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A STUDY ON THE DIVERSIFICATION OF INDUSTRIAL ACTIVITIES IN INDIA

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ABSTRACT

Industrialisation in developing economies plays a vital role in promoting aggregate economic growth and development. It involves basic changes in the manufacturing sector usually accompanied by technology modernisation, commodity diversification and economies of scale. The structural change towards heavy industrial commodity manufacturing not only brings in its wake accelerated rates of growth in the industrial output as per cent of the GDP of the nations but also, account for the improved quality of life of the people. The relative decline in the importance of the traditional Light industries in favor of the non-traditional Heavy industries, more often are explained in the empirical studies through such factors as the accumulation of capital, technical progress and human capital resource base on the one hand and the expanded domestic and international market for the manufactured goods on the other. They do not provide a systematic and comprehensive theoretical explanation of the dynamics involved in the long-run economic growth and the sectoral linkages. Industrial diversification measures, the extent by which the of industrialization acquires the capacity to manufacture diversified commodity output that could cater to the sophisticated input requirement of the industrial system as it moves towards achieving industrial maturity as well as meeting the material living standards of the people. In general, industrial diversification can be defined as the process of structural spread in the commodity manufacturing activity in a competitive market economy. Diversifications of industrial activity enable the system to move towards self-sufficiency and sustain the tempo of economic growth. Many of the earlier studies were concerned with the effects of product and firm-level diversification, rather than the broader concept of the structural diversification of the manufacturing sector at various levels in the value-adding process. The study aims at coherently integrating the structural change and diversification of the Indian industries in India during 1998 - 99 to 2013 -14.To estimate the extent of industrial diversification in the Indian Non-traditional industries employing Herfindahl Index and relate the findings with Macroeconomic policies and industrial growth. The estimation of industrial diversification at a micro level assumes importance because it has a direct implication on the antitrust policies formulated by the state. The level of industrial diversification has secured a slow growth rate during the period 1998-99 to 2007-08. The periods after 2007-08, the study observed the moderate level of diversification of industrial activities. This means the economic reforms have to be accelerated with the efforts to build facilities, infrastructure, and encouragement to embark on R & D programs, support services through industrial consultancy and engineering design services, project management services.

KEYWORDS: *Industrialisation , Macroeconomic policies and industrial growth.*

INTRODUCTION:

Industrialisation in developing economies plays a vital role in promoting aggregate economic growth and development. It is a sine-qua-non for achieving a diversified industrial structure capable of producing a wide range of commodities to meet increased levels of investment growth and consumption standards. It involves

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basic changes in the manufacturing sector usually accompanied by technology modernisation, commodity diversification and economies of scale. The expansion of both domestic and export markets acts as a stimulus to accelerate the pace of industrialisation. The process consequently results in 'widening' and 'deepening' the productive capital and enables the manufacturing sector to operate at higher and efficient production frontiers. Chang[1] has observed that during the period of industrialisation, changes of a series of strategic production functions take place which alters the techno-economic relationship between factor inputs, productivity levels and economies in the scale of operation.

The historical pattern of industrialisation across nations, unmistakably reveals dynamic structural transformation taking place within the manufacturing sectors. The shift in the relative importance of the Light industries in favour of the Heavy industries is accompanied by higher rates of capital accumulation and corresponding developments in human capital formation. The structural change towards Heavy industrial commodity manufacturing not only brings in its wake accelerated rates of growth in the industrial output as a per cent of the GDP of the nations but also, account for the improved quality of life of the people. Economic development in the advanced nations was closely associated with higher rates of per capita income growth supported by equally strong rates of per capita manufacturing output in the industrial sectors which were sustained over a fairly long period. The relevance of structural change in the process of industrialisation and to promote economic development has been vividly discussed by Hoffman[2], Chenery[3] and Kuznets[4]. The relative decline in the importance of the traditional Light industries in favor of the non-traditional Heavy industries, more often are explained in the empirical studies through such factors as the accumulation of capital, technical progress and human capital resource base on the one hand and the expanded domestic and international market for the manufactured goods on the other. These factors, in turn, trigger structural shifts both in the aggregate economy and also in the manufacturing sector. The classical growth theories provide only a partial explanation of these behavioural characteristics in a market-centered economy. They do not provide a systematic and comprehensive theoretical explanation of the dynamics involved in the long-run economic growth and the sectoral linkages. The functional mechanism that explains the historical link of the movement of the industrial structure from one stage to the other and the conditions that shape the transition process has been mostly confined to empirical research investigations.

