
ANALYSIS AND COMPARISON OF OVERALL GDP DEPENDING ONLY ON THREE MAJOR SECTORS IN INDIAN ECONOMY

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ABSTRACT

Indian economy is characterized by a diverse mix of economic activities related to agricultural sector, industrial sector and service sector. Alternatively, from an economic point view, the Indian economy can be broadly decomposed into three major sectors, namely, primary sector, secondary sector and tertiary sector that are more commonly known as agricultural sector, industrial sector and service sector respectively. The adoption of New Economic Policy in 1991 witnessed a paradigm shift in Indian economy as it diluted the mixed economy model and opened the Indian economy to the world. Economic liberalization measures including industrial deregulation, privatization of state-owned enterprises and reduced controls on foreign trade and investment served to accelerate country's economic growth. The present research study is aimed at analyzing and comparing the data with regard to the contribution of the major sectors of Indian economy (i.e. agricultural sector, industrial sector and service sector) in the overall GDP of the country during the period 1990-91 to 2009-10. The concerned GDP data have been retrieved from <https://data.gov.in> (Open Government Data Platform India). Moreover, for drawing useful inferences from the available secondary data, the statistical tools and tests like correlation analysis, analysis of variance and F-test have been used.

Finally, the study concludes that there is a significant difference among the performances of the three sectors with regard to GDP contribution during the period 1990-91 to 2009-10. The increasing share of Service Sector in the overall GDP of the country is the sign that we are a developing economy that is striving hard to become a developed economy. All the developed economies of the world have a large enough share of Service Sector in their respective GDPs, so there is no harm if our economy is also moving on the same path. The major problem of our economy is that there is big mismatch between sector-wise GDP figures and sector-wise employment figures.

Keywords: Indian Economy, GDP, Agricultural Sector, Industrial Sector, Service Sector.

INTRODUCTION

Indian Economy – An Overview

At the time of independence, the Indian economy was in great distress. Being a colonial economy, it was fulfilling the growth and development needs of Britain and the British. The state that should have been responsible for breakthroughs in agricultural and industrial sectors refused to play even a minor role in these sectors. On the other hand, during the half century before India's independence the world was witnessing an accelerated development and expansion in agriculture and industry in India because of an active role being played by the independent Indian states. British rulers never brought any significant reforms for the benefit of the social sector and this hampered the productive capacity of the economy. Therefore, once India became independent, systematic organization and restructuring of the economy was a real challenge for the Indian government. To deliver growth and development was the greatest need of the hour at that time and it was also the greatest challenge before the political leadership of that time because the country was riding on the promises and vibes of nation-building. Many important and strategic decisions were taken by 1956, which are still shaping India's economic journey. The adoption of the New Economic Policy in 1991 witnessed a landmark shift in the Indian economy, as it diluted

the mixed economy model and license raj system and opened the Indian economy to the world.

India is developing into an open-market economy, yet traces of its past autarkic policies remain. Economic liberalization measures, including industrial deregulation, privatization of state-owned enterprises, and reduced controls on foreign trade and investment began in the early 1990s and served to accelerate the country's growth which averaged nearly 7% per year from 1997 to 2017.

The overall outlook for India's long-term growth is moderately positive due to a young population and corresponding low dependency ratio, healthy savings and investment rates; and increasing integration into the global economy. However, long-term challenges remain significant including discrimination against women and girls, an inefficient power generation and distribution system, ineffective enforcement of intellectual property rights, decades-long civil litigation dockets, inadequate transport and agricultural infrastructure, limited non-agricultural employment opportunities, high spending and poorly targeted subsidies, inadequate availability of quality basic and higher education, and accommodating rural-to-urban migration.

Major Sectors of Indian Economy

Everyday we find so many economic activities happening around us. From cultivation to production to providing services, every minute we are surrounded by such activities. An economy includes all activities related to consumption, production, trade of goods and services. It applies to everyone from individuals to entities such as corporations and governments. The economy of a country is governed by its culture, laws, history, geography and so many other factors; and it evolves due to necessities of people or nation. Because of this reason, no two economies are the same. The Indian economy is also unique. It is composed of three major sectors, namely, Primary, Secondary and Tertiary Sectors. The various economic activities are classified into these three major sectors. An explanatory description of these three sectors is as below—

1) Primary Sector (i.e. Agricultural Sector) — When the goods are produced by exploiting natural resources, it comes under the primary sector. It involves transforming natural resources into primary products. It forms the base for all other products that we eventually make. The primary sector in India is the sector which is largely dependant on the availability of natural resources in order to manufacture the goods and also to execute various processes. Most of the natural products we get are from agriculture, dairy, fishing and forestry. The best example to discuss in this sector is agriculture. The other examples in this sector include dairy,

fishing and forestry; but agriculture accounts for the largest proportion in this sector. This is why this sector is commonly known as Agricultural Sector.

