India's Services Sector and Its Determinants: An Empirical Investigation

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Abstract

The present study is an attempt to examine in detail the role of services sector in the growth of Indian Economy. To explain this, trends and growth of services sector have been very well explained in the study. Structure of production for Indian economy since independence has also been presented by using Holub's methodology. Moreover, VAR methodology has been applied to evaluate the determinants of growth of services sector in India by using time-series data from 2000-01 to 2012-13. The overall picture one can portray from the whole study is that the share of services sector in total GDP is increasing over the years. One of the reasons might be of increasing GNP Per-Capita. The main services sectors attracting FDI in India are Telecommunications, Construction and Hotels and Restaurants. The results of VAR analysis shows that the growth of per-capita GNP is major factor of increasing share of services sector in Indian economy. Domestic investment and openness also effect positively to the share of services sector in GDP. Further, the effect of net FDI inflows is negative and insignificant. The reason of this negative effect might be the increasing share of FDI inflows in manufacturing sector, which in turn reduce the share of services in total proportion.

Keywords: Service Sector, India, VAR analysis, A. Holub

1. Introduction

Services play a central role in the economies of both developed and developing countries. They account for over half of the gross domestic product of all developed economies and constitute the single largest sector in most developing economies.

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The services sector comprises Trade, Hotels & Restaurants, Construction, Electricity, Transport, Storage, Communication, Banking, Insurance, Education & Research, Medical & Health, Ownership of Dwellings, Real Estate & Business Services and Other Services (Business Services, Computer & Related Services, Legal Services, Real Estate Activities, Renting of Machinery & Equipments and Social & Personal Services). Main reasons behind the growth of services include rapid urbanization, the expansion of the public sector and increased demand for intermediate and final consumer services. The successful growth of the primary and secondary activities in the economy, to a large extent, is dependent on services offered by banking, insurance, trade, commerce, entertainment, maintenance of machinery and equipment and numerous other services categorized as tertiary activities (Soni & Parashar, 2013).

Services are extensively used by people day by day in all aspects of life. From education to entertainment, finance to fast food, travel to telephone, advertisement to amusement parks, market research to maintenance services, and retailing to recreation and so on. The tremendous growth of service sector has resulted in its increased importance to the world economies. The era of economic liberalization has ushered in a rapid change in the service industry. As a result, over the years, India is witnessing a transition from agriculture-based economy to a knowledge-based economy. The knowledge economy creates, disseminates, and uses knowledge to enhance its growth and development. One of the major functional pillars of this economy is Information Technology (IT) and IT-enabled services (ITeS) industry. The 'Department of Information Technology' has been making continuous efforts to make India a front-runner in the age of Information revolution. IT continues to be a dominating sector in the overall growth of the Indian industry. A large number of Indian software companies have acquired international quality certification. Several policies have also been framed on the key issues of IT infrastructure, electronic governance as well as IT education.

The present study is an attempt to study in detail the Indian services sector growth over the years and estimate the determinants of service sector growth in India by using VAR analysis.

To pursue the study's objective, the whole study has been divided into five sections including the present introductory one. In Section 2, database and methodology utilized for empirical analysis has been explained. Section 3 presents the trends and growth of India's services sector over the years.

It also explains the trends of sub-services sectors of the Indian economy.. In Section 4, empirical results have been presented and discussed. Final section concludes the whole study.

2. Database and Methodology

The present section presents the sources of database utilized and methodology applied to get empirical results. Section 3.1 shows the construction of relevant variables for the VAR analysis. In Section 3.2, VAR methodology has been explained in detail.

2.1 Database and Construction of Variables

For the analysis purpose, time-series data on various variables have been culled out from Handbook of Statistics on Indian Economy, provided by Reserve Bank of India. The main variable is the share of various sectors in total GDP over the years. Further, for regression analysis, data on four more variables from 2000-01 to 2012-13 has been utilized. The complete detail of those variables has been given in the following table.

Table 2: Description of Variables Used for VAR Analysis			
Nature	**S.N.**	**Variable**	**Description**
Dependent	1	**ln(Share)**	Log of Share of Services Sector in Total GDP
Independent	2	**ln(Open)**	Log of Openness constructed as follows: (Total Exports + Total Imports) / Total GDP
	3	**ln (GCF)**	Log of Gross Capital Formation
	4	**ln(FDI)**	Log of Net Foreign Direct Investment Inflows
	5	**LNGNPPC**	Log of Per-Capita GNP
Notes: Nature of variable is defined only to estimate the regression in the first instance. As in VAR analysis, every variable is endogenous variable, so while doing VAR analysis, every variable is assumed as endogenous one.			

For the analysis purpose, all variables have been taken in log terms to neutralise the unit effect and also to make interpretation in proportionate terms.

The variable openness has been constructed by using exports, imports and total GDP of India. Further, the variable, gross capital formation (GCF) represents the level of domestic investment over the years. It is a sum of Gross domestic capital formation (GDCF) and changes in stocks in an economy. GDCF includes all expenses made by household, business people and Govt, adding new durable goods to the fixed capital stock of a country. These assets are in the form of infrastructure such as buildings, roads, canals, bridges, means of transport, machinery and other equipments. The change in stock means the change in stocks or inventories. The change in stock is the difference between market prices of the stock held by the government at the beginning and end of the period. In addition, the variable Net FDI has been constructed by subtracting repatriation from gross FDI inflows in India.

Sample has been taken from the year 2000-01 to 2012-13. The reason of choosing these years is the simultaneously data availability for all the variables for these years. To neutralise the impact of prices, all variables are taken at constant prices with the base year 2004-05.

