CHAPTER II

REVIEW OF LITERATURE AND METHODOLOGY

This relevant literature on sectoral shares of GDP, workforce, and exports had been reviewed under two broad classifications, namely, (i) International studies and (ii) Indian studies.

International studies on Growth and Structural changes in GDP, Workforce and Exports

The fundamental way of depicting the behaviour of the GDP, Workforce and the Export growth and the structural patterns would be through an analysis of the GDP, Workforce and Exports. The growth and the structure of the GDP had been identified with the relative shares of GDP, Work force and Exports which present a picture of the composition or structure of the total sectoral product of the economy.

Colin Clark (1940), Kuznets (1957), Chenery (1968), and Taylor (1969) had examined the process of economic development of a number of nations over a

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period of many years. They had found a significant relationship between national income and the sectoral composition of output. They had noted that the advanced economies had undergone the three stages of transformation in their economies during the process of national income growth. The first stage of transformation had been identified by the predominance of the primary sector’s contribution. The second stage of the transformation is characterized by the shift in the centre of gravity of the economy away from that of primary production and towards the manufacturing activities. The transformation from the second stage to that of the third stage three could be identified by an increase in the tertiary sector’s share in national income.

Ranen Ghosh (1983)⁵ had made a case study of Nigeria and had covered the period from 1960 to 1975. The main objective of his study was to report as to whether the Nigerian economy had been industrialized or not. He had used the three methods, namely, trend study, frequency distribution and the Chi-square test to make a better empirical analysis to understand the “industrialization” of a country over a period of time. The data used for this study had been taken from the UNO Year Book of National Accounts Statistics. The result of his study shows that except agriculture and trade all the other components of the GDP had disclosed an upward trend and the frequency distributions of these sectors were

skewed to the right and this had indicated the high value of the GDP components and remarkable development. Added to this, the Chi-square test of significance had indicated that the null hypothesis that the Nigerian economy did not move away from industrialization could not be rejected with the observed time series data on the GDP components.

Ratti Ram (1986) had estimated the rate of economic growth based on GDP data at international Prices, for 104 countries and had also compared these with the conventional growth rates based on domestic prices between the periods of 1960 and 1980. Using the data published by the World Bank and Summers and Heston (1984) of short-cut GDP estimates at international prices, he had concluded that the two growth rates of GDP based on international prices and domestic prices correlated quite well. However, for 14 countries, the differences were least a full percentage point; for another 21, countries the difference was at least half of a percentage point. Besides, the divergence was found to be the largest for the least developed countries. The conventional growth rates were found to be either greater or lesser than those based on international prices in an almost equal number of cases. Lastly, in some cases the difference had probably reflected the structural changes and the associated relative price movements.

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Chowdhury (1992)\textsuperscript{7} had investigated sectoral linkages in 13 countries for the period 1968 to 1988. Using the methodology suggested by Granger, the sample of countries chosen for this study were South Korea, China, Japan, Indonesia, Malaysia, Thailand, Philippines, India, Pakistan, Sri Lanka, Bangladesh, Nepal and Australia. The data had been obtained from the World Tables 1990-91. The study had observed that for China, Malaysia, and Sri Lanka the causation was from that of the agricultural sector to that of the industrial sector. For Thailand, Pakistan, Australia, and Bangladesh, Industry was found to be the leading sector. The Philippines economy had exhibited a bi-directional causality between agriculture and industry and lastly, South Korea, Japan, India, Indonesia and Nepal had shown independence in their sectoral articulation. These findings had been further strengthened by the sectoral growth rates and the sectoral share analysis.

Sukumar Nandi and Sanjib Basu (1994)\textsuperscript{8} had made a comparative study of the pace of economic development in Pakistan and Bangladesh over a period of twenty six years during 1960 to 1986. All the required data had been collected from the different issues of International Financial Statistics published by the


IMF. They had used the Chow test to test the hypothesis that there had been no structural changes in the economy of Pakistan due to its break up in 1971.

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F = \frac{(SSE_R - SSE_1 - SSE_2) / K}{(SSE_1 - SSE_2) / (n+m-2K)}
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where, \(SSE_R\) was the combined regression for the whole period, and \(SSE_1\) and \(SSE_2\) referred to the regression of period one (1960-1972) and period two (1973-1986) respectively. The data for the second period had excluded East Pakistan as it had emerged as the Bangladesh economy. The number of parameters was ‘K’ and ‘n’ and ‘m’ were the sample sizes respectively of the two time periods. They had concluded that there had been structural changes in the Pakistan’s economy in or near about the year 1971-72. They had also tested the null hypothesis that the stoppage of the real resource transfer from the former East Pakistan to the West had not resulted in the higher rate of growth of the East. The compound growth analysis adopted in the study had failed to reject the null hypothesis. The fact was that the growth rate had declined significantly.

Francois and Reinert (1996)\(^9\) had explored the role of the services in the structure of production and trade with the help of a cross-country sample of national income data published in the Penn World Tables for 15 countries by using social accounting matrices. Their analysis had disclosed that the share of

value added originating from the services, and the sectoral exports were positively linked to the level of development. Per-capita income levels were strongly linked to the demand by firms for the intermediate or producer services, more particularly in the manufacturing sectors. Moreover, the per-capita income levels were also positively associated with the employment shares of intermediate services and with the share of indirect labour in the total manufacturing employment.

Anilyadav’s (1999)\textsuperscript{10} study had out the relationship between the rate of growth of the GDP and its sectoral shares and their fluctuations over the decades. He had compared the overall sectoral rates of growth among the developing, the faster developing and the developed countries of the world. For, this purposes the growth rates of the domestic product for nearly 25 years (from 1969 to 1993) for different types of countries, nineteen developing countries, four faster developing countries and six developed countries had been examined. The same procedures were followed for studying independent by the sectors of agriculture, industry and the services in order to understand clearly as to how the different sectors had contributed to the growth of the countries. In the case of the developing countries, the process of structural changes was found to be different from that of the developed countries in the sense that, instead of the gradual shifting of the GDP’s

\textsuperscript{10}Anilyadav K, *Structural Change in Indian Economy: A Comparative Analysis*, Northern Book Centre, New Delhi, 1999, pp-48-56
share from agriculture to that of the industry and then to the services sector as in the developed countries, it had been directly shifted from agriculture to that of the services sector, and India also was not an exception to this general trend. Similarly as far the employment was concerned, a close proximity had been observed among the shares of employment in the different sectors among the developed countries while, no such proximity was found in case of the developing countries.

