

Emirates' Operations in India: Its Impact on Output and Employment

November 2015

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**National Council of Applied Economic Research
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Foreword

Aviation provides a fast, efficient and reliable mode of passenger and cargo transport and acts as a catalyst for growth. The sector has undergone substantial change in the past few years, and more is expected. Economies of scale and other innovations are allowing much higher volumes to be handled.

Air transport has wide ranging linkages with other sectors of the economy. The impact that air transportation has on an economy therefore, is shaped by these linkages, including both direct and indirect effects.

Emirates, a Dubai-based international airline, commenced its operations in India in 1985. It has grown over the years to become a catalytic force for the growing relationship between India and the Middle East. This report by NCAER assesses and estimates the size of this impact based on Emirates' operations in India. Using NCAER's input-output framework, the study quantifies these effects in the form of direct economic contributions, multiplier effects on output and employment, and induced effects on tourism.

The study was carried out under the leadership of Dr Saurabh Bandyopadhyay at NCAER. Prof Devendra B Gupta was the project advisor. Mr Palash Baruah was integral part of the core team at NCAER and provided important inputs at different stages of the work. I would like to acknowledge the support from Emirates for this study and their willingness to share data, knowledge and understanding of India's civil aviation sector.

Studies such as this one extend NCAER's tool sets and allow NCAER researches to sharpen and deepen their understanding of the impact of key infrastructure for India's development. I hope that the analysis and the results of this report will be useful to policy makers and policy analysts. I also hope that the approach used in this study will facilitate further analysis focussing on India's rapidly growing civil aviation sector.

Shekhar Shah

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Disclaimer: The findings, interpretations, and conclusions expressed are those of the authors and do not necessarily imply endorsement by NCAER or its Governing Body.

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Executive Summary

In 2012, NCAER conducted an analysis of the impact of Emirates' India operations on the Indian economy. This analysis was based upon a seat allocation of 54,200 seats per week from Dubai to 10 points in India and vice versa.

The analysis showed that Emirates' operations provide an annual direct economic contribution of US \$274 million and total impact of US \$596 million. Emirates' operations supported a total of 72,323 jobs, 9,304 in direct employment and 63,019 as an indirect employment impact. These operations facilitated 529,928 foreign tourist arrivals and US \$1.15 billion in Foreign Exchange Earnings (FEE).

In February 2014, the aeronautical authorities of India and Dubai negotiated the first expansion in market access since 2008. Dubai based carriers were awarded an additional 11,000 seats per week.

As a result of this increase, NCAER have updated the analysis to highlight the benefits to India's economy as well as modelling the impact of additional increases, should the bilateral agreement be expanded in the future.

The updated analysis is based on 60,200 seats per week, which is inclusive of the additional capacity granted to Emirates in February 2014. The original base of 54,200 seats per week is simulated to arrive at the current base of 60,200 seats per week.

The current base scenario estimates total direct impact for 2015 at US \$370.9 million. The total output multiplier impact is estimated at US \$848.6 million. While the direct impact is US \$370.9 million, the indirect impact is US\$477.7 million. The total number of direct jobs through employment multiplier comes to 14,868, while indirect jobs created stood at 71,386. The arrival of tourists per year is estimated at 673,544 and the resultant Foreign Exchange Earnings are around US \$1.75 billion.

Introduction

Based in Dubai and established in 1985, Emirates is the world's largest international carrier in terms of Revenue Passenger Kilometres (RPKs). At the end of 2014, Emirates operated to 147 destinations in 84 countries and had a fleet of over 230 wide-body Airbus and Boeing aircraft with an average fleet age of 72 months. In 2013–14 Emirates carried 44.5 million passengers, with an average seat factor of 79.7 per cent.

Emirates and India

Emirates' 30 years in India has been one of investment, partnership and progressive growth. Building new links, particularly to regional and secondary airports has delivered substantial economic opportunities via the creation of vital trade and tourism links.

In 2013–14, Emirates carried 4.86 million passengers on 185 weekly flights from Dubai to its network of 10 cities across India - Ahmedabad, Bengaluru, Chennai, Delhi, Hyderabad, Kochi, Kolkata, Kozhikode, Mumbai and Thiruvananthapuram. During the same period Emirates carried 216,000 tonnes of high value cargo between India and Dubai, 55 per cent of which was to/from non-hub airports, benefitting the regional economies, particularly the six non-hub points in southern India.