INDUSTRIAL DIVERSIFICATION

Industrial diversification measures, the extent by which the process of industrialisation acquires the capacity to manufacture diversified commodity output that could cater to the sophisticated input requirement of the industrial system as it moves towards achieving industrial maturity as well as meeting the material living standards of the people. In general, industrial diversification can be defined as the process of structural spread in the commodity manufacturing activity in a competitive market economy.

Diversifications of industrial activity enable the system to move towards self-sufficiency and sustain the tempo of economic growth. The process of diversification of the industrial base has been guided in the West, by the strength of the free market mechanism. The market mechanism has ensured optimal allocation of the investible resources. This process, in the long run, has resulted in the development of diverse industrial activities with a strong base of science and technology embodied in the hardcore of the manufacturing process.

Economic theory and the existing empirical studies provide only limited insight into the question of industrial diversification and the overall performance of the national economy. This is partially because the phenomenon of diversification has been traditionally associated with the subject matter of the theory of firms. Therefore, many of the earlier studies were concerned with the effects of product and firm-level Diversification, rather than the broader concept of the structural diversification of the manufacturing sector at various disaggregate levels in the value-adding process.

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[1]. Chang, P.K. (1949), **Agriculture and Industrialization**, Harvard University Press, Cambridge.

[2]. Hoffman, W.G. (1958), **the Growth of Industrial Economics**, Manchester University Press,   Manchester.

[3]. Chenery, H.B.(1960), "*Patterns of Industrial Growth*", **American Economic Review**, Vol.10, September.

[4] Kuznets, S.(1971), **Economic Growth of Nations : Total Output and Production Structure**, Harvard University Press, Cambridge Mass.

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In the Indian context, it becomes an important empirical question to analyses the nature of structural change and the extent of industrial diversification so that the underlining economic implications can be studied in detail. Most studies on diversification and concentration were mainly based on product diversification at the level of firms. Limited attempts have been made to measure the structural domains of industrial diversification within the manufacturing system in India. An attempt in this direction will be made in the present study to fill this gap by examining the pattern of structural change and the extent of industrial diversification that has taken place in the Indian Traditional Manufacturing industries. Herfindahl Index is a useful tool to measure diversification quantitatively. The findings of the analysis are interfaced with the macroeconomic growth and the policies relevant to this context.

NEED, SCOPE AND SIGNIFICANCE OF THE STUDY

From the precedingdiscussion, it is evident that as the process of industrialisation reaches higher levels of maturity, it organically not only contributes for the national economies to experience the accelerated pace of economic growth and development but also it brings forth structural changes within the manufacturing sector. Such structural changes enhance the capacity of the national economies to produce a highly diversified mix of manufactured commodities clustered around the Heavy industrial categories. The structural diversification in a growing competitive market alters both the short-run and long-run profitability of the manufacturing industries through changes in the domain of price-cost relationship. In light of the issues highlighted, the present research work identifies the following aspects of analysis to form the scope of the study. These aspects of enquiry are chosen after a careful evaluation of the theoretical and empirical literature in this field. The study aims at coherently integrating the structural change and diversification of the Indian Non-traditional industries in India during 1998 - 99 to 2013 -14.

OBJECTIVES OF THE STUDY

The study is directed to empirically examine Structural Change, Diversification in the Indian Non-traditional industries from 1998 - 99 to 2013 -14. Following are the specific objectives formulated in the present research investigation.
1. To estimate the extent of industrial diversification in the Indian Non-traditional industries employing the Herfindahl Index and relate the findings with Macroeconomic policies and industrial growth.
2. To study the impact of globalisationon the Indian Non-traditional industries.

METHODOLOGY

The study, by and large, has been visualised in the background of the neo-classical theoretical framework. Herfindahl Index is used to measure the industrial diversification in Indian Non-traditional Industries.

