



COMPETITION COMMISSION OF INDIA

Suo Motu Case No. 03 of 2015

In Re: Alleged Cartelization in the Airlines Industry

CORAM

Mr. Ashok Kumar Gupta
Chairperson

Ms. Sangeeta Verma
Member

Mr. Bhagwant Singh Bishnoi
Member

Order under Section 26(6) of the Competition Act, 2002

Facts:

1. The present case pertains to alleged cartelization amongst various domestic airlines operating in India in contravention of the provisions of Section 3 (1) of the Competition Act, 2002 (“the Act”) read with Section 3 (3) thereof. By way of background, it is noted that the case emanated upon receipt of a letter dated 31.01.2014 from Lok Sabha Secretariat with a request to examine whether there is any evidence of cartelization in the airlines sector.
2. The matter was examined, and information was sought from various airlines and Directorate General of Civil Aviation (DGCA). The data was analyzed for the sample reference period *i.e.*, April 2012 to March 2014 in respect of Jet Airways (including JetLite), Indigo, SpiceJet, GoAir and Air India. For analyzing the conduct of airlines, data pertaining to four major routes *viz.* Delhi-Bombay-Delhi, Delhi-Bangalore-Delhi, Delhi-Hyderabad-Delhi, and Delhi-Pune-Delhi were obtained from the airlines, including information about costs of operations, flights operated, and passengers carried throughout the year on these four routes.



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3. The analysis of the four major routes indicated that airlines were maintaining some degree of stability in their market shares in both lean and peak seasons during the examined period. Further, almost similar cost structure of the airlines also appeared to facilitate collusion on price to be charged in contrast to differentiated cost structure, where low-cost firms usually compete with high-cost firms on prices to capture greater market share. Also, it was observed that despite differences in base fares and airlines fuel surcharge, the end fares charged by all the airlines for tickets, were almost similar.
4. Based on the above, the Commission *prima facie* opined that the airlines viz. Jet Airways (including Jet Lite), Indigo, Spice Jet, Go Air and Air India were exhibiting characteristics of anti-competitive conduct which was in contravention of the provisions of Section 3(1) of the Act read with Section 3(3) thereof, and accordingly, passed an order dated 26.03.2015 under Section 26(1) of the Act, directing the Director General ('DG') to cause an investigation into the matter.
5. The DG, accordingly, conducted investigation and submitted an investigation report dated 15.09.2016 to the Commission.

Investigation by the DG:

6. To investigate the matter, the DG firstly examined the structure of the aviation sector in India and noted that aviation services have witnessed rapid growth in demand; however, the airlines have only been marginally profitable. It was observed that airlines can be segmented into full-service carriers (FSC) and low-cost carriers (LCC). The low-cost carriers seemed to be economically profitable as compared to regular service providers. It was further noted that FSC and LCC exert significant competitive pressure on each other. Apart from FSC, LCC also face competition from faster and premium trains and deluxe buses on some routes.



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7. Further, to investigate as to whether the airlines have indulged in cartelization by way of an agreement or understanding amongst themselves in contravention of the provisions of Section 3 of the Act read with Section 3 (3) thereof, the DG primarily examined *inter alia* the following issues:
 - (i) Examination of market share of the airlines on four sectors *i.e.*, Delhi-Bombay-Delhi, Delhi-Bangalore-Delhi, Delhi-Hyderabad-Delhi, and Delhi-Pune-Delhi to determine if these were relatively stable during April 2012 to March 2014.
 - (ii) Examination of cost structure of the five airlines and the fare setting practices adopted by them, which included:
 - (a) Manner of determination of the price of tickets and if these are fixed or dynamic.
 - (b) If dynamic, how the system works?
 - (c) What kind of technology is used for determining the dynamic pricing?
8. In order to examine whether market shares of the airlines on the identified sectors exhibited any stability or indicated any pattern, the DG collected the relevant data regarding number of passengers travelled on each sector every month from April 2010 to March 2016 from the airlines as well as from DGCA. This period included the investigation period *i.e.*, April 2012 to March 2014 as also the pre-investigation (April 2010 to March 2012) as well as post-investigation (April 2014 to March 2016).
9. Thereafter, the DG went on to analyze the above data in the following manner:
 - (i) On the basis of monthly market share for each of the four sectors.
 - (ii) On the basis of annual market share for each of the four sectors.
 - (iii) Consolidated All India Annual Market Share and its analysis.
 - (iv) Economic analysis of monthly share for each of the four sectors.



