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C O N T E N T S

Editorial Note

Glass Ceiling: A study of women in Senior Management roles within the Mauritian Banking Sector

GUNNOO Leenshya

University of Technology Mauritius

MUNGRAH Kooshali

University of Technology Mauritius

01-16

The Status of Inter-Sectorial Physical Infrastructural Integration in Selected Sectors in Addis Ababa City, Ethiopia

Misiker Negash Bitew

Ethiopian Civil Service University, College of Finance, Management and Development, Ethiopia

Admassu Tesso Huluka

Associate Professor in Ethiopian Civil Service University, College of Finance, Management and Development, Ethiopia

17-29

An Examination of the Application of Corporate Governance Principles in the Global Business Sector of Mauritius

Bhavna MAHADEW

Lecturer in Law

University of Technology, Mauritius

30-37

Legal Awareness on Child Trafficking: A Critical Assessment of the Role of Physicians.

Bhavna MAHADEW

Lecturer in Law

University of Technology, Mauritius

38-44

Analyzing the Dynamics of Trade in Services of India

Arnob Paul

Department of Economics,

Rajiv Gandhi University, Arunachal Pradesh, India

Sushanta Kumar Nayak

Professor and Head, Department of Economics,

Rajiv Gandhi University, Arunachal Pradesh, India

45-59

An Empirical Study into the Influence of Brand Image on Smartphone Purchases in Raipur, Chhattisgarh

Jayant Isaac

Associate Professor, Faculty of Management Studies,

The ICFAI University Raipur, India

Rahul Singh

MBA Student, Faculty of Management Studies,

The ICFAI University Raipur, India

60-69

A Comparative Journey into Luxury Sportswear Online Buying Trends: With A Special Focus on Pune City. Harshi Garg Research scholar, School of commerce and management, IIMT University, Meerut, Uttar Pradesh, India. Priyank Sharma Associate professor, school of commerce and management, IIMT University, Meerut, Uttar Pradesh, India.	70-77
Factors Affecting Adoption Intention of AI: A Comprehensive Review with Bibliometric Analysis Purva Kansal Professor, University Business School, Panjab University, Chandigarh, India Apoorva Dawara Research Scholar, University Business School, Panjab University, Chandigarh, India	78-92
Does Perceived Service Quality of Airlines Influence Passenger Satisfaction? An Empirical Investigation Ranjit Roy Research Scholar, Department of Commerce, Assam University, Silchar, Assam, India Kingshuk Adhikari Associate Professor, Department of Commerce, Assam University, Silchar, Assam, India	93-102
Identification of Factors Influencing Retail Investors Perception for Investment in Mutual Funds Smarajit Sen Gupta Assistant Professor, Eastern Institute for Integrated Learning In Management, Kolkata, India Sarmistha Biswas Associate Professor, Eastern Institute for Integrated Learning In Management, Kolkata, India	103-115
Impact of Workplace Ostracism on Organizational Culture among Academicians in ED Tech Startups: A Comprehensive Analysis Surbhi Jain PhD Scholar, Amity Institute of Psychology and Social Sciences, Amity University, Noida, Uttar Pradesh, India. Mamata Mahapatra Professor & PhD Supervisor, Amity Institute of Psychology and Social Sciences, Amity University, Noida, Uttar Pradesh, India.	116-124
Empowering Rural Women through ORMAS and Transformation by Mission Shakti in Odisha Kailash Chandra Dash PhD. Research Scholar Department of Business Administration, Sambalpur University, Burla, Odisha, India Tushar Kanti Das Professor and Head, Department of Business Administration, Sambalpur University, Burla, Odisha, India	125-133

Social Sell: How Retail Merchants wield Social Media to persuade the Customers 134-144
Shobin Mathew

Research Scholar, Dept of Journalism and Science Communication, Madurai Kamaraj University, Madurai, Tamil Nadu, India.

S. Jeneffa

Professor and Head, Department of Journalism and Science Communication, School of Linguistics and Communication, Madurai Kamaraj University, Madurai, Tamil Nadu, India

Short Term Impact of Acquisition on Stock Returns- A Study Based on BSE Listed Select Companies In India

Subhajit Bhadra

Ph.D. Research Scholar, Department of Management and Marketing, West Bengal State University, West Bengal, India.

145-154

Ashoke Mondal

Ph.D. Research Scholar, Department of Management and Marketing, West Bengal State University, West Bengal, India.

Analyzing the Dynamics of Trade in Services of India

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Abstract

This article tries to analyse (a) Trend and composition of India's services export for the period of 2002 to 2021, (b) Intensity of intra-industry trade in services of India and (c) Revealed Comparative Advantage of India's services export during 2005-2020. To study the trend and composition, Annual Growth Rate and Compound Growth Rate are used, further the rank correlation is used to see the change in the composition of services export of India. Lastly, the RCA calculated analysed using the Balassa Index. The result indicates that (a) India has experienced an increase in the services export and also, its share in the GDP and total trade has improved over time, also, the composition of services export has not changed significantly over time which is tested using the Spearman's Rank Correlation method; (b) the average intensity of intra-industry trade in services is found to be moderately high (0.61) for all the years and highest in construction services followed by financial services; and (c) the RCA index shows that the India has a revealed comparative advantage in the export of telecommunication, computer and information services and other business services. For this study, the secondary data has been collected from the WTO trade in services database (ITC Trade Map, 2022) based on the IMF database from 2001 to 2021.

JEL: F10, F13, F19

Keywords: Service Sector, Services Export, Grubel-Llyod Index, Balassa Index, Spearman's Rank Correlation, India.

