3.1 SSIM (Structural Self-Interaction Matrix)

As mentioned earlier in Section 5, with the consultation of industry and the academia experts, the nature of the contextual relationships among the barriers was identified. Following four symbols have been used for developing SSIM to denote the direction of relationship between two barriers i and j:
V—barrier 'i' will lead to barrier 'j';
A—barrier 'j' will lead to barrier 'i';
X—barrier 'i' and 'j' will lead to each other;
O—barrier 'i' and 'j' are unrelated.

SSIM has been developed on the basis of contextual relationships (Table 3).

Table 3- Ssim (Structural Self-Interaction Matrix) Matrix

Sl.No	Barrier For Entry	2	3	4	5	6	7	8	9
1.	Competitors	V	V	O	A	V	A	O	V
2.	Competitors provide Attractive offers and loyalty benefits.		O	O	A	O	A	O	X
3.	Competitors expand no. of flight			O	A	O	A	O	X
4.	Negligible Profits				A	O	A	X	O
5.	Government Regulations					V	X	V	V
6.	Staffing Difficulties						A	O	O
7.	Global Aspects							V	V
8.	Competitor offers Service in the same route								O
9.	Unavailability of attractive slots								

3.3.2 Reachability Matrix

The SSIM obtained from the previous section is converted into initial reachability matrix, which is a binary matrix, by substituting V, A, X, O by 1 or 0 and using following rules:

- The (i, j) value in the reachability matrix will be 1 and (j,i) value will be 0, if (i, j) value in the SSIM is V.
- The (i, j) value in the reachability matrix will be 0 and (j, i) value will be 1, if (i, j) value in the SSIM is A
- The (i, j) and (j, i), both values will be 1 in the reachability matrix, if (i, j) value in the SSIM is X.
- The (i, j) and (j,i), both values will be 0 in the reachability matrix, if (i, j) value in the SSIM is O
- The initial and the final reachability matrices are shown in Table 4 and Table 5 respectively.

3.3.3 Level's Partitioning

The level's partitioning is done to get the importance level of each barrier. From the final reachability matrix, the reachability and antecedent set [13,14] for each barrier have been obtained. The reachability set of a barrier is the set of barriers influenced by it and the barrier itself, whereas the antecedent set of a barrier is the set of barriers which may influence it and the barrier itself. Reachability set, antecedent set and intersection sets for all the barriers have been found. In the ISM hierarchy, the barrier having same reachability and intersection has been assigned as level 1 barrier-top level.

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Level 1 is then discarded for the next iteration to find further levels. This iterative procedure is repeated till the level of each barrier is found. These levels have been summarised in table.

Table 4- Initial Reachability Matrix

Sl.No	Barrier For Entry	1	2	3	4	5	6	7	8	9
1.	Competitors	1	1	1	0	0	1	0	0	1
2.	Competitors provide Attractive offers and loyalty benefits.	0	1	0	0	0	0	0	0	1
3.	Competitors expand no. of flight	0	0	1	0	0	0	0	0	1
4.	Negligible Profits	0	0	0	1	0	0	0	1	0
5.	Government Regulations	1	1	1	1	1	1	1	1	1
6.	Staffing Difficulties	0	0	0	0	0	1	0	0	0
7.	Global Aspects	1	1	1	1	1	1	1	1	1
8.	Competitor offers Service in same route	0	0	0	1	0	0	0	1	0
9.	Unavailability of attractive slots	0	1	1	0	0	0	0	0	1

Table 5- Final Reachability Matrix

Sl.No	Barrier For Entry	1	2	3	4	5	6	7	8	9	Driving Power
1.	Competitors	1	1	1	0	0	1	0	0	1	5
2.	Competitors provide Attractive offers and loyalty benefits.	0	1	1	0	0	0	0	0	1	3
3.	Competitors expand no. of flight	0	1	1	0	0	0	0	0	1	3
4.	Negligible Profits	0	0	0	1	0	0	0	1	0	2
5.	Government Regulations	1	1	1	1	1	1	1	1	1	9
6.	Staffing Difficulties	0	0	0	0	0	1	0	0	0	1
7.	Global Aspects	1	1	1	1	1	1	1	1	1	9
8.	Competitor offers Service in same route	0	0	0	1	0	0	0	1	0	2
9.	Unavailability of attractive slots	0	1	1	0	0	0	0	0	1	3
	Dependence Power	3	6	6	4	2	4	2	4	6	