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(i) On the basis of monthly market share for each of the four sectors

10. Based on the data collected from the airlines regarding the number of passengers travelled on each sector from April 2010 to March 2016, the relative market share of the airlines on the four sectors was calculated. The whole data was divided in three periods: *Pre-Investigation period (April 2010-March 2012)*, *Investigation period (April 2012-March 2014)*, *Post-Investigation period (April 2014-March 2016)*.
11. The DG observed that the monthly market shares of each of the five airlines on all the four sectors during the given period had been fluctuating, at times by significant margins, and that the pattern of market share did not indicate any linkage between two or more airlines.
12. The DG further observed that had there been any cartelization amongst the airlines, the respective cartel members would have maintained stability in their relative market shares. However, no such behavior of maintaining stable market share was noticed by the DG during the analyzed periods.

(ii) On the basis of annual market share for each of the four sectors

13. The DG also compared the growth, year-on-year (YOY), for each of the five Airlines on all the four sectors during the given period *vis-à-vis* growth in the overall market, in terms of number of passengers. The Investigation revealed that there is significant variation in growth witnessed by different airlines as compared to growth in the overall market which resulted in some of the airlines losing market share whereas few others gaining. This indicates that the airlines were not sharing the market growth in any particular arrangement or pattern.

(iii) Consolidated All India Annual Market Share and its Analysis

14. The DG also examined the consolidated all India annual market share of each airline, as per the data provided by DGCA during the period 2010-11 to 2015-16. The DG investigation revealed that the variation in the market shares of the five airlines did not witness any specific pattern as shown in the Table below.



Indigo has been able to significantly increase its market share from 21.7% in 2010-11 to 38.7% in 2015-16 at the cost of other airlines as Air India, Jet Airways and Spice Jet lost market share on a consolidated all India basis level. Go Air has been able to barely maintain its market share during the period.

All India Market Share of the Airlines on Yearly Basis

Market Share in %						
Year	Air India	IndiGo	Jet Airways	Spice Jet	Go Air	Total
2010-11	21.3	21.7	32.5	16.7	7.8	100.0
2011-12	19.5	23.7	31.8	17.8	7.3	100.0
2012-13	19.4	27.3	26.4	19.3	7.6	100.0
2013-14	19.4	29.4	24.0	18.7	8.5	100.0
2014-15	18.3	34.3	22.5	15.5	9.4	100.0
2015-16	16.7	38.7	22.7	13.1	8.8	100.0

(iv) Economic Analysis of monthly share for each of the four sectors

15. To understand further whether market shares of airlines were exhibiting parallelism, the DG used economic tools and utilized Herfindahl-Hirshman Index, descriptive statistics measures (like standard deviation, variance, *etc.*) and analysis of variance single factor test (ANOVA) including Levene's test, Welch F Test and Games Howel Post-hoc Test in ascertaining whether airlines maintained market stability, during the relevant period.

16. On the basis of the above tests, the DG found that in three sectors *i.e.*, Delhi-Bombay-Delhi, Delhi-Bangalore-Delhi, Delhi-Hyderabad-Delhi, there was significant variance among the market shares of different airlines and these market shares did not show any kind of stability or parallelism. However, in one sector *i.e.*, Delhi-Pune-Delhi, it was observed that there was no significant variance during 2011 and 2012-14 but variance was found to be quite significant during 2014-16. The DG observed that considering that variance was quite significant in other sectors, no conclusive finding can be arrived with regard to operation of cartel among the five airlines on this sector also.



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17. Accordingly, the DG concluded that there were significant variations in the market shares and market positions of different airlines during 2010-2016, and these market shares did not show any kind of stability or parallelism.
18. In view of the above analysis, the DG concluded that the market shares and market positions of different airlines have not remained stable during 2010-2016.