2.2 Methodology Used

For the empirical analysis, study has utilised two main methodologies to explain in detail the role of services sector in Indian economy. Following two sub-sections explains them in detail.

2.2.1 Structural Changes by A. Holub

According to Holub, if primary, secondary and tertiary sectors are denoted by the letters 'A', 'I' and 'S' respectively and if these sectors are ranked in order of their proportion in percentage share in GDP then the different production structures can be explained as given in Table 3.

Table 3: Typology of Production Structure as per the A. Holub		
S.N.	**Percentage Share in GDP**	**Type of Structure**
1.	Agriculture > Services > Industry	ASI – Traditional
2.	Agriculture > Industry > Services	AIS – Traditional
3.	Industry > Agriculture > Services	IAS – Transitional
4.	Services > Agriculture > Industry	SAI – Transitional
5.	Industry > Services > Agriculture	ISA – Modern
6.	Services > Industry > Agriculture	SIA – Modern
Source: *Kaur, 2008*		

It explains the different production structures of any economy depending upon the share of primary, secondary and tertiary sector in GDP.

2.2.2 Vector Autoregressive (VAR) Analysis

In economics, it is quite common to have models where some variables are not only explanatory variables for a given dependent variable, but they are also explained by the variables that they are used to determine the dependent variable. In those cases, we have models of simultaneous equations, in which it is necessary to clearly identify which are the endogenous and which are the exogenous variables. When we are not confident that a variable is really exogenous, we have to treat each variable symmetrically. For example, the time series Y_t that is affected by current and past values of X_t and, simultaneously, the time series X_t to be a series that is affected by current and past values of the Y_t series. In this case we will have the simple bi-variate model given by:

$$y_t = \beta_{10} - \beta_{12}x_t + \gamma_{11}y_{t-1} + \gamma_{12}x_{t-1} + u_{yt} \qquad (1)$$
$$x_t = \beta_{20} - \beta_{21}y_t + \gamma_{21}y_{t-1} + \gamma_{22}x_{t-1} + u_{xt} \qquad (2)$$

Where we assume that both Y_t and X_t are stationary and u_{yt} and u_{xt} are uncorrelated white noise error terms. Equations (1) and (2) constitute a first order VAR model; because the longest lag length is unity. These equations are not reduced form equations since Y_t has a contemporaneous impact on X_t (given by $-\beta_{21}$), and X_t has a contemporaneous impact on Y_t (given by $-\beta_{12}$). Rewriting the system with the use of matrix algebra, we get:

$$\begin{bmatrix} 1 & \beta_{12} \\ \beta_{21} & 1 \end{bmatrix}\begin{bmatrix} y_t \\ x_t \end{bmatrix} = \begin{bmatrix} \beta_{10} \\ \beta_{20} \end{bmatrix} + \begin{bmatrix} \gamma_{11} & \gamma_{12} \\ \gamma_{21} & \gamma_{22} \end{bmatrix}\begin{bmatrix} y_{t-1} \\ x_{t-1} \end{bmatrix} + \begin{bmatrix} u_{yt} \\ u_{xt} \end{bmatrix} \qquad (3)$$

Or

$$Bz_t = \Gamma_0 + \Gamma_1 z_{t-1} + u_t \qquad\qquad (4)$$

Where $B = \begin{bmatrix} 1 & \beta_{12} \\ \beta_{21} & 1 \end{bmatrix}$, $\quad z_t = \begin{bmatrix} y_t \\ x_t \end{bmatrix}$, $\quad \Gamma_0 = \begin{bmatrix} \beta_{10} \\ \beta_{20} \end{bmatrix}$, $\quad \Gamma_1 = \begin{bmatrix} \gamma_{11} & \gamma_{12} \\ \gamma_{21} & \gamma_{22} \end{bmatrix}$, and

$u_t = \begin{bmatrix} u_{yt} \\ u_{xt} \end{bmatrix}$.

Multiplying both sides by B^{-1}, we obtain:

$$z_t = A_0 + A_1 z_{t-1} + e_t \qquad\qquad (5)$$

Where $A_0 = B^{-1}\Gamma_0$, $A_1 = B^{-1}\Gamma_1$ and $e_t = B^{-1}u_t$.

For purpose of notational simplification we can denote as a_{i0} the ith element of the vector A_0, a_{ij} the element in row i and the column j of the matrix A_1 and e_{it} as the ith element of the vector e_t. Using this we can rewrite the VAR model as:

$$y_t = a_{10} + a_{11}y_{t-1} + a_{12}x_{t-1} + e_{1t} \qquad\qquad (6)$$
$$x_t = a_{20} + a_{21}y_{t-1} + a_{22}x_{t-1} + e_{2t} \qquad\qquad (7)$$

To distinguish between the original VAR model and the system we have just obtained, we call the first a structural or primitive VAR system and the second a VAR in standard (or reduced) form. It is important to note that the new error terms e_{1t} and e_{2t}, are composites of the two shocks u_{yt} and u_{xt}. Since $e_t = B^{-1}u_t$ we can obtain e_{1t} and e_{2t} as:

$$e_{1t} = (u_{yt} + \beta_{12}u_{xt})/(1 - \beta_{12}\beta_{21}) \qquad\qquad (8)$$

$$e_{2t} = (u_{xt} + \beta_{21}u_{yt})/(1 - \beta_{12}\beta_{21}) \qquad (9)$$

Since u_{yt} and u_{xt} are white noise processes, it follows that both e_{1t} and e_{2t} are white noise processes as well.

