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INVESTIGATING CAUSALITY BETWEEN SERVICE EXPORT AND GDP OF INDIA

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ABSTRACT

The service sector has been the major source of economic growth in India in recent years. The growth of this sector has drawn a global attention. Unlike other countries where economic growth has led to a shift from agriculture to industries, in India there has been a shift from agriculture to the service sector. It now contributes around 53 per cent to India's Gross Value Added (GVA). In the trade mode, services trade has also grown at the same rate as goods trade over the 1990s. Now, India had a dominant presence in global services exports. It remained among the top ten services exporting countries in 2020, with its share in world commercial services exports increasing to 4.1per cent in 2020 from 3.4 per cent in 2019 (GoI, 2021).

In light of the above facts, an attempt has been made to examine the relationship between the services export and the economic growth of India, using time series data ranging from 1991 to 2021. Data has been collected from the secondary sources such as Reserve Bank of India (RBI), Ministry of Commerce & Industry, and Economic Survey. Various statistical tools have been applied such as the Augmented Dickey Fuller (ADF) unit root test, Johansen Co-integration and Granger-Causality test. The ADF unit root test shows that service export and Gross Domestic Product (GDP) series become stationary at first difference. The empirical results revealed that there is no co-integrating relationship between GDP and service export. Further, Unidirectional causality running from service export to GDP is found. However, GDP does not granger cause service export.

Keywords: Causality, Co-integration, Service Export, GDP

INTRODUCTION

The service sector has been the major source of economic growth in India in recent years. The growth of this sector has drawn a global attention. Unlike other countries where economic growth has led to a shift from agriculture to industries, in India there has been a shift from agriculture to the service sector. It now contributes around 53per cent to India's Gross Value Added (GVA). Services export not only grew more rapidly than the country's merchandise exports, but also increased much faster than the world average. Due to such rapid growth in

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services export, India has succeeded in increasing its penetration in global markets more rapidly in the case of services than goods.

The services sector comprises a host of very different kinds of services. In India, the National Income Classification given by Central Statistical Organization is followed. In the National Income Accounting in India, service sector includes the following items-

1. **Trade, hotels, and restaurants**
   Trade
   Hotels and restaurants
2. **Transport, storage and communication**
   Railways
   Transport by other means
   Storage
   Communication
3. **Financing, insurance, real estate and Business Services**
   Banking and Insurance
   Real estate, ownership of dwelling, &
   Business Services
4. **Community, Social, and Personal Services**
   Public administration and defense
   Other services

India's emerging services trade sectors are no longer traditional sectors like transport, travel, and tourism services. It is financial services and information and communication technology services that presently dominate India's services export basket. These are the sectors that are growing much faster than the traditional sectors.
In this context the present paper makes an attempt to fulfill the following objectives:

- *To investigate the performance of the service sector in terms of It's share in the GDP as well as the share of it's export in the Global services export.*
- *To examine the causality between Indian service export and GDP of India.*

LITERATURE REVIEW

Trade in services has been an area of interest for very long, dating back to the works of Adam Smith, David Riccardo, and Karl Marx, who considered services as distinct from goods when defining labour productivity. Classical economists thought of services as input to agriculture and industry, and as such did not devote much attention to services trade or to services as drivers of growth. However, technological changes and globalization in the last decade have changed the traditional notions about services, and the way economists have looked at it. Here are some studies which will be helpful to understand the concept as how the service sector has become the country's engine of economic growth.

Mishra, Lundstrom and Anand (2011) try to find out if increasing sophistication in services exports can lead to economic growth or not. An index of 'service exports sophistication' has been constructed to document this phenomenon. By using panel data, the study reveals a positive association between growth in per capita income and higher sophistication of service exports. The results also suggest that this phenomenon is growing in importance over time.

Thomas (2016) examines the impact of services exports on India's economic growth by comparing the input-output table of India for 2007-08 with that of 1993-94. It is found that

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among the major services in India's export basket construction, transport and business services are found to exhibit strongest backward linkages, and hence, can act as engines of export-led growth.

Mishra (2009) attempts to reinvestigate the dynamics of the relationship between exports and economic growth for India over the period of 1970 to 2009. The study establishes long-run equilibrium relation between them, although they may be in disequilibrium in the short-run. Furthermore, the results of granger causality test based on vector error correction model estimation indicate the existence of a unidirectional causality running from real GDP to exports.