Air fare Determination

19. To understand how the prices of air tickets are determined, the DG asked all the five airlines, *vide* questionnaire dated 16.09.2015, to explain the complete procedure of price determination followed by them, and based on the replies received from the airlines, the following observations were made by the DG:
 - (i) The utmost priority of the airlines is to ensure sale of as many seats as possible considering that seats are a perishable commodity.
 - (ii) To achieve this objective, airlines resort to dynamic pricing. The pricing of a seat is a complex interplay of several variables, which include,
 - a. the time gap between booking date and departure date.
 - b. peak season or lean season.
 - c. peak time or lean time in a day.
 - d. price of the competitor.
 - e. some special events, festivals, *etc.*
 - f. direct or indirect in terms of connectivity, *etc.*
20. The DG found that airlines follow a dynamic pricing mechanism for which they use softwares such as 'Navitaire' and 'airRM' *etc.* which update the airfares dynamically by taking into consideration factors such as prevailing/ expected demand conditions, actual booking, price of competitors, seasonality *etc.* and set corresponding booking limits for the updated airfares for each flight.



21. The DG observed that the airlines follow a system of yield management to optimize revenue commensurate with the seating capacity of a flight. This system requires the airlines to segment their inventory into different fare buckets. The fare charged would move from lower to higher bucket as the occupancy increases and as the departure date comes closer. In a high demand scenario, the number of seats allocated in a given bucket may be reallocated to higher buckets.
22. The DG further stated that some airlines start their fare in higher bracket, however, market forces compel them to reduce their fare perhaps because of less occupancy rate. DG also noted sharp changes in fares for a few periods either to attain higher occupancy or maximizing the revenue, but they are soon followed by price correction and fares are brought at par with other competitors.
23. The DG observed that dynamic pricing is the acceptable pricing strategy in India as well as internationally. Further, since all the airlines are offering more or less similar kind of services, the pricing of ticket becomes the single most important factor to attract maximum number of passengers and thus, pricing of ticket is mainly decided by the competition and costing takes a back seat. The DG also stated that the technological assistance has further complicated the competition as each airline can monitor the pricing of the competitors on real time basis.
24. In view of the above factors, the DG concluded that price parallelism has become the natural outcome, but it cannot be said to be the result of any agreement or action in concert.
25. The DG also found that airlines come out with various schemes like 'Seasonal Sale of tickets' which benefit the consumers who opt for a journey in the distant future by allowing them to buy the ticket at an economical price, but such schemes are not generally imitated by other airlines, and that this further indicates that such pricing strategy is independent of other airlines.



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26. Apart from the two factors *i.e.*, *Market Share* and *Air fare Determination*, the DG also observed that there is a huge demand in the airlines industry which attracts new players to the market, and that there has been perceptible change in terms of entry and exit of players - new operators such as SpiceJet, IndiGo, Air Costa, Vistara and GoAir have entered the market in the decade preceding the investigation. On the other hand, Kingfisher, Paramount Airlines and MDLR have exited the market, and in years preceding the investigation, the joint venture between TATA and AirAsia started operating domestic flights in India. This vibrancy in the market, where new entrants are able to gain a strong foothold and established players are not immune from being edged out of the market, was noted as a testament to the high level of competition in the Indian airline sector.
27. In view of the above, the DG concluded that no contravention of the provisions of Section 3(1) read with Section 3(3) of the Acts by the parties in the matter, was made out.
28. Upon consideration of the Investigation Report as submitted by the DG, the Commission was of the opinion that certain aspects such as dynamic pricing, role of algorithms in the softwares used by these airlines and the impact of capacity on pricing of ticket, were not examined in detail by the DG. Accordingly, the Commission, *vide* its order dated 23.11.2016, directed the DG to conduct further investigation into the matter, in terms of the provisions contained in Regulation 20(6) of the Competition Commission of India (General) Regulations, 2009.

