

Analyzing the Impact of Service Sector Growth on Indian Economy Using Correlation & Regression Analysis

Prof. (Dr.) B.B.S. Parihar

Director, R.B.S. Management Technical Campus, Agra
drbbp@gmail.com

Abstract

During the last few decades the service sector has emerged as the lifeline of Indian economy. At present, it is the largest and fastest growing sector of Indian economy making highest contribution to the overall GDP of the country. Increasing urbanization, privatization and more demand for intermediate and final consumer services are a few obvious reasons of the growth of service sector. Moreover, the implementation of the New Economic Policy characterized by liberalization, privatization and globalization in 1991 witnessed the landmark restructuring of Indian economy. It diluted the mixed economy model and license raj system; and opened the Indian economy to the world. The sector that benefited most from the New Economic Policy was the service sector. As a result, the services like Banking, Finance, Business Process Outsourcing and most importantly Information Technology have seen tremendous growth. Availability of IT-enabled services and young workforce has been instrumental in the growth and development of service sector in India. At present, service sector is supposed to be the power house of Indian economy.

The main objective of the present study is to understand and assess the impact of service sector growth on Indian economy by analyzing the overall GDP of the country, contribution of service sector in the overall GDP of the country, Year on Year growth rate of overall GDP and Year on Year growth rate of service sector during the period 1990-91 to 2009-10. The concerned GDP and YoY data have been retrieved from <https://data.gov.in> (Open Government Data Platform India). Moreover, for drawing useful inferences from the available secondary data, the statistical tools and tests like correlation analysis, regression analysis, t-test and F-test have been used.

The present study reveals that there is a significant and strong positive correlation between YoY growth rate of overall GDP and YoY growth rate of service sector. Alternatively, we can say that the YoY growth rate of overall GDP (Y) and YoY growth rate of service sector (X) are moving in the same direction and thus setting almost similar trends. Finally, we can conclude that the service sector is growing at a rapid pace. In terms of size, growth and development, it has come far ahead of the agricultural and industrial sectors. The present structure and composition of Indian economy reveal that it is being driven by the service sector up to a great extent or in a true sense, the Indian economy is being dominated by the service sector.

Keywords: *Indian Economy, GDP, Service Sector, Year on Year Growth Rate.*

Introduction: -

Indian economy is a developing economy that is striving hard to become a developed economy. During the process of growth and development every economy experiences certain structural shifts. Initially, the agricultural sector (i.e. primary sector) dominates the scene but when the process of development begins, the contribution of industrial sector (i.e. secondary sector) starts increasing in a gradual way and paves the way for the rapid growth of service sector (i.e. tertiary sector). Finally, the service sector surpasses the agricultural sector and industrial sector both. These two consecutive shifts are known as industrialization and post-industrialization. As every growing economy of the world undergo these major structural shifts that is why the Indian economy too has undergone these structural shifts and as a result of this process the service sector has emerged as the largest sector of Indian economy.

The adoption of the New Economic Policy in 1991 witnessed a landmark shift in the Indian economy, as it diluted the mixed economy model and license raj system and opened the Indian economy to the world. The sector that benefited most from the New Economic Policy was the services sector. As a result, the services like Banking, Finance, Business Process Outsourcing and most importantly Information Technology have seen tremendous growth.

Service sector is the power house of Indian economy. Rather it is the fastest growing sector of the world; any country doing well in service sector is either a developed nation or a nation developing at a very fast pace in terms of economic parameters. The major drivers of service based economy are – urbanization, privatization, globalization, liberalization, increasing consumption, quality higher education and knowledge of foreign languages. Availability IT-enabled services and young workforce has been instrumental in the growth and development of service sector in India.

Anything intangible but consumable offered to the society is a service. Services are perishable inseparable and non-transferable in nature. Production of services involves huge manpower, therefore it is considered as the largest employer of any developed or developing economy. According to World Bank data, 2018, in India service sector contributes approximately two-third to the overall GDP of the country and about one-third of the total workforce of the country is employed in this sector.

Central Statistical Organization (CSO) divides service sector into the following four categories –

(i) Transport, Storage and Communication, (ii) Trade, Hotel and Restaurants, (iii) Finance, Insurance, Real Estate, Business Services, (iv) Community and Social Services. Future of some of the service areas is brighter than the others. India has good share in software export across the world and its health & wellness tourism is also burgeoning because of low cost but quality services. Share of service sector in the overall GDP of India is highest as compared to the other two sectors, namely, agricultural sector and industrial sector, which is 54% in 2018-2019 at current prices.