2.2.3 Testing for Causality

One of the good features of VAR models is that they allow us to test for the direction of causality. Causality in econometrics is somewhat different to the concept in everyday use; it refers more to the ability of one variable to predict (and therefore cause) the other. Suppose two variables, say Y_t and X_t, affect each other with distributed lags. The relationship between those variables can be captured by a VAR model. In this case it is possible to have that a) Y_t causes X_t, b) X_t causes Y_t, c) there is bi-directional feedback (causality among the variables), and finally d) the two variables are independent. The problem is to find an appropriate procedure that allows us to test and statistically detect the cause and effect relationship among the variables.

Granger (1969) developed a relatively simple test that defined causality as follows: a variable Y_t is said to Granger-cause X_t, if X_t can be predicted with greater accuracy by using past values of the Y_t variable rather than not using such past values, all other terms remaining unchanged. The Granger causality test for the case of two explanatory variables Y_t and X_t, involves as a first step the estimation of the following VAR model:

$$y_t = a_1 + \sum_{i=1}^{n} \beta_i x_{t-i} + \sum_{j=1}^{m} \gamma_j y_{t-j} + e_{1t} \qquad (10)$$

$$x_t = a_2 + \sum_{i=1}^{n} \theta_i x_{t-i} + \sum_{j=1}^{m} \delta_j y_{t-j} + e_{2t} \qquad (11)$$

Where it is assumed that both e_{2t} and e_{1t} are uncorrelated white-noise error terms. In this model we can have the following different cases:

a) When the lagged x terms in (10) may be statistically different from zero as a group, and the lagged y terms in (11) not statistically different from zero then in this case we have that x_t causes y_t;

b) When the lagged y terms in (11) may be statistically different from zero, and the lagged x terms in (10) is not statistically different from zero then in this case we have that y_t causes x_t;

c) When both sets of x and y terms are statistically different from zero in (10) and (11) then we have bi-directional causality; and

d) When both sets of x and y terms are not statistically different from zero in (10) and (11), so that x_t is independent of y_t.

To test Granger causality, estimate the VAR model given by equations (10) and (11), check the significance of the coefficients and apply variable deletion tests first in the lagged x terms for equation (10), and then in the lagged y terms in (11). According to the results of the variable deletion tests we may conclude about the direction of causality based upon the four cases mentioned above.

3. India's Services Sector: Trends and Growth

At the time of independence, Indian economy was primarily a rural economy, with agriculture contribution for approximately 75 percent of the workforce and 55 percent of GDP. The agriculture growth increased (permanently) during the mid-1960s. This is followed by a take-off in the service sector in the mid 1970s. Finally, manufacturing output growth broke in 1982-83 (Balakrishnan and Paramewswaran, 2007). The shift to a higher growth path during the course of the 1980s is referred to as the Indian growth turnaround. Fast growth in India, since the early 1980s, has placed it amongst the top nine rapidly growing economies in the world (Ahmed and Varshney, 2009).

Global Economic crisis that first hit the U.S economy spread globally to weaken many developed and emerging economies. Among nations, India was less affected due to its highly resilient domestic economy characterized by high saving and investment rates and a dynamic service sector.

Even in 2008-09, when the world financial system was stumbling in the aftermath of the global financial crisis, India's Gross Domestic Product (GDP) growth was relatively lower at 6.8 percent but supported by service sector that grew at 10.1 percent, contributing 56.4 percent of the country's GDP.

In the same year, service sector's subcomponents, "finance, insurance, real estate and business services" and "community and personal services" expanded living12.5 percent and 12.7 percent respectively.

According to the Prime Minister's Economic Advisory Council (EAC), the growth rate of service sector in the last few years (2007-2011) has been a robust 10 percent (Saravanan & Chandrasekaran, 2013).

Services sector has become important for many economies in the world and very important particularly for India. Among fast growing developing countries, India is distinctive for the role of the service sector. India stands out for the size and dynamism of its service sector (Eichengreen and Gupta, 2010). In line with the global trend, service sector in India has also grown rapidly in the last decade. Its growth has in fact been higher than the growth in agriculture and manufacturing sector. It contributes around 64.8 percent of GDP in 2012-13. In the trade mode, services trade has also grown at the same rate as goods trade over the 1990s (i.e., about 6.5 per cent) and its share in total trade has reached around 24 per cent. The unique characteristic of India's service sector growth is the entire decline in the share of agriculture sector in GDP, i.e., from 32 % in 1990 to 22% in 2003, has been picked up by the service sector while manufacturing sector's share has remained more or less the same. In general, such a trend is mainly experienced by high-income countries and not by developing countries.

3.1 Growth Trends of Sub-Sectors of Services in India

It is found that growth pattern in the service sector has not been uniform across all services in India. Some services have grown fast in terms of their share in GDP and also in terms of their share in trade and FDI (e.g., software and telecommunications services).

But there are some services, which have grown fast but have not been able to improve their share in international transactions (e.g., health and education) while there are some services that have in fact witnessed a negative growth and also a low share in international transactions. One of the probable reasons for this lopsided growth in services is the fact that reforms in India at the sectoral level have evolved in an ad-hoc way rather than as part of a coherent overall strategy. Though there exists an overall industrial policy and agricultural policy in India, there is no integrated service policy.

Consequently, the pace of reforms and their impact lacks uniformity across sectors (Joshi, 2004). Table 1 shows the share of different sub-sectors to the total share in services sector in Indian economy from 1950-51 to 2012-13 at constant prices.

