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Pattern of Foreign Exchange Earning in Tourism Industry and Medical Tourism Impact

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ABSTRACT
The medical tourism industry is growing fast in India and contributing to the growth of Foreign Exchange Earnings (FEE) through tourism. This industry has been developed in India with the collective efforts of Government, Corporate hospitals and foreign stakeholders. It generates direct and indirect job opportunities and revenues in India. This paper carries out the analysis of the pattern of FEE through the tourism and then checks the impact of medical tourism on the analyzed pattern to validate the contribution of the medical tourism by exploring significant pattern. It helps to draw impact of medical tourism on FEE. The paper uses the regression method during the analysis and predicting the future possibilities.

Keyword: Medical Tourism, Tourism and Growth, Tourism Policy,

INTRODUCTION

There are different types of tourism in India (Ravish Mathew) (T. Arunmozhi), including medical tourism contributing to foreign exchange earnings (FEE) from the foreign tourist (K. Alphons)(India Tourism Statistics at a Glance-2018)(Indian Tourism Statistics 2017) . The growth in foreign exchange earning has been observed from the reported data including medical tourism (G. Saravana Kumar) (K. C. Roy)(Tayade) which is ultimately contributed in the GDP of the economy of the country (Frangialli) (and impact FDI inflow (Sandhu)). Foreigner patient has their contribution in FEE (Vira) and it is needed to see the recent trend in impact measures. Many different methods of analysis of data for the prediction are available and used by researchers for their work (Battacharya)(Kothari) (Roa) (Granville)(Kakkar and Sapna). The method of pattern using polynomial regression for FEE has not found reported in literature. Therefore, in a present work, the study of FEE from the tourist coming from other countries has been carried out and examined the impact of medical tourism on it using the introduced pattern method.

METHODOLOGY

The raw data has been collected and verified from different sources for the accuracy. The method Regression of data was used and the finalised regression method was the best fit on the basis of R2 value. Therefore linear and nonlinear (polynomial) regression equations were utilized in this work (Frost). Different tools to extract the details from plot have been innovatively implemented in this paper. The data has taken for the year from 2001 to mid of the 2017 or pattern. And for the FTA with FEE, only five year data from 2012 to 2016 has been taken for study.

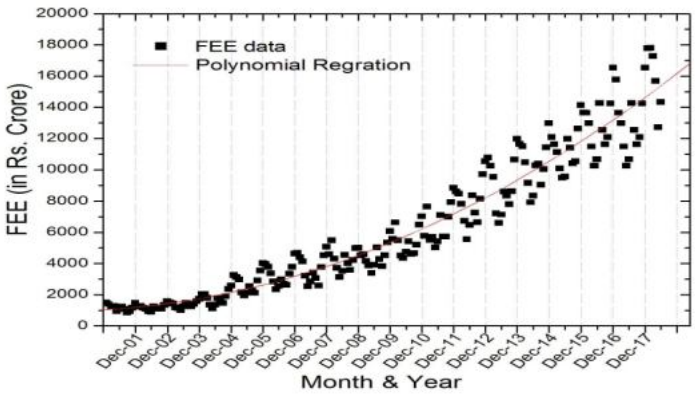

Figure-1: FEE data with regression curve

Regression of FEE of Tourism

The growth of the FEE is not linear and therefore the polynomial regression method is used to fit the data which was plotted in Figure 1 and Figure 2 in a red color curve in the graphs. For Polynomial Regression of

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the Data the following equation (second order polynomial with one variable (C.R. Rao)(Monahan)has been used

$Y=A+B_1 X+B_2 X^2$

Where the A is the intercept on Y axis, B_1 and B_2 are constants. The values of the constants found for best fit are A= 1033.63982 with error 239.61097; B_1=9.50593 with error 5.24355 and B_2=0.27969 with an error 0.02407. These are found for the R^2 value 0.9332 with 210 degrees of freedom for which P value was <0.0001 and standard deviation was 1146.42528.