Table 6-Various Level of Barriers

Sl.No	Barrier For Entry	Reachability Set	Antecedent set	Intersection	Level
1.	Competitors	1, 2, 3, 6, 9	1, 5, 7	1	2
2.	Competitors provide Attractive offers and loyalty benefits.	2, 3, 9	1, 2, 3, 5, 7, 9	2, 3, 9	1
3.	Competitors expand no. of flight	2, 3, 9	1, 2, 3, 5, 7, 9	2, 3, 9	1
4.	Negligible Profits	4, 8	4, 5, 7, 8	4, 8	1
5.	Government Regulations	1, 2, 3, 4, 5, 6, 7, 8, 9	5, 7	5, 7	3
6.	Staffing Difficulties	6	1, 5, 6, 7	6	1
7.	Global Aspects	1, 2, 3, 4, 5, 6, 7, 8, 9	5, 7	5, 7	3
8.	Competitor offers Service in same route	4, 8	4, 5, 7, 8	4, 8	1
9.	Unavailability of attractive slots	2, 3, 9	1, 2, 3, 5, 7, 9	2, 3, 9	1

3.4. Stage4- Framing of ISM Model

Once all levels are found, these levels have been summarized in Table 6. From the final reachability matrix Table 5, the model is generated by vertices and edges [3].

In this model development, the top level factor is positioned at the top of the digraph and second level factor is placed at second position and so on, until the bottom level is placed at the lowest position in the digraph. Digraph is converted into an ISM model by replacing nodes of the factors with statements [8].

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Out of 9 barriers, two are lying at the bottom level, six are lying at top level and one at the intermediate level of ISM model. “Competitors expand no. of flight”, “Competitors provide Attractive offers and loyalty benefits”, “Staffing Difficulties”, “Unavailability of attractive slots”, “Competitor offers Service in same route”, “Negligible Profits” is lying at the top level of model. “Government Regulations” and “Global Aspects” lie in the bottom level. Rest one barrier i.e. “Competitors” lie in between top and bottom levels.

After removing the transitivity's as described in the ISM methodology, ISM model has been made as shown in Fig. 1

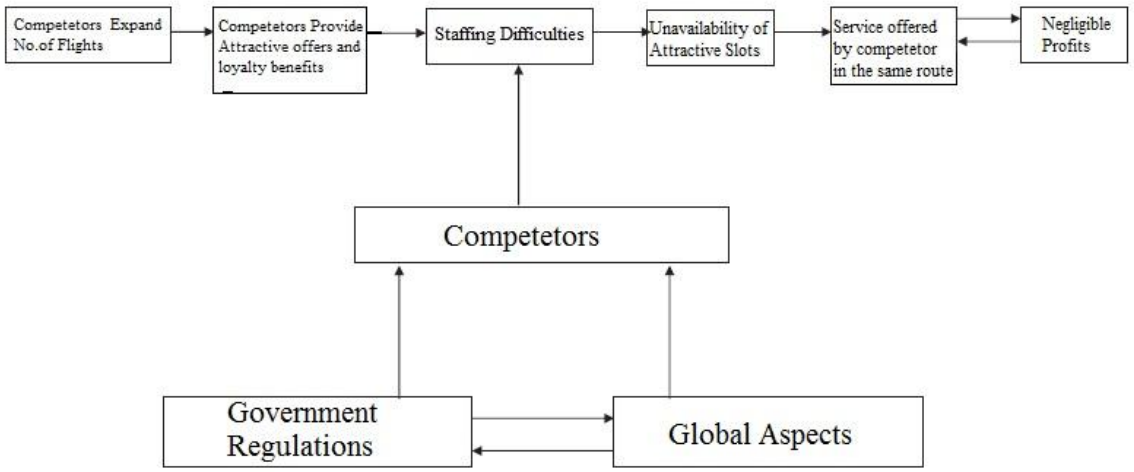

Fig 1- ISM Model for Barriers Negatively Influencing Entry of Start-Up Airlines

4. CONCLUSIONS

The paper proposes a research model for analysing the barriers negatively influencing the entry of start-up airlines into the aviation industry. The aviation industry plays an important role in the aspect of work and leisure to people around the globe, helps to promote and improve quality of life, and living standards of people within the nation. It has been also found that it’s very difficult for a start-up airline company to enter into aviation industry until it overcomes the 6 barriers prescribed in the first level. All these impacts of the air transport helps to generate economic growth and poverty alleviation by providing employment opportunities, and increasing revenues from taxes. The employment opportunities would be generated through supply chain transformation from the airports. Out of 9 barriers, two are lying at the bottom level, six are lying at top level and one at the intermediate level of ISM model. “Competitors expand no. of flight”, “Competitors provide Attractive offers and loyalty benefits”, “Staffing Difficulties”, “Unavailability of attractive slots”, “Competitor offers Service in same route”, “Negligible Profits” is lying at the top level of model. “Government Regulations” and “Global Aspects” lie in the bottom level. Rest one barrier i.e. “Competitors” lie in between top and bottom levels. Though the major factors in various cases are identified, there can be more factors depending on the regions under consideration.

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