Table 1 shows that the share of services sector which includes 'electricity, gas & water supply', 'construction', 'trade, hotels transport & communication', 'financing, insurance, real estate business services', 'community, social & personal services' in GDP improved from Rs. 976.33 crore, in 1950-51 to Rs. 7270.97 crore in 1991-92, and further increased to about Rs. 38125.58 crore in 2012-13. The share of electricity, gas & water supply has been improving from 0.81 per cent in 1950-51 to 4.30 per cent in 1994-95. Thereafter it started decreasing and gone the lowest level of 2.70 per cent in 2012-13. The share of construction has been increasing from 14.60 per cent in 1950-51 to 16.30 per cent in 1981-82. Thereafter; it started declining and reached at the lowest level of 11.49 per cent in 2003-04. After that it has been fluctuating and reached at the level of 11.29 per cent in 2012-13. The share of 'trade, hotels, transports and communication' was 31.54 per cent in 1950-51 and reached at a maximum of 36.16 per cent in 1983-84. Thereafter, it started decreasing and reached at 34.92 per cent in 1994-95. After that it started increasing continuously and reached at 40.18 per cent in 2012-13. The share of 'financing, insurance, real estate and business services' has been declining from 22.89 per cent in 1950-51 to 22.31 per cent in 1990-91. Thereafter, it started increasing and reached at the highest level of 24.21 per cent in 1994-95. Since then it has been fluctuating and started improving and increased to 27.03 per cent in 2012-13. Similarly, the share of 'community, social and personal services' has been declining almost continuously since 1950-51 when it was 29.16 per cent and reached at its lowest level of 18.80 per cent in 2012-13.

Table 1: Sub Sector of Services Sector at Constant prices (at Factor Cost) (Rs. Crore)					
Year	Electricity Gas & Water Supply	Construction	Trade, Hotels, Trans & Comm.	Financial, Insurance, Real Est. &Busi. Ser.	Comm., Social & Personal Services	Total
1950-51	7.91 (0.81)	142.51 (14.60)	307.92 (31.54)	233.25 (23.89)	284.74 (29.16)	976.33 (100)
1955-56	12.02 (1.01)	194.56 (16.28)	387 (32.38)	271.9 (22.75)	329.55 (27.58)	1195.03 (100)
1960-61	21.27 (1.40)	262.95 (17.27)	518.79 (34.07)	312.52 (20.52)	407.41 (26.75)	1522.94 (100)
1965-66	38.92 (1.95)	365.09 (18.33)	680.79 (34.18)	367.66 (18.46)	539.5 (27.08)	1991.96 (100)
1970-71	61.41 (2.48)	450.96 (18.23)	842.05 (34.04)	437.35 (17.68)	682.18 (27.57)	2473.95 (100)
1975-76	84.98 (2.87)	479.48 (16.17)	1059.8 (35.75)	521.42 (17.59)	819.14 (27.63)	2964.82 (100)
1980-81	118.38 (3.17)	607.57 (16.28)	1339.06 (35.88)	650.41 (17.43)	1016.66 (27.24)	3732.08 (100)
1981-82	129.6 (3.30)	640.84 (16.30)	1420.57 (36.12)	703.26 (17.88)	1038.42 (26.40)	3932.69 (100)
1982-83	138.13 (3.35)	595.84 (14.46)	1499.03 (36.37)	770.29 (18.69)	1118.49 (27.14)	4121.78 (100)
1983-84	147.67 (3.39)	628.02 (14.41)	1575.45 (36.16)	845.85 (19.41)	1160.27 (26.63)	4357.26 (100)
1984-85	163.68 (3.55)	649.76 (14.08)	1650.37 (35.77)	909.07 (19.70)	1240.65 (26.89)	4613.53 (100)
1985-86	176.67 (3.57)	686.54 (13.86)	1781.95 (35.96)	997.83 (20.14)	1311.84 (26.48)	4954.83 (100)
1986-87	194.89 (3.68)	702.96 (13.26)	1888.88 (35.64)	1102.95 (20.81)	1410.43 (26.61)	5300.11 (100)
1987-88	210.01 (3.73)	743.25 (13.19)	1985.78 (35.24)	1183.83 (21.01)	1512.4 (26.84)	5635.27 (100)
1988-89	230.38 (3.82)	795.51 (13.19)	2104.05 (34.87)	1299.34 (21.54)	1603.85 (26.58)	6033.13 (100)
1989-90	252.81 (3.86)	851.47 (12.99)	2260.74 (34.48)	1460.88 (22.28)	1730.22 (26.39)	6556.12 (100)
1990-91	269.71 (3.88)	951.84 (13.68)	2377.36 (34.18)	1551.65 (22.31)	1805.64 (25.96)	6956.2 (100)
1991-92	295.87 (4.07)	971.44 (13.36)	2431.78 (33.45)	1719.56 (23.65)	1852.32 (25.48)	7270.97 (100)
1992-93	316.4 (4.13)	1005.26 (13.11)	2568.97 (33.51)	1813.2 (23.65)	1963.32 (25.61)	7667.15 (100)
1993-94	340.13 (4.17)	1010.99 (12.38)	2746.82 (33.64)	2015.68 (24.69)	2051.01 (25.12)	8164.63 (100)
1994-95	372.03 (4.30)	1065.39 (12.32)	3019.97 (34.92)	2094.01 (24.21)	2097.42 (24.25)	8648.82 (100)
1995-96	397.31 (4.20)	1129.11 (11.93)	3425.36 (36.18)	2263.48 (23.91)	2251.57 (23.78)	9466.83 (100)