Introduction

In the last two decades the services sector has grown tremendously in terms of its contribution to GDP as well as to Export. The services sector has come into the focus of the mainstream economists after the WTO General Agreement on Trade in Services (GATS) in 1994 (Uruguay Round). During 2005, the services export of the whole world was US \$2558.34 Billion, which has increased to US \$6217.45 Billion in 2019. On the other hand, during same period, the goods export of the world has increased from US \$10360.50 Billion to US \$18750.89 Billion. This reflects that the services export has increased by more than 143 per cent while the goods export has registered a growth of around 81 per cent. This figure reflects the growing importance of the services sector in the global economy.

Bhagwati (1984) stated that services can be divided into two categories; first, those that necessarily require the physical proximity of the user and the provider; and second, those that do not necessarily require physical proximity. Hindley, B. and Smith, A. (1984) stated that none of the differences between the trade of goods and trade of services can change the normative implication of existing theoretical approaches. Stern and Hoekman (1987) stated that when the domestic factors receive payments for providing services from non-residents, it is a trade in services. However, mainly two widely used definitions of trade in services are there which helps in differentiating the goods trade with the services trade. The first one given in the IMF Balance of Payments Manual states that *Trade in services are the current account transactions that are neither goods transactions nor income payments* (IMF, 1993).

On the other hand, the second definition in the GATS Article 1 defined (WTO, 1995) a service as any service supplied across national borders by one of four modes. These are the Mode 1 or 'cross-border trade', Mode 2 or 'consumption abroad', Mode 3 or 'commercial presence' and Mode 4 or 'presence of natural persons'.

A number of literatures (such as Smith, A. D., 1992; Ito, T et al., 2003) have come up in recent time to examine the impact of different services on the economic growth. Further, new ideas such as 'Weightless Economy' is introduced by Danny Quah (2002) to explain the process and impact of dematerialisation of economic transaction. The Table I represents the percentage share of the services sector in India's Gross Domestic Product (GDP) over a span of four decades, from 1981-82 to 2021-22. The data highlights the steady growth and increasing significance of the services sector in India's economy.

Table 1: Share of Services Sector in GDP (percentage)

Year	Percentage share	Year	Percentage share	Year	Percentage share
1981-82	40.39	2004-05	57.19	2013-14	59.51
1985-86	43.06	2005-06	57.49	2014-15	60.34
1987-88	44.58	2006-07	57.14	2015-16	60.22
1989-90	44.17	2007-08	57.65	2016-17	60.37
1993-94	45.57	2008-09	58.61	2017-18	60.28
1997-98	47.45	2009-10	58.30	2018-19	61.17
2001-02	51.99	2010-11	57.47	2019-20	62.28
2002-03	53.13	2011-12	58.56	2020-21	60.40
2003-04	53.25	2012-13	59.26	2021-22	60.71

Note: The share is computed from the Current Price data.

Source: Reserve Bank of India

The services sector's share of the GDP increased from 40.39 per cent in 1981–1982 to 60.71 per cent in 2021–2022. This suggests that the sector's share of the total economic output has increased significantly over time. The percentage shares fluctuate over the course of the period, reflecting shifting economic conditions and shifts in policy.

The growth trajectory does, however, exhibit some fluctuations, with minor declines observed in a few years, such as the declines from 2003–04 to 2004–05 and from 2010–11 to 2011–12. All things considered, the steadily rising trend in the services sector's percentage share highlights how crucial it is becoming to India's economic development and expansion. This trend indicates India's shift over the decades towards a more service-oriented economy and is consistent with the broader global shift towards economies led by services.

Table 2: Share of Services Trade in GDP (in percentage)

Year	India	China	UK	US	World
2001	7.71	9.67	15.27	4.78	9.36
2002	7.87	10.13	15.33	4.77	9.75
2003	8.03	6.82	15.75	4.80	9.75
2004	10.37	7.78	16.38	5.20	10.48
2005	12.11	7.11	16.90	5.30	11.02
2006	13.61	7.08	17.81	5.59	11.42
2007	12.88	7.48	17.99	6.09	12.04
2008	13.48	7.01	18.94	6.51	12.39
2009	10.87	5.93	19.73	6.42	11.72
2010	11.70	6.11	19.84	6.77	11.70
2011	11.86	5.94	20.72	7.07	11.85
2012	12.34	5.66	20.66	7.10	11.97
2013	12.27	5.62	21.18	7.04	12.32
2014	11.69	6.22	20.89	7.11	12.85
2015	11.36	5.90	21.21	6.96	13.02
2016	11.23	5.79	22.48	6.94	12.96
2017	11.11	5.56	23.70	7.12	13.22
2018	12.18	5.46	24.85	6.97	13.56
2019	12.19	5.25	25.01	6.94	13.70
2020	11.96	4.16	22.68	5.66	11.68
2021	11.92	4.38	21.48	5.77	11.89

Sources: World Bank Databank.

With the increasing share of services sector in the GDP, the volume of the services trade is also enlarging. Table 2 figures out that India's services trade as a share of GDP is quite similar with the world pattern. It has increased from 7.71 per cent in 2001 to 11.92 per cent in 2021 whereas the share of services trade in the GDP of the World has increased from the 9.36 per cent to 11.89 per cent. Interestingly, the share is quite low in case of the

countries like US and China. China's services trade share as a share of GDP has declined from 10.13 to 4.38 per cent during 2002-2021. China's services trade as a percentage of GDP was higher than that of the US for the period of 2001-2008 and has fallen below the US after 2008.

Out of these five countries, the United Kingdom has the highest share of services trade in the GDP for all the years. It has increased from 15.27 per cent in 2001 to 25 per cent in 2019 and has fallen to 21.48 per cent in 2021. This fall in the share during the period of 2019-2021 is observed for world in general and the given countries in particular. This was caused by the Covid-19 pandemic which interrupted the movement of different services like tourism, transportation, manufacturing services etc.

