



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 4, April 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

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 www.ijrset.com

The Rise of the Indian Aviation Industry and Their Role in the Development of Indian Economy

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ABSTRACT: This paper seeks to give a descriptive examination of the Indian aviation sector's emergence and significant influence on the country's economic growth. The study investigates the reasons driving the aviation boom, such as deregulation, economic development, and altering consumer tastes, using a systematic literature analysis that includes academic papers, industry reports, government statistics, and news items from the previous decade. The results show a clear link between deregulation, economic growth, and the emergence of the Indian aviation sector, which is marked by increasing competition, affordability, and an increase in passenger traffic. This increase has had a substantial impact on many parts of the Indian economy, including increasing tourism, providing direct and indirect employment, promoting a speedier flow of products and corporate activities, and driving infrastructure development. However, the research admits its shortcomings. The report focuses on passenger traffic statistics and economic indicators, emphasizing the need for policy solutions, stakeholder engagement, and further research to solve data gaps and study long-term consequences on diverse socioeconomic groups. Important implications include the need for infrastructure improvements, skill development programs, sustainable tourism practices, and collaborative efforts among airlines, governments, and local communities to ensure equitable growth and maximize the sector's potential contribution to India's economic and social advancement.

KEYWORDS: Aviation, Indian economy, Air Passenger Traffic, Airline deregulation, Airlines

I. INTRODUCTION

The rise of the Indian aviation industry is noteworthy due to its complex influence on the country's economy. Initially regulated, the sector's development into a competitive market with low-cost carriers represents India's economic liberalization, as well as the promotion of competition and affordability. Beyond transportation, aviation is a critical economic multiplier, boosting tourism, creating jobs, and revitalizing area economies. It democratizes travel, promoting social mobility and opening up new possibilities across India. Notably, improved air connectivity encourages investment in previously underserved regions, fostering inclusive and equitable economic development. Furthermore, the increase in employment creation, especially in smaller areas with new airports, empowers locals and supports future economic growth. The aviation boom also allows for more efficient movement of products and people, improving regional economic integration and boosting chances for firms, big and small, to compete on a global scale. Finally, the story of India's aviation sector reflects economic empowerment, job creation, and the transformation of cities into bustling economic centres, highlighting its critical role in defining India's path to a more inclusive and prosperous future.



II. OBJECTIVES OF THE STUDY

The primary goal of this research is to investigate the transformational influence of the Indian aviation industry on economic development, social mobility, and regional growth, with a particular emphasis on understanding the relationship between deregulation, economic liberalization, and the aviation boom.

III. LITERATURE REVIEW

The findings reveal a positive influence of the aviation industry on tourism growth in the South Pacific Region. Additionally, the study highlights the relatively low sensitivity of tourism demand to the income levels of source markets. The research emphasizes the importance of government support for the aviation sector in the SPR and encourages collaboration between the aviation and tourism industries at a regional level. **Vinolia Kilinaivoni Salesi, Wai Hong Kan Tsui, Xiaowen Fu, and Andrew Gilbey (2021).**

The findings suggest that the reciprocal causal relationship between air transport and economic growth is more prevalent in less developed economies. In contrast, in more developed economies, the causality tends to be unidirectional, with economic growth influencing air transport. The impact of airline enplanement on service-related employment is emphasized. The paper also discusses the implications of these findings for understanding imperfections and inefficiencies in aviation markets and proposes future research directions. **Zhang Fangni & Graham Daniel (2019).**

The research methodology involves studying India's regional aviation policy and collecting data on its performance. The article may use a combination of quantitative and qualitative analysis to assess the impact of the policy. Economic and commercial challenges are likely identified through a comprehensive review of the policy implementation. **Amit Kumar Das, Amit Kumar Bardhan, Xavier Fageda, (2020).**

The findings of the research reveal a fluctuating upward trend in the coupling relationship between airport economies and regional development. However, the overall coupling level is identified as being at a low level of maladjustment decline. Regional variations are noted, with the eastern region demonstrating a more advanced form of coordinated development. The research recommends that each city identifies its suitable leap path, with specific emphasis on investing public resources in airport economic zones and exploring opportunities for an Air Silk Road and an airport-type-free trade port. **Tang, Kai Wang, Hai-Jie Wang, & Ning (2021).**

TECHNIQUES FOR DATA ANALYSIS

Techniques for data analysis include various steps. The data collected has to be collected from various studies, news articles, etc. Once sufficient data has been collected, it will be filtered, organized, and finalized and will be visualized using different data analytical tools

To understand various aspects like – Economic growth, the number of passengers traveling via Air, and GDP per Capita attached below are some of the graphs and Tables that help in understanding the various factors of cyber fraud.