The major problems of this sector are underemployment, disguised employment and low productivity. At the time of India's independence this sector had biggest share in the GDP of India. But year by year its contribution went on declining and during 2009-10 it contributed only 14.64 % to the GDP of the country. It is also worth mentioning that 51% workforce of the country was employed in Agricultural Sector during 2009-10.

2) Secondary Sector (i.e. Industrial Sector) — The secondary sector encompasses activities in which natural products are changed into other forms or finished goods through manufacturing and are consequently used for consumption. The product has to be made and therefore some process of manufacturing is essential. The manufacturing could be done in a factory, workshop or at home. For example, using cotton fiber to spin yarn and weave cloth or using sugarcane to make jaggery and refined sugar. The manufacturing process is usually associated with the different kinds of industries that come up; therefore, this is also called as Industrial Sector. Secondary Sector or Industrial Sector is usually divided into Light Industry and Heavy Industry. Light Industry involves products that require less capital and are more consumer-oriented e.g. Manufacturing of clothes, shoes, furniture, etc. Heavy Industry involves products that are either heavy in weight or in their production

process. They require huge capital and advanced resources or facilities e.g. Heavy machinery, heavy equipments like cranes etc.

Again, this sector includes mining, quarrying, manufacturing, electricity, construction and water supply etc. During 2009-10, this sector contributed 28.27 % to the GDP of the country and was also found responsible for the employment of almost 22 % of the entire workforce of the country. This sector is supposed to be the backbone of any economy.

3) Tertiary Sector (i.e. Service Sector) — The economic activities included in the tertiary sector help in the development of the primary and secondary sectors. These activities do not produce any good but they are an aid or a support for the production process. For example, borrowing money from banks to help production and trade or goods that are produced in the primary or secondary sector would need transportation facility for being sold through retail shops. Tertiary Sector includes Transport, Storage, Communication, Banking, Insurance, Trade, Hospitality, Tourism, Entertainment, Management Consultancy etc. Since the activities involved in Tertiary Sector generate services rather than goods, it is also called as Service Sector.

This sector is the fastest growing sector of Indian Economy. It contributes maximum to the GDP of the country. During 2009-10, this sector contributed 57.09 % to the GDP of the country. It is also worth mentioning here that only 27 % workforce of the country was found to be employed in Service sector during 2009-10. Agricultural Sector during 2009-10. Currently this sector is the backbone of Indian economy.

Measurement of an Economy

Gross Domestic Product (GDP) is a broad measurement of a nation's overall economic activity. It is one of the primary indicators used to gauge the health of a country's economy. Alternatively, GDP is one of the most widely used measures of an economy's output or production. It is defined as the monetary value of all the finished goods and services produced within a country's borders in a specific time period. GDP includes all private and

public consumption, government outlays, investments, additions to private inventories, paid-in construction costs and the foreign balance of trade (i.e. exports are added and imports are subtracted).

Samuelson and Nordhaus neatly sum up the importance of the national accounts and GDP in their textbook “Economics.” They equate the ability of GDP to give an overall picture of the state of the economy with that of a satellite in space that can survey the weather across an entire continent. GDP enables policymakers and central banks to judge whether the economy is contracting or expanding, whether it needs a boost or restraint, and if a threat such as a recession or inflation looms on the horizon.

In fact, Gross Domestic Product is a good measure of an economy and with the improvements in research and quality of data, statisticians and governments are trying to find out measures to strengthen GDP and make it a comprehensive indicator of national income.

Calculation of GDP comprises several components. GDP can be calculated either through the expenditure approach (the sum total of what everyone in an economy spend during a particular period) or the income approach (the total of what everyone earned during a particular period). Both methods should produce the same results. A third method, the value-added approach, is used to calculate GDP by industry.

Expenditure-based GDP produces both real (inflation-adjusted) and nominal values while the calculation of income-based GDP is only carried out in terms of nominal values. The expenditure approach is the more common one and computes GDP by summing up consumer spending, business spending, government spending and net exports. Thus, $GDP = C + I + G + (X - M)$, where C is consumer spending, I is business spending, G is government spending, X is exports and M is imports.

Objective of the Study

The main objective of the present study is to analyze and compare the contribution of the three major sectors (i.e. Agricultural Sector, Industrial Sector and Service Sector) of Indian Economy in the overall GDP of the country during the period 1990-91 to 2009-10; and thereby drawing certain useful inferences.