The survey of the literature shows that a number of studies (such as Nath, H. K., et al., 2015; Gaurav, K. and Bharti, N, 2018) have been done in the field of services export to examine the revealed comparative advantage of different services. So, in this paper an attempt has been made to analyse the (a) Trend and composition of India's services trade for the period of 2002 to 2021, (b) Intensity of intra-industry trade in services of India and (c) Revealed Comparative Advantage of India's services export during 2005-2020.

Methodology

The study has used the annual data of total export of different services by India obtained from the WTO trade in services database. The classification of Trade Map data is based on the IMF fifth edition of the Balance of Payments Manual (BMP-5) methodology where the services are classified into 11 categories at level 1 classification.

In the study, all the calculations are done using the data of World Trade Organisation Trade in services data, 2022. For analysis, the compound annual growth rate, Spearman's correlation coefficient, Intra-industry Trade Index and Revealed Comparative Advantage (RCA) index are calculated.

Compound Annual Growth Rate (%)

The Compound Annual Growth Rate (CAGR) is determined using the Formula 1.

$$CAGR = \left[\left(\frac{V_{final}}{V_{begin}} \right)^{\frac{1}{t}} - 1 \right] \times 100 \dots \dots \dots (Formula 1)$$

V_{final} is the Final Value, V_{begin} is the end value, and t is the number of periods.

Analytical Tools for testing the significance of Trend

To test that if there is any significant trend of the export, the following model is estimated:

$$E_t = \alpha + \beta_1 t + \beta_2 D_1 + \beta_3 (D_1 \times t) + u_t \dots \dots \dots (Model 1)$$

Here,

- E_t repr
- E is the natural log of value of services export of India during the period of 2002 to 2021.
- t represents the time component which ranges from 2002 to 2021.
- D_1 is the time dummy for the years from 2009 to 2021, which is 1 for the period after 2009 and 0 otherwise.
- $(D_1 \times t)$ is the interaction term. Here, the coefficient β_3 shows the difference in the growth rate of the export in between the two time periods (2002-2008 and 2009-2021)

Spearman Rank Correlation Coefficient (ρ)

India's services export for different services are given a rank (the category of service having highest share in the total services export was given 1 and so on) for the initial period (2012) and the end period (2020) (here, the initial period is considered as 2012 because data of some category of services are not available for the period of 2005-2011). The Spearman rank correlation coefficient (Spearman, C., 1904) has been calculated using the Formula 2. A sign

Significant positive correlation will indicate that there is no significant change in the composition of services export of India during the study period. And on the other hand, an insignificant positive correlation will indicate that there is a significant change in the composition of services export of India.

$$\rho = 1 - \frac{6\sum d_i^2}{n(n^2 - 1)} \dots \dots \dots (\text{Formula 2})$$

The Spearman's rank correlation coefficient will help in knowing has there been any change in the composition of India's services export during the period of 2012 to 2020.

Analytical Tools for preparing Intra-Industry Trade Index

To assess the Intra-Industry Trade (IIT) intensity among countries, we employed the static Grubel-Lloyd index, as proposed by Grubel and Lloyd in 1971 and 1975. This index serves as a quantitative measure, allowing for the examination of the proportion of simultaneous imports and exports within the same industry, providing valuable insights into the level of intra-industry trade intensity. This index is able to measure the portion of balanced trade within a specific sector. Suppose, there are n number of services industries in a country, then X_{it} and M_{it} will be the aggregate Export and Import of the i^{th} industry in period t where, $i = 1, 2, 3, \dots, N$ and $t = 1, 2, 3, \dots, T$. Therefore, the total IIT in a particular services industry is the value that export of i industry which is equal to the import of the same industry. Finally, the IIT index can be formed as:

$$GL_{it} = 1 - \frac{|X_{it} - M_{it}|}{(X_{it} + M_{it})}, \quad GL_{it} \in [0,1] \quad (3)$$

The value of the GL index lies between 0 and 1 where 0 indicates perfect inter-industry trade and 1 indicates complete intra-industry trade (IIT). The trade weighted average of the industry indices can be used to compute the GL index across all industries. Further, it can also be computed for a subset of trade partners or for the total trade of a nation. In other words, using the shares of each sector in overall trade as the weights, we can calculate the weighted average of the GL and aggregate it. The aggregate index that is produced can be written as:

$$GL_t = \frac{\sum_{i=1}^N (X_{it} + M_{it}) - \sum_{i=1}^N |X_{it} - M_{it}|}{\sum_{i=1}^N (X_{it} + M_{it})}, \quad GL_t \in [0,1] \quad (4)$$

Analytical Tools for preparing Revealed Comparative Advantage Index

The RCA is calculated using the method suggested by Balassain1965. The comparative advantage is revealed by the relative export performance of the individual product category (Balassa, 1965). In our study to compute the RCA of countries for different service categories, we have used the same method as:

$$RCA_{ij} = \frac{x_{ij}}{x_{wj}} / \frac{X_i}{X_w}$$

Where, RCA_{ij} = Revealed comparative advantage of the i^{th} country's j^{th} service; x_{ij} = Exports of the j^{th} service by the i^{th} country; X_i = Total service exports of the i^{th} country; x_{wj} = World exports of the j^{th} service; X_w = Total world exports of services

Revealed Comparative Advantage captures the degree of specialisation of the export sector. A value of $RCA > 1$ indicates that the country has a comparative advantage in export of that particular product/sector/industry. A value of $RCA = 1$ indicates that the country has no different degree of specialisation than the world.

Results and Discussions of the Study

Trend and Composition of India's Services Export

India's position in the world services export has also improved over the period of 2002 to 2021. There is a continuous increase in the India's services export as a share of World services export. During 2019 and 2021, one of the highestchanges in the rate of growth of about 0.51per cent is observed (from 3.42per cent in 2019 to 3.93per cent in 2020).