Supplementary Investigation by the DG:

29. In its Supplementary Investigation Report submitted to the Commission on 23.10.2019, the DG has analysed the following issues in terms of the directions of the Commission:



- (i) The software or the algorithm deployed by the Airlines and the mechanism on which these softwares function, which help in determining / updating the airfare.
- (ii) Allocation of seats to a fare bucket: It needs to be examined if the fare movement occurred simultaneously across the five domestic airlines during the period under investigation.
- (iii) Analysis of airfares for the period April 2012 to March 2014 to detect any price parallelism.
- (iv) Capacity utilization by each of the five domestic airlines for the above mentioned four routes.

Role of software / algorithm deployed by the airlines

30. The DG found that the airlines use the following softwares respectively for the purpose of revenue management, which includes determination of prices:

Air India	PROS
Indigo	Navitaire, QL2, Sky Price and Air-RM
GoAir	Navitaire and AIR-RM
SpiceJet	Navitaire, Sky Price

31. It was noted by the DG that the use of software by Air India is the least when compared to the other competing airlines in as much as its fare is determined manually by its route controllers a few months before the date of departure. The PROS software used by Air India facilitates the route controllers to determine the price of the tickets on the basis of historical data. The PROS software helps only to a limited extent of interpolating the historical data available with it. Further, route controllers also access external websites like Make My Trip, Clear My Trip, etc. to know the current market situation across the routes and take a final call on pricing of the ticket.

32. Indigo uses Navitaire, QL2, Sky Price and Air-RM softwares. Navitaire is a display software which shows the fare at which a ticket for a particular route is



available for purchase to the customer. QL2 software gets the information about the fares of competing airlines which are available in public domain like the fares shown in Make My Trip website, Clear My Trip websites, and websites of other airlines. Based on historical data, the Sky Price tool forecasts the demand of each flight on each day of departure. However, the route analyst modifies these forecasts to determine the price after considering factors which the software is not capable of capturing. AIR-RM integrates the information from QL2 data and allocates the inventory of different flights. These recommendations are further analyzed by route analysts and they finally upload the inventory and the selling price in the reservation system. The revenue management team, on the basis of historical data, demand forecast and competitive pricing, fixes the prices of each flight and allocates seats against each bucket.

33. GoAir uses two softwares namely Navitaire and AIR-RM. The first software is the display software which enables multiple websites and travel agents to know availability of seats and the price of a ticket on the routes operated by them. The second software AIR-RM functions as a feeding software to Navitaire and uses the algorithm to arrive at a price on a particular date. The AIR-RM software provides several in built options to the airline, who as per their revenue strategy fix the price and feed it to the display software Navitaire.
34. SpiceJet uses Navitaire software. This software displays the fare at which a ticket for a particular route is available for purchase. The sale of tickets by SpiceJet is done through various websites like Make My Trip, Clear Trip and other websites including SpiceJet's own website. SpiceJet also uses Sky Price software which gives a price range on the basis of analysis of inputs like capacity increase, demand in the market, seasonality, and frequency of flights on a particular sector, *etc.* Based on price range provided by the software, the revenue management team formulates the strategies for pricing.



35. The softwares used by the airlines were noted to be guided by algorithms (formulae) in-built in the software, configured by the software company, on the basis of inputs provided by the revenue management team of each airline to the software developer. The algorithm uses parameters such as historicity and frequency of flight, capacity of the aircraft, seasonality, time slot of flight, seat configuration of the aircraft, competitors' fares, gap between date of booking and departure date of flight, day of the week, profile of passengers, input costs, government order (if any), scale of inventory, festivals, and holidays *etc.* to predict demand and assign seat to fare buckets. Most of these factors vary from airline to airline. These factors combined with historical data gives the route analysts a base fare price which they modify taking into account factors such as competitors price, inventory position, *etc.* Historical data contains information about seats sold in peak season, lean seasons, peak hours, date of festivals, weekends, traffic of passengers between two cities, number of flights on a particular route, *etc.*
36. The DG also found that the algorithm as well as the final price of the ticket is determined by the personnel working in the revenue management team of each airline. The role of the software is limited to the extent of helping the revenue management team to arrive at a price that will optimize revenue. However, the algorithm as well as the final price of the ticket are determined by the personnel working in the revenue management team of each airline. The DG further found that the airline revenue management team only provides the parameters and algorithm is designed/ programmed into the software by the software company. It was noted by the DG that, in the absence of any evidence to the contrary, it was not possible to establish concerted action on the part of these airlines at the software level.
37. Further, it was found that the revenue management team also called as route analysts have the final say in fixing the prices. A route analyst can modify the prices if he does not agree with the forecast predicted by the softwares. Softwares are not programmed to include any unforeseen event that may affect