Ananya Ghosh Dastidar (2004)\textsuperscript{11} had examined the relationship between the process of structural change and income inequality within a group of eighteen developing countries for Asia and Latin America. The required data had been collected from World Development Indicator 2000. He had pointed out that both Asian and Latin American countries had experienced a considerable degree of structural changes over a period 25 years during 1965-66 to 1990-94. There had been a significant fall in the share of the agricultural sector with a corresponding increase in the share of the industrial and the services sector in the total output. He had observed that agriculture to industry transition had not affected the income distribution in both the Asian and the Latin American economies. However a transition involving the services’ sector had led to a worsening of the level of income distribution in the Asian countries.

Masakazu Katsumoto and Chihiro Kuatanabe (2005)\textsuperscript{12} had explained that the paradigm of an industrial shift from the manufacturing based industrial structure to a service oriented industrial structure had become crucial for a nation’s competitiveness. While it had generally been postulated that a shift to a service-oriented industrial structure was the consequence of a virtuous cycle between an increase in the income level leading to a qualitative change in demand and increased service industry productivity, they had attempted to identify the source of the contradiction regarding the above postulate on the basis of an empirical analysis of the growth trends, sectoral structures and income levels of 100 countries during the last two decades. Further, they had divided the 100 countries into high, middle and low income countries. They had found from their analysis that (i) in high income countries; the productivity improvement in the service industry had a positive impact on the income. The demand shift in quality had been promptly and appropriately satisfied by the shift in the supply side (ii) in the middle income countries, the productivity increase in services industry had a negative impact on income growth. This meant that the demand shift in respect of quality had not been satisfied leading to the possibility of the Boumol’s Disease and (iii) in the low income countries, the productivity growth in the services’ industry had a positive impact on income growth as they had incorporated a

restrictive virtuous cycle, that had covered up to a certain level of absorption. Finally, they had concluded that in the light of the increasing significance of the nations’ as well as firms’ services there had been an acceleration in the management to accelerate a structural shift from a manufacturing – based industrial structure to a service-oriented industrial structure

Arvind Virmani (2005)\textsuperscript{13} had conducted a study by way of extending his growth projections to the years of 2025 and 2050. In this paper he had pointed out that the USA was the first and foremost economy in terms of its GDP contribution to the world’s GDP (21.1 percent) followed by China (12.0 percent) Japan (7 percent) and India (5.7 percent). Thus, the current situation is that of a unipolar world since China’s contribution is still nearly half of that of the US economy while, India’s contributions is half of that of the Chinese economy. However, with his high growth projection analysis, he had come to the conclusion that the Chinese’s economy would become equal that of the United States during the first quarter of this century. But well before that event the US would have lost its monopoly as the foremost world power as China had already begun to challenge it. Indian economy would overtake that of Japan within the next five years to become the third largest power in the world. Thus, the Indian economy would equal that of US economy by 2040. He had arrived at the conclusion that the

current uni-polar world would be transformed into that of a bi-polar world (China and USA) during the first quarter of this century, and into a tri-polar world (China, USA and India) during the second quarter of this century.

Rashmi Banga (2005)\textsuperscript{14} had identified the factors that lead to a higher utilisation of the services in the growth process of the developing countries as their higher income elasticity of demand for the services, their structural changes and trade liberalization together with other reforms and improved technology. It had been emphasized that the process of growth had been accompanied by the dual spill-over effects. The growth in the manufacturing sector had improved the growth in the services’ sector as it created an additional demand for the services. The services’ sector, in its turn led to a higher growth rate in the manufacturing sector as it led to a higher demand for new products and brought about improvements in the productivity of the manufacturing sector.

Dipak Mazumdar and Sandip Sarkar (2009)\textsuperscript{15} had investigated the recent growth patterns and the shares of GDP and workforce, especially, in the manufacturing sectors of India, China, and East Asia. For this study, the data had been collected from the UNO Year Book of National Accounts Statistics and Economic Surveys of the various years. They had stated that an important aspect


of the recent growth pattern of the Indian economy had been the apparent sluggishness in the output and employment growth rates in the manufacturing sector, in spite of a period of relatively high growth rates of the GDP. A contrast had been noticed in the experience of China, and in the historical experience of the developed countries, including those of the East Asian countries. This study has attempted to bring into focus an aspect of the manufacturing sector of India, which might indeed turn out to be the heart of the problem. This is the development and persistence of the peculiar size structure with its ‘missing middle’ even when we concentrate our attention on the non-household sector of manufacturing employing more than five workers. The study had concluded that the low level of technology and productivity in the sector and the very limited vertical mobility of this enterprise might have contributed to the critical factor in the sluggish rate of development and in the re-allocation of labour to the manufacturing sector.

(ii) Review of Indian Studies

In this section, an attempt had been made to highlight the Indian studies which had analysed the changes in the GDP, Workforce and Exports. The growth and structure of the GDP had been identified with their relative shares in the GDP, Workforce and Exports which give us a clear picture of the composition and the structure of the total sectoral product of the economy.
Indian studies on Growth and Structural changes in GDP, Workforce and Exports

Sukhmay Chakravarthy (1987)\textsuperscript{16} had attempted to explore the strength of the industry and agriculture linkages over three decades of planning (from 1950 to 1980) by estimating the elasticity of the GDP in the manufacturing sector with respect to GDP in the agricultural sector. It was found that this magnitude was of the order of 2.19 percent during the 1950’s, which had declined to the level of 1.77 percent in the 1960’s had risen slightly to reach the level of 1.88 percent in the 1970’s. The co-efficient for the entire period of 1970-71 to 1983-84 was of the order of 1.76 percent and these magnitudes had not been significantly affected even when lagged relations were computed. Moreover, there had been a decline in the elasticity co-efficient of the GDP in the manufacturing sector with respect to the food grains production in the 1970’s as compared to that of the 1950s. He had argued that the strength of the industry-agriculture linkages seemed to have weakened to a certain extent. It was mainly attributed to the fact that the increase in the agricultural production had been very substantially confined to food grains production. The commercial crops which entered into industrial processing had recorded much lower rates of increase, creating constraints for industrial expansion.