Table 3: Percentage Share of India's services export in the World

YEAR	India (Billion \$)	World (Billion \$)	Share (%)	YEAR	India (Billion \$)	World (Billion \$)	Share (%)
2002	19.48	1632.34	1.19	2012	145.53	4595.00	3.17
2003	23.90	1894.50	1.26	2013	149.16	4882.50	3.06
2004	38.28	2299.53	1.66	2014	157.20	5240.72	3.00
2005	52.18	2653.64	1.98	2015	156.28	5004.68	3.12
2006	69.44	3030.68	2.30	2016	161.82	5084.42	3.18
2007	86.55	3629.82	2.39	2017	185.29	5532.02	3.35
2008	106.05	4074.92	2.63	2018	204.96	6095.94	3.36
2009	92.89	3653.40	2.54	2019	214.76	6279.02	3.42
2010	117.07	3972.72	2.95	2020	203.25	5171.70	3.93
2011	138.53	4468.06	3.10	2021	240.66	6033.03	3.99

Source: ITC Trade Map, value in US\$ billion

It is interesting to state that India's rate of growth of services export is at a higher side than that of the world for most of the years between 2002 and 2021. During 2009 the services export has gone negative for India in particular and the world in general which was a cause of global financial crisis of 2008. When we consider the period after 2019 (Covid-19 Out-break), we can see that the India as well as the world has faced a negative growth. But the percentage fall in the services export of India (5.36 per cent) is less than that of the world (20.1 per cent) and therefore, between 2019 and 2020 India's share in world export of services has increased from 3.45 per cent to 4.09 per cent.

Table 4: Annual Growth Rate (%) of Services Export

Year	India	World	Year	India	World
2002	22.71	16.06	2013	2.50	6.26
2003	60.16	21.38	2014	5.38	7.34
2004	37.22	15.40	2015	-0.58	-4.50
2005	32.75	14.21	2016	3.55	1.59
2006	24.66	19.77	2017	14.51	8.80
2007	23.24	12.26	2018	10.61	10.19
2008	-13.29	-10.34	2019	4.78	3.00
2009	26.03	8.74	2020	-5.41	-17.64
2010	18.33	12.47	2021	18.47	16.65
2011	5.05	2.84	CAGR	14.15	7.12
2012	22.71	16.06			

Source: ITC Trade Map

It is seen the services export of India has an increasing trend over this period (2002-2021). The rate of growth of the services export of India remained higher than that of the world growth rate for the all periods during 2002-2021. During 2008 Financial Crisis (Global Slowdown) as well as Covid-19 pandemic, volume of services export of both India and the world has come down. During the 2008, India faced with a higher fall in the volume of services export in comparison with the world, while the rate of fall in services export is lesser in case of India during 2020. To test if there is any significant change in the trend of the services export of India through the year of 2002-2021, we have employed the Model 1. The model 1 is estimated using the ordinary least square method with Newey-West Covariance (to deal with the possible problem of autocorrelation and heteroscedasticity). The result of the Model 1 is presented in the Table 5.

Table 5: Analysis of Trend

Variables	Coefficient
Constant	23.71***
D ₁	465.62***
Time	0.30***
D ₁ × Time	-0.23***
R ²	0.98
Adjusted R ²	0.98
F statistics	504.92***
AIC	-2.02

Dependent Variable: Natural log of value of Export of India

Note: ***significant at 1%, **significant at 5% and *significant at 10%.

In the Table 5, we have displayed the result of the trend analysis of Services Export of SAFTA. The Model 1 is employed to test the trend. The significant (at 1 per cent level) value of the coefficient t signifies that there is a positive trend exist between the period of 2002 to 2021. Also, the coefficients of D₁ and (D₁× t) are significant at 1 per cent level; significant and positive coefficient of D₁ represents that after the financial crisis of 2008, the average value of Export of SAFTA has increased. On the other hand, the coefficient of the interaction term (D₁× t) is found to be significant and negative, which implies that there is a change in the average growth rate of services export of India between the period of 2002-2007 and 2008-2021, the negative value of the coefficient represents that the average growth rate of services export of India during 2002-2007 is higher than that of the 2008-2021.

In the Figure 1, the relative importance of services trade over the goods trade is analysed. It is seen that the services export as a ratio of goods export for India is higher than the world for all the study years (2003-2021). The Figure-1 show that the ratio of services export and goods export for the world is somewhat stagnant over this period. It was around 0.25 during 2003 reached its maximum (0.33) in 2019 and then fallen to 0.27 in 2021. A very slow growth is observed during 2011-2019. However, this increasing share is not as high as India.

For India, the path is not that smooth, during 2003 to 2007, it has increased from 0.40 to 0.59. This pattern reflects an increasing importance of services export over goods export. Since, during the same period, India's services sector was growing tremendously. As a shock of the financial crisis of 2008, this ratio has fallen from 0.58 in 2008 to its all-time low of 0.53 in 2009 and to 0.44 in 2013. After 2013, it has increased at very faster rate from 0.44 in 2013 to 0.74 in 2020. In 2021 this ratio has fallen from 0.74 (in 2020) to 0.61. Two reasons can be put forward: (a) During the pandemic (2020), India's export had fallen but, the fall in the goods export was higher (14.76 per cent) than that of the services export (5.41 per cent) and therefore, the ratio of services export to goods export has achieved an all-time high milestone. (b) Soon the pandemic was over, the trade in goods started at full pace and the goods export of India has recorded a growth of 43.31 per cent which is higher than that of the services export growth of 18.47 per cent during the same period (2020-2021).