A study by Priyankara (2018) tries to test the Export-led growth hypothesis (ELGH) in the case of services exports by analyzing annual time series data from 1984 to 2013 in Sri Lanka. The study employs Granger-causality procedure developed by Toda and Yamamoto in a vector autoregressive model (VAR) to identify the causality relationship between services exports and GDP. The findings indicate that unidirectional causality is running from services exports to economic growth in Sri Lanka. Therefore, ELGH holds for services exports for Sri Lanka.

Revolution in ICT technologies has made services more productive (Mishra et al, 2011). A productive service sector is known to strengthen the performance of other sectors in the economy such as manufacturing. This is because the sector enables and facilitates the functioning of most sectors (manufacturing, industrial sector, etc), as most of these sectors rely majorly on the service sector to supply needed functions such as banking, accountancy, information, and technology (Adetokunbo, 2020). The relationship between service sector's productivity and living standards was examined in a study by Eichengreen and Gupta (2010) in India. Using descriptive statistics, they found a positive correlation between output share of services and income per capita. Furthermore, they have classified services in three groups- Traditional, Hybrid and Modern services and found that modern services not only have the highest productivity growth, but their share in output tends to rise rapidly at high income levels.

Mukharjee (2013) argues that the service sector of India has the highest labour productivity and it is projected to continue to grow at a fast pace. The author suggested that by enhancing investment, creating employment and human capital, and developing infrastructure the productivity and efficiency of the sector will enhance which lead to inclusive growth.

Sahadevan (2010) examines the role of fast growing services economy in promoting overall growth. Further, he concludes that the higher overall growth achieved through an increasing contribution of services sector during post reform period has widened the gap between rural and urban India in terms of income and purchasing power parity. The study reveals that the strength of intersectoral linkages and the penetration of services to rural areas are vital for achieving sustainable and unbiased growth.

Mehta (2015) tries to investigate the relationship between Gross Domestic Product (GDP), Export and Import in India using time series data from 1976 to 2014. The results reveal a long run co-integrating relationship between GDP, export and import in India. The study also found an unidirectional causality running from GDP to export, it means in long run GDP lead to export but export does not lead to GDP.

Eichengreen and Gupta (2012) have surveyed India's experience with exporting services. The study argued that India cannot take the growth of services exports for granted. The growth of service exports globally and from India especially slowed in the recent global crisis, suggesting that service exports remain vulnerable to fluctuations in global demand. In addition to this,

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service exports from India are disproportionately destined for the two largest English speaking countries, the United States and United Kingdom, which renders Indian exports vulnerable to demand conditions as well as trade policies in these countries. The Indian exporters have not been able to penetrate the market in non-English speaking countries, further limiting market potential.

As services have grown in importance and their exports are increasing rapidly, there are very few studies available assessing the causal relationship between services export and economic growth of India. In this respect, the paper tries to investigate this relationship by using some of the econometrics methods.

India's Trade in Services

International trade in services has become more important in recent years as advances in technology have permitted new means of providing services across borders. Apart from it, the World Trade Organization (WTO) as an institution has also played an important role in promoting services trade.

Trade in services in India has been growing rapidly since beginning of 1990s, following significant domestic liberalization on one hand, and access to a growing overseas market for services, on the other. Today, services trade contributes around 12 per cent of India's GDP (World Bank, 2021). India's share in world services exports, which increased from 0.6 per cent in 1990s to 1.1 in 2000 and further to 4.1 per cent in 2020, has been increasing faster than the share of merchandise exports in world exports (1.7 per cent). It remained among the top ten services exporting countries in 2020. India's services export growth has been faster than that of merchandise exports with the export of services growing at a compound annual growth rate (CAGR) of 13.50 per cent during 1991-92 to 2021-22, while merchandise exports grew at a CAGR of 10.72 per cent during the same period (Figure 1). After witnessing high growth during 2002-03 to 2008-09 with a CAGR of 31.2 per cent and a pick up and good growth in 2010-11 and 2011-12 in the aftermath of the global financial crisis, export growth of services decelerated in 2012-13 to 3.4 per cent. The impact of Covid-19 induced global lockdown on India's services exports was less as compared to merchandise exports. The services which are contact intensive in nature like trade, hotels, transport, communication and services related to broadcasting have been affected more from the pandemic than the less contact intensive services such as financial, real estate and professional services (GoI, 2021-22). But the overall service sector has been lesser impacted than the merchandise sector. And now this sector has mostly recovered from the impact of the nationwide lockdown imposed during 2020-21, with the services exports grew by 21.6 per cent during the first half of the year 2021-22. (Figure 2)