Research Methodology

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

Results & Discussion

Table-01 : Overall & Sector- wise GDP Figures (1990 - 91 to 2009 - 10)

Financial Year	Gross Domestic Product (in Rs. Cr) at 2004-05 Prices (Overall GDP)	Agriculture & Allied Services (in Rs. Cr.) at 2004- 05 Prices (Agricultural Sector)	Industry (in Rs. Cr.) at 2004-05 Prices (Industrial Sector)	Services (in Rs. Cr.) at 2004-05 Prices (Service Sector)
1990-91	1,347,889	397,971	372,360	573,465
1991-	1,367,171	390,201	373,634	600,366

92				
1992-93	1,440,504	416,153	385,647	634,549
1993-94	1,522,344	429,981	406,848	681,351
1994-95	1,619,694	450,258	444,122	721,140
1995-96	1,737,741	447,127	494,262	794,041
1996-97	1,876,319	491,484	525,864	853,843
1997-98	1,957,032	478,933	546,966	930,089
1998-99	2,087,828	509,203	569,656	1,007,138
1999-2K	2,246,276	522,795	603,631	1,119,850
2000-01	2,342,774	522,755	640,043	1,179,976
2001-02	2,472,052	554,157	656,737	1,261,158
2002-03	2,570,690	517,559	704,095	1,349,035
2003-04	2,777,813	564,391	755,625	1,457,797
2004-05	2,971,464	565,426	829,783	1,576,255
2005-	3,253,073	594,487	910,413	1,748,173

06				
2006-07	3,564,364	619,190	1,021,204	1,923,970
2007-08	3,896,636	655,080	1,119,995	2,121,561
2008-09	4,158,676	655,689	1,169,736	2,333,251
2009-10	4,516,071	660,987	1,276,919	2,578,165

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

Table-02 : Contribution of Various Sectors in Overall GDP (1990 - 91 to 2009 - 10)

Financial Year	Contribution of various sectors in overall GDP (%)		
	Agricultural Sector	Industrial Sector	Service Sector
1990-91	29.53	27.63	42.55
1991-92	28.54	27.33	43.91
1992-93	28.89	26.77	44.05
1993-94	28.24	26.73	44.76
1994-95	27.80	27.42	44.52
1995-96	25.73	28.44	45.69
1996-97	26.19	28.03	45.51
1997-98	24.47	27.95	47.53
1998-99	24.39	27.28	48.24

1999-2K	23.27	26.87	49.85
2000-01	22.31	27.32	50.37
2001-02	22.42	26.57	51.02
2002-03	20.13	27.39	52.48
2003-04	20.32	27.20	52.48
2004-05	19.03	27.93	53.05
2005-06	18.27	27.99	53.74
2006-07	17.37	28.65	53.98
2007-08	16.81	28.74	54.45
2008-09	15.77	28.13	56.11
2009-10	14.64	28.27	57.09

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

Table-03 : Descriptive Statistics

<i>Column1</i>		<i>Column2</i>		<i>Column3</i>	
Mean	22.7064844	Mean	27.6315547	Mean	49.5675586
	3				2
Standard Error	1.05778205	Standard Error	0.14443693	Standard Error	1.01253630
	5		6		1
Standar d Deviatio n	4.73054516	Standar d Deviatio n	0.64594161	Standar d Deviatio n	4.52819999
	2		6		8
Sample Variance	22.3780575	Sample Variance	0.41724057	Sample Variance	20.5045952
	3		1		2
Standar	4.73054516	Standar	0.64594161	Standar	4.52819999

d Deviation	2	d Deviation	6	d Deviation	8
Count	20	Count	20	Count	20

Source: MS Excel Output

Table-04 : Correlation Matrix

	<i>Column 1</i>	<i>Column 2</i>	<i>Column 3</i>
<i>Column 1</i>	1		
<i>Column 2</i>	-0.53459	1	
<i>Column 3</i>	-0.99188	0.42330 8	1

Source: MS Excel Output

The above Correlation Matrix reveals that the value of correlation coefficient between Column 1 (Agricultural Sector) and Column 2 (Industrial Sector) is - 0.53459 i.e. $r_{12} = - 0.53459$, that between Column 2 (Industrial Sector) and Column 3 (Service Sector) is -0.53459 i.e. $r_{23} = + 0.423308$ and that between Column 1 (Agricultural Sector) and Column 3 (Service Sector) is - 0.99188 i.e. $r_{13} = - 0.99188$. Here, the value $r_{13} = - 0.99188$ implies that there is a very strong negative correlation (i.e. almost perfectly negative correlation) between the GDP contributions of Agricultural Sector and Service Sector. Again, $r_{12} = - 0.53459$ implies that there is moderate negative correlation between the GDP contributions of Agricultural Sector and Industrial Sector. Further, $r_{23} = + 0.423308$ implies that there is a positive but weak correlation between the GDP contributions of Industrial Sector and Service Sector.