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1996-97	418.93 (4.14)	1150.27 (11.38)	3702 (36.63)	2403.54 (23.78)	2432.88 (24.07)	**10107.62 (100)**
1997-98	451.27 (4.09)	1270.73 (11.53)	3981.09 (36.12)	2684.95 (24.36)	2634.86 (23.90)	**11022.9 (100)**
1998-99	483 (4.06)	1350.48 (11.34)	4286.13 (36.00)	2894.4 (24.31)	2890.85 (24.28)	**11904.86 (100)**
1999-00	508.91 (3.86)	1463.8 (11.11)	4760.88 (36.15)	3149.9 (23.92)	3287.71 (24.96)	**13171.2 (100)**
2000-01	520.3 (3.75)	1553.78 (11.20)	5067.42 (36.52)	3292.71 (23.73)	3439.63 (24.79)	**13873.84 (100)**
2001-02	529.9 (3.59)	1615.74 (10.95)	5503.83 (37.30)	3527.92 (23.91)	3579.84 (24.26)	**14757.23 (100)**
2002-03	555.03 (3.51)	1749.59 (11.08)	5969.06 (37.79)	3800.81 (24.06)	3720.48 (23.55)	**15794.97 (100)**
2003-04	580.62 (3.39)	1967.08 (11.49)	6634.32 (38.74)	4022.43 (23.49)	3921.21 (22.90)	**17125.66 (100)**
2004-05	626.75 (3.36)	2288.55 (12.25)	7277.2 (38.96)	4371.74 (23.41)	4113.61 (22.02)	**18677.85 (100)**
2005-06	671.23 (3.24)	2581.29 (12.45)	8154.07 (39.33)	4923.4 (23.75)	4404.26 (21.24)	**20734.25 (100)**
2006-07	733.62 (3.21)	2848.06 (12.48)	9100.84 (39.88)	5610.63 (24.58)	4528.23 (19.84)	**22821.38 (100)**
2007-08	794.3 (3.16)	3154.95 (12.54)	10095.2 (40.12)	6281.24 (24.96)	4839.17 (19.23)	**25164.86 (100)**
2008-09	830.5 (3.02)	3323.29 (12.09)	10851.25 (39.48)	7036.29 (25.60)	5444.97 (19.81)	**27486.3 (100)**
2009-10	882.18 (2.92)	3544.36 (11.73)	11978.91 (39.65)	7719.05 (25.55)	6083.69 (20.14)	**30208.19 (100)**
2010-11	927.73 (2.80)	3906.92 (11.79)	13456.6 (40.62)	8496.32 (25.64)	6343.58 (19.15)	**33131.15 (100)**
2011-12	988.14 (2.77)	4124.12 (11.54)	14403.12 (40.31)	9488.08 (26.56)	6724.69 (18.82)	**35728.15 (100)**
2012-13	1029.18 (2.70)	4302.77 (11.29)	15320.34 (40.18)	10306.84 (27.03)	7166.45 (18.80)	**38125.58 (100)**
Total	**15511.77 (3.31)**	**57127.12 (12.20)**	**178414.75 (38.09)**	**113535.64 (24.24)**	**103783.14 (22.16)**	**468372.42 (100)**
Note: Figures in parenthesis are the percentage of total.						
Source: Author's Calculations from Handbook of Statistics on Indian Economy, RBI.						

3.2 FDI in Services Sector

Figure 1 shows the share of Foreign Direct Investment (FDI) inflows in Services Sector to Total FDI inflows. The economic role of FDI has increasingly become significant in Indian economy with the transition of FDI policy.

Figure 1: Share of FDI Inflows in Services Sector to Total FDI Inflows

Share of FDI Inflows in Services Sector to Total FDI Inflows
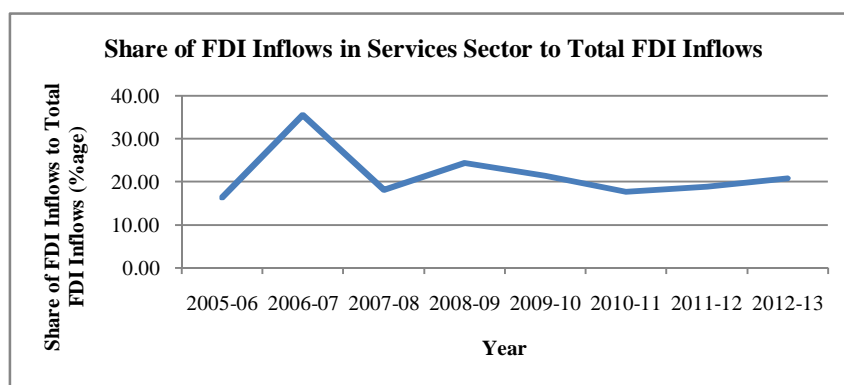
Source: Author's Calculations

FDI inflows to service sector have been phenomenal in the past few years. Since the onset of the liberalization of the Indian economy in 1991, the country has experienced a huge increase in the inflows of foreign sector (Chawla, 2013). There is a continuously increasing trend of FDI inflows in services sector with a steep rise in the inflows from 2005 onwards.

Service sector received an investment of US$ 22 bn which is 28% of the total FDI inflows from 1991-2012. Share of FDI inflows in services in 2005-06 was 16.29 percent and in 2006-07 it has increased to 35.46 percent to total FDI inflows. Due to global meltdown FDI inflow in services reduced to 18.03 percent in 2007-08. The economic and financial crisis of 2008 created uncertainty across the world. Although the maximum impact of the crisis was felt in the western countries, even emerging market economies like India saw a few percentage points being shaved off their growth in the ensuring period. India still does not rank highly as an FDI destination amongst global investors due to infrastructure concerns. FDI still reduced to 17.57 in 2010-11 and showed signs of progress in 2012-13 by contributing 20.78 percent share in services sector.