\textsuperscript{16}Sukhmay Chakravarthy, \textit{Development planning: The Indian Experience}, Oxford University Press, New Delhi, 1987, pp-62-64
Bhattacharya and Arup Mitra (1989) had estimated the compound growth rate of GDP at factor cost of 14 major studies in India over a period of a decade (1970-71 to 1980-81). There had been a wide difference in the growth rates of the GDP from the highest growth range (4.6 percent) followed by Punjab (3.7 percent), Karnataka (3.3 percent), Gujarat (3.1 percent), Haryana (2.8 percent) and West Bengal (2.8 percent); while Kerala, Madhya Pradesh and Tamil Nadu had recorded negative growth rates. In the case of SDP from registered manufacturing industries, Punjab (8.8 percent), Karnataka (8.7 percent), Orissa (8.5 percent), Haryana (7.9 percent) and Tamil Nadu (7.2 percent) had performed well above the all India growth rate of 4.8 percent annum. In the tertiary sector, in the unorganized tertiary sector’s activities (trade, real estate, and other services) the growth rates were found to be lower than in the organized sectors (transport, communication, banking, and public administration). Haryana had registered the highest rate (3.7 percent) in the total tertiary SDP among all the Indian states while Kerala had registered the lowest growth rate (1.9 percent).

Nagaraj (1990) had attempted to test the hypothesis on the long-term trend growth rate of India’s GDP, using National Accounts Statistics for the period 1950-51 to 1987-88. He had arrived at the conclusion that the long-term trend growth rate of India’s GDP, using National Accounts Statistics for the period 1950-51 to 1987-88. He had arrived at the conclusion that the long-term trend growth rate of India’s GDP, using National Accounts Statistics for the period 1950-51 to 1987-88. He had arrived at the conclusion that the long-term

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trend analysis had rejected the hypothesis of the growth rate over the entire period during 1950-51 and 1987-88. Since, there was a statistically significant break in the series, the hypothesis of a break in the trend during the years 1975-76 and 1979-80 and a higher growth rate thereafter could not be rejected statistically. However, the break in the series for 1979-80 appeared to be a statistically storage proposition than the break in the series for 1975-76. These frequencies were found to be valid even when the value for 1979-1980 was dropped since during this year, there had been a sharp fall in the GDP growth rate over that of the previous year.

Bhargav and Joshi (1990)\(^\text{19}\) had tested the hypothesis that there had been a change in India’s growth rate of the aggregated as well as the disaggregated sub-sectoral GDP levels since 1975-76 and 1980-81. Their empirical study had pointed out that India’s growth rate had increased during the period 1960-61 to 1986-87. The increase was more pronounced during the year 1980-81 rather than during 1975-76 which was the break year. At the disaggregated sub-sectoral GDP levels, there had been a significant increase in growth rates in four sub-sectors namely mining and quarrying, manufacturing, transport. Storage and communication finance insurance, real estate and business services during post-1980 period. They had pointed out that a combination of the stability of public

investment and economic liberalization had been responsible for the improved growth performance.

Kannan (1990) had estimated the compound growth rate of the SDP and its major sectors in Kerala during the period 1962-63 to 1985-86. By dividing the period into 1962-63 to 1974-75 (period I) and 1975-76 to 1985-86 (period II), he had arrived at the conclusion that the primary sector’s growth rate had been negative (-0.70 percent) in period II leading to a decline in the growth rate of the aggregate state income or SDP from that of period I (3.21 percent) to that of period II (1.76 percent). The growth rate of the secondary sector (4.71 percent) had been the highest among all the sectors in period I but it declined to nearly one half (2.15 percent), during period II. However, tertiary sector had achieved consistently high rates of growth during both the periods with period II registering a higher growth rate (5.32 percent) compared to that of (4.24 percent) period I.

Nagaraj (1991) had compared the share of the tertiary sector with those of the primary and the secondary sectors for the period 1950-51 to 1987-88, by using Net Domestic Product (NDP) at factor cost at 1980-81 prices. His study had revealed that of the share of tertiary sector in NDP (26.6 percent) was higher than that of the secondary sector (15.1 percent) and was lower than that of primary

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sector (58.8 percent) in the year 1950-51. In 1987-88, the tertiary sector’s share (39.7 percent) was found to be higher than that of both the primary sector (34.0 percent) and that of the secondary sector (26.3 percent). However, the percentage increase in the share of the tertiary sector between 1950-51 and 1987-88 was found to be lower (49.2 percent) than that of the secondary sector (74.2 percent). He had concluded that as a result of a higher initial share and a steady growth rate, the tertiary sector had come to acquire a relatively higher share, in NDP compared to the other two sectors in the year 1987-88.

Tarlok Singh (1992)\textsuperscript{22} had offered an analytical description of the structural characteristics of the Indian states using the CSO estimates of SDP and according to its major sectors. He had observed that the share of the primary sector had fallen sharply in all the states and that for the tertiary sector it had risen in all the states and Union Territories (except Delhi and Goa). The share of the tertiary sector had overtaken that of the primary sector in most of the states, though the point of time at which it had happened had differed from state to state. The overtaking had occurred primarily in the late 1970s and in the early 1980s. However, in Haryana and Punjab, the overtaking had not come about yet. Further, the changes in the primary and the tertiary sectors had been roughly equal in their magnitude and with opposite signs in all the states, confirming the stable trend or

\textsuperscript{22}Tarlok Singh, “An Inter-Spatial Analysis of Growth and Structural Disparities in India”, \textit{Indian Journal of Economics}, Vol LXXIII No 288, July 1992, pp-1-29
its marginal increase in the share of the manufacturing sector in the SDP in almost all the states, except those of Assam and Manipur.