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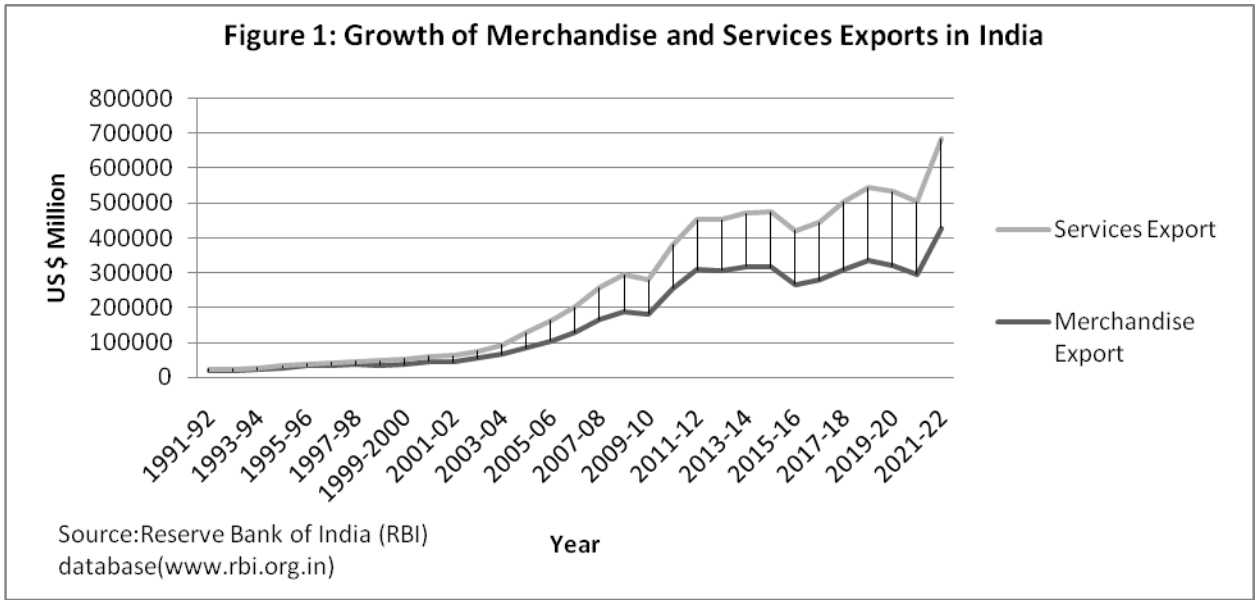

Services Export and Gross Domestic Product (GDP) of India

With the consistent expansion in the services sector, India's services exports have grown rapidly over the past two decades (Figure-1). As services tend to be more labour intensive than manufacturing or mining, growth in services exports has also been supported by relatively cheap labour, a large tertiary-educated workforce and the fact that English is widely spoken, which give India an advantage when doing business with foreign companies from English-speaking economies.(Hyvonen & Wang, 2012) The table 1 shows the share of India's trade in services as percentage of GDP during the period 1991 to 2021 and it is found that its share has increased by almost three times over the time period.

Table 1: India's Trade in Services (percentage of GDP)

Year	**1991**	**1992**	**1993**	**1997**	**2000**	**2005**	**2008**	**2009**	**2013**	**2019**	**2021**
percentage of GDP	4	4	4.2	5.2	7.7	12.1	13.5	10.9	12.3	12.2	11.9

Source: *World Bank, IMF, BOP Statistics, Yearbook.*

Over the past year, even as GDP growth has slowed, services exports from India have continued to expand strongly (Hyvonen & Wang, 2012). India's services exports accounted for 9 percent of GDP in 2021-22(Figure 2). It was at its highest level (9.5 per cent) in the year 2008-09 during the post reform period. During sub prime crisis in 2008, it came down to 7.6 per cent. Again due to Covid-19, some fluctuations can be seen by the graph. However, this sector has started reviving from the impact of lockdown imposed during pandemic and thus the graph clearly shows the increasing share of services exports in the GDP.