Figure 2: Share of FDI in Sub-Services Sectors to Total FDI in Services Sector
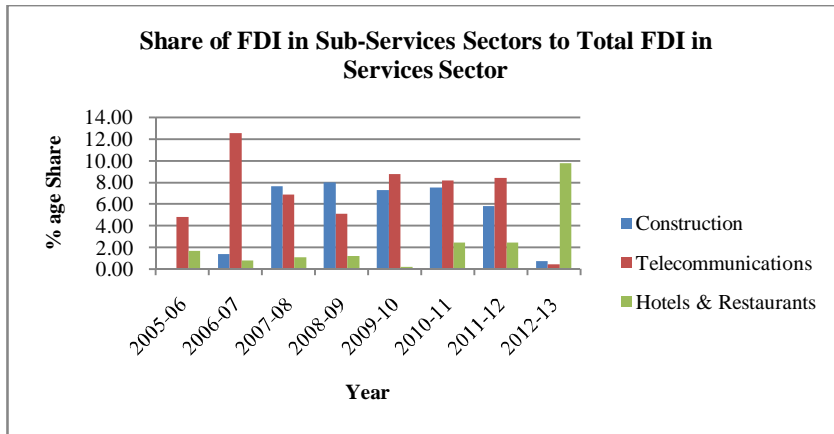
Source: Author's Calculations

Further, figure 2 shows the share of FDI in sub-services sectors to Total FDI in services sector particularly in Construction, Telecommunication and Hotels & Restaurants to total FDI in India.

The construction activities sector shows a rise in FDI inflows from 2006-07 onwards. Construction activities Sector includes construction development projects viz. housing, commercial premises, resorts, educational institutions, recreational facilities, city and regional level infrastructure, township etc. FDI inflows in Construction sector show declining trend because construction could not create enough jobs which are highly productive.

As the number of people looking for jobs because of the increasing population and share of agriculture shrinks (Economic Survey, 2013). Telecommunication Sector comprises Cellular Mobile, Basic Telephone Services etc. Telecommunication sector ranks 2nd in the list of sectors in terms of cumulative FDI approved from August 1991 to Dec 2008 (Sagar and Lalitha, 2013). India has been attracting foreign direct investment especially during post reforms period. The sectors like telecommunication, construction activities and computer software and hardware have been the major sectors for FDI inflows in India. It is fair to expect that India would have a larger share of FDI in the coming decades. The challenge before India is to disentangle the effects of FDI by taking measures to maximize positive spillovers and minimize the negative effects (Madem *et al.*, 2012).

The Telecommunication industry, especially the equipment part of the industry is the second largest in world (next to China) and therefore has attracted considerable FDI in the manufacture of handsets leading to the employment of skilled manpower (Mani, 2008). FDI share in Telecommunication was highest in 2006-07 it fluctuates upto 2011-12 and shows decline in share in 2012-13 due to new projects of both private sector and government had been falling. Policy issues such as in telecom spectrum allocations have also played a major role in the decline of FDI share (Economic Survey, 2013). In the service sector, the Hotels and Restaurants still remain significant. From 2005-06 to 2006-07 it shows decreasing trend and remain stagnant in 2007-08 and 2008-09. It shows tremendous decline in 2009-10 due to global economic crisis. FDI inflows to the services sector (top five sectors including Hotels and Restaurants) have slowed down in 2009-10 (Bhardwaj, 2013). It attracted more share of FDI in 2012-13 due to tremendous increase in tourism and tourism sector increased by a very high 328 per cent over the corresponding period in the previous year (Economic Survey, 2013).

4. Empirical Analysis

The whole empirical section is further divided into two sub-sections. Wherein one sub-section explains India's changing production structure with the help of A. Holub's methodology and the second sub-section presents the results of VAR analysis to calculate the determinants of services sector growth in India.

4.1 Structural Changes by A. Holub: An Indian Case

By using Holub's methodology, typology of India's production structure has been presented over the study period in the following table. Table 4 point out the sectoral composition of Gross Domestic Product at constant prices.

Table 4 India's Production Structure according to A. Holub				
Year	Share of Agriculture (A)	Share of Industry (I)	Share of services Sector (S)	Type of Structure
1950-51	53.30	11.11	35.59	A > S > I (Traditional)
1955-56	51.38	12.21	36.42	A > S > I (Traditional)
1960-61	48.91	13.51	37.58	A > S > I (Traditional)
1965-66	41.43	16.14	42.43	S > A > I (Transitional)
1970-71	42.73	15.32	41.95	A > S > I (Traditional)
1975-76	40.97	15.80	43.23	S > A > I (Transitional)
1980-81	36.60	16.99	46.41	S > A > I (Transitional)
1981-82	36.24	17.53	46.23	S > A > I (Transitional)
1982-83	35.11	17.84	47.05	S > A > I (Transitional)
1983-84	35.86	18.02	46.11	S > A > I (Transitional)
1984-85	35.08	17.99	46.93	S > A > I (Transitional)
1985-86	33.76	17.88	48.36	S > A > I (Transitional)
1986-87	32.22	18.27	49.51	S > A > I (Transitional)
1987-88	30.62	18.57	50.81	S > A > I (Transitional)
1988-89	32.15	18.51	49.34	S > A > I (Transitional)
1989-90	30.62	18.93	50.45	S > A > I (Transitional)
1990-91	30.22	19.00	50.78	S > A > I (Transitional)
1991-92	29.24	18.50	52.26	S > A > I (Transitional)
1992-93	29.63	18.05	52.33	S > A > I (Transitional)
1993-94	28.97	18.31	52.72	S > A > I (Transitional)
1994-95	28.53	19.03	52.44	S > A > I (Transitional)
1995-96	26.37	20.15	53.49	S > A > I (Transitional)
1996-97	26.87	20.17	52.96	S > A > I (Transitional)
1997-98	25.06	19.61	55.32	S > A > I (Transitional)
1998-99	24.99	18.96	56.05	S > A > I (Transitional)
1999-00	23.81	18.51	57.68	S > A > I (Transitional)
2000-01	22.82	18.89	58.29	S > A > I (Transitional)
2001-02	22.91	18.28	58.81	S > A > I (Transitional)
2002-03	20.58	18.83	60.59	S > A > I (Transitional)
2003-04	20.75	18.42	60.83	S > A > I (Transitional)
2004-05	19.44	18.50	62.06	S > A > I (Transitional)
2005-06	18.66	18.37	62.97	S > A > I (Transitional)
2006-07	17.74	18.99	63.27	S > I > A (Modern)
2007-08	17.16	18.99	63.84	S > I > A (Modern)
2008-09	16.09	18.51	65.40	S > I > A (Modern)
2009-10	14.93	18.84	66.23	S > I > A (Modern)
2010-11	14.73	18.79	66.48	S > I > A (Modern)
2011-12	14.37	18.10	67.52	S > I > A (Modern)
2012-13	13.95	17.39	68.67	S > I > A (Modern)
Source: Author's Calculations.				