Ganesh Kumar (1992)\textsuperscript{23} had attempted to find out the break in the growth rate of the GDP and its three broad sub-sectors (Primary, secondary and tertiary) in India during the period 1950-51 to 1989-90). He had gathered data on GDP originating from the primary sector, the secondary sector, and the tertiary sector and on overall GDP at 1980-81 prices from various Economic Surveys and for various years National Accounts Statistics. By using the dummy variable technique in the compound growth model, he had come to the conclusion that there had been no break in the growth rates of the primary sector, the tertiary sector and the overall GDP growth rates in the mid 1960s. Though there has been a deceleration in the growth rate of the secondary sector since the mid 1960s to the year 1980-81, it had had no impact on the trend growth rate of the overall GDP. He had arrived at the conclusion that the year 1981-82 was the year in which the real GDP had experienced the break in the trend due to the breaks in the growth rates of all the three sectors. Further, the GDP and the service’s sector’s growth after adjusting for Public Administration and Defence (PAD) has also exhibited the break in the year 1981-82. Thus he had come to the conclusion that the break in the tertiary sector and in the overall GDP growth rates had been only

due to the increase in the growth rate of the GDP originating from the PAD sub-sector.

Krishna Mazumdar’s study (1995)\textsuperscript{24} had provided a possible explanation for the disproportional share of the services sector in the GDP and in the labour force. The planned development process in India, the demonstration effect, the process of urbanization, tourism and the increasing complexities of the modern industrial organization have all been responsible to a great extent for the impetus in the expansion of the infrastructure and the social and community services, transport, trade, hotels, communication, banking and finance and consequently the service’s sector which had grown tremendously in the recent years in India. Besides, the replacement of an old technology and the introduction of new products and imported technology, the reversed investment allocation pattern in India and the availability of the skilled labour force have all resulted in the growth of the labour force in the services sector leaving behind the growth of the share of the services sector in production. Innovative policies had to be adopted, for making the service sector in India play a greater role in the expansion of employment opportunities along with an expansion in the growth of the GDP.

Gor Krishna Saha and Bimal Kumar Saha (1997)\textsuperscript{25} had reviewed the origin of the declining trend in the growth rate of Assam’s NSDP for the period 1976-77 to 1984-85. The required data regarding Assam’s economy had been collected from the Economic Survey, Assam 1985-86. They had arrived at the conclusion that the declining trend in the growth of the secondary sector was so strong that it outweighed the respective constant and increasing growth rates of the primary and the tertiary sectors. Therefore, in order to achieve the best possible results in the rebuilding of Assam’s economy, it was suggested that the state government of Assam should formulate and implement such plans, programmes and policies that would resist the declining trend of the rate of its growth of secondary sector on the one hand and at the same time present the trends of the growth of the primary and that of the tertiary sectors from moving in the adverse direction.

Sampath Rao and Mahender Reddy (1997)\textsuperscript{26} had reviewed the structure of the State Domestic product (SDP) of Andhra Pradesh. The required data regarding the Andhra Pradesh economy was collected from the various issues of the Economic Surveys of the Government of Andhra Pradesh. The changes in the SDP structure had been analysed in terms of the percentage contributions of the major sectors to the SDP. They had arrived at the conclusion that the relative

\textsuperscript{25}Gor Krishna Saha and Bimal Kumar Saha, “Genesis of Declining Growth Rate of Assam’s Economy”, \textit{Economic Affairs}, Vol 42 Qr-3, September 1997, pp-188-192
importance of the agricultural sector had significantly diminished where as the relative importance of the secondary and the tertiary sectors had increased over a period of time. Thus, their analysis of the state income had revealed that there had been a transformation in the state economy of Andhra Pradesh from that of an agriculture to that of a non agriculture oriented economy.

Bhalla (2000) had empirically studied about the growth of the Indian economy in its Post-Independence period, from 1950-51 to 1998-99. For proposes of analysis, he had divided the entire study period of 1950-51 to 1998-99 in to four sub-periods, namely, 1950-51 to 1964-65, 1967-68 to 1979-80, 1980-81 to 1990-91 and 1991-92 to 1998-99. The required information had been gathered from the various issues of the Economic Surveys, published by the Government of India. He had observed that in the first sub-period, the growth rate of the industrial sector had been one of higher growth rates due to the Nehru. Mahalanobis strategy of industrial development was followed in mid fifties. The second sub-period had been characterized as a period of slow down in the growth rates of the GDP and of all the major sectors of the economy. In the third and fourth sub-periods, the Indian economy had witnessed a period of high GDP growth. There had been a notable deceleration in the growth rate of the agricultural sector during the period 1980-81 to 1991-99. During the eighties, the

growth of the secondary sector had emerged as the leading sector of the economy followed closely to be tertiary sector’s growth and it was the opposite during period of the nineties. It had been concluded that the liberalization policies pursued so far had failed to become an engine of rapid growth in the agricultural sector as also in its attempt to create more employment opportunities.

Again, Nagaraj (2000) had examined the GDP and its major components taking the break year as 1991. The twenty year time period from 1980-81 to 1999-2000 had been taken up for his study and the required data had been collected from the National Accounts Statistics. Using the semi-log model with a dummy variable, he had concluded that there was no statistically significant break in the growth rate of the GDP and in the primary and tertiary sectors growth rates during 1980-81 to 1999-2000. The secondary sector’s growth rate had witnessed a modest statistically significant slow down after the year 1991-92.