The economic activities included in the tertiary sector help in the development of the primary and secondary sectors. These activities do not produce any good but they are an aid or a

support for the production process. For example, borrowing money from banks to help production and trade of goods that are produced in the primary or secondary sector would need transportation facility for being sold through retail shops.

This sector is the fastest growing sector of Indian Economy. It contributes maximum to the GDP of the country. In 1950-51, the share of service sector in the overall GDP of the country at 2004-05 prices was 29.54 %, it became 42.55 in 1990-91, 50.49 % in 2000-2001, 57.09 % in 2009-10 and 59.93 % by the end of 2013-14. Currently this sector is the backbone of Indian economy and contributes more than 60 % to the overall GDP of the country

Objective of the Study:-

The main objective of the present study is to understand and assess the impact of service sector growth on Indian economy by analyzing the overall GDP of the country, contribution of service sector in the overall GDP of the country, Year on Year growth rate of overall GDP and Year on Year growth rate of service sector during the period 1990-91 to 2009-10.

Research Methodology:-

This research study is an analytical kind of research study based on secondary data. The present study is related to the statistical analysis of the secondary data on GDP and YoY growth rate (i.e. Overall GDP, contribution of service sector in overall GDP, Year on Year growth rate of overall GDP and Year on Year growth rate of service sector) in India for a specified time period i.e. 1990-91 to 2009-10. The said secondary data have been retrieved from the website <https://data.gov.in> (Open Government Data Platform India). Moreover, for drawing useful inferences from the available secondary data, the statistical techniques and tests like correlation analysis, regression analysis, t-test and F-test have been used.

Results & Discussion: -

Table-01 : Overall GDP & the Share of Service Sector in Overall GDP

Financial Year	Gross Domestic Product (in Rs. Cr) at 2004-05 Prices (Overall GDP)	Services (in Rs. Cr.) at 2004-05 Prices (Service Sector)	Service Sector (Share in Overall GDP)
1990-91	1,347,889	573,465	42.55
1991-92	1,367,171	600,366	43.91
1992-93	1,440,504	634,549	44.05
1993-94	1,522,344	681,351	44.76
1994-95	1,619,694	721,140	44.52
1995-96	1,737,741	794,041	45.69
1996-97	1,876,319	853,843	45.51
1997-98	1,957,032	930,089	47.53

1998-99	2,087,828	1,007,138	48.24
1999-2K	2,246,276	1,119,850	49.85
2000-01	2,342,774	1,179,976	50.37
2001-02	2,472,052	1,261,158	51.02
2002-03	2,570,690	1,349,035	52.48
2003-04	2,777,813	1,457,797	52.48
2004-05	2,971,464	1,576,255	53.05
2005-06	3,253,073	1,748,173	53.74
2006-07	3,564,364	1,923,970	53.98
2007-08	3,896,636	2,121,561	54.45
2008-09	4,158,676	2,333,251	56.11
2009-10	4,516,071	2,578,165	57.09

Source: CSO Data on GDP (Retrieved from <https://data.gov.in>)

Table-02 : Year on Year Growth Rates of Overall GDP and Service Sector

Financial Year	Year on Year (YoY) Growth Rate in Percentage	
	Overall GDP (Y)	Service Sector (X)
1990-91	5.29	5.19
1991-92	1.43	4.69
1992-93	5.36	5.69
1993-94	5.68	7.38
1994-95	6.39	5.84
1995-96	7.29	10.11
1996-97	7.97	7.53
1997-98	4.30	8.93
1998-99	6.68	8.28
1999-2K	7.59	11.19
2000-01	4.30	5.37
2001-02	5.52	6.88
2002-03	3.99	6.97
2003-04	8.06	8.06
2004-05	6.97	8.13
2005-06	9.48	10.91
2006-07	9.57	10.06
2007-08	9.32	10.27
2008-09	6.72	9.98
2009-10	8.59	10.50

Source: CSO Data on GDP (Retrieved from <https://data.gov.in>)

The figures related to the overall GDP and the share of service sector in overall GDP from 1990-91 to 2009-10 are presented in Table-01. It can be observed from here that the share of service sector in overall GDP is increasing on a regular basis. It was 42.55 % in 1990-91, 50.37 in 2000-2001 and 57.09 % in 2009-10. Further, the data with regard to the Year on Year growth rate of overall GDP and Year on Year growth rate of service sector are presented in Table-02.

