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# Emirates in India

## Assessment of Economic Impact and Regional Benefits

National Council of Applied Economic Research

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# **Emirates in India**

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and Regional Benefits**

National Council of Applied Economic Research

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## Foreword

Air travel remains the fastest mode of long-distance passenger transport and freight. Its wide-ranging inter-linkages with other sectors in the economy means that air transportation can bring with it tremendous direct and indirect benefits to the economies in which it operates. An efficient national civil aviation infrastructure and efficiently run airlines have the potential of bringing down transport costs, promoting commerce, expanding culture and communications, and ultimately drawing people together.

This NCAER study provides an assessment of the impact of expanding air travel and the civil aviation sector in India by using the experience of one of the largest international carriers operating in India – Emirates Airlines. Emirates began its operations in India in the mid-1980s and carried 12 per cent of India's international passengers and 14 per cent of international freight in 2010–11. Emirates' success in India mirrors the deep and still rapidly growing economic links between India and the Middle East, which in turn also integrate India more closely with the global economy.

A large international airline's operations demand many inputs. Besides generating income, the supply of these inputs creates a multiplier effect for other goods and services required to produce these inputs. Besides air travel or the movement of air freight, aviation also generates other outputs such as second order effects on tourism. Input–output analysis provides a methodology to estimate the effects of one sector on another as well as on the entire economy. Emirates asked NCAER to take a look at its India operations and estimate what these multiplier effects across sectors would be. This report by NCAER is an assessment of these effects. Using input–output analysis, the study quantifies these effects in the form of direct economic contributions, multiplier effects on output and employment, and induced effects on tourism.

This study was carried out under the leadership of Tushar Nandi at NCAER. Devender Pratap, Shashanka Bhide, Saurabh Bandyopadhyay and Nikita Jain at NCAER provided important inputs at different stages of the work. I would like to acknowledge the financial and information support from Emirates for this study and their willingness to share data, knowledge, and their understanding of India's civil aviation sector.

I hope that the analysis and the results of this NCAER report will be useful to policy makers and policy analysts. I also hope the report and the methodology used will facilitate further analysis of India's civil aviation sector.

New Delhi

**Shekhar Shah**  
*Director-General*  
NCAER



# Acknowledgements

The study team wishes to place on record the support received from Emirates Airline in terms of data and information relating to their operations as relevant for the assessment of economic impact.

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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.





# Contents

<i>Executive Summary</i> .....	1
<b>1. Introduction</b> .....	<b>7</b>
1.1 Structure of the Report .....	7
<b>2. Indian Economic Context and Air Transport Sector</b> .....	<b>9</b>
2.1 Policies to Catalyse the Sector .....	13
2.2 Airports Economic Regulatory Authority (AERA).....	13
2.3 Airports Authority of India (AAI).....	14
2.4 Directorate General of Civil Aviation (DGCA).....	14
2.5 The Issues .....	14
2.6 Air Services Agreements.....	15
2.7 Aviation Turbine Fuel Cost.....	15
2.8 Service Tax on Air Tickets.....	16
2.9 Foreign Direct Investment in the Domestic Airline Industry.....	16
<b>3. Emirates in India</b> .....	<b>19</b>
3.1 Introduction.....	19
3.2 Emirates in the Indian Air Transport Sector .....	19
3.3 Emirates' Passenger and Freight Traffic in 10 Indian Airports .....	21
3.4 Share of Emirates' Traffic at Various Indian Airports .....	22
3.5 Emirates' Passenger Traffic: 3rd, 4th, and 6th Freedoms, 2011–12.....	24
3.6 Emirates' Passenger Traffic to MENA Countries, 2011–12 .....	27
<b>4. Economic Impacts Associated with Emirates Airline Operations in India</b> .....	<b>31</b>
4.1 Introduction.....	31
4.2 Economic Contribution of Airline Operations.....	31
4.3 Direct Impact of Emirates' Operation in India.....	33
4.3.1 Direct Contribution to Indian Civil Aviation .....	33
4.3.2 Direct Contribution at Indian Airports .....	34
4.3.3 Seat Factors.....	36
4.3.4 Direct Employment in India.....	36
4.3.5 Contribution to the Indian Carriers.....	37
4.3.6 Media and Other Spending .....	37

4.4	Multiplier Impact of Emirates' Operation in India.....	38
4.4.1	Output Multiplier Impact.....	38
4.4.2	Multiplier Impact on Sectors.....	39
4.4.3	Impact on Indian Cities.....	40
4.4.4	Employment Multiplier Impact.....	42
4.5	Induced Effect on Tourism in India.....	43
4.6	Other Benefits.....	47
<b>5.</b>	<b>Expansion of Emirates' Operations in India.....</b>	<b>49</b>
5.1	Scenario 1: 60,000 Seats per Week.....	49
5.2	Scenario 2: 70,000 Seats per Week.....	50
5.3	Scenario 3: 80,000 Seats per Week.....	51
5.4	Sector-wise Distribution of Benefits from Higher Seat Allocations.....	51
5.5	Benefit from Emirates' Operation to Additional Points.....	52
5.5	Conclusion.....	53
<b>5.</b>	<b>Appendix.....</b>	<b>55</b>

# List of Tables

E.1: Passenger and Freight share of Emirates Airlines .....	2
E.2: Percentage share of Emirates in India for destinations Dubai and beyond .....	2
E.3: Economic Impact of Emirates operation-1 .....	3
E.4: Economic Impact of Emirates operation-2 .....	4
E.5: Economic Impact of Emirates operation-3 .....	4
E.6: Economic Impact of Emirates operation-4 .....	5
2.1: Air Passenger Traffic, India, 2008–09 to 2010–11 .....	11
3.1: International Air Traffic: Emirates and India .....	19
3.2: Emirates’ passenger (in numbers) and Freight Traffic (in tonnes) in India .....	20
3.3: Emirates in India: Year to year growth (%) .....	22
3.4: Emirates’ Passenger and Freight Share in 10 Airports (%) .....	23
3.5: Emirates’ Passenger Traffic in India: To and From Dubai and Beyond (%), 2011-12 .....	25
3.6: Number of Points Connected by Emirates’ 6th Freedom Traffic, 2011–12 .....	26
3.7: Emirates’ Passenger Traffic: India - MENA and India - outside MENA, 2011-12 (%) .....	27
4.1: Emirates’ Direct Contribution in India’s Economy: 2008–09 to 2010–11 .....	33
4.2: Emirates Expenditure in India: 2008–09 to 2010–11 (%) .....	34
4.3: Emirates’ Contribution at Points of Operation: 2008–09 to 2010–11, (million US\$) .....	35
4.4: Emirates Seat Factor at 10 Airports: 2008–09 to 2010–11 (%) .....	35
4.5: Emirates’ contribution to Indian carriers, 2010–11 .....	37
4.6: Emirates’ Advertisement and Promotion in India (million US\$) .....	37
4.7: Emirates’ Total Contribution to India in 2010–11 (million US\$) .....	38
4.8: Multiplier Impact of Emirates’ Contribution .....	39
4.9: Emirates’ Multiplier Impact at 10 Airports, 2010–11 (million US\$) .....	40
4.10: Emirates Passenger Traffic in Routes without Direct Link from Indian Airports, 2010–11 (%) .....	42
4.11: Emirates’ Contribution to India’s Tourism Sector, 2009 .....	44
4.12: Emirates’ Passenger Traffic to Nine Major Countries Outside MENA (2011-12) .....	45
4.13: Tourist arrivals by Emirates from Major Countries, 2009 .....	46
5.1: Scenario 1: Emirates with 60,000 Seats per Week .....	49
5.2: Scenario 2: Emirates with 70,000 Seats per Week .....	50
5.3: Scenario 3: Emirates with 80,000 Seats per Week .....	51
5.4: Output and Employment Multiplier Impacts .....	52
5.5: Direct Impact from Expansion to Four Additional Points (US\$ million) .....	52

5.6: Output and Employment Multiplier Impacts at the Four Additional Points .....	53
A1: Input–Output Table .....	55
A2: Mapping of Sectors from 130×130 to 33×33 Table.....	57

## List of Figures

2.1: Air Passenger Traffic in India (million): 2007–08 to 2010–11 .....	10
2.2: Air Freight Traffic in India during 2007–08 to 2010–11 (thousand tonnes).....	10
3.1: Emirates Passenger Share at Hub Airports and Non-Hub Airports (%) .....	23
3.2: Emirates Freight Share at Hub and Non-Hub Airports (%) .....	23
3.3: Emirates’ Passenger Traffic: India to Middle East and North Africa (MENA) 16 countries, 2011-12, [%](2.7 million PAX) .....	28
3.4: Emirates’ Passenger Traffic: India to 50 countries outside MENA, 2011-12, [%](2.0 million PAX).....	28
3.5: Emirates’ India Traffic to/from MENA Countries, 2011-12, [%] (2.7 million PAX) .....	29
4.1: Distribution of Emirates’ Expenditure in different components in India (%).....	34
4.2: Sector-wise Distribution of Multiplier Impact (%).....	39
4.3: Emirates’ Multiplier Effect at Hub Airports: 2010–11 (million US\$).....	40
4.4: Emirates’ Multiplier Effect at Non-Hub Airports 2010–11, (million US\$) .....	41
4.5: Sector-wise distribution of employment impact (%).....	43
4.6: Emirates’ Traffic: India to 50 Countries Outside MENA (%) (2.0 million PAX).....	45

## List of Boxes

2.1: A Note on JV airports .....	12
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## Executive Summary

The rapid growth of the Indian economy and corresponding policy changes in the last two decades have also led to the faster development of the Indian Aviation sector. The accelerated growth in the Indian Aviation sector began in the mid-1990s and continued right through the seven year period covering 2004-05 to 2010-11 but for the year of global crisis in 2008-09.

Indian industry and consequently the civil aviation sector have also been adversely impacted by the weak economic growth following the current European economic crisis. The rise in fuel costs, borrowing costs and the economic slowdown have impacted the sector leading to major financial crises in some of the Indian carriers.

India's long term air transport needs are expected to rise significantly as the economy expands. There is, therefore, a need to provide an enabling policy environment that will give an impetus to the growth of this sector and help realise its long term potential.

Emirates Airline is an independent international airline based in Dubai and one of the world's largest. In 2011-12 it carried 34 million passengers and flew to 122 destinations in 72 countries.

Reflecting the positioning of its network, when airlines were cutting down flights in the current phase of global economic downturn, Emirates maintained its flights into India.

Emirates' operations in India started in 1985 with 10 flights per week from Dubai to Delhi and Mumbai. The airline currently operates 185 weekly flights to/from 10 airports in India. As per the present bilateral agreement its weekly seat allocation in India is 54,200 seats. Its current seat factor for India is 84%. With no increase in entitlements since 2008 and such high seat factors, carriage growth has been marginal in 2011-12. Emirates is looking at the possibility of expanding its operation in India both in terms of higher seat allocation and additional points of service. Higher seat allocation and additional points of service would lead to higher passenger as well as cargo traffic. Increased connectivity also results in increased tourist inflow and economic activity leading to development of local economies.

Emirates commissioned the National Council of Applied Economic Research (NCAER) to conduct a study to examine the economic benefit of its operation to the Indian economy. NCAER is an independent, non-profit research institution. The Council has expertise in applied economic research on issues pertaining to the Indian Economy using Indian data.

### **Aim of Research and Methodology**

The present study examines the economic impact of Emirates' operations in India. The study provides estimates of direct and indirect multiplier effects using Input-Output model for India.

Using data from Emirates and a variety of sources from India's official statistics, this study measures the impact of Emirates' operation in India along the following lines:

- Direct contribution to the Indian economy.
- Contribution through linkages of the aviation sector to other sectors – Multiplier impact.
- Employment generation in India – Direct and Multiplier impact.
- Contribution to foreign exchange earnings from tourists.

The study also takes into consideration the multiplier effect if Emirates expands its operations to four additional points.

## Emirates in India

Emirates carries passenger and freight to/from 10 airports in India. They are Delhi, Mumbai, Bengaluru, Hyderabad, Kochi, Kozhikode, Kolkata, Chennai, Thiruvananthapuram and Ahmedabad.

The following table shows Emirates’ share in international passenger traffic at these 10 airports, hub (Delhi and Mumbai) and non-hub airports and in India for the year 2010-11.

**Table E.1: Passenger and Freight share of Emirates Airlines**

<b>Emirates’ Passenger share (%), 2010-11</b>			
10 airports	Hub airports	Non-hub airports	India
13.28	8.87	18.14	12.26
<b>Emirates’ Freight share (%), 2010-11</b>			
10 airports	Hub airports	Non-hub airports	India
14.50	9.95	20.80	14.39

Emirates carried 12.26 per cent of India’s international passenger and 14.39 percent of international freight in 2010-11. Its share at non-hub points is higher than that at hub points.

Emirates’ India operation carried 45 per cent of the passengers between 10 Indian points and Dubai. The remaining 55 per cent of passenger traffic was carried between Indian airports and points beyond Dubai.

**Table E.2: Percentage share of Emirates in India for destinations Dubai and beyond**

<b>Emirates’ Passenger share (%), 2011–12</b>		
3 <sup>rd</sup> /4 <sup>th</sup> freedom		45
6 <sup>th</sup> freedom		55
Division of 6 <sup>th</sup> freedom traffic	To/from points served by Indian carriers	18
	To/from points served by non-Indian carriers	15
	To/from points without any direct link	67

Out of the total 6th freedom passenger traffic, only 18 per cent is carried between points served by Indian carriers. A vast majority of the 6th freedom passenger traffic, 82 per cent, is carried between points not served by Indian carriers. In fact 67 per cent of the 6th freedom traffic is between points that do not have any direct link.

## Summary of Emirates' Economic Impact in India

The study examines the economic impacts of Emirates operation in India for current (54,200 seats per week) and possible future operations in terms of additional seat allocation and additional points of service.