Pattern Analysis

"W" Shape Pattern

The regression of the FEE has shown in the Figure 2 by a red color curve with the pattern shown by the FEE data from December to December variation. The "W" shape pattern between the Decembers of consecutive years is being reported in this work. These "W patterns' two negative peaks (voids) are representing the fall in the earning during the respective months. The positive peak has been reported for the December and their consecutive months. One of the causes can be the Leakage and Retention of the Revenue for voids and mounds respectively as mentioned in the literature (Goswami).This "W" shape of the pattern is hence periodic in nature for the time period of one year.The FEE plot verses months in years as a series can clearly identify the "W" shape FEE values in Rs. crore in a Figure 3. Other than the "W" shape pattern there is another pattern throughout the years from 2001 to 2018-June has been observed above and below the curve of fitting (red color). The residual from these was obtained in the regression.

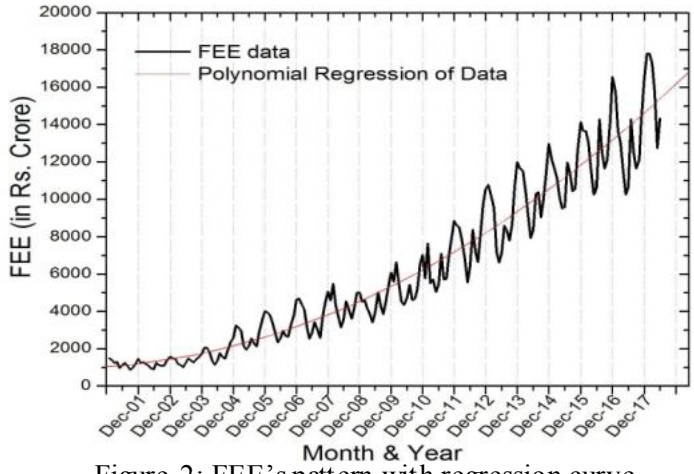

Figure-2: FEE's pattern with regression curve

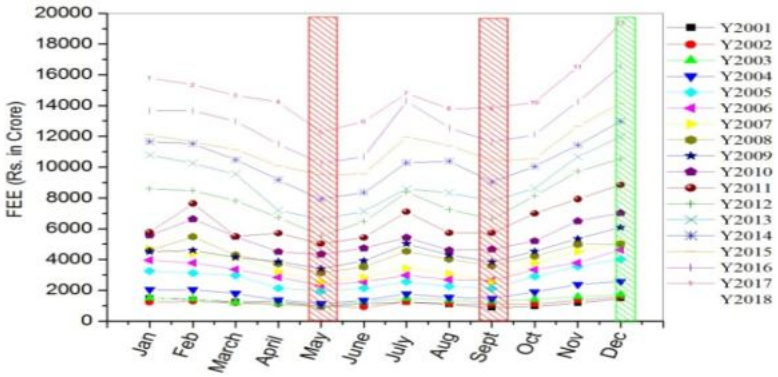

Figure-3: Close look of "W" shape pattern of FEE with respect to months from Jan to Dec.

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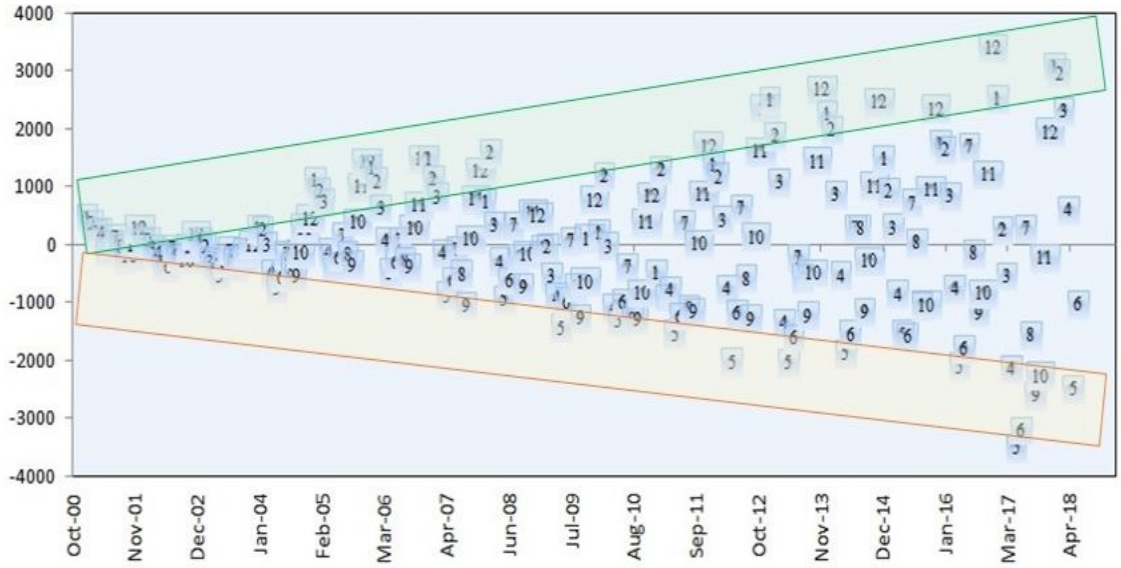