Emirates has emerged as one of the most preferred airlines in India with flights operating at an average seat factor of 88 per cent during 2013–14. All ten destinations, except Kolkata and Ahmedabad, had seat factors equal to or greater than 86 percent with Kochi and Hyderabad, indicating the highest level of seat factors above 90 per cent.

An analysis of Emirates' 2013–14 passenger traffic on Indian routes indicates that during this year, the airline did not increase the number of passengers transported to and from India in comparison to the previous year. In fact there was a reduction of 2 per cent year on year. As there was no increase in the capacity entitlement for UAE carriers on the routes between 2008 and 2013–14 the 2 per cent reduction in passenger numbers is most likely a result of spillage.

The target set by Airports Authority of India to achieve 82 per cent growth in international passenger traffic over the next five years is achievable in the current market dynamics, in which Emirates could play an important role. The capacity increase from 54,200 to 60,200 will help to support this, but much more capacity in the market is required to meet these ambitious targets.

The detailed analysis in this study supplements the report that NCAER had prepared entitled, "Emirates in India, Assessment of Economic Impact and Regional Benefits" in 2012 and a supplementary report in 2013, however a summary of the 2012 analysis is provided as a reference.

This study provides an assessment of the impact of Emirates' India operations on the Indian economy.

Summary of Emirates' Economic Impact in India in 2012

The 2012 study examined the economic impact of Emirates' operation in India based on the bilateral allocation of 54,200 seats per week. Table 1 summarises the key findings of the analysis.

Table 1: Economic Impact of Emirates' operation

54,200 seats per week (4.65 million passengers in 2010-11)
Direct Contribution: US\$274 million
<ul style="list-style-type: none"> ● US\$67 million in hub airports ● US\$207 million in non-hub airports
Multiplier Impact: US\$596 million to Indian Economy
<ul style="list-style-type: none"> ● US\$274 million in the Air transport sector ● US\$76 million in the Petroleum and Chemicals sector ● US\$62 million in the Manufacturing sector ● US\$39 million in the Trade, Banking & Insurance sector ● US\$145 million in the rest of the economy
Employment Impact
<ul style="list-style-type: none"> ● Emirates employs 1,045 employees in India ● Emirates' operations support a total of 72,323 jobs in India ● 9,304 jobs as a direct employment impact ● 63,019 jobs as an indirect employment impact
Induced effect on Tourism:
<ul style="list-style-type: none"> ● 529,928 foreign tourist arrivals by Emirates ● US\$1,153 million as Foreign Exchange Earnings (FEE)

Source: Emirates in India—Assessment of Economic Impact and Regional Benefits, NCAER, 2012.

Regional Economic Benefits

The 2012 NCAER report observed that Emirates connects relatively small airports to a significant number of points beyond Dubai. Emirates connects Mumbai and Delhi to 64 and 58 points respectively that do not have any direct link. However, for other relatively small airports, Emirates' 6th freedom service connects airports to a higher number of points without any direct links. There are 94 points which are connected to Ahmedabad airport, 87 to Kozhikode and more than 80 points to and from each of the remaining airports.

Emirates contributes significantly to the connectivity of eight non-hub airports (Bengaluru, Hyderabad, Kochi, Ahmedabad, Kozhikode, Kolkata, Chennai and Thiruvananthapuram) in India. Connectivity in terms of number of points linked to Indian airports over Dubai is between 94 to 98 points for non-hub airports and 99 points for both Delhi and Mumbai. Therefore, rather than providing services solely on trunk routes, Emirates connects non-hub

airports to a significant number of points which would otherwise not be directly linked to these airports. This highlights the connectivity Emirates provides, as well as emphasizing their role in enhancing air transport and tourism, thereby providing significant value for the regional economy of an airport.

Expansion of seat capacity by Emirates and its impact on the Indian economy

Emirates is a significant player in the Indian aviation industry and under the current framework it has been contributing significantly to the Indian economy. The previous two reports from NCAER documented the benefit that accrued to the economy as a result of Emirates' operations in India.

As a result of the increased seat allocation in the 2014 bilateral negotiations Emirates' weekly seat allocation has risen to 60,200. To calculate the impact of this increase the original base of 54,200 seats per week is simulated to arrive at the current base of 60,200 seats per week. Table 2 narrates the output and employment multiplier with the current base of 60,200 seats per week.

Table 2: Output and Employment multiplier for the current base 60,200 seats per week

60,200 seats per week			
Number of passengers (million/year) 5.27			
Output multiplier impact		Employment multiplier impact	
Total (US\$ million)	848.6	Total (number of jobs)	86,255
Direct	370.9	Direct	14,868
Indirect	477.7	Indirect	71,386
Tourism impact			
Number of foreign tourists/year		673,544	
Foreign Exchange Earnings (US\$ million)		1,747.9	

Source: NCAER estimate using IO Table, NSS data and data received from Emirates.