**Table E.3: Economic Impact of Emirates operation-1**

<p>54,200 seats per week (4.65 million passengers in 2010-11)</p> <p>Note: Impact would have been similar for 2011-12 given marginal growth in carriage to 4.71 million due to constrained entitlements).</p>
<b>Direct Contribution: US\$274 million</b>
<ul style="list-style-type: none"> <li>● US\$67 million in hub airports</li> <li>● US\$207 million in non-hub airports</li> </ul>
<b>Multiplier Impact: US\$ 596 million to Indian Economy</b>
<ul style="list-style-type: none"> <li>● US\$274 million in the Air transport sector</li> <li>● US\$76 million in the Petroleum and Chemicals sector</li> <li>● US\$62 million in the Manufacturing sector</li> <li>● US\$39 million in the Trade, Banking &amp; Insurance sector</li> <li>● US\$145 million in the rest of the economy</li> </ul>
<b>Employment Impact</b>
<ul style="list-style-type: none"> <li>● Emirates employs 1045 employees in India</li> <li>● Emirates' operations support a total of 72,323 jobs in India</li> <li>● 9,304 jobs as a direct employment impact</li> <li>● 63,019 jobs as an indirect employment impact</li> </ul>
<b>Induced effect on Tourism:</b>
<ul style="list-style-type: none"> <li>● 529,928 foreign tourist arrival by Emirates</li> <li>● US\$1153 million as Foreign Exchange Earning (FEE)</li> </ul>

Table E.4: Economic Impact of Emirates operation-2

60,000 seats per week (5.03 million passengers per year)
<b>Direct Contribution: US\$296 million</b>
<b>Multiplier Impact: US\$644 million to Indian Economy</b>
<ul style="list-style-type: none"> <li>• US\$296 million in the Air transport sector</li> <li>• US\$83 million in the Petroleum and Chemicals sector</li> <li>• US\$67 million in the Manufacturing sector</li> <li>• US\$42 million in the Trade, Banking &amp; Insurance sector</li> <li>• US\$157 million in the rest of the economy</li> </ul>
<b>Employment Impact:</b>
<ul style="list-style-type: none"> <li>• Emirates' operations will support a total of 78,227 jobs in India</li> <li>• 10,063 jobs as a direct employment impact</li> <li>• 68,163 jobs as an indirect employment impact</li> </ul>
<b>Induced effect on Tourism:</b>
<ul style="list-style-type: none"> <li>• 641,260 foreign tourist arrival by Emirates</li> <li>• US\$1485 million as Foreign Exchange Earning (FEE)</li> </ul>

Table E.5: Economic Impact of Emirates operation-3

70,000 seats per week (5.63 million passengers per year)
<b>Direct Contribution: US\$332 million</b>
<b>Multiplier Impact: US\$721 million to Indian Economy</b>
<ul style="list-style-type: none"> <li>• US\$332 million in the Air transport sector</li> <li>• US\$92 million in the Petroleum and Chemicals sector</li> <li>• US\$75 million in the Manufacturing sector</li> <li>• US\$47 million in the Trade, Banking &amp; Insurance sector</li> <li>• US\$176 million in the rest of the economy</li> </ul>
<b>Employment Impact</b>
<ul style="list-style-type: none"> <li>• Emirates' operations will support a total of 87,572 jobs in India</li> <li>• 11,266 jobs as a direct employment impact</li> <li>• 76,306 jobs as an indirect employment impact</li> </ul>
<b>Induced effect on Tourism</b>
<ul style="list-style-type: none"> <li>• 717,868 foreign tourist arrival by Emirates</li> <li>• US\$1662 million as Foreign Exchange Earning</li> </ul>



Table E.6: Economic Impact of Emirates operation-4

80,000 seats per week (6.16 million passengers per year)
<b>Direct Contribution: US\$363 million</b>
<b>Multiplier Impact: US\$790 million to Indian Economy</b>
<ul style="list-style-type: none"> <li>● US\$363 million in the Air transport sector</li> <li>● US\$101 million in the Petroleum and Chemicals sector</li> <li>● US\$82 million in the Manufacturing sector</li> <li>● US\$51 million in the Trade, Banking &amp; Insurance sector</li> <li>● US\$192 million in the rest of the economy</li> </ul>
<b>Employment Impact</b>
<ul style="list-style-type: none"> <li>● Emirates' operations will support a total of 95,862 jobs in India 12,332 jobs as a direct employment impact</li> <li>● 83,530 jobs as an indirect employment impact</li> </ul>
<b>Induced effect on Tourism</b>
<ul style="list-style-type: none"> <li>● 785,828 foreign tourist arrival by Emirates</li> <li>● US\$1819 million as Foreign Exchange Earning</li> </ul>

## Regional Economic Benefits

The 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.

An improvement in connectivity brings benefits to users of air transport services through reduction in transit time, allows for shorter waiting times, as well as improving the quality of service. Improvements in connectivity also reduce the cost of air transport services making air transport more competitive relative to other modes of transport. This competitive edge places air transport in the set of factors facilitating international trade.

This study highlights the benefits with an economic impetus to the cities of Amritsar, Pune, Mangalore and Tiruchirappally if Emirates were allowed to fly there, flowing from its worldwide network and greater connectivity.

In 2011-12, Emirates carried passengers between India and 66 countries. India, being an important investment destination and trading partner of the MENA (Middle East and North African) countries, witnessed a lot of passenger traffic to and from these nations. The traffic share of the other 50 countries connected to India by Emirates is 43 per cent.

### Conclusion

The study finds that Emirates makes an important contribution to the Indian air transport sector in terms of passenger and freight traffic and connectivity to points not directly served by other carriers. The airline's economic contribution to the air transport sector magnifies to the wider economy through the multiplier effect. The benefit to non-hub points appears to be significant in regional economies. Income, employment and tourism impacts point to the potential of Emirates' contribution to regional economic development.

The study predicts further economic benefit for the Indian economy in scenarios of Emirates' expansion in India. They are quantified as direct economic contribution, multiplier effect on output and employment and induced effect on tourism. Apart from quantified benefits from Emirates' operations in India, the identified qualitative benefits highlight the need for an expansion of air transportation capacities in India.

The Civil aviation sector is a critical segment of the transport infrastructure in a large country like India. It not only provides for movement of goods and passengers, but is also an enabler of global economic integration. This sector provides domestic and overseas linkages that boost international trade and tourism. Policies that enhance these benefits will contribute to the growth of India's economy through a variety of direct and indirect multiplier effects.

# 1. Introduction

Emirates Airline, based in Dubai, is one of the world's largest and fastest growing carriers. It is the largest foreign airline in the Indian air transport sector and contributes a significant proportion of the market for India's international passenger and freight volumes.

The airline currently operates a fleet of more than 170 wide-bodied aircraft and in 2010–11 recorded its 23<sup>rd</sup> consecutive profit, earning US\$1.61 billion. The airline has focused on its own network expansion and has remained independent of the three global alliances. Largely because of Emirates' growth, Dubai International Airport is now the world's eighth largest hub, handling nearly 51 million passengers in 2011.

The present bilateral agreement between India and Dubai allows Emirates to operate 54,200 seats weekly to and from India. The airline enjoys strong demand for its Indian services with flights operating on an average of 84 per cent full (seat factor). The airline currently operates 185 weekly flights to and from 10 Indian destinations and is looking at the possibility of expanding its operation and introducing the Airbus A380 into India.

## 1.1 Structure of the Report

The report presents the economic analysis carried out to assess the economic impact of Emirates' operation in India and is structured as follows:

- Chapter 2 presents Indian economic landscape and the role of air transport in stimulating its economic growth.
- Chapter 3 covers the role of Emirates in the international segment of India's air transport sector.
- Chapter 4 presents the analysis of the economic impact of Emirates' operations in India. It quantifies the economic benefits in terms of direct impacts, induced impacts and the multiplier effects on India's tourism industry.
- Chapter 5 forecasts the benefits to the Indian economy derived by Emirates' expansion.



## 2. Indian Economic Context and Air Transport Sector

India's recent economic growth has been propelled by a sustained increase in the service sector. Over the last decade, the service sector contributed more than half of India's total GDP. The service sector accounted for 56.3 per cent of GDP (at factor cost) for 2011–12, or approximately US\$987 billion.

The service sector requires strong transport and communication networks to connect the different centres of economic growth within India and abroad. Air transport plays a vital role in this respect. It is the fastest mode of transport and is a necessity rather than a luxury.

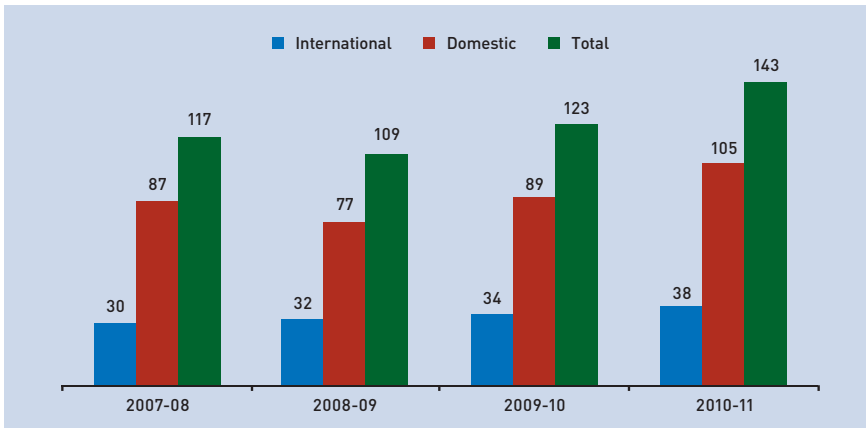
The Indian service sector is connected to trade centres abroad. India is a cost-effective and labour-abundant economy with a strong manufacturing and export oriented industrial framework. It has thus benefited immensely from outsourcing work opportunities from developed countries. Faster modes of transportation between Indian growth centres and their trade partners abroad have facilitated the economic ties that drive the Indian economy. International air transport contributes to this aspect of the economy by providing faster transportation of passengers and freight.

The importance of FDI (foreign direct investment) on India's economic growth since liberalisation in 1991 is well recognised. Labour costs, political stability, and tax rules are considered to be the main factors that determine the flow of FDI. Recent trends show that transport links also play an important role in investment decisions. International air transport and connectivity makes the Indian economy an attractive investment destination.

It is estimated that transport contributes 17 per cent to the Indian service sector GDP. This significant contribution is partially accounted for by the increase in air transport. Though the air transport sector in India has witnessed a remarkable growth in the present decade, its potential is yet to be fully realised. It was only in 2006–07 that air transport overtook water transport in terms of its contribution to India's transport GDP. Air transport still contributes less than 1 per cent of the country's GDP but is predicted to rise considerably in the coming years.

Air transport in India witnessed a steady growth over the last decade except in 2008–09, when the global downturn had an adverse impact on demand for domestic air travel. However, international passenger traffic to and from India was largely unaffected. The total passenger volumes (international and domestic) grew by 14 per cent in 2009–10, and by 15 per cent in 2010–11. Figure 2.1 presents the Indian passenger traffic from 2007–08 to 2010–11. It may be noted that during the period, international passenger traffic increased by 27 per cent while domestic passenger traffic grew by 21 per cent. Freight traffic in India during 2007–08 to 2010–11 is presented in Figure 2.2. Except for 2008–09, it has experienced a steady increase. On the other hand, international and domestic freight traffic increased by 30 per cent and 50 per cent, respectively during the same period.

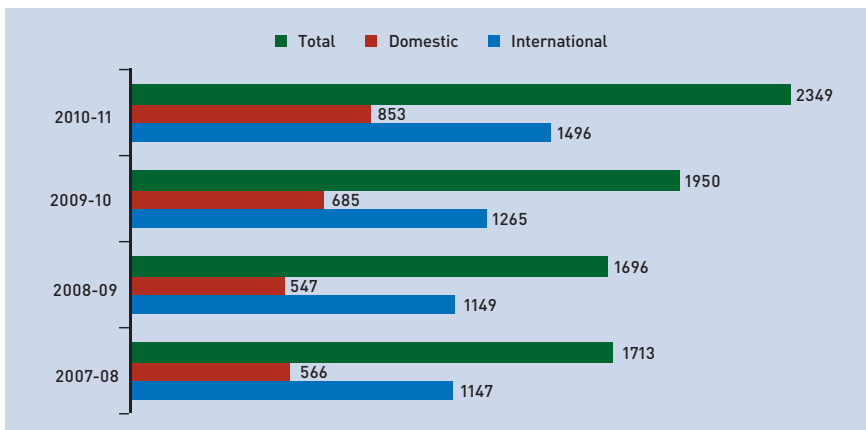
Figure 2.1: Air Passenger Traffic in India (million): 2007–08 to 2010–11



Source: Airport Authority of India, Director General of Civil Aviation, India.

These figures show that the Indian air transport sector is back to its growth path after a year-long slowdown due to the global downturn.

Figure 2.2: Air Freight Traffic in India during 2007–08 to 2010–11 (thousand tonnes)



Source: Airport Authority of India, Director General of Civil Aviation, India.

India has 37 airports, of which 17 operate international services while 20 focus on domestic operations. Among the international airports, there are six JV (joint venture) airports, namely Delhi, Mumbai, Bengaluru, Hyderabad, Kochi and Nagpur. Data suggests that JVs have handled an average of 56 per cent of domestic passenger traffic and 66 per cent of international passenger traffic during 2008–09 and 2010–11.<sup>1</sup> (Table 2.1) This implies that the other 31 airports handle a small proportion of air passengers. This share will be very low if two major non-JV airports – Chennai and Kolkata are left out. Chennai has handled 7 per cent of domestic passenger traffic and 11 per cent of international passenger traffic from 2008–09 to 2010–11, while Kolkata airport handled 4 per cent and 8 per cent of domestic and international passenger traffic, respectively, during the same period.

1. Note that the calculation for 2008–09 does not include Nagpur as a JV airport. There were five JV airports in 2008–09.

Table 2.1: Air Passenger Traffic, India, 2008–09 to 2010–11

Air Passenger Traffic, India 2008–09 to 2010–11											
	India total		Major airports (%)			JV airports (%)	Region wise division (%)				
	(in million)		Delhi	Mumbai	Chennai		Eastern	Western	Southern	Northern	North-east
2008–09	International	31.58	24.60	25.71	11.59	66.85	3.33	29.48	39.74	27.42	0.02
	Domestic	77.30	19.50	19.82	7.99	56.29	10.00	31.44	29.55	25.17	3.84
	Total	108.88	20.98	21.53	9.04	59.35	8.06	30.87	32.50	25.83	2.73
2009–10	International	34.37	24.18	23.95	11.23	65.43	3.64	27.99	40.91	27.41	0.06
	Domestic	89.39	19.92	19.43	7.46	56.38	10.59	30.98	28.07	26.32	4.04
	Total	123.76	21.11	20.69	8.51	58.90	8.66	30.15	31.63	26.62	2.93
2010–11	International	37.91	24.48	23.95	11.21	65.58	3.91	27.91	40.68	27.41	0.09
	Domestic	105.52	19.53	18.95	7.39	55.85	10.96	30.83	27.68	26.22	4.31
	Total	143.43	20.84	20.27	8.40	58.42	9.09	30.06	31.12	26.54	3.20

Source: Airport Authority of India.

Note: Delhi, Mumbai, Bengaluru, Hyderabad, Kochi and Nagpur are JV airports. Nagpur was added in the list of JV airports since 2009–10.