The estimation of industrial diversification at a micro level assumes importance because it has a direct implication on the antitrust policies formulated by the state.

$$I = \sum_{I=1}^{n} w_i p_i$$

Where,

I = measures the index of diversification

Pi = refers to the share of its product or firm in the Market/industry

Wi = weight attached

I = 1,…….n, the number of firms in the industry

A Herfindahl-Hirshman Index (HHI) over .18 or 1800 is considered to highly concentrated
- An HHI index below 0.01 (or 100)
- Indicates a highly competitive market.
- An HHI index below 0.1 (or 1,000)
- Indicates an unconcentrated market.
- An HHI index below 0.1to 0.18 (or 1,000 to 1,800)

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- Indicates moderate market concentration.
- An HHI index above 0.18 (above 1,800)
- Indicates high market concentration

SOURCES OF DATA

The study is primarily based upon the ASI's (Annual Survey of Industries) Factory Sector data for the years 1998-99 to 2013-14. Data on other related information's and variables like the wholesale price index, consumer price index, national income etc., are collected from secondary data published by collected RBI's (Reserve Bank of India) Monthly Bulletins and Reports on Currency and Finance, National Accounts Statistics and Statistical Abstracts of the C.S.O, Economic Survey of the Government of India.

RESULTS AND DISCUSSIONS

An analysis on Industrial Diversification indices estimated using ASI data at two digit level industrial classification about the Number of factory establishments, Gross fixed capital, Number of employees and Gross value added for the Indian industry for the period of 2001-02 to 2011-12 is presented in the following section.

To estimate the index of industrial diversification we have used the Herfindahl Index of concentration. ThoughHerfindahl Index is typically used in empirical studies to calculate the extent of industrial concentration, the present study hasattempted to interpret this index to infer the extent of industrial diversification among the Indian industries.

In Herfindahl-Hirshman Index (HHI) over 0.18 or 1800 is considered to highly concentrated
- An HHI index below 0.01 (or 100)
- Indicates lack of concentration or a high degree of industrial diversification
- An HHI index below 0.1 (or 1,000)
- Indicates un concentrated industrial diversification.
- An HHI index below 0.1to 0.18 (or 1,000 to 1,800)
- Indicates the moderate level of industrial diversification.
- An HHI index above 0.18 (above 1,800)
- Indicates the prevalence of total concentration

This logic from the point of view of diversification is treated in the present analysis to represent total diversification and absolute lack of diversification respectively when the estimated Herfindahl Index values assume 0 and 1.

To appreciate finer variations in the estimated indices and to infer about the nature and extent of diversification, we have defined the mean value to capture the general character of the period in reference. Further, to understand the specific years in which the actual index has implied a different characteristic feature other than the period's mean, we have adopted the following procedure in the present research investigation. The actual index, if, were to be low in value from the mean, then the extent of diversification is implied to represent moderately high and significantly high levels respectively. Similarly, if the actual index has tended to be high in value from the period's mean magnitude, then we have interpreted the extent of diversification to denote moderately low and significantly low levels respectively concerning the period's general characteristic.

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Table No - 1

Estimation of Industrial Diversification in India interms of Number of Factory Establishments During 1998-99 to 2013-14

Industry Code / Year	20	21	22	23	24	25	26	27	28	HHI
1998 - 99	3247	3274	3285	773	10598	6533	12077	7166	7879	0.15
1999-2000	3370	3324	3314	839	10345	6651	11837	7073	8096	0.15
2000 - 01	3227	3425	3178	917	10669	6794	11677	7055	8232	0.15
2001 - 02	3162	3379	2886	885	10577	7094	11758	6746	7999	0.15
2002 – 03	2985	3476	3046	948	10395	6816	11660	6607	7916	0.15
2003 - 04	3042	3579	3007	918	10226	6999	11838	6523	8051	0.15
2004 - 05	3053	3763	3135	990	10747	7225	13223	6736	8138	0.15
2005 - 06	3033	3749	3319	1037	10995	7353	13999	7228	8534	0.15
2006 - 07	3074	3868	3416	965	11065	7798	15085	7795	9019	0.15
2007 - 08	3197	4096	3326	1054	11177	8187	15850	7782	9872	0.15
2008 - 09	8456	3420	8335	16588	8656	9773	2104	5252	8917	0.14
2009 - 10	8418	3477	8344	17469	8921	10854	1876	5487	9009	0.14
2010 - 11	11202	4658	11852	22880	11249	14844	2517	7194	11889	0.14
2011 - 12	11276	4839	12414	24264	11644	15617	2671	7346	11521	0.14
2012 - 13	11426	4907	12677	25253	11877	16206	2581	7702	11877	0.14
2013 - 14	11465	4961	13147	25597	11783	16648	2505	7335	11731	0.14