The share of agriculture and allied activities has declined from 53.30 per cent in GDP in 1950-51 to 13.95 per cent in 2012-13.

Its percentage share in GDP declined over the time period from 1950-51 to 2012-13. The overall share of agriculture & allied activities is 22.42 percent of total GDP from the given time period. The share of mining and quarrying has shown a steady increase from 1.89 per cent of GDP in 1950-51 to 1.99 per cent in 2012-13. Its overall share is 2.75 percent which shows less participation in GDP. The share of manufacturing in GDP increased from 9.22 per cent in 1950-51 to 15.39 per cent in 2012-13. It may also be noted that manufacturing industries are grouped under registered and unregistered. The share of manufacturing doubled during the period. Overall share of manufacturing in total GDP is 15.67 percent which is more than mining and quarrying but less than agriculture and allied activities and approximate one fourth of the services sector. The share of services sector which includes 'electricity, gas & water supply', 'construction', 'trade, hotels transport & communication', 'financing, insurance, real estate & business services', 'community, social & personal services' improved from 35.59 per cent in 1950-51 to 68.67 per cent in 2012-13. It shows the overall highest percentage of GDP among all other sectors i.e. 59.16 percent followed by agriculture and allied activities than manufacturing and mining & quarrying. In the beginning years i.e. 1950-51, services sector showed less percentage share (35.59 percent) than agriculture and allied activities (53.30 percent) in GDP of Indian economy. Services sector stated increasing from 1965-66 but again showed less percentage share in 1970-71. In the years 1975-76 it never saw behind and its growth increased with fast pace and till today it showed the highest percentage share (i.e. 68.67 percent) among all other sectors.

4.2 Determinants of Services Sector Growth: VAR Analysis

To find out the determinants of growing services sector in India, following time-series regression has been estimated in the first instance.

$$LnShare_t = \beta_0 + \beta_1 LnNFDI + \beta_2 LnOpen + \beta_3 LnGCF + \beta_4 LnGNPPC + U_t$$

Table 5 presents the estimated regression results by using EViews 7 software. Results show that all the coefficients of the regression equation are insignificant at a given level of significance. But still, one can infer the effect by looking at the signs of the regression coefficients.

Table 5: Determinants of Increasing Share of Services Sector in India		
Variable	**Coefficient**	**P-Value**
Constant	3.1886*	0.0139
LNNFDI	-0.0116	0.1938
LNOPEN	0.0494	0.3009
LNGCF	0.0399	0.2645
LNGNPPC	0.0704	0.5318
R^2	0.9778	--
Adjusted R^2	0.9667	--
Sample Size (n)	13	--
F-Statistic	88.2069**	0.0000
Notes: * and ** represents the value is significant at 5 percent and 1 percent respectively.		
Source: Author's Calculation.		

Among the positive coefficients, per-capita GNP has the largest impact on rising share of services sector followed by degree of openness and domestic investment. The coefficient of net FDI inflows is negative but insignificant. The reason of the negative effect might be the increasing share of FDI inflows in manufacturing sector, which in turn reduce the share of services sector in total proportion. Further, the value of R^2 shows that the estimated regression is explaining the 97 percent variation in dependent variable due to included independent variables. Significant value of F-statistics also confirms that the overall regression is significant.

4.2.1 Vector Autoregressive Analysis

As we know that most of the time-series variables are interrelated with each other. The purpose of estimating regression in the first instance is just to see the impact of independent variables on share of services sector in India. After looking out the effect, VAR model has been estimated. For analysing the time-series data, VAR is the best suited methodology in the econometrics. Under this one can study the co-integration; known as long-term relationship in between different time-series variables. Due to very short time-series data, the study limits its VAR analysis up to Granger causality test after estimating the VAR at levels. Table 6 presents the estimated results of VAR at levels.