### Box 2.1: A Note on JV airports

JV airports have acquired a new dimension of private-public partnership in India. Important JV airports in India and the extent of relationship between private and public entity is given below:

#### Hyderabad

GMR Hyderabad International Airport Limited (GHIAL) is a joint venture company promoted by the GMR Group (63%) in partnership with Government of India (13%), Government of Andhra Pradesh (13%) and Malaysia Airports Holdings Berhad (11%). The Company was incorporated to design, finance, build, operate and maintain a world class Greenfield airport at Shamshabad, Hyderabad. The project is based on the Public Private Partnership (PPP) model and is structured on a Build, Own, Operate and Transfer (BOOT) basis.

*Source:* <http://www.hyderabad.aero/our-company.aspx>

#### Delhi

Delhi International Airport (P) Limited (DIAL) is a joint venture consortium of GMR Group, Airports Authority of India, Fraport and Malaysia Airports Holdings Berhad (MAHB). In January 2006, the consortium was awarded the concession to operate, manage and develop the IGI Airport following an international competitive bidding process. DIAL entered in to Operations, Management and Development Agreement (OMDA) on April 4, 2006 with the AAI. The initial term of the concession is 30 years extendable by a further 30 years.

*Source:* <http://www.newdelhiairport.in/our-company.aspx>

#### Mumbai

Mumbai International Airport Pvt. Ltd. (MIAL) is a Public Private Partnership joint venture between GVK, BSDM, ACSA Global and Airports Authority of India (AAI). MIAL was awarded the mandate for operating and modernising the Chhatrapati Shivaji International Airport, Mumbai (CSIA) in April 2006. GVK leads the consortium with 50.5% stake in MIAL while Bid Services Division (Mauritius) Limited (BSDM) holds 13.5%, ACSA Global 10% and AAI the remaining 26%. The GVK led consortium comprises of GVK, Bidvest and Airports Company South Africa (ACSA). This consortium has led the redevelopment and modernisation of CSIA.

*Source:* <http://www.csia.in/corporate/partners.aspx>

#### Bengaluru

The Government of India has given Bengaluru International Airport Limited (BIAL) the exclusive right and privilege to carry out the development, design, financing, construction, operation, and management of the airport for a period of 30 years from its opening date, with an option to extend the concession for another 30 years. The BIAL is the joint venture of the public and private sector initiatives. AAI and KSIIDC are the state promoters having a total of 26% of the share, while Siemens, Unique Zurich Airport and Larsen & Toubro are the private promoters with 40 per cent, 17 per cent, and 17 per cent of the share.

*Source:* <http://www.Bengaluruairport.com/ourBusiness/aboutBia.aspx>



**Cochin**

Cochin International Aviation Services Limited (CIASL) is a subsidiary of Cochin International Airport Limited, established on 8th September 2005 under Companies Act, 1956. CIASL has been established for the purpose of setting up a world class Aircraft maintenance, repair and overhaul (MRO) facility clubbed with an Aviation Training Institute for imparting training to Pilots, Cabin Crew, Engineers and Technicians for in-flight and ground support, at Cochin International Airport, Nedumbassery.

*Source:* <http://www.cial.aero/contents/viewcontent.aspx?linkIdLv12=73&linkId=73>

**Nagpur**

In February, 2009, the government approved a joint venture between the Airports Authority of India (AAI) and Maharashtra Airport Development Co. (MADC) – promoted by the Maharashtra government – for developing the Nagpur airport as a multi-modal international passenger and cargo hub. In this, AAI, India's airports operator, would hold 49 per cent while MADC will have 51 per cent equity in the joint venture. AAI has been permitted to invest Rs 490 million (Rs 4.9 crore) in the venture. The Nagpur airport modernisation programme also includes a special economic zone (SEZ) besides a second airstrip, which would be 60 metres wide and 4,000 metres long.

Three major airports Delhi, Mumbai, and Chennai, accounted for 45.87 per cent or 48.4 million of the domestic passenger traffic in 2010–11. For international passenger traffic, the share of these airports stood at 59.64 per cent or 22.6 million passengers in 2010–11. This indicates the concentration of traffic in these airports, specifically in Delhi and Mumbai. Though Delhi's airport share in both domestic and international passenger traffic has remained constant over the last three years, the share of Mumbai airport has declined marginally.

Regional differences in air passenger traffic reflect disparities in economic opportunities and connectivity. The southern region has the highest share of international passenger traffic and the western region has the highest share in domestic passenger traffic. Passenger traffic is relatively low in the eastern and north-eastern regions.

## 2.1 Policies to Catalyse the Sector

The regulatory framework for India's civil aviation sector has been evolving over the last few years as the sector has seen considerable expansion of its role in the economy. Globalisation of Indian economy has necessitated faster expansion of air transportation services. We first note some of the key regulatory institutions and their role and then discuss some of the critical policy issues facing the sector.

## 2.2 Airports Economic Regulatory Authority (AERA)

The Airports Economic Regulatory Authority (AERA) is a statutory body constituted under the Airports Economic Regulatory Authority of India Act, 2008. The statutory functions of the AERA are to determine the tariff for the aeronautical services taking into consideration a number of factors like capital expenditure incurred and timely investment in improvement of airport facilities, service provided and its quality, revenue received from services other than aeronautical services, concession offered by the Central Government in any agreement, etc.

Apart from this, AERA determines the amount of the Development Fees in respect of major airports and the amount of the Passengers Service Fee levied under rule 88 of the Aircraft Rules, 1937 made under the Aircraft Act, 1934. It monitors the set performance standards relating to quality, continuity and reliability of service as may be specified by the Central Government or any authority authorised by it in this behalf.

### **2.3 Airports Authority of India (AAI)**

The Airports Authority of India (AAI) is an organisation working under the Ministry of Civil Aviation that manages most of the airports in India. The AAI manages and operates 126 airports and 329 airstrips, including 16 international airports, 89 domestic airports and 26 civil enclaves.

The main functions of AAI inter alia include construction, modification & management of passenger terminals, development & management of cargo terminals, development & maintenance of apron infrastructure including runways, parallel taxiways, apron etc., provision of communication, navigation and surveillance which includes provision of DVOR / DME, ILS, ATC radars, visual aids etc., provision of air traffic services, provision of passenger facilities and related amenities at its terminals thereby ensuring safe and secure operations of aircraft, passenger and cargo in the country.

### **2.4 Directorate General of Civil Aviation (DGCA)**

The Directorate General of Civil Aviation (DGCA) is the Indian governmental regulatory body for civil aviation under the Ministry of Civil Aviation. DGCA renders advice to the Government on matters relating to air transport including bilateral air services agreements, on ICAO matters and generally on all technical matters relating to civil aviation, and acts as an overall regulatory and developmental body for civil aviation in the country.

The authority is responsible for registration of civil aircraft; formulation of standards of airworthiness for civil aircraft registered in India and grant of certificates of airworthiness to such aircraft; licensing of pilots; licensing of air traffic controllers; granting of Air Operator's Certificates to Indian carriers and regulation of air transport services operating to/from/within/over India by Indian and foreign operators, including clearance of scheduled and non-scheduled flights of such operators. DGCA also conducts investigation into accidents/incidents and takes accident prevention measures including formulation of implementation of Safety Aviation Management Programmes.

### **2.5 The Issues**

Notwithstanding the impressive numbers and future projections relating to the prospects for Indian civil aviation, there are important reforms that are needed to realize this potential. Even from the perspective of Indian carriers, they presently carry only 30 per cent of the country's international traffic. Indian carriers are also not able to tap into intercontinental markets like Europe to South East Asia and Europe to Australasia. The Indian carriers Air India, Jet Airways and Kingfisher have 1 per cent of this traffic share. On the Europe to Australasia route Indian carriers again have a negligible presence.

A lot of this state of affairs has to do with the regulatory bottlenecks that exist in the Indian aviation sector. The regulations constrain not only the expansion of Indian carriers but also the expansion of the sector as a whole that can also help economic growth.

Some of the significant regulatory policy decisions have to do with:

1. Bilateral air service agreements that India has with various countries for operating flights to and from India.
2. ATF taxes.
3. Service tax on tickets.
4. Foreign direct investment in private Indian carriers.

## 2.6 Air Services Agreements

Bilateral air services agreements are official agreements that governments of various countries exchange with each other so as to allow their airlines to operate flights between the two countries. In principle, these agreements help expand the services available to the consumers and economic activities such as business operations and tourism. The agreements create an opportunity for the expansion of the domestic airlines and also international airlines. However, realizing the benefits of this opportunity will also depend on the network that the airlines are able to create globally.

India has allowed operations of international airlines under bilateral agreements as well as an 'open sky' policy to facilitate global commerce and transportation. There is an obvious concern that this policy has not led to the expansion of Indian carriers as much as it has helped expand traffic volumes.

The situation in Indian aviation has changed dramatically in the last decade with private domestic Indian carriers growing substantially. Today Jet Airways, SpiceJet, IndiGo, Air India, Air India Express, JetLite and Kingfisher are flying to different parts of the world. At the moment Air India, Jet and Kingfisher are operating to Europe, America and Canada. Along with these three airlines, other Indian private carriers are also operating to destinations in South Asia, the Far East and the Gulf.

Strategies to provide adequate opportunities to Indian carriers should be pursued while Indian consumers and global travel is not restricted by such policies.

## 2.7 Aviation Turbine Fuel Cost

One of the most critical issues in Indian aviation is the high price of ATF. Cost of ATF constitutes approximately 40 to 50 per cent of the operational expenses of an airline in India. The world average cost on ATF is 20 per cent of an airline's operational expenses. ATF prices at Delhi and Mumbai airports are 10 to 18 per cent higher than those at other competing hubs.

ATF's base cost in India has increased by 46 per cent since 2007 which has led to a further dent in the profitability especially of Indian carriers.

The reason for this state of affairs is the fact that the sale of ATF in India is subject to a number of taxes and duties that add to the already higher base cost of the fuel. The sales tax on ATF imposed by state governments is the biggest component here as this tax ranges from 16 per cent to 30 per cent in the different states with an average of around 25 per cent across the country.

One measure that is likely to benefit the sector is the direct import of ATF by the airlines. This may help in the reduction of cost of fuel.

## 2.8 Service Tax on Air Tickets

Another major policy working against the aviation industry is the service tax that is levied by the government on air tickets. Not only is India among the few countries in the world which levy this tax, but this service tax is also among the highest in the world.

Just as high ATF taxes make cost of operating airlines more expensive, service tax on air tickets makes air transport more expensive to travellers which in turn limits the growth of both domestic and international travel.

The Indian government started levying service tax on air tickets in July 2010. During financial year 2012–13, the service tax on air tickets was increased four times and now it is levied on 40 per cent of the gross value of the ticket (earlier it was 10 per cent of the gross value or Rs 100 per journey, whichever was lower for domestic passengers flying on any class and 10 per cent of the gross ticket value or Rs 500 per journey whichever was lower for international travel).

This changeover to an ad valorem rate of taxation without any maximum cap means that air travellers now have to pay much more for flying in India.

## 2.9 Foreign Direct Investment in the Domestic Airline Industry

At present there is no automatic approval given to an international airline or a firm wanting to invest in a domestic carrier. Each proposal has to be approved by the inter-ministerial Foreign Investment Promotion Board (FIPB) under the Commerce Ministry.

The situation was, however, different a few years ago when foreign airlines were allowed to invest in domestic airlines till the mid-1990s. Hence, Jet Airways had a stake from Kuwait Airways and Gulf Air. The policy was changed and when that happened, Jet Airways bought back the equity that foreign airlines owned in its airline.

Today, there are a number of foreign airlines which may be interested in acquiring a stake in domestic Indian airlines. This is primarily because India is one of the few global aviation markets that are seeing strong growth. It makes sense for international carriers to look at investing in domestic Indian airlines for various other reasons as well. Compared to a developed aviation market like the US, which has around 2.5 air trips per year per capita, India has under 0.05 air trips per capita per year so there is a large domestic market potential in the coming years.

Changing the policy on FDI in aviation will also provide a breather to Indian carriers who are finding it financially difficult to keep their operations afloat. Further, creditors to the airlines too need assurances that they will get returns on the investments that they have made in domestic airlines. Moreover requirements of capital will be increasing for expanding the sector to meet the future needs

The present economic conditions and air transport's role in it points to the need for investment and regulatory reforms to realise its full potential. It is expected that demand for air transport will grow in the future in view of the continued globalisation of the Indian economy, the growing GDP, anticipated policy reforms to facilitate expansion of civil aviation sector, as well as the ongoing investments in airport modernisation.



## 3. Emirates in India

### 3.1 Introduction

Emirates Airline is an independent international airline based in Dubai and one of the world's largest. In 2011/12 it carried 34 million passengers and flew to 122 destinations in 72 countries. Its operations in India started in 1985 with 10 flights per week to Mumbai and Delhi. Currently, Emirates operates 185 passenger flights every week between Dubai and 10 places in India, namely Ahmedabad, Bengaluru, Chennai, Delhi, Hyderabad, Kochi, Kolkata, Kozhikode, Mumbai and Thiruvananthapuram.

Over the last 27 years, Emirates has progressively increased its investment in the Indian market and expanded its services. Trade and tourism links between UAE and India have benefited Emirates' growth. In fact, Emirates has served as an important catalyst in creating broader bilateral links between the two countries. Emirates is a commercial carrier and its operation in India is driven by rational commercial behaviour. This has allowed Emirates to grow in India, and India in turn to benefit from its services.

### 3.2 Emirates in the Indian Air Transport Sector

In the last three years, Emirates' contribution to India's air transport industry has grown significantly. India's international passenger traffic increased from 32 million in 2008–09 to 38 million in 2010–11, an increase of 20 per cent (Table 3.1). In the same period, Emirates' contribution to India's international passenger traffic increased from 9.84 to 12.26 per cent.

In addition to passenger traffic, Emirates has also significantly contributed to India's international cargo traffic segment. India's international cargo traffic was 1.15 million tonnes in 2007–08 which grew to 1.50 million tonnes in 2010–11, a 30 per cent increase. During the same period, Emirates' cargo traffic in India, as a percentage of India's total international cargo, increased from 11.43 to 14.39 per cent.

**Table 3.1: International Air Traffic: Emirates and India**

		2008–09	2009–10	2010–11
Passenger millions	India	31.58	34.37	37.91
	Emirates	3.11	4.15	4.65
	Emirates (%)	9.84	12.09	12.26
Cargo '000 tonnes	India	1149	1271	1496
	Emirates	131	190	215
	Emirates (%)	11.43	14.92	14.39

Source: Emirates; Airport Authority of India.