As a result of the enhanced capacity of 60,200 seats per week, the current scenario estimates total direct impact for 2015 at US\$370.9 million and the indirect impact is US\$477.7 million. The output multiplier impact is estimated at US\$848.6 million.

The total number of direct jobs supported is 14,868, while indirect jobs created stand at 71,386. The arrival of tourists per year is estimated at 673,544 and the resultant Foreign Exchange earnings are around US\$1.75 billion.

If the bilateral entitlements were to increase further then these numbers would increase and benefit the economy and increase the number of jobs.

In order to have a better understanding of the economic value of a potential increase in capacities, the following exclusive scenarios have been modelled:

Scenario 1. Projected growth in the form of an additional 4,500 seats

Scenario 2. Phasing out of Airbus A330 and Boeing 777-Classics currently operating on the Indian routes and replacing them with Boeing 777-300ER aircraft

Analysing the total impact of an increase in seats

Given the impact of Emirates' current operations, the additional contributions of increased seat allocation scenarios are calculated using parameters of the Input-Output model derived in NCAER's September 2012 report, with revised prices for 2013-14.

Scenario 1

Projected growth modelling for an additional 4,500 seats. This would provide Emirates with flexibility for further growth and allow them to respond to changes in demand in the Indian market

When an additional 4,500 seats are modelled on top of the current 60,200, the total output multiplier is estimated at US\$896.1 million, of which the direct impact is US\$391.7 and indirect impact is US\$504.4 million. This will also result in the creation of an estimated 91,086 jobs, of which direct impact would be 15,701 jobs, while indirect impact would be 75,385 jobs. The impact in terms of tourist arrivals is estimated at 711,272 tourists and the corresponding Foreign Exchange Earnings would be US\$1.84 billion.

The additional seat capacity of 4,500 alone, would result in an additional 37,728 tourists per year and the corresponding Foreign Exchange Earnings would be US\$97.9 million.

Table 3: Impact of generating additional 4,500 seat capacity in the projected scenario

64,700 per week			
Number of passengers (million/year) 5.57			
Output multiplier impact		Employment multiplier impact	
Total (US\$ million)	896.1	Total (number of jobs)	91,086
Direct	391.7	Direct	15,701
Indirect	504.4	Indirect	75,385
Tourism impact			
Number of foreign tourists/year		711,272	
Foreign Exchange Earnings (US\$ million)		1,845.80	

Source: NCAER estimate using IO Table, NSS data and data received from Emirates.

Table 4: Direct Impact of an increase of 4,500 seats per week for Scenario 1

	Direct Impact (US\$ million)
Total	20.78

Source: NCAER estimate using IO Table, NSS data and data received from Emirates.

The direct impact of an increase of 4,500 seats per week is estimated at US\$20.78 million.

Table 5: Impact on tourism as a result of an increase of 4,500 seats for Scenario 1

Number of tourists/year	37,728
Foreign Exchange Earnings (US\$ million)	97.9

Source: NCAER estimate using IO Table, NSS data and data received from Emirates.

The additional seat capacity would result in an additional 37,728 tourists per year and the corresponding Foreign Exchange Earnings would be US\$97.9 million.

Scenario 2

Phase-out Airbus A330 and Boeing 777-Classics currently operating on the Indian network and replace with wider-gauge Boeing 777-300ER: leading to an increase of 13,849 seats per week

As part of its fleet renewal/rationalisation strategy, Emirates is phasing out its A330 and B777-Classics aircrafts and replacing them with B777-300ER type aircraft. This change will result in an increase of 13,849 additional weekly seats in each direction.

If the existing bilateral agreement was expanded to allow for a weekly allocation of 74,049 seats per week (60,200 plus 13,849), Emirates passenger numbers would increase to 6.14 million passengers to and from India every year. This net increase will also have a corresponding multiplier impact to the economy.

Table 6 presents the output, employment multiplier effects and tourism impact of Emirates' operation with 74,049 seats per week which includes the additional 13,849 seats.