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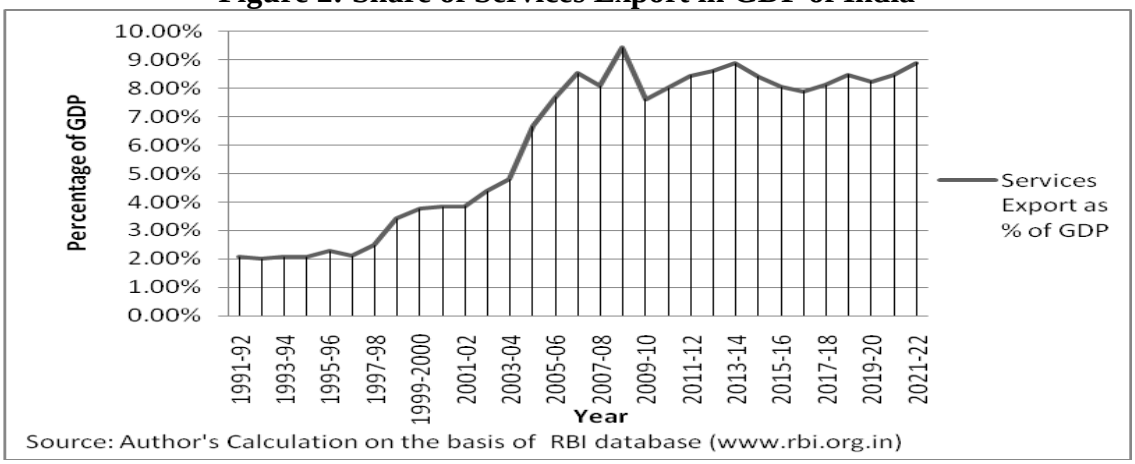
Figure 2: Share of Services Export in GDP of India



Source: Author's Calculation on the basis of RBI database (www.rbi.org.in)

Faster export growth over import in services has led to generate a growing surplus in trade balance. Net services has been a major source of financing India's growing trade deficit in recent years, financing around 57 per cent of merchandise trade deficit in 2021-22. This surplus has been expanding over the years (Table 2).

Table 2: Net Services Exports and Merchandise Trade Deficit of India (in Rupee Crore)

Year	Net Services Exports (Surplus)	Merchandise Trade Deficit	Percentage Share of Net Services Exports in Financing Merchandise Drade deficit
2015-16	455828	-849531	53.66 per cent
2016-17	458450	-754452	60.77 per cent
2017-18	499968	-1031727	48.46 per cent
2018-19	573783	-1260861	45.51per cent
2019-20	602381	-1114902	54.03 per cent
2020-21	656900	-753065	87.23 per cent
2021-22	801311	-1413934	56.67 per cent

Source: Author's Calculation on the basis of RBI database (www.rbi.org.in).

Developed countries are major trading partners for India in services. The EU as a bloc is the largest trading partner. Country wise, the US is the largest export destination followed by the UK and other European countries and other English speaking countries like Canada. India imports bulk of its services from the US, the UK, Australia, Germany, Japan, France and Korea.

DATA SOURCE AND METHODOLOGY

Data has been collaborated from various sources such as Reserve Bank of India (RBI), Ministry of Commerce & Industry, and Economic Survey. Various statistical techniques i.e. Unit root

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testing, Johansen's Cointegration Test, Vector Autoregressive Model (VAR) and Granger-Causality has been applied to fulfill the objectives of the study. Firstly, the stationarity of time series variables is checked through the unit root test. In general, a time series model is said to be stationary if the two conditions are satisfied. First, the whole potential distribution is independent of time and second, the covariance at any two-time points is dependent only on the distance between those points and are independent of time. It is important to have a stationary time series data as it will be time invariant and also it ensures that time series distribution will fluctuate around its mean value with nearly constant amplitude. Also, it is difficult to generalize the results of non-stationary distribution as it can only be studied at a particular point in time. And is therefore of least practical use. The approach to unit root testing implicitly assumes that the time series that is to be tested can be written as $Y_t = D_t + z_t + \varepsilon_t$ where, D_t = deterministic component (trend, seasonal components etc.) z_t = stochastic component, ε_t = stationary error process. The aim is to determine whether the stochastic component contains a unit root or is stationary.

Table 3 shows the results of the test, indicating that all the variables are non-stationary at the level and stationary at first difference when Akaike Information Criterion is applied at both intercepts and at the trend.

Table 3: Unit Root Results

Augmented Dicky Fuller Test			
Variables	Level/First Difference	Without Trend (p- value)	With Trend (p- value)
: LNGVA	Level First Difference	0.258 0.017	0.567 0.048
LNSERVICES EXPORT	Level First Difference	0.323 0.001	0.982 0.002

Source: Author's Calculation based on Secondary Data

Ho -variable has a unit root. P<0.05 null hypothesis is rejected.