Figure-4: Residuals in Polynomial regression of FEE

Analysis of Residual data

The data of residual versus month-year plotted in the graph shown in Figure 4. The data points are represented by the month in numerical format. The Months in numerical format taken as 1 for Jan, 2 for Feb, 3 for Mar, 4 for April, 5 for May, 6 for June, 7 for July, 8 for August, 9 for Sept, 10 for Oct, 11 for Nov, 12 for Dec. The zero i.e. "0" on Y-axis represents the regression curve and residual data points in positive and negative side of it. For more close analysis two rectangular boxes are used to represent green box for positive side peaks and reddish box for negative side peaks. Green Box captured frequently "12" and "1" and less frequently in "2" i.e. the FEE is maximum in December and January and sometime in February which is also shown in the positive peaks of "W" shape in Figure 2. However, Reddish Box captured frequently "5" and "6" for one and frequency "9" in second negative peak i.e. the FEE is achieved at its minima in May-June and in Sept and sometime in February which is also shown in "W" shape pattern's two downward peaks in Figure 2. In this residual analysis, the green and reddish boxes are showing the periodic pattern of variation of the positive and negative peaks. Positive peaks in Green box is showing wavy or sinusoidal pattern, but the irregular pattern is in negative peaks.

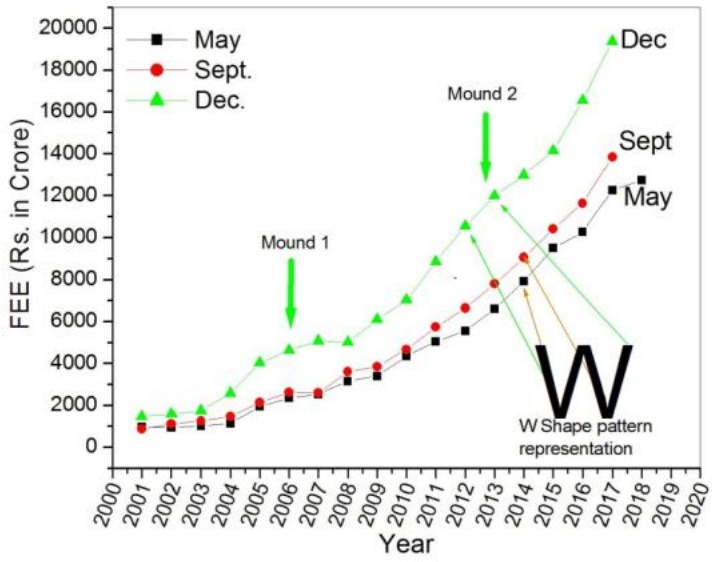

Figure-5: Mound pattern and FEE for positive and negative peaks

Mound Pattern

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For more close observation in these boxes the plot of Dec, May and Sept with respect to the years has been done here. It is shown in Figure 5 in which illustrative representation of "W" shape pattern is given. In addition to that the new "Mound" pattern (concerned with the Green box in Figure 4) was seen coming from the Dec's series plot. There are two Mounds first is "Mound 1" and second is "Mound 2". The interval in years between these consecutive mounds is observed six (6). From the Mound pattern, it is found that there shall be the interval between two wavy consecutive (positive "W" shape peaks) mounds. Therefore from this the next mound would be expected to be in Dec 2020 i.e., "Mound 3". Previous mounds are observed in 2006 and 2013 with FEE 4642 and 11994 in Rs. Crore respectively. The ration of "Mound 2" to "Mound 1" is more than that of 2.5. Therefore the 2020's "Mound 3" is estimated as 30990 Rs. in Crore FEE from the tourism.