Figure 1: Services Export as a Ratio of Goods Export

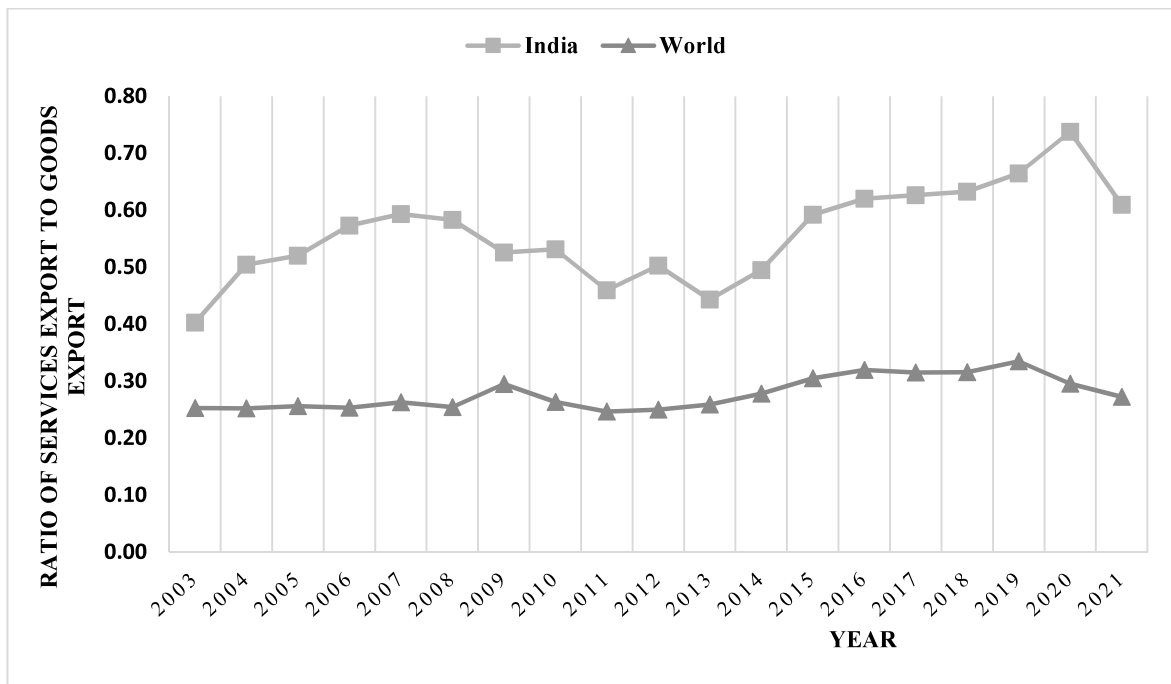


Figure 1: Services Export as a ratio of Goods Export.

Source: Authors' own calculation based on the ITC Trade Map Data, 2022.

Table 6 shows that during 2005-2020, it is seen that the personal, cultural, and recreational services have the highest CAGR of 20.51 per cent followed by construction services (13.96 per cent) and charges for the use of intellectual property services (11.95 per cent). Other business services and Telecommunications, computer, and information services has a high CAGR of 9.52 per cent and 9.13 per cent respectively. The travel services have the lowest CAGR of 3.52 per cent. The financial services export has been severely impacted and witnessed de-growth of 15.70 per cent during the period of 2008 to 2009 which is merely a result of the global financial crises of 2008.

Table 6: Growth of Different services export of India during 2005 to 2020

Service Label	2006	2007	2008	2009	2010	2011	2012	2013
Manufacturing services	---	---	---	---	---	---	---	-3.83
Maintenance and repair services	---	---	---	---	---	---	---	160.55
Transport	32.35	18.02	25.40	-12.28	18.18	33.34	-1.10	-3.38
Travel	15.23	24.27	10.28	-5.88	30.12	22.21	1.49	2.37
Construction	79.00	21.69	11.63	-3.78	-35.01	59.46	9.98	32.22
Insurance and pension services	18.29	35.26	3.67	-2.98	17.57	45.11	-12.62	-5.04
Financial services	106.21	43.35	27.00	-15.70	61.29	7.11	-14.36	19.14
Charges for the use of intellectual property	-70.43	167.80	-9.39	29.85	-33.64	137.57	6.22	38.61
Telecommunications, computer, and information services	33.16	27.60	29.52	-8.29	19.03	16.30	3.58	10.25

Service Label	2006	2007	2008	2009	2010	2011	2012	2013
Service Label	2006	2007	2008	2009	2010	2011	2012	2013
Other business services	37.11	21.49	19.91	-24.15	25.13	11.64	22.16	-0.93
Personal, cultural, and recreational services	175.90	66.06	38.96	233.58	-58.65	-64.68	122.51	60.74
Service Label	2014	2015	2016	2017	2018	2019	2020	CAGR (%)
Manufacturing services	262.54	-15.55	-21.20	-12.44	106.67	3.22	6.23	---
Maintenance and repair services	-7.45	-15.21	-7.63	50.81	-5.39	-6.36	-24.90	---
Transport	9.94	-23.00	5.98	11.89	11.90	11.19	-1.56	7.50
Travel	7.08	6.66	6.73	22.02	4.40	7.53	-57.57	3.52
Construction	32.34	-8.08	40.17	9.91	39.02	-8.32	-3.89	13.96
Insurance and pension services	6.39	-12.98	7.53	15.22	4.89	-2.05	-6.90	5.89
Financial services	-11.46	-5.33	-5.05	-11.61	21.13	-11.26	-14.86	8.32
Charges for the use of intellectual property	47.84	-29.17	12.50	25.67	18.99	11.05	43.83	11.95
Telecommunications, computer, and information services	1.36	0.94	-2.26	1.08	7.01	11.58	5.11	9.13
Other business services	3.88	3.38	9.10	9.53	8.94	13.47	5.46	9.52
Personal, cultural, and recreational services	2.74	-0.02	10.86	4.47	28.36	9.97	6.18	20.51

Source: *ITC Trade Map*

Considering the period of the pandemic (2019-2020), it is seen that the travel services (-57.57 per cent growth rate) followed by maintenance and repairing services (-24.90 per cent growth rate) and Financial Services (-14.86 per cent growth rate) has affected adversely.