Table 3.2: Emirates' passenger (in numbers) and Freight Traffic (in tonnes) in India

Emirates' passenger traffic in India												
Hub Airport		Non-hub Airports (South India)								Non-hub Airports (Other than South India)		
	Delhi	Mumbai	Bengaluru	Chennai	Hyderabad	Kochi	Kozhikode*	Thiruvananthapuram	Kolkata	Ahmedabad		
2008-09	517,232	736,123	243,465	364,301	334,591	301,012	120,794	186,927	154,585	146,429		
2009-10	669,118	889,424	393,971	511,988	402,452	407,312	231,279	242,265	198,295	207,884		
% growth from 2008-09 to 2009-10	29	21	62	41	20	35	91	30	28	42		
2010-11	677,694	950,284	444,077	575,848	470,951	424,948	328,801	288,961	248,154	237,619		
% growth from 2009-10 to 2010-11	1	7	13	12	17	4	42	19	25	14		
2011-12	707,195	949,402	445,375	584,267	490,543	433,487	328,682	297,100	239,402	234,343		
% growth from 2010-11 to 2011-12	4	-0.1	0.3	2	4	2	-0.04	3	-4	-1		
Emirates' freight traffic (tonnes) in India												
2008-09	19,387	34,600	12,699	23,005	7,154	9,510	2,615	9,404	7,291	5,669		
2009-10	30,672	49,458	19,163	31,701	10,125	12,602	7,616	11,887	9,931	6,394		
% growth from 2008-09 to 2009-10	58	43	51	38	42	33	191	26	36	13		
2010-11	32,570	53,140	22,794	37,059	14,247	11,321	8,599	14,795	12,222	8,527		
% growth from 2009-10 to 2010-11	6	7	19	17	41	-10	13	24	23	33		
2011-12	28,432	51,561	19,813	31,836	13,620	9,309	9,684	15,194	11,672	8,676		
% growth from 2010-11 to 2011-12	-13	-3	-13	-14	-4	-18	13	3	-5	2		

Source: Emirates, \*Operation at Kozhikode commenced from 1<sup>st</sup> July 2008.



### 3.3 Emirates Passenger and Freight Traffic in 10 Indian airports

Table 3.2 shows Emirates' international passenger and freight traffic at 10 airports in India for four years, 2008-09 to 2011-12. During the years 2008-09 to 2010-11, Emirates' passenger and freight traffic steadily increased in nine airports, with one exception being a decline in freight traffic at Kochi airport in 2010-11. The year 2011-12, however, has shown a decline in both the passenger and freight traffic strength at most of the airports as the economy slowed down in India considerably during the year.

A comparison of year-on-year data reveals that Emirates' traffic grew to non-hub airports by 66 per cent, compared to 32 per cent in India's hub airports over the last four years. The share of two airport hubs, i.e. Mumbai and Delhi, in Emirates' overall passenger traffic declined as the share of passenger traffic grew in some non-hub and regional airports such as Kozhikode. The combined share of the two airports of Mumbai and Delhi has decreased from 40 per cent in 2008-09 to 35 per cent in 2011-12. Mumbai's share in passenger traffic dropped to 20 per cent in 2011-12 from 24 per cent in 2008-09. Delhi's share dropped to 15 per cent in 2011-12 from 16.7 per cent in 2008-09. Yet Emirates continues to grow in passenger volumes at both airports. On a stand-alone basis, Mumbai witnessed arrivals and departures totaling 949,402 passengers carried by Emirates in 2011-12, an increase of 29 per cent from 736,123 in 2008-09. Delhi registered arrivals and departures of 707,195 Emirates passengers in 2011-12, an increase of 32 per cent from 517,232 in 2008-09.

The share of these two airports in Emirates' Indian freight traffic also decreased, even though overall freight volume rose. This is because at these airports, as with passenger operations, freight at points other than Mumbai and Delhi have grown at faster rates. Comparing 2009-10 and 2010-11 data indicates that Emirates' international passenger traffic increased by 42 per cent in Kozhikode and 25 per cent in Kolkata. Against such gains, passenger traffic in Mumbai and Delhi in the same period increased by a mere 7 per cent and 1 per cent, respectively. Over the same period, Emirates' freight traffic at Ahmedabad and Hyderabad increased by 33 and 41 per cent, respectively while the increase in Delhi and Mumbai were just 6 and 7 per cent, respectively.

Between 2008-09 and 2009-10, Emirates' passenger volume to and from India grew by 1.04 million. i.e., 34 per cent, was due to the increase in passenger volumes at the non-hub airports. Table 3.3 below presents Emirates' growth in hub and non-hub points. The adverse impact of slower economic growth in 2011-12 on passenger traffic was less pronounced in Mumbai and Delhi as compared to the other airports in the country but the freight traffic declined in the hub airports more than in the non-hub airports.

Table 3.3: Emirates in India: Year to year growth (%)

Year	Hub airports (Delhi and Mumbai)	Secondary airports	All airports
<b>Passenger</b>			
2008-09 to 2009-10	24	40	34
2009-10 to 2010-11	4	17	12
2010-11 to 2011-12	2	1	1
<b>Freight</b>			
2008-09 to 2009-10	48	43	44
2009-10 to 2010-11	7	19	14
2010-11 to 2011-12	-7	-5	-7

Source: Emirates.

The growth of Emirates freight traffic in India was higher in hub points than in non-hub points during 2008-09 to 2009-10. However, during 2009-10 to 2010-11, the growth rate was more in non-hub points than in hub points. The overall trend shows increasing focus of Emirates' operation in non-hub points.

### 3.4 Share of Emirates' Traffic at Various Indian Airports

Table 3.4 and Figures 3.1 to 3.2 present Emirates' passenger and freight traffic as a percentage of total international passenger and freight traffic at 10 airports in India. Emirates' share is the lowest in main hubs like Delhi and Mumbai. However, it accounts for considerable traffic at smaller airports such as Ahmedabad, Hyderabad, Bengaluru and Kozhikode. Thus, Emirates has a positive contribution in promoting traffic in major non-hub airports. Delhi and Mumbai together represented an average 49 per cent of India's international passenger traffic during 2008-09 to 2010-11. The average percentage of international passengers at Ahmedabad is 2 per cent, Hyderabad - 5 per cent, Bengaluru - 5.5 per cent and Kozhikode - 5 per cent over the three year period from 2008-09 to 2010-11. The total international passenger share of eight airports (Emirates' 10 Indian destinations excluding Delhi and Mumbai) is 39 per cent.

Table 3.4: Emirates' Passenger and Freight Share in 10 Airports (%)

	Emirates' Passenger Share in 10 Airports			Emirates' Freight Share in 10 Airports		
	2008-09	2009-10	2010-11	2008-09	2009-10	2010-11
Ahmedabad	21.4	24.54	28.74	55.07	54.85	65.69
Bengaluru	14.83	20.29	19.97	12.74	18.65	16.85
Mumbai	9.07	10.8	10.47	9.14	12.11	11.3
Kozhikode	7.97	13.95	17.97	20.83	44.46	39.15
Kolkata	15.43	16.7	17.38	17.9	24.77	27.1
Kochi	14.98	18.29	18.02	37.71	38.45	35.16
Delhi	6.66	8.05	7.31	6.51	9.2	8.33
Hyderabad	21.35	23.46	24.91	24.12	27.9	33.84
Chennai	9.94	13.26	13.56	10.48	12.7	12.54
Thiruvananthapuram	12.68	14.29	15.68	31.17	37.49	39.15

Source: Emirates; Airport Authority India.

Figure 3.1: Emirates Passenger Share at Hub Airports and Non-Hub Airports (%)

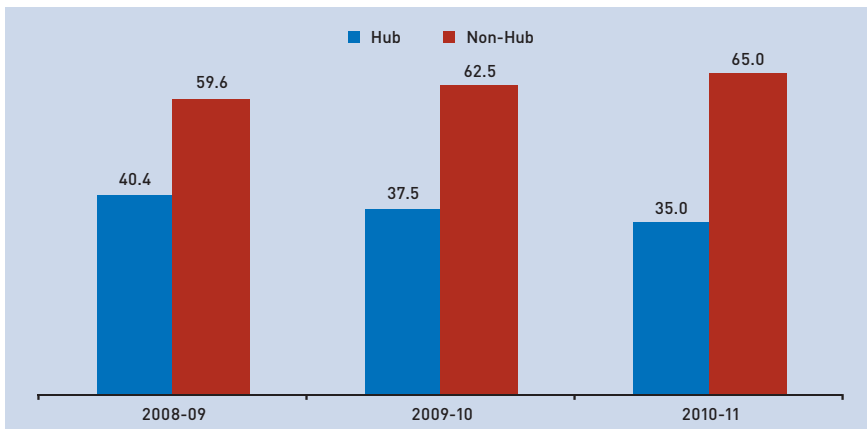
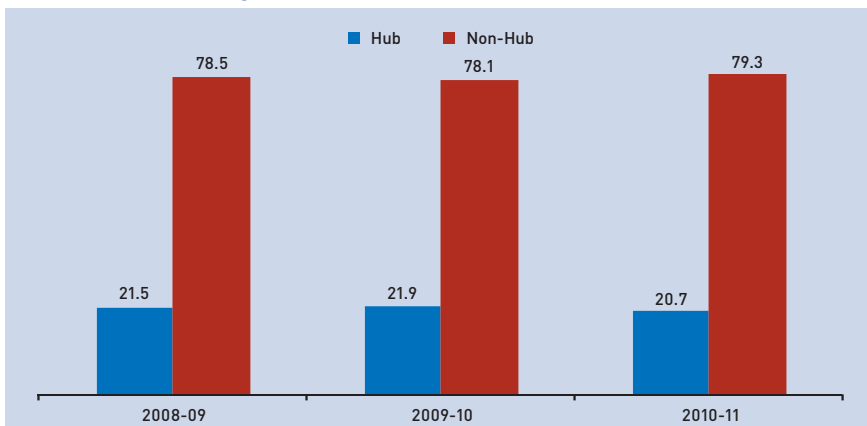


Figure 3.2: Emirates Freight Share at Hub and Non-Hub Airports (%)



It may be noted that India's international traffic at the non-hub airports have a lower share as a result of limited international links from these points. The higher percentage of Emirates' share at these airports demonstrates the fact that Emirates has no immediate substitute or potential competitor at these points. It also indicates that Emirates' passenger and freight operations to connecting points in India are often underserved by other carriers.

### 3.5 Emirates' Passenger Traffic: 3rd, 4th, and 6th Freedoms, 2011-12

International commercial aviation traffic rights are usually expressed as "freedoms of the air", which constitute a set of commercial aviation rights granting a country's airline(s) the privilege to enter and land in another country's airspace. There are six freedoms of which the first two are covered by IASTA (International Air Services Transit Agreement). They are the following, as defined by ICAO (International Civil Aviation Organisation):

**1st freedom:** The right or privilege, in respect of scheduled international air services, granted by one State to another State or States to fly across its territory without landing.

**2nd freedom:** The right or privilege, in respect of scheduled international air services, granted by one State to another State or States to land in its territory for non-traffic purposes.

The 3rd, 4th, and 5th freedoms are negotiated between countries through ASAs (Air Services Agreements). They are as follows:

**3rd freedom:** The right or privilege, in respect of scheduled international air services, granted by one State to another State to put down, in the territory of the first State, traffic coming from the home State of the carrier.

**4th freedom:** The right or privilege, in respect of scheduled international air services, granted by one State to another State to take on, in the territory of the first State, traffic destined for the home State of the carrier.

**5th freedom:** The right or privilege, in respect of scheduled international air services, granted by one State to another State to put down and to take on, in the territory of the first State, traffic coming from or destined to a third State, for example New Delhi-London-New York and vice versa for Indian carriers (5th freedom rights granted by UK applies in the example).

**6th freedom:** The privilege, in respect of scheduled international air services, of transporting, via the home State of the carrier, traffic moving between two other States. For example, in India the 6th freedom traffic of Emirates involves flying passengers from India through Dubai (its home state) to Egypt, South Africa or Brazil. Table 3.5 below presents Emirates' passenger traffic for 2011-12 divided into 3rd/4th and 6th freedom traffic.

**Table 3.5: Emirates' Passenger Traffic in India: To and From Dubai and Beyond (%), 2011-12**

	Emirates' passenger traffic in India: to/from Dubai and beyond (%)		6th freedom traffic			
	3rd/4th free-dom traffic (to/from Dubai)	6th free-dom traffic (to/from beyond Dubai)	to/from points	to/from points served by non-Indian carriers	to/from points without any direct link	Others
Ahmedabad	32	68	9	2	89	0
Bengaluru	40	60	0	24	75	0
Mumbai	53	47	28	14	57	1
Kozhikode	65	35	62	15	23	0
Kolkata	34	66	0	5	95	0
Kochi	49	51	14	1	84	0
Delhi	41	59	25	19	55	1
Hyderabad	32	68	10	21	69	0
Chennai	42	58	15	25	61	0
Thiruvananthapuram	53	47	19	6	75	0
India	45	55	18	15	67	0

Source: Emirates.

For the 10 airports Emirates serves in India, 45 per cent of Emirates' passengers flew to Dubai from India, while 55 per cent travelled between Indian points and destinations beyond Dubai.

Table 3.5 gives a further division of the 6th freedom traffic carried by Emirates. It shows that only 18 per cent of the 6th freedom passengers fly between the points served by Indian carriers. For Bengaluru and Kolkata, Emirates carries no 6th freedom passengers between points where other Indian carriers operate. Only 9 per cent of the 6th freedom passengers from Ahmedabad are carried to points where Indian carriers operate. Apart from Kozhikode, Emirates' 6th free-dom passenger traffic from points where Indian carriers operate is very low. This implies that Emirates' 6th freedom traffic poses little competition to Indian carriers.

Emirates' 6th freedom passenger traffic from points where Indian carriers operate is very low. This implies that Emirates' 6th free-dom traffic poses little threat or competition to Indian carriers.

A similar conclusion can be drawn considering Emirates' 6th freedom passenger traffic to points served by non-Indian carriers. Out of Emirates' 6th freedom passenger traffic at the 10 airports, only 15 per cent fly to and from points served by non-Indian carriers. As a result, ma-

majority of Emirates' 6th freedom passenger traffic is between points that have no direct link from the Indian points. On an average, 67 per cent of Emirates' 6th freedom passengers are carried between such points. At the airport level, the share of Emirates' 6th freedom passenger traffic to points without any direct link is as high as 95 per cent for Kolkata, 89 per cent for Ahmedabad, 84 per cent for Kochi, 75 per cent each for Bengaluru and Thiruvananthapuram, and 69 per cent for Hyderabad. At all airports except Kozhikode, which is principally guest worker and VFR (visiting friends and relatives) traffic, the split is more than 50 per cent. Table 3.6 shows the connectivity in terms of number of points for Emirates' 6th freedom passenger traffic.