FEE in Medical Tourism

The data of FTA and FE are available but for the present work only 2012 to 2016's data for 'Percentage of the Medical FTA' has been found in literature. Therefore only the 2012 to 2016 analysis has been done to see impact. The information published by Press information Bureau (PIB) Government of India, about arrival of foreign medical tourist on the basis of medical visa as on 2nd, May 2016 (Sharma)(This information was given by Minister of State for Culture and Tourism (Independent Charge) and Minister of State for Civil Aviation in a written reply in Lok Sabha.), on 04th, April 2018 (K. J. Alphons)(This information was given by Union Minister of State (I/C) for Tourism in a written reply in Lok Sabha.) and on 19th March 2018 (K. Alphons)(This information was given by Union Minister of State (I/C) for Tourism in a written reply in Lok Sabha) have been utilized as a raw data along with others(India Tourism Statistics at a Glance-2018)(Indian Tourism Statistics 2017). Foreign exchange earnings from Medical tourism are not available for the number of data points for good approximation analysis. Therefore the new way to analysis is implemented in the present work. For this, the study takes 'Percentage of the Medical FTA' and correlates it with the 'FEE from Total FTA'. The details are given in Table 1.

Table 1: FTA (Total and Medical) and FEE for five year from 2012 to 2016

Year	FTA (in millions)		Percentage of Medical FTA	FEE from Total FTA (Rs. in Crores)
	Total	Medical		
2012	6.58	0.17	2.60	94487
2013	6.97	0.24	3.40	107671
2014	7.68	0.18	2.40	123320
2015	8.03	0.23	2.91	135193
2016	8.8	0.43	4.85	154146

The data points of 'Percentage of the Medical FTA' have been fitted using linear regression of 'Percentage of the Medical FTA' as shown in Figure 6. The Linear Regression for Data is found with positive slope using the equation -

$Y=A\_1+B\_3 X,$

Where, A_1 is Y-intercept and B_3 is slope of the straight line of linear regression. The obtained value of A_1 and B_3 are -804.382 and 0.401 with error 549.52696 and 0.27285 respectively for R2 = 0.64699, standard deviation = 0.86284 and P = 0.238. This shows approximately with a rate of 0.401% per year, the growth of 'Percentage of the Medical FTA' is reported here subjected to the same pattern of the inbound flow of FTA. With respect to this the slope of FEE i.e. 14684 Rs. in crore per year (with an error 594.67406 and standard deviation 1880.5245 for R2 = 0.99755) is related with previously discussed slope 0.401% per year. This is the clear indication of the earning from medical tourism (even on the consideration of Leakage of the Revenue according to (Goswami)). And it's increasing as a function of the 'percentage contribution of medical FTA' in 'total FTA'.

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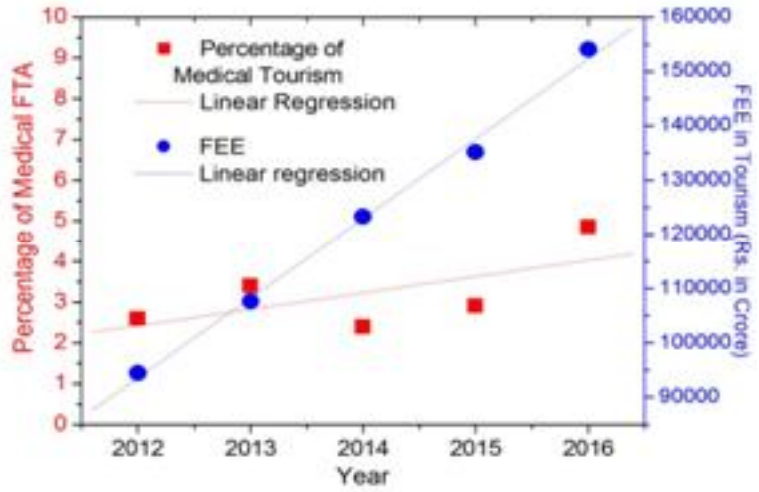