Table 6: Emirates with 74,049 seats per week

74,049 per week			
Number of passengers (million/year) 6.14			
Output multiplier impact		Employment multiplier impact	
Total (US\$ million)	987.8	Total (number of jobs)	100,405
Direct	431.7	Direct	17,308
Indirect	556	Indirect	83,098
Tourism impact			
Number of foreign tourists/year		784,042	
Foreign Exchange Earnings (US\$ million)		2,034.65	

Source: NCAER estimate using IO Table, NSS data and data received from Emirates.

With the inclusion of an additional 13,849 seats, the total economic benefit of Emirates' operations would rise to US\$987.8 million, with US\$431.7 million being the direct impact and US\$556 million as the indirect impact.

The additional seats combined with the existing operations would generate 100,405 jobs in the economy and would bring in 784,042 foreign tourists to India, with Foreign Exchange Earnings for the tourism sector rising to US\$2.03 billion.

Table 7: Impact on tourism as a result of an increase of 13,849 seats for Scenario 2

Number of tourists/year	110,498
Foreign Exchange Earnings (US\$ million)	286.8

Source: NCAER estimate using IO Table, NSS data and data received from Emirates.

The additional 13,849 seats would allow for an additional 110,498 tourists per year resulting in additional Foreign Exchange Earnings of US\$286.8 million to the Indian economy.

NCAER have observed that Emirates makes an important contribution to the Indian air transport sector in terms of passenger traffic, connectivity and coverage to points not directly served by other carriers.

The study predicts further escalation of economic benefits for the Indian economy as an expansion of seat capacity by Emirates would bring in direct economic contribution, having a multiplier effect on output and job-creation, along with an induced effect on tourism.

Overall assessment: economy and the regions

Emirates' Indian operations generate considerable economic benefits for its customers in particular and other sectors of the Indian economy. Enhanced connectivity between cities and markets due to Emirates' operations leads to increases in income and employment.

GDP impact on income, employment and tourism highlights the potential of the airline's contribution to regional economic development in the country.

Overall, the expansion of Emirates' operations provides significant economic benefits to the Indian economy, which are unique and essential if India is to achieve Prime Minister Modi's goal to be the 3rd largest aviation market by 2020.

Concluding observations

The current NCAER report observed that Emirates makes an important contribution to the Indian air transport sector in terms of passenger traffic and Foreign Exchange Earnings (FEE).

The airline's economic contribution to the air transport sector is seen to percolate to the economy at large through various multiplier effects. The benefit to non-hub points also appears to have significant impact for the regional economies in terms of income, employment and tourism.

The study predicts further escalation of economic benefits for the Indian economy as Emirates grows the number of seats into India. This growth would result in direct economic contribution, multiplier effect on output and job-creation along with an induced effect on tourism.

Apart from the quantified benefits from Emirates' operations in India, the identified qualitative benefits also entreat an expansion of its operation in India.

Technical Annex

An Input–Output table is a methodical description of the interdependence among different sectors of an economy. It shows the flow of goods and services from one sector of the economy to other sectors over a period of time—usually a year. For producing the output of any sector of the economy, different types of raw material inputs and capital equipment along with labour are required. The output produced may be utilised both for intermediate and final use. A part of the total output by each sector of the economy goes to other sectors as they use it as inputs into their production process. The rest goes to the final consumers.

In the Input–Output table the economy is divided into a number of similar sectors, each of which is represented by a row and a column. The row corresponding to a sector gives the use pattern of total output of the sector. And the column gives details of inputs absorbed by the sector. The entry into the cell of the i th row and j th column is the quantity of output of sector i consumed as input by sector j and is generally denoted by X_{ij} . The output of sector j is denoted by X_j (Table A1).

Table A1: Input-Output Table

	Consuming Sectors						Final demand	Output
	1	2	•	•	•	n		
Producing Sectors								
1	X_{11}	X_{12}	•	•	•	X_{1n}	F_1	X_1
2	X_{21}	X_{22}				X_{2n}	F_2	X_2
•	•					•	•	•
•	•					•	•	•
•	•					•	•	•
n	X_{n1}	X_{n2}	•	•	•	X_{nn}	F_n	X_n
Primary inputs								
	V_{11}	V_{12}	•	•	•	V_{1n}	V_{1n+1}	
	V_{21}	V_{22}				V_{2n}	V_{2n+1}	

	•	•				•	•	
	V_{k1}	V_{k2}	•	•	•	V_{kn}	V_{kn+1}	
Output	X_1	X_2	•	•	•	X_n		

Source: Standard Input-Output Table of CSO.

Table A1 shows the supply and absorption patterns of a sector by row and column, respectively. E_j denotes the final demand for the output of sector j and V^j stands for k different primary inputs used by sector j . Primary inputs consist of factor payments to labour and capital, indirect taxes, non-competing imports, depreciation, and so on.