**Table 3.6: Number of Points Connected by Emirates' 6th Freedom Traffic, 2011-12**

	to/from points served by India carriers	to/from points served by non-Indian carriers	to/from points without any direct link	Others	Total
Ahmedabad	2	1	94	1	98
Bengaluru	1	8	82	7	98
Mumbai	11	14	64	10	99
Kozhikode	5	2	87	0	94
Kolkata	0	1	93	4	98
Kochi	6	1	87	3	97
Delhi	12	15	58	14	99
Hyderabad	3	4	88	3	98
Chennai	3	8	82	4	97
Thiruvananthapuram	4.0	1	88	1	94
India	14	17	53	15	99

Source: Emirates.

Emirates carried 6th freedom passengers to only 14 destinations abroad where Indian carriers operate. There are 17 points to which Emirates carried 6th freedom traffic where non-Indian carriers are also present. In addition, Emirates carried 6th freedom passengers between India and 53 foreign points that have no direct links. This number is more than triple the number of points on those destinations where the connectivity is provided either by Indian carriers or non-Indian carriers.

We observe that Emirates connects relatively small airports to a significant number of points beyond Dubai. Emirates connect 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, 93 to Kolkata and more than 80 points to and from each of the remaining airports.

It is evident that Emirates contributes significantly to the connectivity of eight non-hub airports 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. Connectivity to

and from airports that are not directly linked is the lowest for hub airports where other non-Indian carriers are available. 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.

A recent report by Oxford Economics<sup>2</sup> on Indian Transport found that an improvement in connectivity brings benefits to users of air transport services by: reducing time spent in transit, allowing for shorter waiting times and improving the quality of service. Improvements in connectivity also reduce the cost of air transport services making air transport more competitive relative to other modes of transport. This competitive edge places air transport in the set of factors facilitating international trade.

### 3.6 Emirates' Passenger Traffic to MENA Countries, 2011-12

In 2011-12, Emirates carried passengers between India and 66 countries. India, being an important investment destination and trading partner of the MENA (Middle East and North African) countries,<sup>3</sup> witnessed a lot of passenger traffic to and from these nations. At present, Emirates carries passengers between India and 16 MENA countries via its hub in Dubai. With Emirates' 6th freedom traffic into and out of India, 57 per cent is with the MENA region. The traffic share of the other 50 countries connected to India by Emirates is 43 per cent. Table 3.7 and Figures 3.3 and 3.4 show the percentage of Emirates' traffic between the MENA region and India and the percentages of Emirates' traffic at Indian airports to 50 non-MENA destinations.

**Table 3.7: Emirates' Passenger Traffic: India - MENA and India - outside MENA, 2011-12 (%)**

City	Emirates' passenger traffic: India-Middle East & North Africa (MENA) (%)	Emirates' passenger traffic: India - 45 countries outside MENA (%)
Ahmedabad	41	59
Bengaluru	49	51
Mumbai	59	41
Kozhikode	92	8
Kolkata	50	50
Kochi	58	42
Delhi	49	51
Hyderabad	51	49
Chennai	54	46
Thiruvananthapuram	72	28
India	57	43

Source: Emirates.

2. Oxford Economics (2011), Economic benefits from air transport in India.

3. India represents 1 to 4 per cent of total imports of most MENA countries [World Bank (2008) "Strengthening MENA's trade and investments links with China and India"]

Figure 3.3: Emirates' Passenger Traffic: India to Middle East and North Africa (MENA) 16 countries, 2011-12, [%](2.7 million PAX)

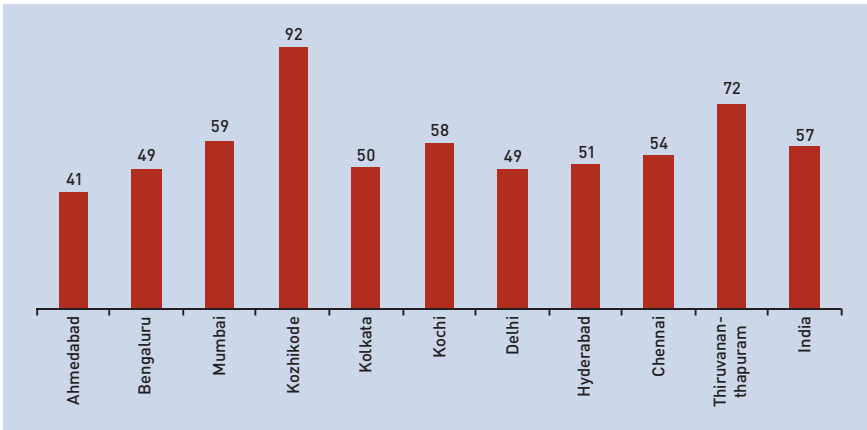
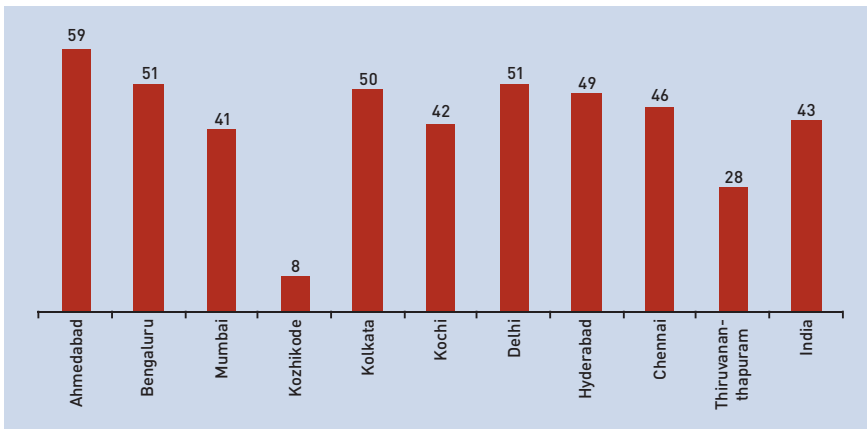


Figure 3.4: Emirates' Passenger Traffic: India to 50 countries outside MENA, 2011-12, [%](2.0 million PAX)



In all the Indian airports that Emirates serves apart from Ahmedabad, the majority of passenger traffic is carried between India and MENA countries. In Kozhikode and Thiruvananthapuram, the share is as high as 92 per cent and 72 per cent respectively. Even at a small airport like Kochi, 58 per cent of Emirates' passengers fly to MENA countries. Only Delhi, Bengaluru, and to some extent Kolkata, witness equal distribution of passengers to both MENA and non-MENA countries. Emirates carried passengers from all the Indian points to each of the 16 MENA countries. Apart from Thiruvananthapuram, Emirates connects each of the 10 Indian points to 50 non-MENA countries.

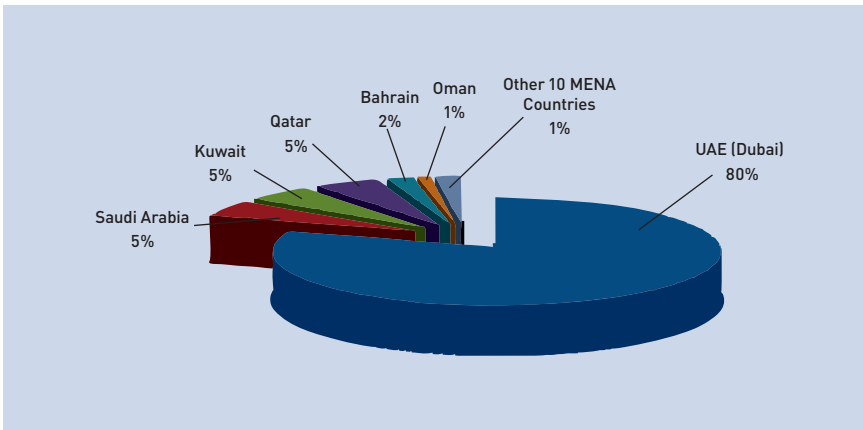
The following are the details of Emirates' India traffic with MENA countries (2.7 million passengers) (Figure 3.5).

- UAE (Dubai) – 80 per cent
- Qatar – 5 per cent



- Kuwait – 5 per cent
- Saudi Arabia – 5 per cent
- Bahrain – 2 per cent
- Oman – 1 per cent
- Other 10 MENA countries – 2 per cent

Figure 3.5: Emirates' India Traffic to/from MENA Countries, 2011-12, [%]  
(2.7 million PAX)





## 4. Economic Impacts Associated with Emirates Airline Operations in India

### 4.1 Introduction

This chapter presents a brief overview of the overall economic and social impact of the air transport operations in a country. Estimating the economic impact can be helpful for understanding potential benefits. Other than generating income and employment opportunities in the aviation sector itself, an airline service also provides benefits to the public in the form of a comfortable, fast and modern mode of transport. At the outset, a short note on the economic rationale is being provided that brings out the importance of the air transport facilities in the overall performance of the economy.

This chapter also examines in detail the economic benefits that the Indian operations of Emirates Airlines provide to the Indian economy. These benefits are accrued through the following channels:

**Direct impacts:** Benefits specific to the aviation sector by generating economic activities and business opportunities at airports and supporting services.

**Multiplier effects:** The additional income and employment opportunities generated in other sectors of the economy down the supply line of aviation sector.

**Induced impacts:** The effects of airlines' operation, in addition to direct and multiplier effects, by enabling activities in other sectors of the economy, such as tourism.

### 4.2 Economic Contributions of Airline Operations

Air transport services and economic growth are related through a series of mutually causal feedback mechanisms. The causality is the relationship between an event, for example the provision of air transport, and the second event, that is, the economic growth. Thus, both the airlines' operations and economic growth impact each other. Air transport generates income and employment in the aviation sector and also contributes in the form of wider socioeconomic benefits through its potential to enable certain type of activities in an economy. For instance, the availability of air transport services effectively increases the scope of economic activity. This economic activity in turn generates the need for air transport of passenger and freight, and drives the demand for air transport services.

At the macroeconomic level, air transportation impacts the economy by not only providing employment but also by enabling access to:

- Markets
- People and communities
- Capital

- Ideas and knowledge
- Labor supply, skills, and opportunities
- Resources

This macro level impetus to the economy in turn provides capital and generates demand for passenger and freight travel. This mutually beneficial mechanism drives both economic development and air transport.

The following distinctive features of air transport sets it apart from other modes of transportation, such as:

- Speed
- Cost
- Flexibility
- Reliability
- Safety

In addition, air transport is the only feasible long-distance mode of transportation for high-value perishable commodities. It is often the only means of access for geographically remote or isolated areas and also critical for time-sensitive corporate initiatives. It is because of these features that the economic impact of air transport differs from other transport modes.

Internal to the air transportation system is the supply and demand relationship. Airlines provide supply through pricing and scheduling of flights based on the revenues and profitability of a particular route, factors that are governed by both passenger and freight demand on these routes. The passenger flow can be divided into three categories:

- Business
- Leisure (holiday and recreation)
- Personal (visiting friends and relatives, and education related trips)

The passenger flow shapes up the economy by its effect on investment, tourism, remittance and knowledge. The cargo flow similarly affects the economy by enabling a faster flow of exports and imports.

Several methodologies exist in economic literature to examine the effect of airlines' operation in each dimension, namely:

- Investment
- Tourism
- Remittances

### Flow of knowledge across borders

These methodologies differ in their purpose and data requirements. Often, a distinction is made between air transport's impact on an economy along the lines of direct impact, indirect impact, and induced impact.

Of all the quantitative economic techniques, Input–Output model represents the interdepen-

dence between different sectors (industries) of an economy. This technique is widely used in order to assess the economic impact of air transport. The present study uses the Input-Output model of the Indian economy to study the economic impact of Emirates' operation in India. The methodology allows for the identification of output and employment multiplier effects. The impact on tourism sector of India is obtained using an indirect estimation method.

Therefore, the focus of the study is to quantify the impact of Emirates' operation in India along the following lines:

- Direct impact
- Multiplier impact – output and employment
- Induced effect on tourism

### 4.3 Direct Impact of Emirates' Operation in India

An airline operation requires a wide range of facilities and supporting services provided by the airport. Since Emirates is the largest foreign airline operating in India and creates significant demand for services at the 10 airports it serves, its expenditures contribute significantly to the Indian aviation industry.

#### 4.3.1 Direct contribution to Indian civil aviation

Emirates' operation in India contributed US\$ 274 million in 2010–11. This is 0.32 per cent of India's transport GDP<sup>4</sup> for the year (Table 4.1).

**Table 4.1: Emirates' Direct Contribution in India's Economy: 2008–09 to 2010–11**

Year	Contribution (in million US \$)	% Transport GDP of India
2008–09	134	0.20
2009–10	217	0.33
2010–11	274	0.32
Overall (Total & Average)	631	0.28

Source: Emirates; Central Statistical Organisation, India.

The total for three years has been calculated using deflator and adjusts for inflation. Emirates' total contribution for the last three years is worth US\$ 631 million in 2010 after adjusting by deflator.<sup>5</sup>

4. Transport GDP of India includes contribution from land, water, and air transport and services incidental to it. Its average share in total GDP over the last three years is 5.4 per cent. The lion's share of transport GDP comes from road transport, followed by air and water transport. In 2010–11, the transport GDP of India is US\$ 85542 million (estimate) and the air transport GDP is US\$3311 million (estimate).

5. Deflators are used to compare relative worth of money in different periods of time. The idea derives from the observation that with positive inflation, value of money decreases. Hence adjustment is required to compare the amounts in different time periods. We use US GDP deflator to calculate the value of Emirates' contribution in the three-year period. GDP deflator is provided by the Bureau of Economic Analysis, US Department Commerce.

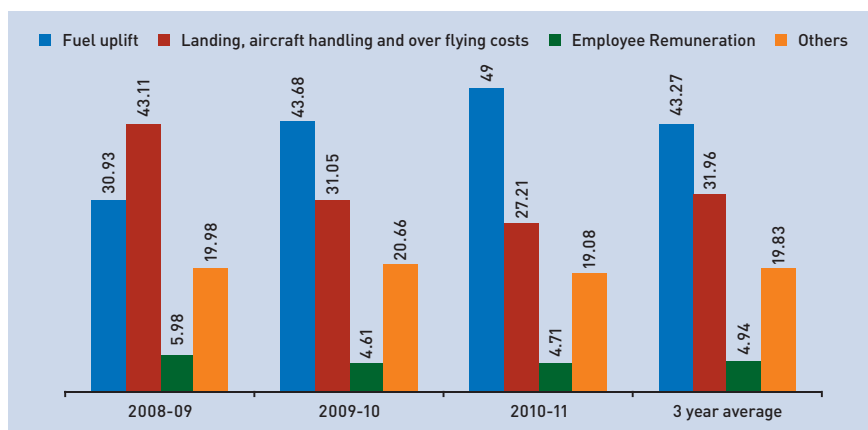
Emirates' direct contribution generates demand for goods and services essential for its operation. Table 4.2 and Figure 4.1 show the share of Emirates' main expenditures in India. Of the total expenditures over the last three years, 43 per cent accounts for fuel uplift and 32 per cent on services such as landing, handling and over-flight charges.