Now, for testing the equality of population means (i.e. equality of average contribution to GDP by the three sectors from 1990-91 to 2009-10, we are using the technique of Analysis of Variance (ANOVA) and F-test.

The null and alternative hypotheses in this case are—

Null hypothesis, $H_0: \mu_1=\mu_2=\mu_3$ i.e. There is no significant difference among the average contributions of the three sectors in the overall GDP during the period 1990-91 to 2009-10.

Alternative Hypothesis, $H_1: \mu_1\neq\mu_2\neq\mu_3$ i.e. There is a significant difference among the average

contributions of the three sectors in the overall GDP during the period 1990-91 to 2009-10.

Table-05 : Analysis of Variance (ANO VA)

Anova: Single Factor					
SUMMARY					
Groups	Count	Sum	Average	Variance	
Column 1	20	454.129688	22.7064844	22.37805753	
		5	3		
Column 2	20	552.631094	27.6315547	0.417240571	
Column 3	20	991.351172	49.5675586	20.50459522	
		4	2		

ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>d.f.</i>	<i>MS</i>	<i>F calculated</i>	<i>P-value</i>	<i>F critical</i>
Between Groups	8179.746	2	4089.87297 4	283.3637217	2.42706E- 30	3.15884271 9
Within Groups	822.698	57	14.4332977 7			
Total	9002.444	59				

Source: MS Excel Output

Now, it is evident from the above ANOVA table (Table-04), the F-statistic is computed to be 283.3637 i.e. $F_{\text{calculated}} = 283.3637$

Again, at 5 % level of significance, for 2 and 57 d.f., the critical value or the tabulated value of F is 3.1588 i.e. $F_{\text{tabulated}} = 3.1588$.

Now, since $F_{\text{calculated}} > F_{\text{tabulated}}$, so we reject the null hypothesis and conclude that there is a significant difference among the average contributions of the three sectors in the overall GDP during the period 1990-91 to 2009-10.

CONCLUSION

The present study is an attempt to analyze and compare the contribution of the three major sectors (i.e. Agricultural Sector, Industrial Sector and Service Sector) of Indian Economy in the overall GDP of the country during the period 1990-91 to 2009-10; and thereby drawing certain useful inferences. The concerned GDP data have been retrieved from the website <https://data.gov.in> (Open Government Data Platform India) and the same have been

presented in Table-01 & 02. Table-02 clearly depicts a sharp fall in the contribution of Agricultural Sector in overall GDP i.e. in 1990-91 it was 29.53 % and by the end of 2009-10 it got reduced to 14.64 %. On the contrary to this, a significant rise in the contribution of Service Sector in overall GDP can also be observed i.e. in 1990-91, this figure was 42.55 % and by the end of 2009-10 it became

%. Moreover, the GDP contribution of Industrial Sector remained almost constant during the period 190-91 to 2009-10 i.e. 27.63% in 1990-91 and 28.27% in 2009-10.

The results of ANOVA and F-test (Table-05) also support the above claim. These results reveal that there is a significant difference among the average contributions of the three sectors (i.e. Agricultural Sector, Industrial Sector and Service Sector) to the overall GDP during the period 1990-91 to 2009-10. Again, as far as the results of correlation analysis are concerned (Table-04), the value $r_{13} = -0.99188$ implies that there is a very strong negative correlation (i.e. almost perfectly negative correlation) between the GDP contributions of Agricultural Sector and Service Sector; $r_{12} = -0.53459$ implies that there is a moderate negative correlation between the GDP contributions of Agricultural Sector and Industrial Sector and $r_{23} = +0.423308$ implies that there is a positive but weak correlation between the GDP contributions of Industrial Sector and Service Sector.

Finally, we can conclude that there is a significant difference among the performances of the three sectors with regard to GDP contribution during the period 1990-91 to 2009-10. The increasing share of Service Sector in the overall GDP of the country is the sign that we are a developing economy that is striving hard to become a developed economy. All the developed economies of the world have a large enough share of Service Sector in their respective GDPs, so there is no harm if our economy is also moving on the same path. The major problem of our economy is that there is big mismatch between sector-wise GDP figures and sector-wise employment figures. For example, during 2009-10 the GDP

contribution of Agricultural Sector was 14.64 % but almost 51 % of the entire workforce of the country was employed in this sector; the GDP contribution of Industrial Sector was 28.27 % but almost 22 % of the entire workforce was employed in this sector and finally the GDP contribution of Service Sector was 57.09 % but a mere 27 % of the entire workforce of the country was found to be employed in this sector.

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