- **Formula Mean** *=Average(X:Y)
- **Standard Deviation** *=Stdev(X:Y)
- **Year on Year Growth (YoY)** *=(Current Year- Base Year)/ Base Year
- **Correlation coefficient** *= $\rho(X, Y) = \text{cov}(X, Y) / \sigma_X \cdot \sigma_Y$

DATA INTERPRETATION

Passengers traveling via air and GDP per capita

Year	GDP Per Capita (US \$)	Passenger Travel
1990	368.7498	10862200
1991	303.8504	10717400
1992	317.5587	11127100
1993	301.5008	9441600
1994	346.2274	11518400



1995	373.6282	14260600
1996	399.5773	13394600
1997	414.8987	16039800
1998	412.5094	16521000
1999	440.9615	16005400
2000	442.0348	17299483
2001	449.9111	16862737
2002	468.8444	17633019
2003	543.8438	19455085
2004	624.1051	23934074
2005	710.5093	27879461
2006	802.0137	40288794
2007	1022.733	51897450
2008	993.5034	49877935
2009	1096.636	54446373
2010	1350.635	64374253.8
2011	1449.603	73996912
2012	1434.018	72151828.89
2013	1438.057	75589071
2014	1559.864	82718882.88
2015	1590.174	98927860
2016	1714.28	119577835
2017	1957.97	139752424
2018	1974.378	164035637.5
2019	2050.164	167499116
2020	1913.22	68959633
2021	2238.127	83964797

Source: Data compiled from the World Bank & DGCA

Over the period from 1990 to 2021, there is a consistent upward trend in both GDP per capita and passenger traffic in India, indicating a positive correlation between economic growth and air travel. However, there are instances of decline in passenger traffic despite rising GDP per capita, attributed to external factors such as global economic downturns, natural disasters, or fluctuations in fuel prices. For example, a decrease in passenger traffic in 1993 coincided with a worldwide recession, while significant growth in passenger traffic post-2004 aligns with India's robust economic expansion. The notable anomaly in 2020, marked by a sharp decline in passenger travel despite marginal GDP per capita growth, can be attributed to the profound impact of the COVID-19 pandemic, leading to widespread travel restrictions and changes in consumer behavior.

Mean, Median, Standard Deviation & other statistical tool for analysis Table

<i>GDP Per Capita (US \$)</i>		<i>Passenger Travel</i>	
Mean	984.5026531	Mean	51906586.31
Standard Error	112.7096687	Standard Error	8137504.678
Median	756.2615	Median	34084127.5
Mode	#N/A	Mode	#N/A
Standard Deviation	637.5821682	Standard Deviation	46032677.92
Sample Variance	406511.0213	Sample Variance	2.11901E+15
Kurtosis	-1.220789747	Kurtosis	0.651120978
Skewness	0.533305406	Skewness	1.183402084
Range	1936.6263	Range	158057516



Minimum	301.5008	Minimum	9441600
Maximum	2238.1271	Maximum	167499116
Sum	31504.0849	Sum	1661010762
Count	32	Count	32

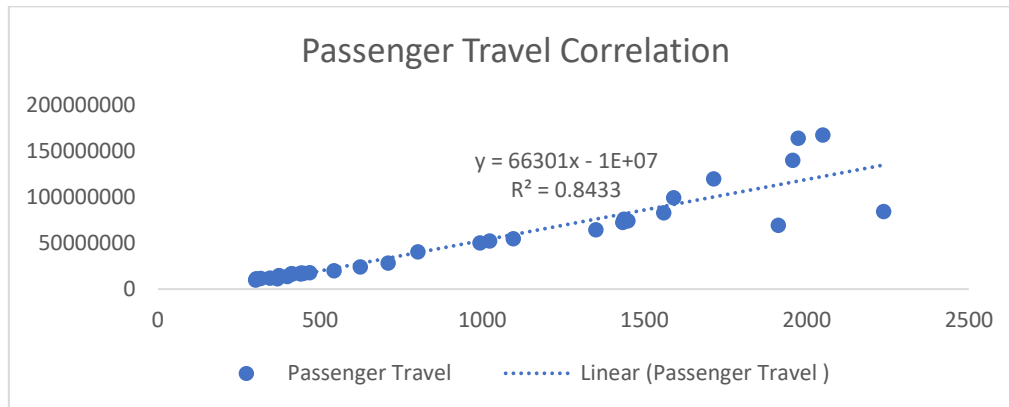


Fig 1: Passenger Travel Correlation

Source: Data compiled from DGCA as presented in Table

Data Displayed in the Graph:

- **X-Axis (Horizontal):** GDP Per Capita (US\$) - This axis depicts a country's economic well-being as measured by the average GDP per person in US dollars. greater numbers suggest a more robust economy with greater average incomes for its population.
- **The Y-axis (Vertical):** displays the total number of air passengers travelling in millions each year.