Mean: 0.147   SD: 0.004   C.V: 0.30

Source: ASI Data Factory Sector

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Diagram - 1
Estimation of Industrial Diversification in India regarding Number of Factory Establishments
During 1998-99 to 2013-14
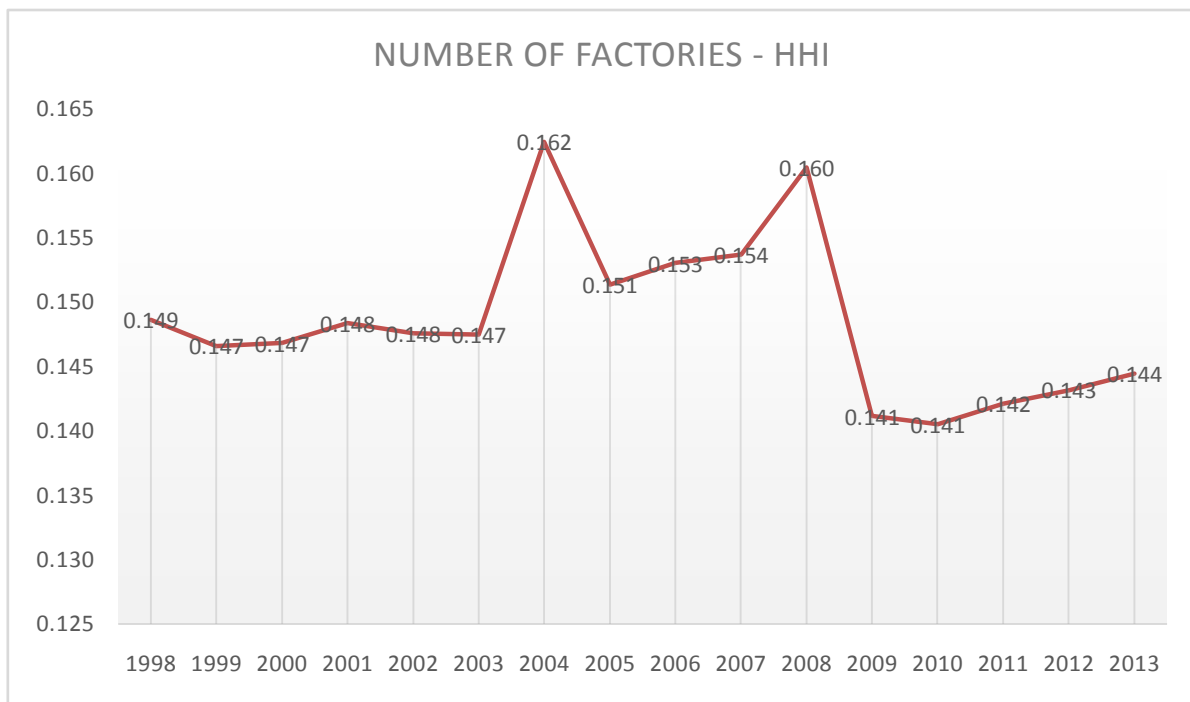
The estimated indices of concentration or alternative diversification in respect of the number of factory establishments in traditional Indian industries at two digits level disaggregation are presented in table 4.1 for the period 1998 - 99 to 2013 -14. The trends of the analysis are portrayed graphically in diagram 4.1.

It can be inferred from the table that the industries engaged in the manufacture of traditional products in India for the period as a whole, with a mean value at around 0.147. This magnitude reveals a moderate level of industrial diversification regardingsome factory establishments. During study period 1998-99 to 2007-08 the level of industrial diversification has registered a slow growth rate. The periods after 2007-08, when compared with the periods mean value, the study observed a moderate level of diversification of industrial activities from the period's decade. The results show that during the study period moderate level of industrial diversification in the number of factory establishments across the constituent in the traditional Indian industries.