On an average, 5 per cent of Emirates' expenditure in India goes to employee remuneration. Emirates has its operational base in Dubai and a low employment base in India as compared to Indian carriers. Indian carriers account for an average of 9.23 per cent of expenditure towards employee remuneration. Emirates' per capita expenditure on employee remuneration is higher.

**Table 4.2: Emirates Expenditure in India: 2008–09 to 2010–11 (%)**

	2008–09	2009–10	2010–11	3 year average
Fuel uplift	30.93	43.68	49.00	43.27
Landing, aircraft handling and over flying costs	43.11	31.05	27.21	31.96
Employee remuneration	5.98	4.61	4.71	4.94
Others	19.98	20.66	19.08	19.83
Total	100	100	100	100

**Figure 4.1: Distribution of Emirates' Expenditure in different components in India (%)**



Source: Emirates.

#### 4.3.2 Direct contribution at Indian airports

Table 4.3 shows Emirates' direct contribution at the airports it serves in India. In all 10 airports the expenditures incurred by Emirates increased by 106 per cent over the last three years. The highest increase was registered at Hyderabad (160%) followed by Kozhikode (157%). In 2010–11, only 35 per cent of Emirates' direct contribution in terms of passenger share went to the three big airports of Mumbai, Delhi, and Chennai whereas 65 per cent was spent on non-hub airports. This indicates Emirates' role in developing economic activities at non-hub points.

**Table 4.3: Emirates' Contribution at Points of Operation: 2008–09 to 2010–11, (million US\$)**

		2008-09	2009-10	2010-11
Hub Airports	Delhi	13	23	30
	Mumbai	16	33	37
Non-hub Airports	Bengaluru	11	20	23
	Hyderabad	9	15	24
	Kochi	12	17	17
	Ahmedabad	5	8	9
	Kozhikode	5	8	12
	Kolkata	9	10	16
	Chennai	16	24	31
	Thiruvananthapuram	7	10	15
	Overheads in India	30	49	60
Total		134	217	274

Source: Emirates.

Analysis of the data<sup>6</sup> reveals that the growth slowed down during 2009–10 to 2010–11 compared to the previous period of 2008–09 to 2009–10. The average growth of direct contributions among the 10 Indian airports was 58 per cent for the period 2008–09 to 2009–10. It declined to 32 per cent during 2009–10 to 2010–11. This decline in growth of direct contributions can be attributed to the increase in Emirates' seat factor at different airports.

**Table 4.4: Emirates Seat Factor at 10 Airports: 2008–09 to 2010–11 (%)**

	2008-09	2009-10	2010-11
Ahmedabad	72.52	78.43	83.58
Bengaluru	60.18	72.93	82.3
Mumbai	78.35	81.58	86.59
Kozhikode	75.61	88.92	90.84
Kolkata	77.57	79.92	73.51
Kochi	86.9	87.16	88.58
Delhi	80.03	81.9	82.33

(Contd.)

6. The year to year growth calculation does not incorporate deflator. However, the high percentages imply that even after deflating for price changes the growth figures remain substantial and do not alter the conclusions derived.

Table 4.4: (Contd...)

Hyderabad	66.44	73.01	83.72
Chennai	81	78.87	84.96
Thiruvananthapuram	89.02	86.93	83.2
Average	76.47	80.39	84.32

Source: Emirates.

### 4.3.3 Seat factors

- Emirates' average seat factor in 2008-09 was 76 per cent. At four airports, the seat factors were greater than 80 per cent.
- The average seat factor grew to 80 per cent in 2009-10, leaving limited opportunity to expand and revealing significant capacity constraints. In 2009-10, the number of airports where Emirates had above 80 per cent seat factor increased to five.
- In 2010-11, Emirates' operations in India enjoyed higher demand, with seat factor registering 84.3 per cent, exceeding 80 per cent at all airports except Kolkata.

This indicates that with the present high seat factors, Emirates' growth in terms of its contribution to the Indian economy is being slowed down and its operations capped by the current bilateral agreement.

Emirates' contribution to Kozhikode increased by 157 per cent in the last three years. Its seat factor in this airport was 76 per cent in 2008-09 which increased to 91 per cent in 2010-11. Without an increase in seat allocation, the growth in economic benefits to Kozhikode is liable to slow down, as operating at 91 per cent seat factor already implies a binding constraint on traffic growth.

Similarly, the growth of Emirates' contribution to Kochi over the last three years, 36 per cent, has been the lowest among all airports. Emirates' seat factor at Kochi was already 87 per cent in 2008-09, leaving limited scope for growth over the following years.

It is important to note that over the long-term, Emirates introduces capacity ahead of demand, and this is thought to have a catalytic effect by stimulating previously untapped demand. For example, in 2008-09 Emirates' seat factors in Bengaluru and Hyderabad were 60 and 66 per cent, respectively. This allowed Emirates to invest and stimulate market demand in these points. In 2010-11, the seat factors in these points grew considerably and stood close to the Emirates average seat factor in India.

### 4.3.4 Direct employment in India

As the largest international airlines in the Indian market, Emirates' operation has created substantial employment in the Indian economy.

- Emirates' operation in India involves 1045 employees in the country.
- Emirates' direct employment in India generated an income of US\$13 million for its employees in 2010-11.

This does not take into account the many more jobs that are supported by Emirates' service in the tourism and trade industries.



### 4.3.5 Contribution to the Indian carriers

Code sharing between two or more airlines is an agreement that allows the airlines to share a flight. One airline actually operates the flight; the others sell tickets on the flight.

Interline agreements between airlines allow carriage of passenger and freight by one airline on behalf of another airline through acceptance of the latter's tickets and coordinating through-check-in, baggage transfer, etc.

Emirates has interline arrangements with three Indian carriers, including a code share agreement with Jet Airways. The interline arrangements allow Emirates to sell tickets on Indian carriers for domestic connections.

Table 4.5 shows that in 2010–11, Emirates sold 33611 tickets on three Indian carriers, for which the total value was US\$4.07 million. The highest contribution was to Jet Airways at US\$ 2.91 million. It is also important to note that most of the coupons were sold abroad. Emirates' presence in more than 67 countries provides superior distribution and marketing channel for destinations in India. This has also been beneficial for Indian carriers.

**Table 4.5: Emirates' contribution to Indian carriers, 2010–11**

Carrier	Number of passengers	% sold abroad	Value (million US\$)
Air India	1423	94	0.24
Kingfisher	10629	92	0.92
Jet Airways	21559	89	2.91
Total	33611	-	4.07

*Note:* Emirates' interline agreement with Kingfisher Airlines ended on 12th March 2012.

*Source:* Emirates.

### 4.3.6 Media and other spending

Emirates' promotions, advertisements and sponsorships also generate income for the Indian economy. It spent US\$16 million during 2008–09 and 2009–10. In 2010–11, the media expenditure further increased to US\$22 million.

**Table 4.6: Emirates' Advertisement and Promotion in India (million US\$)**

Item of Expenditure	2008–09	2009–10	2010–11
Advertisement/promotion	12	13	13
Sponsorship /public relations	4	3	9
Total	16	16	22

*Source:* Emirates.

Emirates' contribution is summarised as follows:

- Emirates carried 12.26 per cent and 14.39 per cent of India's international passenger and freight traffic, respectively, in 2010-11.
- The airline carried 8.87 per cent of international passenger traffic at hub airports and 18.14 per cent of passenger traffic at non-hub airports in 2010-11.
- It accounted for 9.95 per cent of international freight traffic at hub-airports and 20.80 per cent of freight traffic at non-hub airports in 2010-11.
- Emirates' 6th freedom traffic in 2010-11 connected India to 89 points beyond Dubai, including points not served by Indian carriers. The connectivity expanded to 99 points beyond Dubai including 85 points not served by Indian carriers in 2011-12.
- The average connectivity of 6th freedom traffic is to 89 hub-airports and 87 non-hub airports in 2010-11. The connectivity to hub-airports increased to 99 points in 2011-12.
- Emirates' direct economic contribution was US\$66 million in hub-airports and US\$148 million in non-hub airports in 2010-11.

Table 4.7 adds up the direct economic contribution of Emirates in India in 2010-11.

**Table 4.7: Emirates' Total Contribution to India in 2010-11 (million US\$)**

Own operation	To Indian carriers	Advertisement and promotion	Total
274	4	22	300

It may be observed from the Table 4.7 that Emirates' direct economic contribution in 2010-11 was US\$300 million.

#### 4.4 Multiplier Impact of Emirates' Operation in India

Emirates' operation in India provides a positive impact not only on the civil aviation sector, but also in other sectors of the Indian economy. There is always a relationship between various sectors of an economy through inter-sectoral linkages. The outputs of one sector benefits other sectors and vice versa. These help generate additional income and employment in various sectors throughout the Indian economy.

We have already explained that present study is based on the Input-Output model of the Indian economy. This model helps to evaluate and quantify the benefits of inter-sectoral linkages in great detail. The Input-Output model allows the assessment of the multiplier effect. The multiplier effect is the mechanism that leads to incremental amounts of spending and consumption throughout the economy. This has a positive effect on India's GDP. Thus, knowledge about the multiplier effect will determine Emirates' total contribution to the economy in general, and in the air transport sector in particular. A technical description of the methodology is presented in the Appendix.

##### 4.4.1 Output multiplier impact

Output multipliers determine the impact of direct contributions in a sector to the whole economy. Our calculation shows that the output multiplier for Emirates' contribution in the Indian

economy is 2.176. The magnitude of the multiplier 2.176 implies that any contribution of Emirates to Indian air transport sector generates additional 117.6 per cent economic benefit or output in the economy through sectoral feedback mechanism. Thus, for every dollar spent by Emirates, an additional income of US\$1.176 is generated in other sectors of economy.

Table 4.8 further elaborates on the multiplier impact. In 2010–11, Emirates' direct contribution to the air transport sector has been estimated at US\$274 million, which in turn generated a total economic output of US\$596 million throughout the economy, an additional income of US\$322 million.

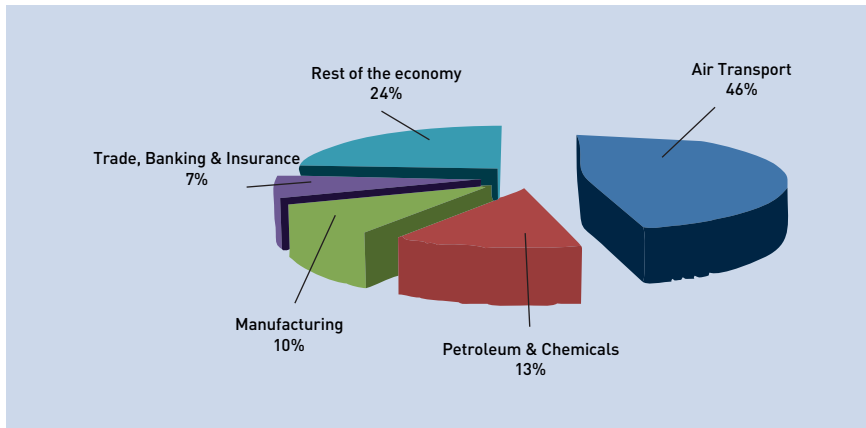
**Table 4.8: Multiplier Impact of Emirates' Contribution**

Year	Direct Impact	Multiplier impact	Gain (%)
2010–11	US\$274 million	US\$596 million	117.6

#### 4.4.2 Multiplier impact on sectors

Using the Input-Output model we can deduce the economic contribution of any specific sector to another sector. The Indian Input-Output model is a matrix of 130 by 130 sectors. For the sake of computational tractability, we have considered 30 important sectors in it. Figure 4.2 gives a clear picture of the distribution of the multiplier effect at the individual level of major group of sectors.

**Figure 4.2: Sector-wise Distribution of Multiplier Impact (%)**



In the Indian air transport sector alone, Emirates' operations generate an economic output of US\$274 million. This is nearly 46 per cent of the total income generated through the multiplier effect by Emirates in India. The petroleum and chemicals industry, which is an important ancillary industry of the air transport sector, is impacted by 13 per cent of the total multiplier effect benefits. The manufacturing sector accounts for 10 per cent gains due to multiplier impact of Emirates' operations; whereas trade, banking and insurance sectors are benefited by only 6 per cent of Emirates' total economic contribution. Other 25 per cent of Emirates' contribution goes to the remaining sectors of the Indian Economy.

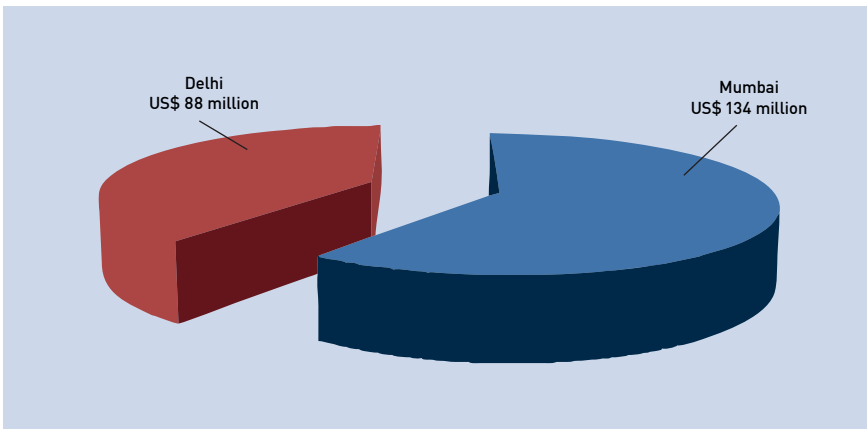
### 4.4.3 Impact on Indian cities

To assess the impact of the multiplier effect in the domestic economy, it is important to identify to what extent various cities have benefited from Emirates’ Indian operations. The model we used for this study provides us a method to calculate the monetary gains at the city level, where the multiplier effect of Emirates’ operation is calculated using weights estimated from direct contribution, and passenger and freight traffic at each airport.<sup>7</sup> The weights are calculated using regression analysis. Table 4.9 and Figures 4.3 and 4.4 below present the multiplier impact of Emirates’ operations throughout its Indian network.