The Table 7 represents the share of different services in total services export of India. It is seen that from 2005, Telecommunications, computer, and information services and other business services remained at top. From 2005 to 2020 each of these two heads are having share more than 30 per cent of the total services export of India.

Also, we can observe that the share of travel services in total services export has fallen from 14.77 per cent in 2017 to 6.41 per cent in 2020. It is obvious that during the covid 19 pandemic, the travel and tourism has declined and therefore, the share from this head in the total export of India has also fallen.

Table 7: Percentage Share of Different services in Total Services Export of India

Service label	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Manufacturing services	---	---	---	---	---	---	---	0.04	0.04	0.13	0.11	0.08	0.06	0.12	0.11	0.13
Maintenance and repair services	---	---	---	---	---	---	---	0.05	0.13	0.12	0.10	0.09	0.12	0.10	0.09	0.07
Transport	12.53	12.46	11.80	12.07	12.09	11.34	12.78	12.03	11.34	11.83	9.16	9.38	9.16	9.27	9.84	10.23
Travel	14.36	12.43	12.40	11.16	11.99	12.38	12.78	12.35	12.33	12.53	13.45	13.86	14.77	13.94	14.30	6.41
Construction	0.66	0.89	0.87	0.79	0.87	0.45	0.61	0.63	0.82	1.03	0.95	1.28	1.23	1.55	1.36	1.38
Insurance and pension services	1.80	1.60	1.74	1.47	1.63	1.52	1.87	1.55	1.44	1.45	1.27	1.32	1.33	1.26	1.18	1.16
Financial services	2.19	3.39	3.90	4.05	3.89	4.98	4.51	3.68	4.27	3.59	3.42	3.14	2.42	2.65	2.24	2.02
Charges for the use of intellectual property	0.39	0.09	0.19	0.14	0.21	0.11	0.22	0.22	0.30	0.42	0.30	0.32	0.36	0.38	0.41	0.62
Telecommunications, computer, and information services	32.32	32.33	33.10	34.99	36.64	34.60	34.01	33.53	36.07	34.69	35.22	33.25	29.35	28.39	30.24	33.58
Other business services	34.90	35.96	35.05	34.30	29.71	29.49	27.83	32.36	31.27	30.83	32.06	33.78	32.31	31.82	34.46	38.40
Personal, cultural, and recreational services	0.21	0.44	0.59	0.67	2.54	0.83	0.25	0.53	0.83	0.81	0.81	0.87	0.79	0.92	0.96	1.08

Source: Authors' calculation from the data obtained from ITC Trade Map.

By the time the share of Personal, cultural, and recreational services and Construction services has increased in the India's total services export. The share of Personal, cultural, and recreational services has increased from 0.21 per cent to 1.08 per cent and the share of construction services has increased from 0.66 per cent to 1.38 per cent. And the remaining sectors are more or less remained stagnant in terms of its share in the total services export of India over the period

The rank correlation coefficient is used to see if there is any structural change between two periods. So, a significant and high positive value represent that there is no change in the ranking of the observations in the two periods, which will tell us that there is no change in the structure. On the other hand, an insignificant value will tell us that there is no correlation between the rankings of the observations of two periods. Thus, it signifies that there is a change in the structure.

Table 8: Spearman's Rank Correlation Result

Method	Coefficient
Spearman's Rank Correlation	0.96***

Note: ***denotes significant at 1% level.

This result in the Table8 signifies that no structural change in services export has been observed since the rank correlation coefficient between the share of different services in total services export of India of 2005 and 2020 is positive (0.96) and significant at 1 per cent level.

Analysis of Intra-Industry Trade in Services

Chamberlin-Heckscher-Ohlin-Samuelson (C-H-O-S) model is one of the bases for the development of intra-industry trade theories. This model states that firms within an industry differentiate their products / services from those of other firms within the same industry, leading to the emergence of several types' intra-industry trade. Countries can specialize in areas where they have comparative advantages through intra-industry trade, which makes it easier to obtain a wider range of goods and services at lower prices.

Fundamental research, however, by Verdoorn (1960), Dreze (1961), and Balassa (1965), demonstrated a growing trend of intra-industry specialisation. Grubel and Lloyd's important paper (1975) provided extensive evidence of intra-industry trade among major industrialized nations, even at the third digit level of the Standard International Trade Classification.

The intra-industry trade (IIT) is an important feature of international trade in services. It is important to make a distinction between the horizontal IIT and Vertical IIT in services because the determinant and impact of VIIT and HIIT are different. However, due to the paucity of services data, this article will not be able to address this aspect of the IIT in services. Therefore, the total IIT is calculated using unadjusted GL index (at industry and aggregate level). It is believed that the US BEA's classification system defines an "industry" in an economically relevant manner and does not unnecessarily group services together.

Table 9: Intra-Industry Trade in Services

Year	AggregatedGL Index	Year	AggregatedGL Index
2005	0.66	2014	0.61
2006	0.66	2015	0.60
2007	0.64	2016	0.59
2008	0.65	2017	0.59
2009	0.65	2018	0.59
2010	0.63	2019	0.58
2011	0.63	2020	0.56
2012	0.62	2021	0.55
2013	0.62	AVG	0.61

Notes: GL stand for unadjusted Grubel-Llyod IIT Index
Aggregate GL index is calculated from the data compiled from OECD trade in services databank.
AVG represents average

It is seen in the Table 9, that the intensity of intra-industry trade remained more or less stable over the study period. The average IIT intensity is 0.61 for the years between 2005 and 2021. The trend of the IIT shows that

the intensity of IIT has declined from 0.66 in the year 2005 to 0.55 in the year 2021. Further, the Table 10 shows a more detailed analysis of IIT at industry level.