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the demand and competition. Also, certain events like IPL matches, some international conferences, cultural events *etc.* have to be taken into account by the route analyst. Moreover, inventory position might also affect the price determination.

Allocation of seats to a fare bucket & Analysis of air fares for the period April 2012 to March 2014

38. It was brought out in the investigation report that airlines follow dynamic pricing where the same seat is sold at different fares to customers depending on their date of booking. Most of the airlines use software which is programmed to allocate inventory on the basis of historical data fed into its system. An algorithm configured by software allocates the total number of tickets to different fare buckets immediately on opening of the flight. The route analyst after taking into consideration the competitive airfares determine the price for each bucket.
39. Investigation revealed that there is no fixed inventory allocated to each bucket and that the number of seats allocated to each bucket depends on the time of day, day of week and season. However, no two buckets are simultaneously available to the customers (*i.e.*, at any given point, only one fare is available). Further, airlines keep on changing the price / inventory allocated to fare buckets due to change in demand and competition price, which may happen multiple times a day. When sale happens, the flight fare moves from a lower bucket to higher bucket. These fare buckets are for internal consumption of the airlines and the customers or the competing airlines are not privy to these buckets. The customer gets to see only the airfare in the reservation system of the airline.
40. Further, most of the airlines use some software programmed to allocate inventory (tickets) on the basis of historical data fed into its system. In order to analyse the historical seat allocation by the airlines, DG examined fare buckets of three airlines (IndiGo, GoAir and SpiceJet) (the data for Air India and Jet Airways was unavailable as Air India expressed its inability to provide the data



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and Jet Airways had closed down its operations) that contribute to 80% of the total seats on four different routes viz., (i) Delhi-Mumbai; (ii) Delhi-Pune; (iii) Delhi-Hyderabad; and (iv) Delhi-Bengaluru. Further, data has been examined in respect of one morning flight of each airline on the following dates: (i) 27.05.2012; (ii) 27.03.2013; and (iii) 27.03.2014.

41. Data analysis showed that there was no sacrosanct rule for shifting from one bucket to another. However, it was noted that competitive pricing and availability of unsold inventory become the guiding factor for the route analysts to determine the prices at any given point in time. There is no fixed pattern that can be seen in the sale of ticket with respect to the fare at which maximum tickets were sold by each airline, the date of movement of buckets or the number of buckets used by each airline. Further, the DG found that movement of fares by competing airlines from one bucket to another between competing airlines does not show a definitive pattern that can suggest willful concerted action on their part.
42. After examining the ticket price for the relevant route/ period, the DG found that the flight is opened one year in advance for booking of tickets. The earlier a ticket is booked, lower is the fare and *vice-versa*. As and when a sale happens, the ticket fare moves from a lower bucket to a higher bucket as stimulated by the demand in the market. The airlines follow the system of dynamic pricing where the same product (economy class seat) is sold at different prices to customers depending on their date of booking. Though, the customer is offered a particular fare at a given point of time but internally the airline industry globally follows a system of distributing their inventory (tickets) to different buckets which have different price points. Price of a ticket may vary from airline to airline as many other factors like number of flights on a particular sector, timing of the flight, seating capacity *etc.* have to be considered. It is for this reason that there is no similarity in booking dates as well as the number of buckets used. Closer to departure the prices merge with each other as there is a clamour to sell their tickets at the highest possible price but the balance between unsold inventory



and the competitive price ultimately decides the price of the ticket. Though, some instances of tickets having been sold at the same price were observed during the analysis, but these were not substantial enough to conclude concerted action on their part.