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Table - 2
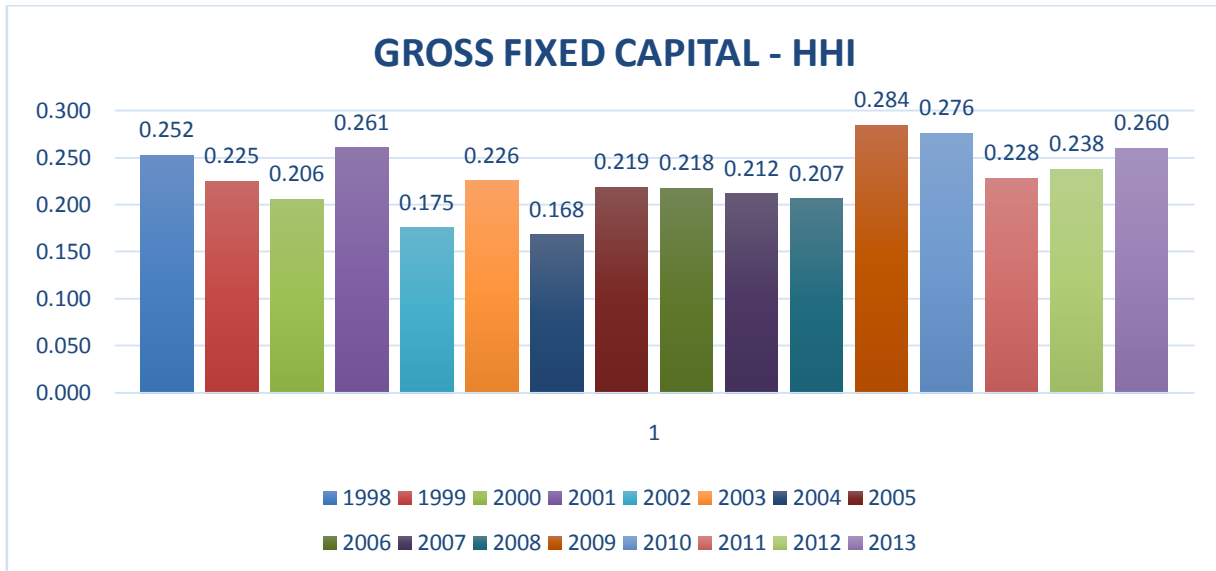**Estimation of Industrial Diversification in India regarding Gross Fixed Capital During 1998-99 to 2013-14**

Industry Code / Year	20	21	22	23	24	25	26	27	28	HHI
1998 - 99	20939	166259	94638	859168	997964	170732	392128	1877278	84425	0.25
1999-2000	8092	117177	61111	496335	887444	173226	233515	264441	78844	0.23
2000 - 01	8119	105496	62050	528866	782730	166906	265666	613170	63596	0.21
2001 - 02	10282	461619	49321	2286727	719986	156217	716335	676568	93894	0.26
2002 - 03	10200	246334	88954	543330	628061	139222	270708	479765	84697	0.18
2003 - 04	10964	124890	76342	570117	655923	231814	277995	1253842	123543	0.23
2004 – 05	14225	153952	97513	401194	841558	407900	473583	1441202	164586	0.21
2005 - 06	21302	299172	184961	1505949	1796513	319885	693252	2577577	287958	0.22
2006 - 07	45097	419106	235962	669345	2068613	432824	879742	2794346	454294	0.22
2007 - 08	42625	539753	210369	709719	2113420	600420	1393241	3521051	716821	0.21
2008 - 09	22860.59	8693.58	8000.52	20922.58	52823.07	7681.31	3751.22	7414.79	8642.26	0.21
2009 - 10	13236.24	8725.5	9693.12	17437.1	72660.07	5261.09	4498.75	6311.61	8566.07	0.28
2010 - 11	14636.86	10467.3	10737.34	16889.06	81951.48	7335.09	3816.77	8090.61	13757.81	0.28
2011 - 12	21812.67	14234.74	13637.88	23053.25	79501.91	9860.68	4574.06	9125.77	12412.84	0.23
2012 - 13	30092.52	12053.04	9025.45	21343.35	73345.09	8177.9	2641.72	7553.68	9802.52	0.24
2013 - 14	24631.02	14113.39	10690.12	18051.38	82214.15	7044.53	3248.45	6916.91	10931.74	0.26

Source: ASI Data Factory Sector Mean: 0.231   SD: 0.028   C.V: 0.124

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Diagram 4.2
Estimation of Industrial Diversification in India regarding Gross
Fixed Capital During 1998-99 to 2013-14