Trendline:

A diagonal line passes across the dispersed data points. This is most likely a trendline, which is a statistical technique for summarising the linear connection between two variables on a graph. It visually shows an increasing trend, implying that as GDP per capita rises, so does passenger travel.

Scatter Plot:

The data points are dispersed around the trendline. This suggests that the link between GDP per capita and passenger travel is not strictly linear. In addition to economic well-being, additional variables may influence passenger travel.

R-squared values:

The coefficient of determination is shown by the text label " $R^2 = 0.8433$ " located in the upper right corner. This number represents the strength of the linear connection between the two variables. An R^2 of 0.8433 indicates a significant positive connection. In this example, changes in GDP per capita account for roughly 84.33% of the variance in passenger travel.

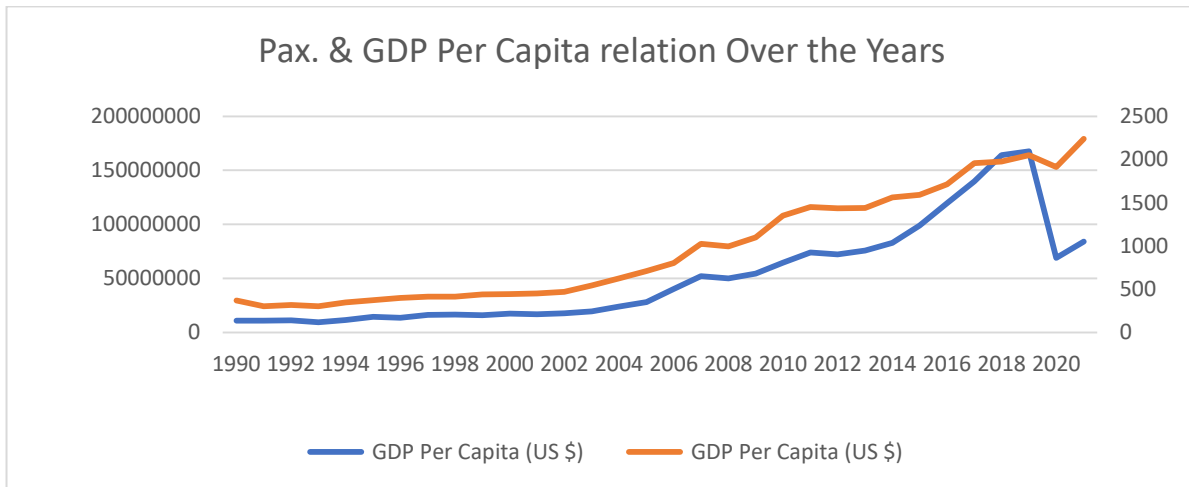


Fig 2: Passenger Travelling via Air and GDP per Capita Correlation
 Source: Data compiled from DGCA as presented in Table

The graph illustrates the correlation between the number of passengers traveling via air in India and the GDP per capita income from 1990 to 2021. The blue line represents the Passengers traveling via Air and the orange line represents GDP per capita (in US dollars).

From the graph, we can observe that both metrics have generally increased over time, indicating a positive correlation. This suggests that as the GDP per capita income in India has increased, so has the number of air passengers, possibly due to increased affordability and accessibility of air travel with economic growth.

However, there is a noticeable dip in both lines around 2020. This is likely due to the impact of the COVID-19 pandemic, which significantly affected both the economy and air travel.

CORRELATION SOLUTION

	<i>GDP Per Capita (US \$)</i>	<i>Passenger Travel</i>
GDP Per Capita (US \$)	1	
Passenger Travel	0.918316317	1

There is a definite positive relationship between GDP per capita and passenger travel. Passenger travel tends to rise with rising GDP per capita. This suggests that if the Indian economy improves and people get richer, they will likely take more flights.

The text " $R^2 = 0.9183$ " in the upper right corner shows a high positive association between GDP per capita and passenger travel. R^2 (coefficient of determination) is a statistical metric that varies from 0 to 1. An R^2 of 0.9183 indicates that changes in GDP per capita account for 91.83% of the variance in passenger travel. However, it's vital to realize that correlation doesn't indicate causality. While economic development seems to have a considerable impact on passenger travel in India, it may not be the main driver.