Sivasubramanian’s study (2000) had attempted to spotlight the various aspects of the structure of GDP during the period 1950-51 to 1999-00 on the basis of the estimates at the 1948-49 prices for India. His analysis of the percentage changes had revealed that the influence of the primary sector on the growth rate of the GDP had diminished and that of the secondary and the tertiary sectors had

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increased during the period 1950-51 to 1999-00 on the basis of the estimates at 1948-49 prices for India. His analysis of percentage change has revealed that the influence of the primary sector on GDP growth has diminished and that of the secondary and tertiary sector has increased during 1950-51 to 1999-00. He had also analysed the real GDP in terms of the commodity sector and in terms of the non commodity sector. The commodity sector (the agricultural and the industrial sector) had accounted for really two thirds of the GDP in the 1950’s and it had dropped to the level of 54 percent during the 1990s. He had stated that due to the acceleration in the service sector’s growth, the gap between the service sector and commodity sector had widened in the nineties compared to that of the eighties which in turn had resulted in inflation and a higher demand for consumer goods.

Sanjay K.Hansda (2001)\textsuperscript{30} had analysed the inter-sectoral linkages as obtained from the Input-Output Transactions Tables for the year 1993-94 both at the aggregated level for 10 constructed national account’s categories and for the most disaggregated level of 115 activities. The Indian economy had been found to be predominantly service-intensive at the disaggregated level. The aggregated analysis had observed that services and agriculture did not seem to share much inter-dependence whereas industry had been observed to be the most service intensive sector. He had noted that trade, transport services and other services and

constructions had been explored as the key sectors, as per the popular Rasmussen, which had induced of the backward and the forward linkages effect. Finally, the expansionary potential of the services on non-services and services had been examined by computing the index of vertical integration. The key sectors in terms of the total of the backward and forward linkages had been also found to be a relatively high index value of vertical integration.

Lakhwinder Singh (2001) had compared the development experience of the Punjab economy between the pre-reform (1980-81 to 1990-91) and the post-reform (1991-92 to 1997-98) periods. During the post reform period, the growth rate of the NSDP and of the other important sectors like the primary, the secondary, and that of the services had dwindled because of a shift from development to that of non-development expenditure by the government of Punjab. They had also made a comparative analysis of the growth rates of 14 major states in India. During the post-reform period, the growth rate of Indian economy had accelerated. However, the growth rates of Punjab, Bihar, Rajasthan, Uttar Pradesh, Orissa, Andhra Pradesh and Haryana had decelerated. On the other hand, there had been a spurt in economic growth in the states of Madhya Pradesh, Tamil Nadu, Kerala, West Bengal, Gujarat and Maharastra and it had remained

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the same in Karnataka during both the pre-reform and that of the post reform periods.

Beebaruah (2001)\textsuperscript{32} had examined as to whether the newly formed states (Arunachal Pradesh, Mizoram, Nagaland and Megalaya) in the North East had a positive impact in the economic performance of the region. The NSDP figures and the data on the sectoral composition of the NSDP of the states during the period 1980-81 to 1996-97 had been taken from the Economic Surveys and the Economic and Political Weekly Research Foundation respectively. It had been shown that except for Meghalaya, the newly formed states in the North East had steadily improved their shares in the National Income, despite the absence of Industrialization and the lack of visible prosperity in the agricultural sector. Rapid economic growth in these newly formed states had been fuelled by the expansion of public administration and the rapid growth in construction work. The liberal fiscal transfers enjoyed by these states due to their special category status, had helped them to maintain their relatively higher share of the public administration sector in the NSDP. A review of the Indian studies on the structure of GDP had revealed that there had been a notable shift away from that of the primary sector to that of the tertiary sector in the composition of the GDP. It had indicated that the Indian economy at present was in the third stage of the growth path and it had ignored the second stage of Industrialization in its growth path.

Jeromi (2003) had reviewed the inter-temporal variations in the growth of the states income in the Kerala economy during the period 1980-81 to 2000-01. During the 1980’s, the rate of growth of the NSDP in Kerala was very much lower at the level of 3.2 percent per annum, as against the growth of 5.8 percent in the case of the national income (GDP). However, the NSDP rate of growth had increased to the level of 6.3 percent during the period 1992-93 to 2000-01, and it was similar to the growth of the national Income. The primary sector continued to grow at a low rate of 2.3 percent during the 1980’s as also during the 1990s, where as the other two sectors had recorded a higher growth rate during the 1990s than during the 1980s.

Uma Kapila (2003) had investigated the growth and the structural changes of the GDP in India during the period 1980-81 to 1997-98, using the data of National Accounts Statistics. By comparing the period of the nineties (1992-93 to 1997-98) with that of the eighties (1980-81 to 1991-92), she had pointed out that the GDP growth (6.5 percent) in the nineties was better than that during the eighties (5.8 percent). While both the industrial as well as the service’s sector had gone through the experience of high growth rates during the period 1992-93 to 1997-98, the agricultural and allied activities had registered a relatively lower rate of growth as compared to their performance in the eighties. She had concluded

34 Uma Kapila, Growth and Structural Change Since 1950, Indian Economy Since Independence, Academic Foundation, New Delhi, 2003, pp-751-786
that the service’s sector had increased the resilience of the economy, even in the phase of adverse agricultural stocks.

Sastry et al., (2003)\textsuperscript{35} had assessed the linkages of growth among the agricultural, industrial, and the service’s sectors of the economy of India, using both the input-output analysis (I-O) and the simultaneous equation framework during for period 1970-71 to 1999-2000. The use of the Input-Output Tables for the years 1968-69, 1979-80, 1989-90 and 1993-94 had explained that over a period of 26 years from 1968-69 to 1993-94, the inter dependence of these three sectors had increased both in terms of their production linkages as well as their demand linkages. The Simultaneous framework analysis had also revealed that the fall in agriculture was likely to cause a set back to the industrial output, and the service sector and thus to the overall growth rate of GDP. Similarly a downward trend in the industrial sector would pull down the services sector and the overall growth rate of the GDP. They had arrived at the conclusion that the agricultural sector had still played an important role in determining the overall growth rate of the economy through its linkages with the other sectors of the economy.