Figure-6: Percentage of medical FTA and FEE in tourism in India

CONCLUSION AND RECONDITIONS

This work reported the "W" shape and "Mound" patterns in FEE which has periodicity of one year and seven year respectively. December, January February are the highest earning months. This is the winter season in India. Whereas FEE is lowest in May and September which is hottest summer period and rain seasons respectively. This could affect and the possible reason for downward peaks of "W" shape pattern. The leakage in revenue can be compensated by the retention of revenue in the latter years in a year-wise-time-series data. This study reveals that the slope of FEE i.e. Rs. 14684 Cr per year is related with 'percentage of Medical FTA with a slope of 0.401% per year. Therefore medical tourism contributes an earning in Foreign Exchange from FTA and indirectly FEE increasing as a function of the 'percentage contribution of medical FTA' in 'total FTA'. Therefore the "W" pattern and "Mound" patterns are recommended for the prediction of Indian Foreign exchange earnings in future.

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Declaration: The work is original and it has not been published earlier. All graphs in figures are plotted by authors.

REFERENCES

- Alphons, K. J. Over 4 Lakhs Foreign Tourist Arrivals (FTAs) in India for Medical Purpose during 2016: Tourism Minister. written reply in Lok Sabha. New Delhi: Press Information Bureau, Government of India,, 2018.
- Alphons, K.J. Foreign Tourist Arrivals in India for the Medical Purpose Have Shown a Substantial Increase from 2014 to 2016. New Delhi: Press information Bureau, Govt. of India, Ministery Tourism , 2 4 2018.
- Battacharya, D. K. Research Methodology. Excel Books, 2003.
- C.R. Rao, H. Toutenburg, Shalabh, C. Heumann. Linear Models and Generalizations - Least Squares and Alternatives by . Springer, 2008.
- Frangialli, Francesco,. "Five challenges for international tourism up to the turn of the Century,." Monthly commentary on Indian economic conditions June 1994.
- Frost, Jim. "http://statisticsbyjim.com/regression/choosing-regression-analysis/." 2017. 2018.

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- G. Saravana Kumar, R. Krishna Raj. "Status, Growth and Impact of Medical Tourism in India." Int. J. Pharm. Sci. Rev. Res. 34.1 (2015): 284-291.
- Goswami, Birinchi Choudhury and Chandan. "Tourism Revenue Leakage Check." SCMS Journal of Indian Management X.1 (2013): 67-77.
- Granville, Vincent. 23 Types of Regression. 18 02 2017. Datasciencecentral. Dec 2018 <https://www.datasciencecentral.com/profiles/blogs/23-types-of-regression.>.
- India Tourism Statistics at a Glance-2018. New Delhi: Ministry of Tourism Govt. of India, 2018.
- Indian Tourism Statistics 2017. New Delhi: Market Research Division, Ministry of tourism, Govt. of India, 2017.
- K. C. Roy, C. A.Tisdell,. Tourism in India and India's economic developement. New York: Nova Science Publisher, 1998.
- Kakkar, Lenna and Sapna. "Impact of Tourism on Indian Economy." International Journal of Marketing, Financial Services & Management Research 1.4 (2012): 70 – 75.
- Ketan Vira. "Make in India: Impact on Medical Tourism." IOSR Journal of Business and Management (2016): 1-5.
- Kothari, C. R. Research Methodology, Research and Techniques. 2nd. Wiley Eastern Ltd., 1973.
- Monahan, John F. A Primer on Linear Models. CRC Press, 2008.
- Ravish Mathew, Anu Chandran R.C., Sampada Kumar Swain. "Backwater Tourism : RT Initiatives and SocioEnvironmental Dynamics." SCMS Journal of Indian Management (2017): 113-127.
- Roa, A. B. Research Methodology. Excel Books, 2008.
- Sandhu, N. Gupta, N. "Determinant of inward Foreign Direct Investigation (1994-2014): The Case of India." SCIM Journal of Indian Management XIII.4 (2016): 83-94.
- Sharma, Mahesh. Promotion of Medical Tourism. Written Reply to lok Sabha. New Delhi: Press Information Bureau, Government of India, 2016.
- T. Arunmozhi, A. Panneerselvam. "Types of tourism in India." Int. J.Curr.Res.Aca.Rev. 1.1 (2013): 84-88.
- Tayade, R. K. "The growth and impact of Medical Tourism in India." IJARIIE 2.3 (2017): 209-213.
- Vira, Ketan. "Make in India: Impact on Medical Tourism." IOSR Journal of Business and Management (2016): 1-5.