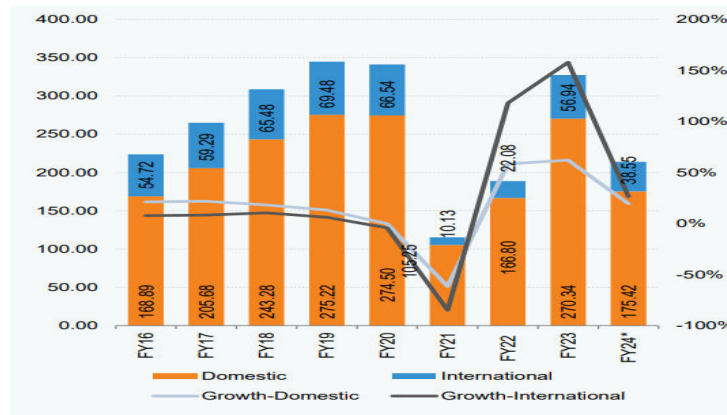


Fig 3: International and domestic passenger traffic (million)

Source: Data compiled from the Airports Authority of India, Ministry of Civil Aviation

India's aviation sector has experienced remarkable growth in passenger traffic, both domestically and internationally, driven by rising incomes and the proliferation of low-cost aviation options. In FY23, total passenger traffic reached 327.28 million, with Delhi's Indira Gandhi International Airport ranking among the world's top 10 busiest airports. India's domestic aviation market is now the third-largest globally and is expected to surpass the UK's by 2024. Projections indicate that India will accommodate 480 million flyers by 2036, surpassing Japan and Germany combined. Forecasts also suggest that India will become the world's third-largest air passenger market by 2030, overtaking China and the United States. Domestic and international passenger traffic has shown consistent growth, with notable surges in FY23 and during April-October 2023, indicating the sector's continued momentum and potential for further expansion.

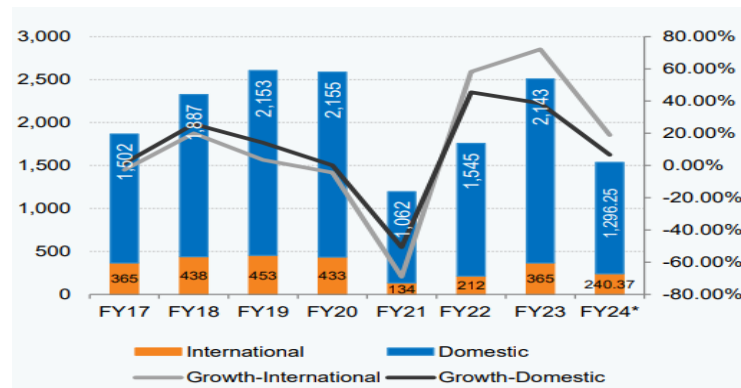


Fig 4: Aircraft movement growth ('000)

Source: Data compiled from the Association of Private Airport Operators, Airports Authority of India

Aircraft movement grew at a 3.37% CAGR from 2.05 million in FY17 to 2.50 million in FY23. Domestic aircraft travel grew at a 6.1% CAGR during fiscal years 2017 and 2023. In FY23, India had a total of 2,143,000 domestic and 365,000 foreign aircraft movements.

India's aviation business has expanded rapidly, owing to reasons such as growing earnings, infrastructural development, and the introduction of low-cost carriers. The industry has reached important milestones, becoming the world's third-largest domestic aviation market, and is expected to outperform big players such as the United Kingdom by 2024 and Japan and Germany combined by 2036. According to estimates, India might overtake China and the United States as the world's third-largest air passenger market by 2030. The industry's resilience is shown by its capacity to recover fast from setbacks such as the global financial crisis and the COVID-19 epidemic. Despite setbacks, passenger and freight traffic continues to increase, demonstrating the sector's significance in generating economic growth, job creation, and infrastructure development, which aligns with India's wider socioeconomic goals.

IV. RESEARCH OUTCOME AND FINDINGS

The Indian aviation industry has emerged as a vital engine of economic development, as seen by its fast rise and predicted position as the world's third-largest aviation market by 2024. The significant growth in air passenger traffic, which reached 214 million in FY24, demonstrates its critical role in promoting economic development, job creation, and infrastructure improvements. With the travel and tourism industry expected to contribute US\$512 billion to GDP by 2028 and Indian travelers spending US\$199.54 billion in 2023, aviation's economic effect is significant. Beyond passenger numbers, the industry supports tourism, trade, and investment, contributing to India's worldwide stature and socioeconomic growth. As the sector continues to develop and expand, it is set to uncover new opportunities for growth, competitiveness, and global connectedness, solidifying India's position as a significant player in the global aviation landscape.

V. CONCLUSION

The aviation industry has emerged as a key driver of economic development in India, promoting growth, connection, and prosperity across several industries and regions. With significant growth in domestic and international air travel, along with extensive airport infrastructure development, the industry has emerged as a key contributor to trade, commerce, and job creation. The government's ambitious measures, like plans to build 100 new airports by 2024 and the UDAN-RCS program, demonstrate its commitment to promoting fair development and connectivity, especially in rural and marginalized regions. Furthermore, the rise of the aviation industry has boosted economic activity and investment in sectors such as tourism, hospitality, and manufacturing, resulting in job creation and revenue growth across the supply chain. As India becomes a global aviation superpower, its geopolitical significance grows, garnering worldwide attention, investment and partnerships, further solidifying its position on the global aviation stage.

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