Seema Bathla (2003)\textsuperscript{36} had examined the nature and the direction of the linkages between the primary, the secondary and the tertiary sectors and their long run equilibrium relationship in the Post Independence period during 1950 to 2001. The study had found that a unidirectional causation ran from the primary sector to the secondary sector and then to the Financial Investment-Business services (FIBS) and from Trade, Hotel, and Restaurant (THR) to the primary sector and to the secondary sector during the period 1950-1979 and had shown its independence in the subsequent two decades. Further, it had shown an independent relationship between the Primary sector and Transport, Storage, and Communication Services (TSC) during the period 1950 to 1979 followed by a significant unidirectional linkage during the period 1980 to 2000. In the case of causality between TSC and the secondary sector, the uni-directional causation runs from TSC to the secondary sector during both the time periods. Further, the unidirectional causation found from the FIBS to the secondary sector during the period 1950 to 1979 had been followed by a bi-directional causation during the period 1980-2000. Finally, in the case of the Social, Community, and Personal Services (CIPS), an independent relationship had been noticed during both the sub-periods. However, there was very strong evidence for the long-run equilibrium relationship between the primary, the secondary and the selected services and the THR and TSC and it was found by the co-integration analysis.

\textsuperscript{36} Seema Bathla, “Inter-Sectoral Growth Linkages in India: Implications for Policy and Liberalized Reforms”, \url{www.ieg.nic.in/dis-seema-77.pdf}, Institute of Economic Growth, University of Delhi, Delhi, October 20, 2003
Since the growth of the tertiary sector depended primarily on the demand for services from the other sectors, she had suggested that liberalized measures should be adopted simultaneously in both the agricultural as well as the industrial sectors so that the goals in could be achieved an appropriate manner.

Ratan Kumar Ghosal (2004)\textsuperscript{37} had examined as to whether the growth performance was really a ‘feel good factor’ by utilizing some macro statistics data. For this, he had first analyzed the growth performance of the economy during the 1980s and the 1990s and then he had compared these growth rates with the employment and poverty levels in India. He had pointed out that the average annual growth rate of the GDP was higher in the 1990s (6 percent) as compared to that of the 1980’s (5.4 percent). It had been actually a service sector driven growth especially due to the faster expansion of the information technology and electronic servicing and the tremendous increase in the salaries of the government servants. However, by analyzing the employment elasticity of the GDP and the poverty level, he had concluded that the recent precipitous increase in the GDP may not necessarily by a ‘feel good’ factor for most of the people.

Arvind Pangariya (2004)\textsuperscript{38} had made an empirical test to find out whether the minor changes in the policy or the changes in the attitudes in the 1980’s had resulted in the same outcome as those of the major reforms undertaken in the 1990s. With the calculation of the co-efficient of variation and the standard F-test he had concluded that the growth in the 1980s had been more fragile than the growth in the 1990s. The most systematic and the system based reforms of the 1990s had given rise to a more sustainable growth in the GDP, in general, and in the services sector, in particular. However, the most disappointing aspect of the experience of the 1990’s had been the absence of an accelerated pace of growth in the industrial sector.

Arvind Virmani (2005)\textsuperscript{39} has reviewed the growth performance of India since 1950-51. He had distinguished two phases of growth during the post-colonial history of India. The first phase of 1950 to 1981 had been characterized by him as the ‘Indian- socialist’ rate of growth (ISRG) with an averages GDP rate of growth 3.5 percent per annum and a per capita average growth rate of 1.3 percent per annum. The second phase started there after form (1980-81) and is still continuing and had been characterized as the phase of the ‘Bharatiya’ rate of growth (BRG). There is a sharp and statistically significant acceleration in the


growth rate (5.7 percent per annum) with the per capita income growing at annual an average rate of 3.6 percent per-annum during the BRG phase of growth. There had also been a significant acceleration in the rate of growth of the service’s sector. He had concluded that the economic reforms introduced during the 1980s had led to this increased growth rates.

Dhal and Saxena (2005)\textsuperscript{40} had studied the output, the income and the employment impacts in various sectors of the economy of Orissa on the basis of the input-output type of multipliers and the linkage measures. The study had revealed that the estimated results of a potential annual growth rate at around 20 per cent in the economy of Orissa was quite appealing but the sectoral incomes and employment effects were found to be highly distorted because of the loose inter industry linkages in the economy. Consequently, the income and employment effects on the low capital intensive agro-based sectors with their low levels of output were found to be better than that of the relatively more capital intensive (secondary and tertiary) sectors with higher levels of output. They had concluded with their suggestion that resources should be allocated to the sectors in a balanced way and this would be possible only when the decisions were taken in the light view of the precise objectives and the sectoral total and the linkage type multiplies.

Rashmi Banga (2005)\textsuperscript{41} had identified and discussed the critical issues related to the growth of India’s services sector. According to his study, during the 1980’s, the service sector had grown at the rate of 6.6 percent per annum, while during the 1990’s the growth rate increased to 7.5 percent per annum. In the last ten years (1994-2004), the services sector had grown on an average at the rate of 7.9 percent by per annum, which was higher than that of the growth rate of agriculture at 3 percent per annum and that of the manufacturing sector with a rate of growth of 5.2 percent per annum. However, this growth rate had not been followed up by a corresponding rate of high growth in employment during the 1990s.

Nirvikar Singh (2006)\textsuperscript{42} had examined the role of the services sector in India’s growth experience. The study had observed that India’s more rapid growth rates in the 1980s and more especially, in the 1990s had been the result of policy changes as well as initial conditions which were favorable for the process of development to take place. The pattern of economic growth had been skewed towards the service sector, as well as towards skill-intensive activities. Moreover India’s service sector had been responsible for more than 60 percent of its GDP growth during 1990’s, which was well above that of the sector’s contribution

during the previous decades. The five fast growing sub-sectors, namely, trade, transport, communications, banking services and community services in the 1990's had accounted of the more rapid growth of the services sector during the 1990’s. He had emphasized on the need for a specific policy to improve the tradability and productivity of the service sector. The review had disclosed that despite planned and sustained efforts since Independence to shift to a higher growth path, India’s secular trend growth rate had hovered around 3.5 percent (Hindu Rate of Growth) till the early 1980’s. However since 1980, the year there had been a significant increase in the growth rate because of increases in the growth rates of all the sectors and more especially that of the service sector which had exhibited a strong growth potential.