GROSS FIXED CAPITAL - HHI

Legend: 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013

Values: 0.252, 0.225, 0.206, 0.261, 0.175, 0.226, 0.168, 0.219, 0.218, 0.212, 0.207, 0.284, 0.276, 0.228, 0.238, 0.260

     The calculated Herfindahl Index regarding the Gross fixed capital stocks of the Indian industrial diversification at two digit level disaggregation are presented in table 4.2,and the trends are graphically portrayed in figure 2

     From table2, it is evident that during the study period the Herfindhal index in regards to gross fixed capital employed by the traditional Indian industries has assumed the mean value around 0.231. It empirically indicates a High degree concentration characterising the deployment of the gross fixed capital across the two-digit Indian Non-traditional industries. When compared with periods mean value, the following years recorded more concentration regarding gross fixed capital viz., 1998-99,2001-02, 2009-10, 2010-11 and 2013-14.

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Table No - 3
Estimation of Industrial Diversification in India regarding Gross Value Added During 1998-99 to 2013-14

Industry Code / Year	20	21	22	23	24	25	26	27	28	HHI
1998 - 99	31669	267039	231457	737435	3925352	575313	697095	2143380	441665	0.27
1999-2000	44486	288721	290080	648394	4269001	706072	971289	2316505	459407	0.26
2000 - 01	37945	458890	276325	874128	3756710	590634	990568	1826563	476011	0.23
2001 - 02	44906	367841	260198	1126354	3652463	702058	1030953	1726678	467718	0.22
2002 - 03	49930	438300	324553	2182991	4047584	742917	996182	2506845	507284	0.21
2003 - 04	52001	429160	351853	2852117	4362510	805235	1072298	3446525	589089	0.21
2004 – 05	49857	442715	350354	3457902	5028724	903777	1512155	5733890	691754	0.22
2005 - 06	87885	539569	516417	4782795	5775738	889457	1586734	5106218	1014900	0.21
2006 - 07	66398	602309	565923	5690106	6508800	987112	2511520	7302001	1519263	0.21
2007 - 08	108387	755260	703996	7115728	7292467	1396882	3627505	9967696	1910471	0.21
2008 - 09	55801.9	35076.5	20927.6	41357.8	84886.16	19782.2	18519.3	25971.3	42339.1	0.14
2009 - 10	64403.7	38314	24845.5	46112.9	90413.29	25581.1	21251.5	31420.6	44254	0.14
2010 - 11	72132.2	43594.8	33554.1	42451.8	101659.5	35501.3	22120.9	37057.1	50213.1	0.14
2011 - 12	86036.4	64040.8	31141.7	52525.1	107663.6	34134.5	20190.4	38548.7	61267.5	0.14
2012 - 13	89350.3	61375.8	31035.2	53668.3	102692.1	36584.5	21134	40363.1	66338.6	0.13
2013 - 14	93217.2	72333.5	43110.6	50860.4	141063.7	34712.4	24608.5	40170.2	54956.9	0.15