Table 10: Intra-Industry Trade in Services of India: Sectoral Breakdown																						
Code	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	AVG				
1	0.75	0.70	0.64	0.60	0.81	0.72	0.64	0.46	0.41	0.39	0.40	0.47	0.54	0.70	0.46	0.53	0.59	0.58				
2	0.11	0.16	0.15	0.19	0.20	0.16	0.21	0.21	0.43	0.39	0.32	0.33	0.29	0.28	0.28	0.36	0.48	0.27				
3	0.64	0.67	0.66	0.75	0.75	0.71	0.74	0.72	0.73	0.74	0.72	0.73	0.71	0.71	0.71	0.75	0.69	0.71				
4	0.81	0.83	0.81	0.83	0.78	0.75	0.78	0.77	0.78	0.75	0.73	0.69	0.71	0.68	0.66	0.51	0.41	0.72				
5	0.84	0.92	1.00	0.99	0.94	0.90	0.91	0.93	0.99	0.92	0.89	0.82	0.84	0.87	0.97	1.00	1.00	0.93				
6	0.74	0.76	0.82	0.90	0.90	0.86	0.90	0.83	0.86	0.86	0.82	0.75	0.78	0.76	0.73	0.79	0.78	0.81				
7	0.77	0.79	0.78	0.88	0.82	0.85	0.80	0.80	0.84	0.91	0.96	0.84	0.82	0.92	0.94	0.83	0.84	0.85				
8	0.47	0.42	0.23	0.22	0.22	0.22	0.32	0.35	0.33	0.31	0.26	0.27	0.34	0.36	0.37	0.43	0.46	0.33				
9	0.38	0.35	0.36	0.36	0.38	0.36	0.32	0.32	0.31	0.33	0.35	0.37	0.39	0.43	0.39	0.41	0.42	0.37				
10	0.73	0.70	0.64	0.58	0.61	0.65	0.59	0.60	0.59	0.57	0.58	0.56	0.53	0.53	0.55	0.55	0.54	0.59				
11	0.85	0.77	0.69	0.74	0.90	0.74	0.88	0.82	0.80	0.94	0.87	0.75	0.73	0.79	0.84	0.70	0.65	0.79				
12	0.64	0.66	0.64	0.78	0.82	0.72	0.82	0.76	0.55	0.59	0.53	0.64	0.70	0.59	0.67	0.63	0.68	0.67				
Note				:	Values are Calculated using the unadjusted GL Index																	
List of Services				:	1. Manufacturing services																	
					2. Maintenance and Repair Services N.I.E.																	
					3. Transport Services																	
					4. Travel Services																	
					5. Construction Services																	
					6. Insurance and Pension Services																	
					7. Financial Services																	
					8. Charges for the use of Intellectual Property N.I.E.																	
					9. Telecommunications, computer, and information services																	
					10. Other Business Services																	
					11. Personal Cultural and recreational Services																	
					12. Government Goods and Services N.I.E.																	
					AVG Average by country																	

Source: GL are calculated from the data compiled from OECD trade in services databank.

India had notable intra-industry trade in 2005 in the following areas: Manufacturing Services (0.75), Travel (0.81), Insurance and Pension Services (0.74), and Fees for Intellectual Property Use (0.77).

In 2021, the sectoral dynamics of intra-industry trade have changed. The biggest shift in trade patterns is seen in the huge growth in intra-industry trading in personal, Cultural, and Recreational Services (1.00). In addition, the importance of financial services (0.78) and maintenance and repair services (0.48) has increased, indicating a diverse portfolio of services supporting India's services trade. The average IIT intensity of 0.64 and 0.63 in 2005 and 2021 respectively indicate a moderate degree of specialisation.

Analysis of Revealed Comparative Advantage

The Absolute Cost Advantage theory was first proposed by Adam Smith in 1776, and it emphasises a nation's specialisation in goods and services in which it excels. This was further developed by David Ricardo's Comparative Cost Advantage theory (Ricardo, 1817), which emphasized specialisation based on relative cost advantages. But it had trouble explaining why relative costs varied so much between countries. This was expanded upon by the Heckscher-Ohlin Theorem (1933, 1949), which provided a more thorough explanation by connecting comparative advantage to variations in factor endowments and prices. However, this is argued that prices for commodities are also influenced by other

elements such as skill levels, laws, and technology. Bela Balassa responded by putting forth the Revealed Comparative Advantage (RCA) framework in the 1960s, which postulates that a nation's current trade pattern reflects its comparative advantage.

In Table 11.a and Table 11.b, we have shown the share of India's services export in World services export for the year from 2005 to 2020. Here, we can see that the share of India's total export of services as a percentage of world's total export of services has increased over the period from 2005 to 2020.