Again, we have performed correlation and regression analysis in order to draw certain useful inferences from the Year on Year growth rate data presented in Table-02. Table-03 & Table-04 deal with the said analysis.

Table-03: Correlation Analysis

Correlations			
		VAR (Y)	VAR (X)
VAR (Y)	Pearson Correlation	1	0.757**
	Sig. (2-tailed)		0.000
	N	20	20
VAR (X)	Pearson Correlation	0.757**	1
	Sig. (2-tailed)	0.000	
	N	20	20

** . Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Output

Table-04 : Regression Analysis

SUMMARY OUTPUT						
Regression Statistics						
Multiple R	0.75698196					
R Square	0.57302169					
Adjusted R Square	0.54930067					
Standard Error	1.40681306					
Observations	20					
ANOVA						
	<i>d.f.</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	47.80909601	47.8091	24.15671	0.000111644	
Residual	18	35.62421382	1.979123			
Total	19	83.43330983				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.34574107	1.296116096	0.266752	0.792692	-2.377297794	3.06878
X Variable 1	0.76320305	0.155282038	4.914947	0.000112	0.436967593	1.089439

Source: MS Excel Output

A no. of useful inferences can be drawn from the above correlation and regression analysis (Table-03 & 04). Firstly, the value of correlation coefficient is 0.757 and this correlation between variable Y and variable X is significant at 1 % level significance. This value of correlation coefficient (i.e. 0.757) implies that there is a strong positive correlation between the dependent variable Y and the independent variable X. Alternatively, we can say that YoY growth rate of overall GDP (Y) and YoY growth rate of service sector (X) are moving in the same direction and thus setting almost similar trends. Secondly, the value of R Square (i.e. 0.5730) indicate that 57.30 % variation in variable Y is explained by the variation in variable X. Again, The value of Adjusted R Square (i.e. 0.5493) implies that 54.93 % of the total variation in variable Y is explained by the the multiple regression model adjusted for the no. of independent variables and sample size. Moreover, the small value of the Standard Error of the Estimate (i.e. 1.4068) is an indication of small amount of variation or scatter around the regression line.

Again, suppose the equation of the line of regression is $Y = b_0 + b_1 X$, then it can be observed from Table-04 that $b_0 = 0.3457$ and $b_1 = 0.7632$. Thus, the required regression equation will be—

$$Y = 0.3457 + 0.7632 X$$

OR

$$(\text{YoY Growth Rate of Overall GDP}) = 0.3457 + 0.7632 (\text{YoY Growth Rate of Service Sector})$$

Again, here F-test has been used for testing the overall significance of the regression model and t-test has been used for the slope of the regression line. It is evident from the ANOVA part of the Table-04 that t-statistic is computed as 4.9149 and corresponding P-value is 0.000112. So, at 5 % level of significance we reject the null hypothesis (i.e. slope is zero) and accept the alternative hypothesis (i.e. slope is not zero). Similarly, F-statistic is computed as 24.15671 and $F_{\text{significance}}$ is 0.000111644. These values indicate the significance of overall regression model.

Conclusion:-

It is indeed a fact that every economy experiences certain structural shifts during its growth and development. In the very beginning the agricultural sector holds the largest share but when the process of development starts, the contribution of industrial sector rises in a gradual manner and paves the way for the rapid growth and development of service sector. Finally, the service sector beats the other two sectors. These two consecutive shifts are known as industrialization and post-industrialization. As every growing economy of the world undergo these major structural shifts that is why the Indian economy too has undergone these structural shifts and as a result of this process the service sector has emerged as the largest sector of Indian economy. This sector is the fastest growing sector of Indian Economy. It contributes maximum to the GDP of the country. In 1950-51, the share of service sector in the overall GDP of the country at 2004-05 prices was 29.54 %, it became 42.55 in 1990-91, 50.49 % in 2000-2001,

57.09 % in 2009-10 and 59.93 % by the end of 2013-14. Currently this sector is the backbone of Indian economy and contributes more than 60 % to the overall GDP of the country. In fact, service sector is the backbone of Indian economy.