Cointegration Test: When the series individually are stationary at the difference and there is the linear combination of the variables at their levels then the series is said to be cointegrated. When the variables are cointegrated then we can say that there is a long term and equilibrium relationship between the variables. Prior to applying cointegration and VEC model it is important to determine the optimum lag length. Importance of lag length in time series data lies in the fact that in time series data the future values are stochastically dependent of the past observations. Lag length identifies the time delay of the response to known leading indicator. If the lag length is too small then the remaining serial correlation in the errors will bias the test and if lag length is too large then the power of the test will suffer. Given a set of I (1) variables $\{X_{it}\ldots X_{kt}\}$. If there exists a linear combination of all variables with vector β so that, $\beta_1 x_{1t} + \ldots\ldots + \beta_k x_{kt} = \beta' xt$.....Trend stationary $\beta j \neq 0$, j=1,...,k. Then the x's are cointegrated of order C (1, 1) Cointegration in this paper is tested using Johansen cointegration test also known as Johansen and Juselius (JJ) test. It has two test statistics to check cointegration among the variables namely, trace test and maximum Eigen value test. Trace test has a null hypothesis that there are at most r cointegration vectors and maximum Eigen value has a null hypothesis that there are r+1 cointegration vectors versus there are r cointegration vectors.

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Table 4: Johansen's Cointegration Test

Hypothesized Number of Cointegrating Equations	Eigen Value	Trace Statistics	Critical Value at 5 per cent (p-value)	Max. Eigen Statistics	Critical Value at 5 per cent (p-value)
None	0.181	8.177	15.49 (0.45)	5.801	14.26 (0.64)
At most 1	0.079	2.375	3.84 (0.12)	2.375	3.84 (0.12)

Source: Author's own Calculation.

The cointegration between the stationary variables has been tested by the Johansen's Trace and Maximum Eigenvalue tests. The results of these tests are shown in the Table 4. The Trace test indicates that there is no cointegration among the variables at 5 per cent level of significance. And, also the maximum eigenvalue test confirms the same results. Thus, the two variables of the study do not have long run equilibrium relationship between them. Therefore, VAR estimates and its diagnosis tests are provided further in Table 6 (Appendix). Both the variables are not significantly affected by their past values. Also, the diagnostic tests suggest the suitability of the model.

Granger Causality test results are shown in the table 5, reflecting the direction lying between the variables.

Table 5: Pairwise Granger Causality Tests			
Sample: 1991 2021			
Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
LNSERV. EXPORT does not Granger Cause LNGVA	30	3.68905	0.0654
LNGVA does not Granger Cause LNSERVICES		0.08982	0.7667

Source: Author's own Calculation.

It can be inferred from the results that services export granger cause GVA at 10 per cent level of significance. However, GVA does not granger cause service export. Therefore, only unidirectional causality runs from service export to GVA.

CONCLUSION

The study found a unidirectional relationship between the variables which means that GVA is sensitive towards services exports of the country but services exports are not being affected by the GVA. This means that any increase in the services exports would have a positive impact on the growth of GVA of the country. In other words, India provides the evidence of services exports- driven growth over the sample period. The Johansen's Cointigration test reflects that there is no long-run cointegration lying between the variables i.e. services exports and GVA of the country. VAR estimates show that both the variables are not significantly affected by their past values. Results are also confirmed by the diagnostic test. This study shows that the rise in the volume of services exports could increase the overall economic growth of the country. Therefore, policy makers should develop strategies to promote services exports in international trade. The availability of export market information and greater support to acquire advanced

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technology for services exporting industries could help the services export to become competitive in the world market and increase the volume exported. A large volume of services exports implies a greater openness for services that could help to re-allocate the resources from less productive and less efficient sectors to more productive and more efficient sectors in the domestic economy.

Appendix

Table 6 :Vector Autoregression Estimates
Standard errors in () & t-statistics in [ ]

	D(LNGVA)	D(LNSERVICES)
D(LNGVA(-1))	0.339275	-0.023873
	(0.20286)	(0.65655)
	[1.67245]	[-0.03636]
D(LNSERVICES(-1))	0.022771	0.155840
	(0.06471)	(0.20944)
	[0.35186]	[0.74407]
C	0.074838	0.146889
	(0.02314)	(0.07490)
	[3.23383]	[1.96117]
R-squared	0.132021	0.023526
Adj. R-squared	0.065253	-0.051588
F-statistic	1.977322	0.313205
Log likelihood	55.45464	21.39495
Akaike AIC	-3.617562	-1.268617
Schwarz SC	-3.476117	-1.127173

Source: Author's Calculation.

Diagnostic Tests

Modulus

Roots of Characteristic Polynomial
Endogenous variables: D(LNGVA) D(LNSERVICES)
Exogenous variables: C
Lag specification: 1 1
Date: 12/31/22 Time: 15:36

Root	Modulus
0.336262	0.336262
0.158853	0.158853

No root lies outside the unit circle.
VAR satisfies the stability condition.

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VAR Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Date: 12/31/22 Time: 15:37
Sample: 1 31
Included observations: 29

Lags	LM-Stat	Prob
1	1.801354	0.7722

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