Table 11 (a): RCA Index

Services	Values in Billion USD (current price)															
	2005		2006		2007		2008		2009		2010		2011		2012	
	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA
Manufacturing services	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.06	0.02
Maintenance and repair services	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.08	0.04
Transport	6.54	0.65	8.65	0.61	10.21	0.61	12.80	0.57	11.23	0.66	13.28	0.55	17.70	0.64	17.51	0.61
Travel	7.49	0.54	8.63	0.56	10.73	0.56	11.83	0.48	11.14	0.50	14.49	0.51	17.71	0.53	17.97	0.51
Construction	0.35	0.55	0.62	0.50	0.75	0.50	0.84	0.35	0.81	0.38	0.53	0.21	0.84	0.29	0.92	0.30
Insurance and pension services	0.94	0.73	1.11	0.84	1.51	0.84	1.56	0.60	1.51	0.59	1.78	0.63	2.58	0.76	2.26	0.61
Financial services	1.14	0.39	2.36	0.41	3.38	0.41	4.29	0.44	3.62	0.43	5.83	0.54	6.25	0.48	5.35	0.40
Charges for the use of intellectual property	0.21	0.02	0.06	0.04	0.16	0.04	0.15	0.03	0.19	0.04	0.13	0.02	0.30	0.03	0.32	0.04
Telecommunications, computer, and information services	16.86	6.19	22.45	6.26	28.65	6.26	37.11	4.95	34.03	4.81	40.51	4.40	47.11	4.18	48.80	4.03
Other business services	18.21	2.13	24.97	2.04	30.34	2.04	36.38	1.79	27.59	1.50	34.53	1.51	38.55	1.33	47.09	1.53
Personal, cultural, and recreational services	0.11	0.39	0.31	0.56	0.51	0.56	0.71	0.61	2.36	2.12	0.98	0.67	0.34	0.21	0.77	0.43
Others	0.33	---	0.27	---	0.32	---	0.39	---	0.41	---	5.02	---	7.14	---	4.40	---
All services	52.18	---	69.44	---	86.55	---	106.05	---	92.89	---	117.07	---	138.53	---	145.53	---
Percentage Share in World (%)	2.04	---	2.29	---	2.39	---	2.61	---	2.55	---	2.95	---	3.11	---	3.17	---
SOURCE: ITC Trade Map (Contd.)																

The Table 11.a and Table 11.b reflects that between 2005 and 2020, there is no change in the RCA position of India. For all the years from 2005 to 2020, India was experiencing a Comparative advantage in Telecommunications, computer and

information services and Business services (being the value of RCA Index > 1). So, no change in the RCA position has been observed during these years.

Table 11 (b): RCA Index

Services	2012		2013		2014		2015		2016		2017		2018		2019		2020	
	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA
Manufacturing services	0.06	0.02	0.05	0.02	0.20	0.07	0.17	0.06	0.13	0.04	0.11	0.03	0.24	0.05	0.25	0.06	0.26	0.07
Maintenance and repair services	0.08	0.04	0.20	0.10	0.19	0.09	0.16	0.07	0.15	0.06	0.22	0.07	0.21	0.06	0.19	0.05	0.15	0.05
Transport	17.51	0.61	16.92	0.59	18.60	0.63	14.32	0.51	15.18	0.55	16.98	0.54	19.00	0.55	21.13	0.59	20.80	0.62
Travel	17.97	0.51	18.40	0.50	19.70	0.53	21.01	0.56	22.43	0.57	27.37	0.62	28.57	0.59	30.72	0.61	13.04	0.60
Construction	0.92	0.30	1.22	0.41	1.61	0.50	1.48	0.50	2.08	0.74	2.28	0.64	3.18	0.82	2.91	0.77	2.80	0.77
Insurance and pension services	2.26	0.61	2.14	0.55	2.28	0.56	1.99	0.52	2.13	0.52	2.46	0.56	2.58	0.54	2.53	0.54	2.35	0.43
Financial services	5.35	0.40	6.38	0.46	5.64	0.40	5.34	0.37	5.07	0.35	4.49	0.27	5.43	0.31	4.82	0.27	4.10	0.19
Charges for the use of intellectual property	0.32	0.04	0.45	0.05	0.66	0.07	0.47	0.04	0.52	0.05	0.66	0.05	0.78	0.06	0.87	0.06	1.25	0.08
Telecommunicatio, computer, and information services	48.80	4.03	53.81	4.22	54.53	3.85	55.05	3.68	53.80	3.47	54.38	3.03	58.19	2.73	64.93	2.76	68.25	2.44
Other business services	47.09	1.53	46.65	1.47	48.46	1.41	50.10	1.47	54.66	1.51	59.87	1.45	65.22	1.43	74.00	1.53	78.04	1.48
Personal, cultural, and recreational services	0.77	0.43	1.23	0.70	1.27	0.67	1.27	0.63	1.40	0.67	1.47	0.59	1.88	0.72	2.07	0.71	2.20	0.71

Table 11 (b). RCA Index (Contd...)

Services	2012		2013		2014		2015		2016		2017		2018		2019		2020	
	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA	Value	RCA
Others	4.40	---	1.72	---	4.06	---	4.93	---	4.27	---	15.01	---	19.67	---	10.34	---	10.02	---
All services	145.5	---	149.2	---	157.20	---	156.28	---	161.82	---	185.29	---	204.96	---	214.76	---	203.25	---
Percentage Share in World (%)	3.17	---	3.06	---	3.00	---	3.13	---	3.19	---	3.36	---	3.37	---	3.45	---	4.09	---
SOURCE: ITC Trade Map																		

The Table 11.a and Table 11.b reflects that between 2005 and 2020, there is no change in the RCA position of India. For all the years from 2005 to 2020, India was experiencing a Comparative advantage in Telecommunications, computer and information services and Business services (being the value of RCA Index > 1). So, no change in the RCA position has been observed during these years.

Service exports offer opportunities for suppliers in developing countries. Technology allows for cost-effective delivery of business and financial services across borders. Outsourcing has gained popularity as corporations in advanced countries strive to reduce fixed overhead by contracting out routine functions. These include data processing, electronic publishing, customer call centres, medical records management, hotel reservations, credit card services etc.

India is a leading exporter of IT, software and business process services, thus, the focus on safety arrangements must be given by the government and private companies so that more and more IT and BPO services centres become operational as soon as possible.

In order of getting benefitted from this sector, India needs to upgrade its technological capability and infrastructure. It is difficult to develop competitive services in the absence of roads, railways, electricity or telecommunications. It is important to promote and target export-oriented investment in services to gain employment, foreign currency and skills, and government's need to support competitiveness in services.

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