Capacity Utilization

43. During the investigation, the DG also analyzed the total capacity and capacity utilization by the three airlines in respect of the aforesaid four routes to study the impact of capacity utilization on the airfares.
44. It was noted that the capacity utilization is dictated by the route at which the aircraft is plying. Generally, aircrafts in domestic market have sitting capacity of about 200 seats; however, it may vary between 150 seats to 350 seats in some cases. The capacity of the aircrafts does have a bearing on pricing as the aim is to sell the air tickets of aircraft to its full capacity at the maximum price per seat. The total cost of flying including the fuel consumption, maintenance, overheads, *etc.* are taken into consideration and this reveals the per seat cost at which the airline will break even. The endeavour of every airline is to sell its seat above the break-even cost and also ensure the flight is utilized to full to its capacity. The balance of the number of seats to be sold and the competitive price determine the optimum generation of revenue by the airline. The DG found that the detailed capacity analysis done did not reveal anything substantial to infer concerted action on part of these competing airlines.
45. The DG concluded that in view of the analysis done with respect to daily bucket wise movement of price, relationship between price and capacity, and in the absence of any evidence suggestive of meeting of minds, the investigation could not find any contravention of the provisions of the Section 3(1) of the Act read with Section 3(3) thereof against the airlines.
46. The Commission has perused the Investigation Report(s) submitted by DG and the material available on record.



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47. To determine as to whether there was any kind of understanding or arrangement between the airlines in contravention of provisions of the Act, the DG had analysed the market share of five airlines on four sectors during the reference period, as well as their air fare and its determination practices in order to detect any sign of stability or parallelism, or any possibility of communication between the airlines to fix prices, *etc.*, if any.
48. However, as brought out by the investigation and as detailed hereinabove, no such pattern of stability or parallelism was noticed between the airlines, rather, a significant variance was seen in the market shares of the airlines.
49. Further, the Commission notes that a parallel conduct is actionable under the Act only when the adaptation to the market conditions is not done independently and is attributable to information exchanged between the competitors or through some other collusive conduct, the object of which is to influence the market. In the present case, no exchange of communication between the airlines could be established.
50. The Commission also observes that different airlines follow different bucket systems. There is no fixed inventory allocated to each bucket and that number of seats allocated to each bucket depends on the time of day, day of week and season. However, at any given point, only one fare is available to the customers. Further, airlines keep on changing the price/ inventory allocated to fare buckets due to change in demand and competition price, which may happen multiple times a day. Further, during sale, flight fares move from lower bucket to higher bucket. These fare buckets are for internal consumption of the airlines and the customers or the competing airlines are not privy to these buckets.
51. The Commission further observes that all airlines use software programs to predict demand and assign seat to fare buckets. The Commission notes that although similar softwares are used by four airlines for the purpose of revenue management, manual intervention plays a pivotal role in determination of final



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prices. Although, demand fluctuations due to peak and lean seasons, festivals, *etc.* can be fed into the algorithms, they cannot be modified to capture unforeseen events like cyclones, IPL matches, international conferences, cultural events, *etc.*, which also have significant bearing on price fluctuations. Thus, revenue management personnel play key role in determination of airfares whereas softwares are merely used to facilitate their decision making.

52. There is no evidence on record to establish cartel amongst airlines during the period April 2012 - March 2014 and having examined the material on record, the Commission finds no reason to differ with the findings recorded by the DG.
53. In view of the foregoing analysis, the Commission is of the opinion that no case of contravention of the provisions of Section 3 (1) of the Act read with Section 3 (3) thereof is made out against the airlines. Therefore, the present matter is ordered to be closed forthwith under the provisions of Section 26 (6) of the Act.
54. The Secretary is directed to inform all concerned, accordingly.

Sd/-
(Ashok Kumar Gupta)
Chairperson

Sd/-
(Sangeeta Verma)
Member

Sd/-
(Bhagwant Singh Bishnoi)
Member

New Delhi
Dated: 22 / 02 / 2021