S   *Source: ASI Data Factory Sector*   Mean: 0.193   SD: 0.047   C.V: 0.241

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Diagram - 4.3
Estimation of Industrial Diversification in India regarding Gross Value Added
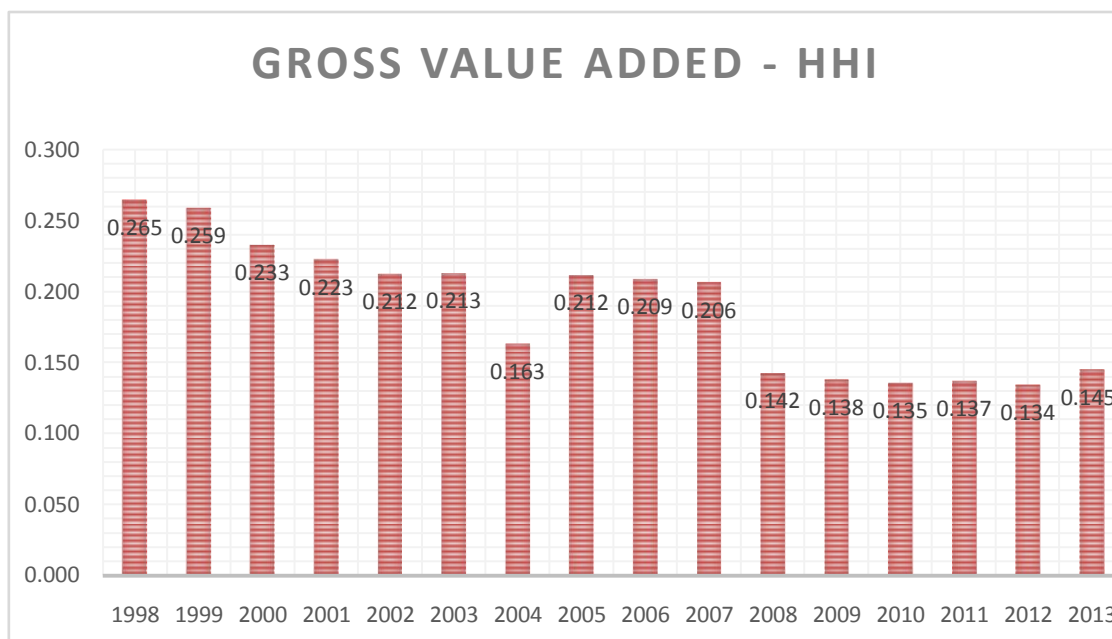**During 1998-99 to 2013-14**

Table 4.3 presents the estimated magnitudes of Herfindahl index for the Indian Non-traditional industries at two digit level disaggregation regarding gross value added during 1998 - 99 to 2013 -14. The trends are graphically portrayed in figure3.

The reference period of the study, the estimated value of the Herfindahl index in regards to gross value added has yielded a mean value at around 0.193. This magnitude reveals a Concentration Level regarding gross value added across the traditional industries. The results show that during the study period from 1998-99 to 2007 – 08 recorded the high degree of concentration in the traditional Indian industries. When compared with the periods mean value, the select traditional industries recorded after the period 2007-08 regarding Gross value added.

SUMMARY OF DISCUSSIONS
NUMBER OF FACTORY ESTABLISHMENTS

- It can be inferred from the study that the industries engaged in the manufacture of traditional products in India for the period as a whole, reveals a moderate level of industrial diversification regardinga number of factory establishments.
- During the studyperiod, 1998-99 to 2007-08, the level of industrial diversification has registered a slow growth rate. The periods after 2007-08, the study observed the moderate level of diversification of industrial activities.
- The results show that during the study period moderate level of industrial diversification in the number of factory establishments across the constituent in the traditional Indian industries.

GROSS FIXED CAPITAL

- The study indicates a High degree concentration ischaracterising the deployment of the gross fixed capital across the two-digit Indian Non-traditional industries.
- The year the following years recorded more concentration regarding gross fixed capital viz., 1998-99,2001-02, 2009-10, 2010-11 and 2013-14.

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GROSS VALUE ADDED

- The studyreveals Concentration Level regarding gross value added across the traditional industries.
- The results show that during 1998-99 to 2007 – 08 recorded the high degree of concentration in the traditional Indian industries.
- When compared with the periods mean value, the select traditional industries recorded less industrial diversification after the period 2007-08 regarding Gross value added.

SIGNIFICANT FINDINGS AND MAJOR CONCLUSIONS OF THE STUDY

- It is evident from all the chosen variables to study the extent of diversification viz., the number of factory units, gross fixed capital and gross value added, the 16 year period in reference has been marked by a less degree of structural spread across the two-digit industries constituting the Indian Non-traditional industries.
- The level of industrial diversification has secured a slow growth rate during the period 1998-99 to 2007-08. The periods after 2007-08, the study observed the moderate level of diversification of industrial activities.

CONCLUDING REMARKS AND SUGGESTIONS FOR THE FUTURE RESEARCH

- Using ASI's annual data for the present study though will cause some limitations; the results are to be viewed as general indicators of industrial diversification in this study. This, however, does not in any way seriously undermine the overall outcome and the reliability of the results.
- The results indicatethat during the study period characterised by less degree of industrial diversification across the constituent Indian Non-traditional industries. This is not a welcome sign for the development of any economy.

POLICY IMPLICATIONS

- Thismeans the economic reforms have to be acceleratedwith the efforts to build facilities, infrastructure, and encouragement to embark on R & D programs, support services through industrial consultancy and engineering design services, project management services.

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