**Table 4.9: Emirates’ Multiplier Impact at 10 Airports, 2010–11 (million US\$)**

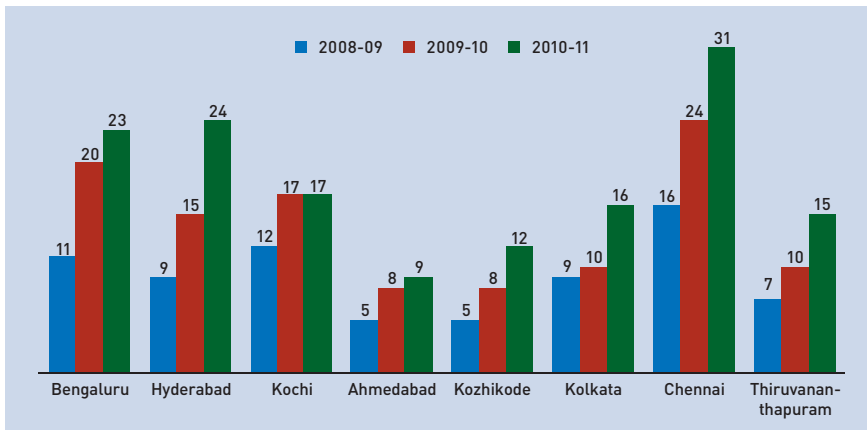
City	Values (million US\$)
Delhi	88
Mumbai	134
Bengaluru	60
Hyderabad	51
Kochi	44
Ahmedabad	27
Kozhikode	34
Kolkata	33
Chennai	87
Thiruvananthapuram	39
Total	596

**Figure 4.3: Emirates’ Multiplier Effect at Hub Airports: 2010–11 (million US\$)**



7. A regression analysis of direct contribution using passenger and freight traffic at each airport gives a weight of 5.04 per passenger and 94.96 per thousand tonnes of freight. This analysis is done for 2010–11, to which the multiplier impact corresponds.

Figure 4.4: Emirates' Multiplier Effect at Non-Hub Airports 2010–11, (million US\$)



Mumbai, the business capital of India, received US\$ 134 million, the highest share of Emirates' benefit. Emirates has 5 daily flights to Mumbai and operates with higher number of seats compared to other points. Mumbai is also India's leading international and domestic hub. Thus, Mumbai alone accounts for 22 per cent of the overall benefits of US\$ 596 million. Mumbai is followed by Delhi with a total income of US\$ 88 million and Chennai with a total income of US\$ 87 million.

The total output share of six metro cities—Delhi, Mumbai, Chennai, Bengaluru, Hyderabad, and Kolkata—comes to US\$ 452 million, which is nearly 76 per cent of the overall multiplier output. The importance of this economic benefit should be judged in relation to the size of the regional economy and population. Chennai, Bengaluru, and Hyderabad each has less than half of the population of Delhi.<sup>8</sup> Yet, the revenue of Chennai (US\$ 87 million) is almost as much as that of Delhi (US\$ 88 million). This indicates the importance of Emirates' contribution to non-hub cities. Bengaluru (with US\$ 60 million) and Hyderabad (with US\$ 51 million), though not amongst major tourist hubs, registered nearly 67 per cent of the multiplier income.

The importance of Emirates' contribution to India's regional economies is visible from the fact that even though these regional cities have a small contribution to India's GDP, Emirates still services them.

Bengaluru's contribution to national GDP is half that of Delhi while both Chennai and Hyderabad contribute a little more than one-third that of Delhi. Yet, these are important points of call for Emirates and its service to these cities is a major economic contributor to the regional economies.

The contribution to non-metro cities is also worth emphasising. The total economic impact of Emirates in non-metro cities is US\$ 143 million. Thiruvananthapuram, a small city in the southern part of India, has a population base of only 1.7 million. Yet Emirates' economic impact on this city was still quite significant, at US\$ 39 million in 2010–11. Similarly, Kochi and Kozhikode each have around 2 million residents, but the income multiplier impact is US\$44 million and US\$ 34 million, respectively. As these are small cities with relatively limited economic opportunities compared to Hyderabad, Bengaluru or even Ahmedabad, Emirates' impact represents an important factor in their overall economic growth.

8. Census 2011, Registrar General of India.

In the non-metro cities, Emirates' share in India's international passenger traffic in Kochi (18%), Kozhikode (18%) and Ahmedabad (29%) is relatively high compared to that in Delhi and Mumbai. Even freight traffic (35 per cent in Kochi, 39 per cent in Kozhikode and 66 per cent in Ahmedabad) is higher than in Mumbai despite being the business capital of India.

Emirates plays a major role in connecting some of these regional economies to other parts of the world. The higher passenger and freight share coupled with higher traffic on routes without any direct link implies that Emirates' impact on these regional cities does not have immediate substitution. Table 4.10 below shows Emirates' passenger traffic in India for 2010–11 on routes that do not have any direct link.

**Table 4.10: Emirates Passenger Traffic in Routes without Direct Link from Indian Airports, 2010–11 (%)**

City	Per cent
Ahmedabad	66.64
Bengaluru	44.64
Mumbai	24.96
Kozhikode	7.48
Kolkata	65.96
Kochi	42.12
Delhi	33
Hyderabad	48.3
Chennai	33.04
Thiruvananthapuram	29.9
India	36.4

The uniqueness of Emirates' contribution in different cities can be inferred from high percentages of traffic on routes without any direct link, especially in cities like Ahmedabad, Kolkata, Bengaluru and Kochi.

Of the total India passenger traffic of Emirates, 36.4 per cent is on routes that do not have any direct link to any of the 10 Indian points. The share of the majority of airports is quite high – 66.6 per cent in Ahmedabad, 66 per cent in Kolkata, 48.3 per cent in Hyderabad, 44.6 per cent in Bengaluru, and 42.1 per cent in Kochi.

#### 4.4.4 Employment multiplier impact

Employment multiplier measures the amount of direct and indirect jobs created in the economy as a whole as a result of economic activity in a sector of the economy. Direct jobs are related to the specific industry, while indirect jobs are those that support the industry. The employment multiplier gives the total employment impact in an economy.

The Input–Output model quantifies the employment effect of increased demand in a sector. Using the employment–output ratio in our model, we find that an additional demand of US\$

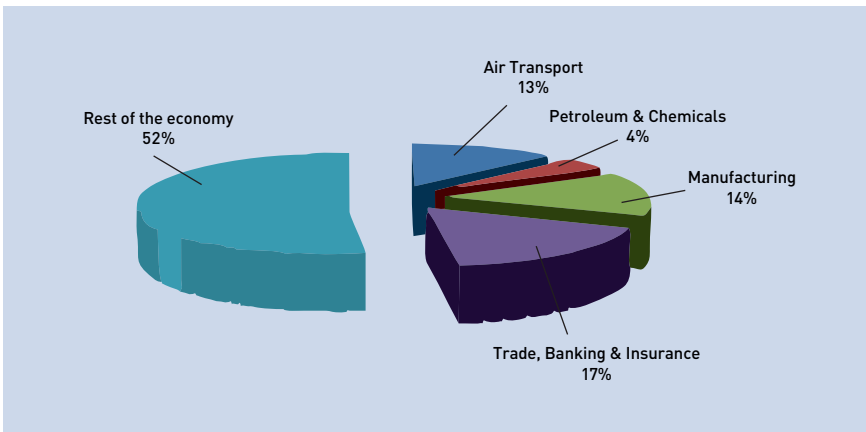
1 million in the Indian civil aviation sector generates 264 jobs in the whole economy. Emirates' operation in India supports 72,323 jobs through its demand for services required for its operation and through the multiplier effect on other sectors. Of the total jobs created by Emirates' operations, nearly 60,000 jobs are in the supporting sectors. This highlights the importance of Emirates' activities in India and the role the airline plays in creating aggregate demand in various other industries.

Emirates' employment impact in India: 72,323 jobs

- 9,304 jobs as direct employment impact
- 63,019 jobs as indirect employment impact

Figure 4.5 below presents the distribution of employment impact in various sectors.

**Figure 4.5: Sector-wise distribution of employment impact (%)**



There are 9,304 jobs generated in the air transport sector through Emirates' direct impact. This is nearly 13 per cent of the overall jobs created by Emirates. However, unlike the output impact distribution where air transport absorbed the largest share (46%) of income, employment is widely distributed among air transport, manufacturing and trade, and banking and insurance sectors. The employment impact resulted in 10,133 jobs in manufacturing, which is 14 per cent of the overall impact; 12,330 jobs in trade, banking and insurance sector, which is 17 per cent of the overall jobs creation and 2,658 jobs in petroleum and chemicals sector. It is important to note that more jobs have been created by Emirates' activities in the miscellaneous sectors of the Indian economy. Of the total jobs, nearly 52 per cent were scattered in sectors other than air transport, manufacturing, petroleum and chemicals and trade, and banking and insurance sectors. This group termed 'rest of the economy' in Figure 4.5 includes 118 sectors throughout the Indian economy.

#### 4.5 Induced Effect on Tourism in India

Foreign tourist arrivals are a major source of foreign exchange earnings for any country. In the past few years, foreign tourist arrivals have seen an uptrend in India.

This study estimates Emirates' contribution in the Indian tourism sector using 2009 data from these sources:

- Airport Authority of India on passenger arrivals from different countries, by different airlines, and percentage of tourists
- Ministry of Tourism on foreign exchange earnings from foreign tourists

In 2009, 529,928 foreign tourists arrived in India by Emirates, 27.71 per cent of Emirates' in-bound passengers in India (Table 4.11).

**Table 4.11: Emirates' Contribution to India's Tourism Sector, 2009**

<b>Number of foreign tourist arrival by Emirates</b>	<b>Share of Emirates' in-bound traffic (%)</b>	<b>Total Foreign Exchange Earnings (FEE) from tourist arrived by Emirates (US\$ million)</b>
529,928	27.71	1,153.72

*Source:* FEE data / calculation.

The foreign exchange earnings from tourists flying through Emirates were US\$1.15 billion in 2009. This amounted to 10 per cent of the total foreign exchange earnings for India in 2009.

Emirates' network has a catalytic effect on the Indian tourism industry as it connects India to a wider set of countries. Emirates carries passengers between India, the UAE, and 16 other MENA countries as well as connects 50 countries outside the MENA region with Indian points.

The following is the distribution of Emirates' traffic to 50 non-MENA countries:

- UK – 26 per cent
- USA – 27 per cent
- Germany – 7 per cent
- South Africa – 5 per cent
- Italy – 4 per cent
- France – 3 per cent
- Nigeria and Switzerland – 3 per cent each
- The Netherlands – 2 per cent
- Other 41 countries – 19 per cent (less than 1 per cent each)



**Figure 4.6: Emirates' Traffic: India to 50 Countries Outside MENA [%]  
(2.0 million PAX)**

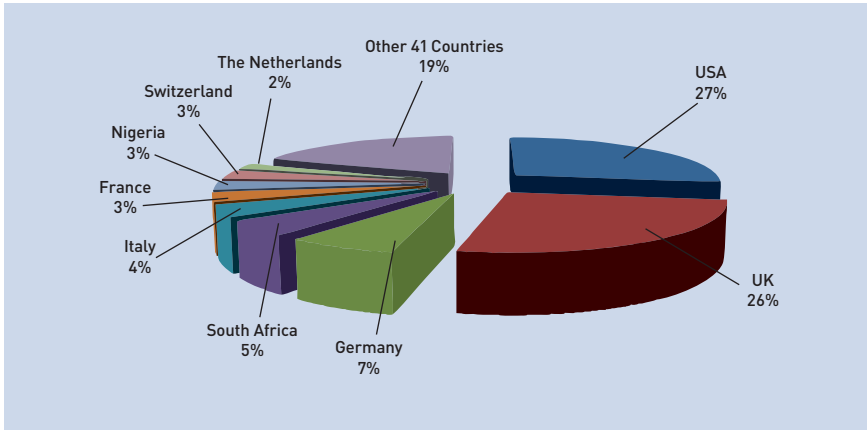


Figure 4.6 shows that nine countries account for 81 per cent of Emirates' India traffic for these countries. However, within these nine major countries Emirates' passenger traffic is distributed between hub and non-hub airports. Table 4.12 shows the percentage of Emirates' passenger traffic from hub and secondary airports in these countries.

**Table 4.12: Emirates' Passenger Traffic to Nine Major Countries Outside MENA (2011-12)**

Country	Number of airports served	Passengers (%)	
		Hub airport (s)	Non-hub airport (s)
USA	6	34	66
UK	6	52	48
Germany	4	59	41
South Africa	3	65	35
Italy	3	43	57
France	2	86	14
Nigeria	1	100	0
Switzerland	2	82	18
The Netherlands	1	100	0

For four out of these nine countries, over 40 per cent of Emirates' passenger traffic is derived from regional and secondary airports. Over 55 per cent of Emirates' passenger traffic to and from USA and Italy connects from regional and secondary airports.

In sum, Emirates' global network provides greater connectivity with all the important airports in India. It connects major Indian hubs as well as non-hub points to a vast number of countries. This flow of passengers at smaller airports like Kozhikode, Thiruvananthapuram and Kochi is

particularly important for providing economic benefits to small cities and holds great potential in increasing aviation activities and tourism in the future. Table 4.13 shows the number of tourists carried by Emirates from major source countries.

**Table 4.13: Tourist arrivals by Emirates from Major Countries, 2009**

<b>Country</b>	<b>Number of foreign tourists</b>
Australia	11,233
Austria	4461
Bahrain	18,081
Canada	5426
Egypt	4213
France	22,168
Germany	44,972
Greece	2931
Iran	3876
Italy	34,360
Kenya	9948
Mauritius	6894
Netherlands	2230
Yemen	2162
Russia	9156
Saudi Arabia	49,049
South Africa	32,508
Switzerland	20,335
Tanzania	5197
Turkey	4866
United Kingdom	146,408
United States	85,249

India received 5.1 million foreign tourists in 2009. Twenty countries contributed more than a 1 per cent share each in foreign tourist arrivals in India. Emirates' operation collects tourists from 19 out of these 20 countries. The relevance of Emirates' operation can be gauged from the fact that it brings tourists from those countries that are often not considered to be among major contributors to the Indian tourism sector, such as Tanzania, Turkey, Kenya, Yemen, Bahrain, Egypt, Mauritius, Saudi Arabia, and South Africa. Emirates' share in overall tourist arrivals from these countries is very high – 67 per cent for Egypt, 41 per cent for Kenya, 38 per cent for Mauritius, 45 per cent for Turkey and 32 per cent for Tanzania. Thus, apart from carrying passengers from prominent tourist source countries for India, Emirates contributes to India's tourism industry by stimulating demand from non-major source countries. This clearly opens up the Indian tourism industry to new countries.

## 4.6 Other Benefits

Emirates brings other benefits to the Indian economy although some of them are not directly measurable by our Input–Output methodology. Their potential benefits can be substantial for an economy, however and some are listed below.