Table 6 : VAR Analysis Results					
Variables	**LNSHARE**	**LNNFDI**	**LNOPEN**	**LNGNPPC**	**LNGCF**
LNSHARE(-1)	0.5094 [1.4907]	-13.2369 [-1.3429]	3.6572 [1.1305]	1.3931*** [4.3493]	4.2202 [1.4078]
LNNFDI(-1)	0.0017 [0.1632]	0.2550 [0.8596]	0.05726 [0.5881]	0.0019 [0.1988]	-0.0718 [-0.7960]
LNOPEN(-1)	-0.0354 [-0.5662]	1.4044 [0.7787]	-0.3690 [-0.6235]	0.0322 [0.5491]	0.5120 [0.9335]
LNGNPPC(-1)	0.1293 [1.1794]	-4.6957 [-1.4851]	1.3319 [1.2836]	0.5290*** [5.1494]	-1.4539 [-1.5120]
LNGCF(-1)	0.0153 [0.4107]	3.6115*** [3.3679]	0.2360 [0.6706]	0.0716* [2.0543]	0.8766** [2.6879]
Constant	0.5175 [0.3276]	76.2455 [1.6733]	-33.1301* [-2.2154]	-1.5097 [-1.0196]	-0.1471 [-0.011]
R²	0.9799	0.9554	0.9826	0.9993	0.9826
Adjusted R²	0.9632	0.9183	0.9681	0.9987	0.9681
F-Statistic	58.5606***	25.7201***	67.8374***	1725.004***	67.7853***
Notes: i) Figures in parenthesis of type [ ] are the t-statistic value of the respective coefficient; ii) *, ** 10 percent, 5 percent and 1 percent respectively.					
Source: Author's Calculation.					

Table 6 shows that most of the relations are insignificant. Further, significant F-statistic of each individual equation in the whole system of equations shows the overall significance of that equation. In case of the significant parameters, for Indian economy, increasing share of services sector effect positively to the growth of per-capita GDP. However, reverse is also true but the coefficient is insignificant. To confirm these relations, next subsection presents the results of Granger causality on the same number of variables at lag.

4.2.2 Test for Causality

Table 7 presents the results of estimated Granger causality test for our sample data. Results show the evidence of positive relation between increasing share of services sector in GDP and GNP per capita is strong (as one of the F-statistic in case of 3rd combination is significant at 1 percent level of significance). Causality runs from share variable to GNP per-capita. But the evidence of other way causality is not so strong, as it is significant at 10 percent level of significance. The regression result confirms the positive relation in between these variables. This relation is already confirmed by VAR results in the previous sub-section.

Table 7 : Granger Causality Test Results			
Combination	**Null Hypothesis**	**F-Statistic**	**P-Value**
1. Share-FDI	NFDI does not Granger Cause SHARE	0.7467	0.4100
	SHARE does not Granger Cause NFDI	0.4757	0.5078
2. Share-GCF	GCF does not Granger Cause SHARE	2.0663	0.1844
	SHARE does not Granger Cause GCF	2.3254	0.1616
3. Share-GNPPC	GNPCAPITA does not Granger Cause SHARE	3.7539*	0.0846
	SHARE does not Granger Cause GNPCAPITA	23.3549***	0.0009
4. Share-Open	OPEN does not Granger Cause SHARE	1.1911	0.3035
	LNSHARE does not Granger Cause LNOPEN	4.3168*	0.0675
5. FDI-GCF	LNNFDI does not Granger Cause LNGCF	0.7341	0.4138
	LNGCF does not Granger Cause LNNFDI	3.7466*	0.0849
6. FDI-GNPPC	GNPCAPITA does not Granger Cause NFDI	0.5327	0.4840
	NFDI does not Granger Cause GNPCAPITA	0.0198	0.8912
7. FDI-Open	OPEN does not Granger Cause NFDI	0.8146	0.3903
	NFDI does not Granger Cause OPEN	0.1574	0.7008
8. GCF-GNPPC	GNPCAPITA does not Granger Cause GCF	0.0959	0.7639
	GCF does not Granger Cause GNPCAPITA	4.9576**	0.0530
9. GCF-Open	OPEN does not Granger Cause GCF	0.0446	0.8374
	GCF does not Granger Cause OPEN	3.5763*	0.0912
10. GNPPC-Open	GNPCAPITA does not Granger Cause OPEN	5.4050**	0.0451
	OPEN does not Granger Cause GNPCAPITA	1.2461	0.2932
Notes: *, ** and *** represents the value is significant at 10 percent, 5 percent and 1 percent respectively.			
Source: Author's Calculation.			

At 5 percent level of significance, domestic investment, measured by GCF, also affects the GNP per-capita (see under 8th combination). Further, GNP per-capita is affecting the degree of openness of the economy (see 10th combination). However, if we consider the 10 percent level of significance, then we got three more causal relations viz, share variable granger cause degree of openness, domestic investment, measured by GCF, effect net FDI inflows and also to openness.

5. Conclusion

The present study is an attempt to examine in detail the role of services sector in the growth of Indian economy. To explain this, services sector has been very well explained in the first two sections.

Structure of production for Indian economy since independence has also been presented by using Holub's methodology. Moreover, VAR methodology has been applied to evaluate the determinants of growth of services sector in India by using time-series data from 2000-01 to 2012-13.   The share of services sector in total GDP is increasing over the years. One of the reasons might be of increasing GNP Per-Capita. The main services sectors attracting FDI in India are Telecommunications, Construction and Hotels and Restaurants. The overall picture one can portray from the whole study is that the growth of per-capita GNP is major factor of increasing share of services sector in Indian economy. Domestic investment and openness also effect positively to the share of services sector in GDP. Further, the effect of net FDI inflows is negative and insignificant. The reason of this negative effect might be the increasing share of FDI inflows in manufacturing sector, which in turn reduce the share of services sector in total proportion. Moreover, trade, hotels, transport, and communication are the only sub-sectors of the services sector whose share has been continuously increasing from 31.54 per cent in 1950-51 to 40.18 per cent in 2012-13.

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