Murali.D, and Ramesh C., (2007)\textsuperscript{43} had explained the economic development of India and had considered the issue of the states competing with one another to attract industry to the services sector. They had indicated that in the process of economic development agriculture was expected to release much of its surplus labour for the industrial and eventually for the service sector. But the process could not occur at the expense of either the rural or the urban sectors. For instance, an increase in agricultural productivity when transferred in the form of lower food grains prices could release much of the

consumer’s income to make them demand more of the manufactured goods and services. They had concluded that the boom in India was leading to concerns of geographic (primary-secondary service) concentration of economic activities and its consequences for economic development.

Papola (2009)\textsuperscript{44} had studied the structural contributions of the Indian economy since the year 1950-51 by using data from the RBI Handbook of Statistics and the NSSO publications in various issues. He had observed that the Indian economy had undoubtedly been on a higher trajectory path for about two decades. But contrary to expectations which were based on theory as well as on history, it had not achieved any significant change in the share of Industry in the GDP. A major contribution to economic growth had been made by the growth of the service sector which had been accompanied by a shift from agriculture to that of services; but a similar shift had not been noticed in respect of the workforce. Agriculture had accounted for only 18 percent of Indian’s GDP employing 56 percent of the workers; while the services had contributed to 55 percent of the GDP employing only 26 percent of the workers. Services had accounted for around 25 percent of the consumption basket of the Indian population; and 75 percent of their consumption still consisted of commodities. He had concluded that it was necessary to have a policy agenda for sustaining a high rate of

\textsuperscript{44}Papola T. S, “India: Growing Fast, but also Needs to Industrialise”, \textit{The Indian Journal of Labour Economics}, Vol 52, No 1, January – March, 2009, pp-57-70
economic growth, by reducing the trade by deficit, creating employment opportunities and by preventing an increase in the inequalities of various kinds.

Gursharan Bhalla Rastogi (2009) had attempted to identify the sectoral pull and push processes of the structural transformation of the workforce in India and the constraints that had been experienced in these processes, by using the RBI Data and the Handbook of Statistics. The Agriculture-led growth had been advocated by many to improve the income and employment levels in the country. This study had found that the rise in labour productivity in agriculture had exerted the strongest influence in the shift of its own workers to the other sectors. The second highest influence had been from the ‘residual sector’, that is, all the sectors other than those of agriculture and the manufacturing sectors. Manufacturing by itself did not directly pull the workers out of agriculture; rather it pushed the workers back into it. The constraining factors seemed to be: (a) the dominance of the organized sector which had promoted high capital intensity, (b) a low work participation rate (WPR) due to the existence of only a small number of factories, and (c) the lack of employment generation in the organized manufacturing sector, due to high rise in the K/L ratio in the organized manufacturing sector over a period of time. However, the manufacturing sector seemed to pull the workers out from agriculture, indirectly by generating a demand from the residual sectors. The

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shift of workers from the manufacturing to the residual sector was found to be the weakest among the various ‘pull’ and ‘push factors’

The foregoing review had brought about the fact that service sector could be termed as the leading sector which had been contributing more to the overall economic growth of India

**Research Gap**

An in-depth analysis of the various GDP related studies had shown that much of these earlier studies had confined themselves to the characterization of the sectoral growth performances in relation to the overall economic growth during the Post-Independence era, especially in the 1980s and the 1990s. Among these studies, a large number of the earlier studies had looked at the growth performance and had attempted to examine the sectoral linkages in the Indian economy in a two-sector framework consisting of agriculture and industry or industry and the services. Although there were some studies examining the structural changes in the Indian economy, they had studied the structural changes using more of descriptive statistics such as percentage analysis, trend analysis and share analysis. Though the recent studies, had studied about the growth performances and the sectoral shares in India, they had not empirically formulated their test procedure to capture the implications of the sectoral growth for the new policy regimes in India. Similarly, the recent studies on inter sectoral growth
linkages in the Indian economy using co-integration models had failed to examine the effects of policy regimes on inter-sectoral linkages and also their level of analysis had been confined to a highly aggregated sectoral classification of the primary-the secondary-and the tertiary sectors. More importantly no study had empirically analysed the sectoral shares of the GDP, the work force and that of exports using time series data during the 1980’s and the 1990’s. Against this backdrop, the present study attempts to fulfill the lacuna in the existing literature with regard to structural transformation and sectoral contributions to growth and inter-sectoral growth linkages.

**METHODOLOGY**

This methodology section deals with the research techniques and the methods applied by the researcher in the collection and in the analysis of the data collected.

**Data Source**

The present study is completely dependent on the secondary data, since it requires a series of aggregate time series data spread over a period of time. Secondary data for the present study were obtained from various issues of the Reserve Bank of India Bulletin, published by the RBI, The Economic Surveys of India, India’s Economic Development Report, the National Sample Survey Organisation’s Reports, Tata Institute of Fundamental Research Reports, and from
the articles published in the various journals, such as, The journal of Economic and Political Weekly, The journal of ‘Southern Economist’, Five Year plans, the Central Statistical Organization’s publications and news items in the daily newspapers such as ‘The Hindu’, ‘The Economic Times’, and ‘Business line’.

Period of study

A period of twenty-seven years from 1980-81 to 2006-07, was selected for the purpose of this study. The period of study was further divided into two ‘sub-periods’ namely, the pre-reform period covering the years 1980-81 to 1990-91 and the post reform period covering the period 1991-92 to 2006-07. The post-reform period had been specifically chosen after taking into consideration the drastic changes that had taken place in the Indian economy after the adoption of the New Economic Reforms since 1991-92. Another reason for choosing this period was that, in response to a fiscal and balance of payments’ crisis that occurred in the year 1991, the Economic Reforms adopted since 1991-92 had contributed more meaningfully to the attainment of the higher rates of economic growth in India. The Reform process in India had been in vogue for more than 27 years. Complete and comprehensive data were also readily available for the period chosen to make the study a scientific and reliable one. Hence, the researcher had preferred to choose these twenty-seven years for the present research study.
Tools of Analysis

With a view to study the sectoral performances of the Indian economy since 1980, the relevant and appropriate statistical tools had been used in the present study. The results of the analysis had further been interpreted and reliable observations had been made from out of the analysis.