Emirates facilitates the flow of capital into the Indian economy. It is well recognised in economic literature that the availability of faster transportation affects investment decisions and flow of FDI (foreign direct investment). Emirates connects India to its major investor countries, thus facilitating the flow of investment to India. In 2010–11 India's FDI inflow was US\$ 27 billion. Major investor countries in the year were Mauritius, USA, UK, UAE, Netherlands, Germany and France. The cumulative FDI inflow to India from UAE during 2000–2011 was US\$ 1.9 billion. After the 2008 financial crisis, the FDI inflow into India from MENA countries increased.

Emirates' service in India potentially has a beneficial effect on India's foreign trade. The airline connects India not only to major trading partners like UAE, EU and USA, but also to potential trading partners of the future. Emirates' freight traffic in India accounts for 14 per cent of India's total international freight traffic. The strong economic ties between UAE and India benefited from Emirates service in India. India's exports to UAE in 2010–11 were US\$ 34.3 billion. Exports to UAE increased by 43 per cent from that of the previous year. In effect, the total UAE trade with India, which amounted to US\$ 67.1 billion in 2010–11, has placed UAE as the largest trading partner for the third year in a row, ahead of China and the US. India's trade relations with MENA countries have been on the rise in recent years. In 2010–11, India's exports to 16 MENA countries, connected by Emirates, were US\$ 52.2 billion. This shows a 43 per cent increase from previous year.

India's trade volumes to African countries have increased and are forecast to continue growing over time. India's export to African countries in 2010–11 was US\$ 16.3 billion, an increase of 58 per cent from the previous year. This shows how Emirates facilitates the opening up of new markets in the African continent for Indian exporters.

Dubai is a major employment destination for Indians and Emirates itself has employed 11,603 Indian nationals. India received a total of US\$ 55 billion in 2010 as remittances from Indians working overseas. This constitutes 3.6 per cent of India's GDP. World Bank ranks India as the largest receiver country of remittances. The recent increase in remittances to India is due to the increased transfer from Gulf countries. In 2010, remittance from UAE was US\$ 10.5 billion and UAE represents the largest source of remittances to India. About 30 per cent of UAE's population is Indian. Indians constitute 42.5 per cent of its labour force. Around 1.2 million Indians reside in Dubai and the Northern Emirates.



## 5. Expansion of Emirates' Operations in India

This Chapter forecasts Emirates' impact on the Indian economy if the seats allocated to it under the bilateral agreement are increased. Emirates currently has operations to 10 airports across India and has the rights to fly 54,200 seats per week to and from India. If the seats allocated to Emirates are increased then the corresponding benefits to the economy and tourism sector will also increase.

We consider three scenarios, the increase of the seat allocation from the present 54,200 per week to 60,000, 70,000 and 80,000 seats per week, respectively. The aim is to assess the varied impact on the output, employment and tourism benefits in all three conditions using forecasts from the Input–Output model that has already been explained in Chapter 4.

### 5.1 Scenario 1: 60,000 Seats per Week

Table 5.1 presents the output, employment multiplier, and tourism impact of Emirates' operation with 60,000 seats per week.

**Table 5.1: Scenario 1: Emirates with 60,000 Seats per Week**

<b>60000 seats per week</b>	
Number of passengers (million/year)	5.03
<b>Output multiplier impact</b>	
Total (US\$ million)	644
Direct	296
Indirect	348
<b>Employment multiplier impact</b>	
Total (number of jobs)	78,227
Direct	10,063
Indirect	68,163
<b>Tourism impact</b>	
Number of tourists/year	641,260
Foreign Exchange Earnings (US\$ million)	1,485

A weekly allocation of 60,000 seats to Emirates would result in their carrying 5.03 million passengers to and from India every year. The total economic benefits accrued to the economy as

a result of this expansion would be US\$ 644 million. Of the total economic output, US\$ 296 million is due to direct impacts and US\$ 348 million is the result of indirect impacts calculated under the multiplier effect. Allocation of greater number of seats would not only increase the value of economic output but would positively impact on employment opportunities. The employment impact would lead to 78,226 new jobs throughout the economy, an increase of 8 per cent from the current allotment. The increase in seat allocation will bring in 641,260 foreign tourists to India. The tourism sector will benefit by US\$ 1,485 million in terms of foreign exchange earnings.

## 5.2 Scenario 2: 70000 Seats per Week

Table 5.2 presents the forecast of benefits from allocation of 70,000 seats per week to Emirates.

This scenario would enable Emirates to fly 5.63 million international passengers to and from India every year, an increase of 0.98 million from Emirates' current passenger traffic in India.

**Table 5.2: Scenario 2: Emirates with 70,000 Seats per Week**

<b>70,000 seats per week</b>	
Number of passengers (million)/year	5.63
<b>Output multiplier impact</b>	
Total (US\$ million)	721
Direct	331
Indirect	390
<b>Employment multiplier impact</b>	
Total (number of jobs)	87,572
Direct	11,266
Indirect	76,306
<b>Tourism impact</b>	
Number of tourists/year	717,868
Foreign Exchange Earnings (US\$ million)	1,662

The overall economic benefit from the higher seat allocation is US\$ 721 million. The employment multiplier impact is 87,572 jobs—11,266 jobs would be supported due to the direct impact of Emirates' operations and 76,306 jobs in other sectors of the economy as a result of the indirect impact of Emirates' activities. The foreign tourists arrived through Emirates in India would be 717,868, accounting for a foreign exchange income of US\$ 1.66 billion. Thus, if seats are increased from the present 54,200 to 70,000 (an increase of nearly 30 per cent), the total foreign exchange earnings would increase from US\$1.15 to US\$ 1.66 billion, a hike of almost 44 per cent.

### 5.3 Scenario 3: 80,000 Seats per Week

Table 5.3 presents the benefits of an even higher seat allocation, 80,000 seats per week, to Emirates in India. A higher seat allocation to Emirates would provide a tremendous boost to the air traffic and tourism activities in India. It would lead to annual inflows and outflows of 6.16 million international passengers by Emirates.

**Table 5.3: Scenario 3: Emirates with 80,000 Seats per Week**

<b>80,000 seats per week</b>	
Number of passengers (million)/year	6.16
<b>Output multiplier impact</b>	
Total (US\$ million)	790
Direct	363
Indirect	427
<b>Employment multiplier impact</b>	
Total (number of jobs)	95,862
Direct	12,332
Indirect	83,530
<b>Tourism impact</b>	
Number of tourists/year	785,828
Foreign Exchange Earnings (US\$ million)	1,819

If Emirates was granted 80,000 seats per week, the total economic benefit for the overall economy would be US\$ 790 million. Of this, US\$363 million is the direct impact and US\$ 427 million is the indirect income generated by the Indian economy. This higher seat allocation would also help generate 95,862 jobs, an increase of 32.5 per cent from the current allotment. The tourism industry would tremendously benefit with 785,828 foreign tourist arrivals and an impressive gain of US\$ 1,819 million as foreign exchange earnings, an increase of 57 per cent.

### 5.4 Sector-Wise Distribution of Benefits from Higher Seat Allocations

The sector-wise distribution of output multiplier impact and employment multiplier impact at different seat allocations is presented in Table 5.4 below.

The increase in allocation from 54,200 to 80,000 seats per week would increase Emirates' contribution in the Indian air transport sector from US\$ 274 million to US\$ 363 million. The multiplier impact would increase from US\$ 596 million to US\$ 790 million.

The employment impact for the same expansion would lead to 12,345 jobs in the Indian air transport sector. The multiplier impact implies that total employments would increase from the present 72,323 to 95,862 jobs.

Table 5.4: Output and Employment Multiplier Impacts

	54,200 seats (present)	60,000 seats	70,000 seats	80,000 seats
Output multiplier impact (US\$ million)	596	644	721	790
Air transport	274	296	332	363
Petroleum & Chemicals	76	83	92	101
Manufacturing	62	67	75	82
Trade, Banking & Insurance	39	42	47	51
Rest of the economy	145	157	176	192
Employment multiplier impact (number of jobs)	72,323	78,227	87,572	95,862
Air transport	9313	10,074	11,277	12,345
Petroleum & Chemicals	2658	2875	3219	3523
Manufacturing	10,133	10,960	12,269	13,431
Trade, Banking & Insurance	12,330	13,336	14,930	16,343
Rest of the economy	37,889	40,982	45,878	50,221

## 5.5 Benefit from Emirates' Operation to Additional Points

Emirates' operation to additional airports would benefit the overall Indian economy as well as the towns/cities linked to the connecting points. We estimate the impact of Emirates' operation to four additional points—Amritsar, Pune, Mangalore and Tiruchirapally. We use regression analysis to estimate direct contribution based on socioeconomic indicators of regional points like population, education, GDP (industry and service). Indirect contribution is calculated using multiplier from Input–Output model. Table 5.5 provides the direct benefit from Emirates' operation to additional points:

Table 5.5: Direct Impact from Expansion to Four Additional Points (US\$ million)

Direct impact from expansion to 4 additional points (US\$ million)				
Amritsar	Pune	Mangalore	Tiruchirapally	Total
15	13	8	13	49

Emirates' direct contribution would provide an impetus to the economic growth of these small cities. Amritsar, Mangalore and Tiruchirapally are cities with a population of less than three million. The marginal benefit from Emirates' contribution to these cities would be much higher than that to India's larger cities.

Operations to these four points would bring in an additional US \$49 million to the Indian Economy. We estimate that this expansion would further benefit wider economy by an output of US\$ 106 million and generation of 13,011 jobs.



Table 5.6 shows the distribution of output and employment multiplier impacts across different sectors of the economy. Out of the total output multiplier impact due to the expansion to four additional points of call, an income of US\$ 49 million is generated in air transport sector. The income effect on petroleum and chemicals; manufacturing; and trade, banking, and insurance sectors are US\$ 14 million, US\$ 11 million, and US\$ 7 million, respectively. A total income of US\$26 million is generated in the rest of the economy.

**Table 5.6: Output and Employment Multiplier Impacts at the Four Additional Points**

<b>Impact</b>	<b>Air transport</b>	<b>Petroleum and chemicals</b>	<b>Manufacturing</b>	<b>Trade, banking and insurance</b>	<b>Rest of the economy</b>	<b>Total</b>
Output multiplier impact (million US\$)	49	14	11	7	26	106
Employment multiplier impact (number of jobs)	1676	478	1823	2218	6816	13,011

In sum, a total of 1676 jobs would be created in the air transport sector. The number of jobs supported by the expansion of Emirates' operation to four additional points for the petroleum and chemicals, manufacturing and trade, banking and insurance sectors are 478, 1823 and 2218, respectively. The rest of economy would be benefited and a further 8816 jobs would also be created in other sectors.

## 5.6 Conclusion

The NCAER report observed that Emirates makes an important contribution to the Indian air transport sector in terms of passenger and freight traffic, connectivity and coverage to points not directly served by other carriers. The airline's economic contribution to the air transport sector magnifies to the wider economy through multiplier effect. The benefit to non-hub points appears to be significant in regional economies. Income, employment and tourism impact highlights the potential of Emirates' contribution to regional economic development.

The study predicts further economic benefit for Indian economy in scenarios of Emirates' expansion in India. They are quantified as direct economic contribution, multiplier effect on output and employment, induced effect on tourism. Apart from quantified benefits from Emirates' Operations in India, the identified qualitative benefits highlight the need for an expansion of air transportation capacities in India.



## Appendix

An Input–Output table is a systematic 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 homogenous sectors, each of which is represented by a row and a column in the Input–Output table. 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**

Producing sectors	Consuming Sectors						Final demand	Output
	1	2	.	.	.	n		
1	$X_{11}$	$X_{12}$	.	.	.	$X_{1n}$	$F_1$	$X_1$
2	$X_{21}$	$X_{22}$				$X_{2n}$	$F_2$	$X_2$
.	.	.				.	.	.
.	.	.				.	.	.
.	.	.				.	.	.
n	$X_{n1}$	$X_{n2}$	.	.	.	$X_{nm}$	$F_n$	$X_n$

(Contd.)

**Table A1: (Contd...)**

Primary inputs								
	$V_1$	$V_2$	$\cdot$	$\cdot$	$\cdot$	$V_{1n}$	$V_{1n+1}$	
	$V_2$	$V_2$	$\cdot$	$\cdot$	$\cdot$	$V_{2n}$	$V_{2n+1}$	
	$\cdot$	$\cdot$				$\cdot$	$\cdot$	
	$V_{k1}$	$V_{k2}$	$\cdot$	$\cdot$	$\cdot$	$V_{kn}$	$V_{kn+1}$	
Output	$X_1$	$X_2$	$\cdot$	$\cdot$	$\cdot$	$X_n$		

Table A1 shows the supply and absorption patterns of a sector by row and column, respectively.

$F_j$  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

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

where  $a_j$  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

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

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

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

$$= R$$
(5)

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,  $\sum r_{ij}$ , 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 Organisation (CSO) of the Ministry of Statistics and Programme Implementation. The table is periodically updated by the organisation. The latest table corresponds to the year 2006–07. The table consists of absorption and supply pattern of 130 sectors of Indian economy. In the present study, Input–Output is aggregated to a table of 33×33 sectors for the sake of computational tractability. 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 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 Sectors from 130×130 to 33×33 Table**

Sl. No.	Broad sectors	Sectors included (Sl. No. from Input–Output table of India, 130×130)	Number of sectors included
1.	Agriculture	1–26	26
2.	Mining and Quarrying	27–37	11
3.	Food Beverage and Tobacco	38–45	8
4.	Textiles and RMG	46–54	9
5.	Wood and Wood Products, Furniture and Fixtures	55–56	2
6.	Paper and Paper Products	57	1
7.	Printing and Publishing	58	1
8.	Leather and Plastic, and their Products	59–62	4
9.	Petroleum Products	63	1
10.	Paints, Varnishes, Lacquers	69	1
11.	Other Chemicals	64–68, 70–73	9

(Contd.)

**Table A2: (Contd...)**

12.	Non-Metallic Mineral Products	74–76	3
13.	Basic Metal and Metal Products	77–82	6
14.	Non-Electrical Machinery and Parts	83–87	5
15.	Electrical Machinery	88–94	7
16.	Transport Equipment and Parts	95–100	6
17.	Other Miscellaneous Manufacturing	101–105	5
18.	Construction	106	1
19.	Electricity	107	1
20.	Water	108	1
21.	Railway	109	1
22.	Land Transport	110	1
23.	Water Transport	111	1
24.	Air Transport	112	1
25.	Supporting and Auxiliary Transport Activities	113	1
26.	Storage and Warehousing	114	1
27.	Communication	115	1
28.	Trade	116	1
29.	Hotels and Restaurants	117	1
30.	Banking	118	1
31.	Insurance	119	1
32.	Computer Related	124	1
33.	Rest of the Services	120–123, 125–130	10

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 Organisation’s 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 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.