The Input–Output model, a set of simultaneous equations, provides a link between final demands and the output level of different sectors. Formal structure of the model can be written as

$$X_i = \sum_j X_j + F_i \dots i = 1, 2, \dots, n \tag{1}$$

Equation (1) means that the output of any sector is equal to the total of the output consumed by different sectors ($\sum_j X_j$) and the final demand (F_i). Assuming Leontief type production function (fixed proportion inputs), intermediate input requirements can be written as

$$X_{ij} = a_j X_j \tag{2}$$

where a_{ij} is the requirement of the output of sector i used as input for a unit level production of sector j . Now the input-output model becomes

$$X_i = \sum_j a_{ij} X_j + F_i \tag{3}$$

In matrix notation the model is written as

$$(I - A) X = F \tag{4}$$

where A is a $n \times n$ matrix of coefficients, X the vector of outputs, F the vectors of final demand and I an identity matrix.

Solving the system of equations gives

$$X = (I - A)^{-1} F \tag{5}$$

$$= R F$$

The matrix R is known as the Leontief inverse or the matrix multiplier. A cell in R , say r_{ij} , gives the amount of output of sector i required directly and indirectly to produce one unit of final demand for sector j .

The summation, $\sum_j r_{ij}$ represents the amount of output required directly and indirectly from different sectors to produce one unit final demand for sector j . When the model is expressed in value terms, this amount represents the multiplier impact of the sector on the whole economy.

Input–Output Transaction Table of India is maintained by the Central Statistical Organization (CSO) of the Ministry of Statistics and Programme Implementation (MoSPI). The table is periodically updated by the organization. The latest table corresponds to the year 2007-08. This has been revised to make it in sync with the price level of 2013-14. The table consists of

absorption and supply pattern of 130 sectors of the Indian economy. In the present study, Input–Output is aggregated to a table of 33×33 sectors for the sake of computational manageability. The selection of 33 sectors is determined by input patterns of the air transport sector, i.e. sectors that supply a significant portion of input to the air transport sector are retained and the rest are aggregated to create a broader group of sectors. Table A2 presents the mapping of the aggregation from 130×130 sectors table of the Indian Input–Output model to 33×33 sectors model used in this study.

Table A2: Mapping of aggregation of 130×130 sectors table into 33×33 sectors

Sl. No.	Broad sectors	Sectors included (Serial No. from Input–Output table of India, 130×130)
1.	Agriculture	1–26
2.	Mining and Quarrying	27–37
3.	Food Beverage and Tobacco	38–45
4.	Textiles and RMG	46–54
5.	Wood and Wood Products, Furniture and Fixtures	55–56
6.	Paper and Paper Products	57
7.	Printing and Publishing	58
8.	Leather and Plastic, and their Products	59–62
9.	Petroleum Products	63
10.	Paints, Varnishes, Lacquers	69
11.	Other Chemicals	64–68, 70–73
12.	Non-Metallic Mineral Products	74–76
13.	Basic Metal and Metal Products	77–82
14.	Non-Electrical Machinery and Parts	83–87
15.	Electrical Machinery	88–94
16.	Transport Equipment and Parts	95–100
17.	Other Miscellaneous Manufacturing	101–105
18.	Construction	106
19.	Electricity	107
20.	Water	108
21.	Railway	109
22.	Land Transport	110
23.	Water Transport	111

contd...

Table A2: contd...

24.	Air Transport	112
25.	Supporting and Auxiliary Transport Activities	113
26.	Storage and Warehousing	114
27.	Communication	115
28.	Trade	116
29.	Hotels and Restaurants	117
30.	Banking	118
31.	Insurance	119
32.	Computer Related	124
33.	Rest of the Services	120–123, 125–130

Source: Input-Output Table of 2007-08, Published by CSO.

The Input–Output table is also used to quantify the employment multiplier. This involves calculating the employment–output ratio for different sectors using National Sample Survey Organization's (NSSO) labour input data. They are numbers of jobs comprising workers with Usual Status, Principal Status, and Subsidiary Status and workers with multiple jobs.

Limitations of the Input–Output methodology

Though the Input–Output model is at the forefront of methodologies to identify wider economic benefits of an economic activity in a sector, it has some limitations.

- It assumes Constant Returns to Scale (CRS) in the production process.
- In India, the Input–Output table is periodically updated. Hence, the table available at a point in time may represent a technological landscape slightly different from the prevailing one.



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