The researcher had analysed the collected data with the basic objectives of the study in his mind. The tools that had been made use of include the following.

(i) Index numbers
(ii) The Time Series Analysis
(iii) The Semi-Log Model; and
(iv) The Chow test
(v) Multiple Regression Analysis
(vi) ‘t’ test

Index Numbers

The index number is a statistical measure designed to exhibit the changes in a variable or the changes in a group of related variables spread over a period of time, or with respect to the geographic locations, or with respect to such their types of characteristics. To find out the extent to which the changes had occurred in the variables from the base year, the ‘index numbers’ had been used.
\[ \frac{\sum P_1}{\sum P_0} \times 100 \]

Where,

\[ \sum P_1 \] represents the current year; and

\[ \sum P_0 \] represents the base year

**Time series Analysis**

One of the most important tasks before economists and business men nowadays is to make forecasts for a future period, for which time series data were usually used. Time series data consisted of the numerical values recorded systematically at various intervals of time. Time series data were often used in association with regression techniques, which had been made use of in the present study also. The following model had been used in this study to fit a straight line.

In the time series analysis, the independent variable \( x \) was taken for a period of time. A linear regression model was used to calculate the trend that the dependent variable \( y \) adhered to as time progressed.

\[ Y_t = \beta_0 + \beta_1 t + \mu_t \]

Where,

\[ Y = \text{Dependent Variable}, \]
\[ \beta_0 = \text{Intercept}, \]
\[ \beta_t = \text{Slope co-efficient,} \]
\[ \mu_t = \text{Stochastic variable.} \]
\[ t = \text{Time} \]

**Multiple Regression**

Multiple regression is an extension of the two variable regression analyses, where instead of a single independent variable; two or more independent variables were used to estimate the values of the dependent variable.

In this study, the three sectors of the economy put together determined the gross domestic product.

Let us consider the following equation:

\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + U \]

Where,

\[ Y = \text{Dependent Variable,} \]
\[ \beta_0 = \text{Intercept} \]
\[ \beta_1, \beta_2, \beta_3, \beta_4 = \text{Partial regression coefficients,} \]
\[ X_1 = \text{Primary sectors’ share to GDP,} \]
\[ X_2 = \text{Secondary sectors’ share to GDP,} \]
\[ X_3 = \text{Tertiary sectors’ share to GDP,} \]
\[ X_4 = \text{GDP; and} \]
U = Disturbance term.

The same pattern had been followed for Workforce and Exports.

**The Compound Growth Rate (Semi-log Model)**

Economists, business people, as also the government were often interested in finding out the rates of growth for a number of variables, such as, Population, GDP, Employment, and the like. One of the objectives of the study had been to analyse the growth pattern of each of the three sectors. The best measure available for such an exercise is the compound growth rate model. The following formula had been used to find out the compound growth rate.

\[ Y_t = Y_0 \times (1+r)^t \]

Where ‘r’ is the compound rate of growth of ‘Y’

Taking the natural logarithm

\[ \ln Y_t = \ln Y_0 + t \ln (1+r) \]

\[ \beta_0 = \ln Y_0, \]

\[ \beta_1 = \ln (1+r) \]

This can also be written as

\[ \ln Y_t = \beta_0 + \beta_1 t \]

Adding the disturbance term to we obtain

\[ \ln Y_t = \beta_0 + \beta_1 t + U_t \]
This model is like any other linear regression model in that the parameter $\beta_0$ and $\beta_1$ are linear; the only difference is the fact that the regressed is the logarithm of ‘Y’ and the regressor is the time, which will take the values of 1, 2, and 3 and so on.

This model had been used to find out the growth rates of the sectoral shares of the GDP, the Labour force, and the Exports of all the sectors.

**Comparison of the Growth Rates**

To examine as to whether the growth rates had differed between the two assumed sub periods the following ‘t’ test had been used.

$$t = \frac{b_1 - b_2}{\sqrt{(SE b_1)^2 + (SE b_2)^2}}$$

Here, ‘$b_1$’ represented the slope coefficient obtained in the regression model estimated for the pre-reform period and ‘$b_2$’ represented the slope coefficient obtained in the regression model estimated for the post reform period. And SE represented the ‘standard error’.

**Structural Changes in the Growth Rates**

The ‘Chow Test’ had been used to find out as to whether there had been any structural changes in the growth rates of the GDP, the Workforce and that of
Exports. It had been used to analyse the sectoral performances for the years 1980-81 to 1990-91 as also for the years of 1991-92 to 2006-07.

The growth rates were estimated for the pre-reform period (1980-81 to 1990-91); for the post-reform period (1991-92 to 2006-07) and also for the whole period of 1980-81 to 2006-07).

The Chow’s test \(^{54}\) had been carried out using the following ‘F’-statistics.

\[
F = \frac{S_5/K}{S_4/ (n_1+n_2-2K)}
\]

Where,

\(N_1=\) Number of years before economic reforms,

\(N_2=\) Number of years after economic reforms,

Degrees of freedom = \((k, N_1+N_2-2K)\),

\(S_5 = S_3- (S_1+S_4)\),

\(S_4 = S_1+S_2\),

\(S_1 =\) Error Sum of squares obtained in the first equation,

\(S_2=\) Error Sum of squares obtained in the second equation, and

\(S_3 =\) Combined Error Sum of squares

The computed ‘F’ value was compared with that of the Table value of ‘T’ for \(K, N1+N_2-2k\) degrees of freedom. If the computed ‘F’ value was found to be greater than that of the table value of ‘F’, it indicated that there had been structural

changes in the post liberalization period as compared to that of pre-liberalization period in the sectoral shares, like, the Primary, the secondary and the Tertiary sectors of the Indian economy.

This model had been used to find out as to whether the structural changes had taken place in the sectoral shares of the Primary, the secondary and that of the Tertiary sectors of the Indian economy.