Again, as far as the YoY Growth Rate of Service sector is concerned, it was 5.19 in 1990-91, 5.37 in 2000-2001 and 10.50 in 2009-10. Similarly, the YoY Growth Rate of the overall GDP of the country was 5.29 % in 1990-91, 4.30 % in 2000-2001 and 8.59 % in 2009-10. The correlation analysis of the YOY Growth Rate data on overall GDP and service sector implies that there is a strong positive correlation between the two variables and the same is also significant at 1 % level of significance. Alternatively, we can conclude that the YoY growth rate of overall GDP (Y) and YoY growth rate of service sector (X) are moving in the same direction and thus setting almost similar trends.

Further, the regression analysis implies that 57.30 % variation in the YOY Growth Rate of overall GDP is explained by the YOY Growth Rate of service sector. Here, the F-test was used to test the overall significance of the regression model. The results of F-test indicate that the regression model is statistically significant.

Finally, we can conclude that the service sector is growing at a rapid pace. In terms of size, growth and development, it has come far ahead of the agricultural and industrial sectors. The present structure and composition of Indian economy reveal that it is being driven by the service sector up to a great extent. Moreover, the future is also expected to witness a significant growth in service sector.

References:-

1. Bajpai, N. (2010). *Business Statistics*. Dorling Kindersley (India) Pvt. Ltd., New Delhi (Licensees of Pearson Education in South Asia).
2. Bandral, N. (2014). *Service Sector in India's Economic Growth*. *International Journal of Research*, 1 (5), 972-981.
3. Banga, Rashmi (2005). *Critical Issues in India's Service-led Growth*. Indian Council for Research on International Economic Relations (ICRIER) Working Paper Series. No. 171. ICRIER, New Delhi.
4. Latha, C.M. and Shanmugam, V. (2014). *Growth of Service Sector in India*. *IOSR Journal of Humanities and Social Science*. 9 (1), 8-12.
5. Chanda, Rupa (2002). *Globalization of Services: India's Opportunities and Constraints*. Oxford University Press, New Delhi.
6. Chawla, D. and Sondhi, N. (2011). *Research Methodology*. Vikas publishing House Pvt. Ltd., New Delhi.

7. *Datt and Mahajan (2016). Indian Economy. S. Chand Company Ltd. New Delhi.*
8. *Garg, I. and Walia, S. (2013). An Analysis of Service Sector in Indian Economy. International Journal of Research and Social sciences. 3 (3), 8-18.*
9. *GDP of India and major Sectors of Economy, Share of each sector to GDP and Growth rate of GDP and other sectors of economy 1951-52 onwards based on CSO Source. Retrieved from <https://data.gov.in>*
10. *Sector-wise Contribution of GDP of India. Retrieved from <http://m.statisticstimes.com>*
11. *Jhingan, M.L. (2010). Macro Economic Theory. Vrinda Publications (P) Ltd., New Delhi.*
12. *Keshava, S.R. (2010). Economics. New Age International Publishers, New Delhi.*
13. *Krishnaswamy, K.N., Sivakumar, A.I. and Mathirajan, M. (2006). Management Research Methodology. Dorling Kindersley (India) Pvt. Ltd., New Delhi (Licensees of Pearson Education in South Asia).*
14. *Lashmi, P. and Kumar, S. (2012). Economic Growth and Impact of Service Sector in India. International Journal of Business, Management and Economics, 3 (5), 627-632.*
15. *Levine, D.M., Stephan, D.F. and Szabat, K.A. (2014). Statistics for Managers. PHI Learning Private Limited, Delhi.*
16. *Lipsey, R. and Chrystal, A. (2011). Economics. Oxford University Press, Oxford, U.K.*
17. *Malhotra, N. and Dash, S. (2011). Marketing Research: An Applied Orientation. Dorling Kindersley (India) Pvt. Ltd., New Delhi (Licensees of Pearson Education in South Asia).*
18. *Misra, S.K. and Puri, V.K. (2011). Indian Economy. Himalaya Publishing House, New Delhi.*
19. *Paneerselvami, R. (2004). Research Methodology. PHI Learning Private Limited, Delhi.*
20. *Samuelson, P.A. and Nordhaus, W.D. (2005). Economics. Tata McGraw-Hill Publishing Company Ltd., New Delhi.*
21. *Sharma, J.K. (2007). Business Statistics. Dorling Kindersley (India) Pvt. Ltd., New Delhi (Licensees of Pearson Education in South Asia).*
22. *Tiwari, S. (2011). Service Sector in India: Performance and Reforms. International Journal of Multidisciplinary Research, 1 (7), 155-162.*