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1. Overview of Manufacturing Industry in India

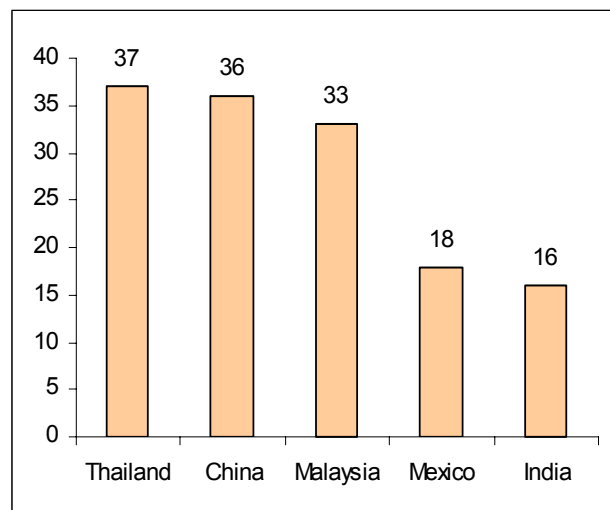
Indian economy is on a high growth trajectory with Gross Domestic Product (GDP) clocking a stable growth rate of over 8% per annum. Today, it is one of the fastest growing economies of the world with rising foreign exchange reserves close to US\$140 billion, a booming capital market with Sensex topping the majestic 11,000-mark, foreign direct investment (FDI) close to US\$8 billion, and over 20% surge in exports.

Industrial growth is driven by robust performance of the manufacturing sector, which has increased steadily from 8.1% in 2003-04 to 9% in 2005-06, when the Indian economy registered an excellent growth rate of 8.4%. The manufacturing sector played a significant role in achieving this higher economic growth rate. It has become a major driving force for the Indian economy and is well poised to create millions of new jobs.

The contribution of manufacturing sector to India's GDP today is just over 15%. The global trends reflect that manufacturing in low cost countries like India will gather momentum over the next decade. This in turn will improve the contribution of manufacturing sector to the GDP of the country. The industry is increasingly focusing on reducing cost through innovations at all levels to take on global competition

India's manufacturing sector is catching up but it is far behind the other emerging economies. In 2004, manufacturing sector's contribution to China's GDP was 36%, while in India it was only 16%. Therefore, manufacturing sector in China plays a crucial role in the robust growth of its GDP.

Manufacturing—percentage share of GDP per capita, 2004



Source: Global Insight, McKinsey Analysis

2. Significance of Manufacturing Industry in Indian Economy

The secondary sector has attained an important place in the Indian economy over the years. Besides being a significant contributor to the GDP growth, it is the second largest employment provider to the country's skilled as well as unskilled labour force and a major export contributor. India needs a strong manufacturing sector for the following reasons:

- The Indian population is estimated to grow by 2.15% annually, whereas the growth of agriculture—the major employment providing sector—has been a meagre 0.99% over past five years. Moreover, the availability of arable land in agriculture is also declining. Therefore, the surplus labour force in the agriculture sector can be absorbed only in the manufacturing sector. Thus, the workforce in manufacturing sector must be increased to off-set the pressure on agriculture sector and increase income levels, especially in rural areas. Agriculture, engaging 60% of the working population, contributed only 19.9% to the GDP in 2005-06. This mismatch between distribution of workforce and value addition in agriculture,

which is expected to further widen in the coming decades, is one of the main reasons for the high levels of poverty. Therefore, considerable shift of workforce from agriculture to manufacturing will help to improve rural incomes and reduce poverty levels.

- Share of the manufacturing sector in India's GDP has remained stable at around 15% while in China, the manufacturing sector accounted for over 36% of the GDP and in Thailand, for over 37% in 2003-04.

2.1 GDP break-up and share of manufacturing sector

The Indian economy is experiencing a mixed trend in the changing equations of the importance of its constituent sectors (primary, secondary and tertiary). The importance of its primary sector is declining while secondary sector is gaining gradually, and tertiary sector is growing fast and emerging as a major contributor to the country's booming economy, as is happening world over. The sectoral contribution of the Indian economy from 1999-2000 to 2005-06 shows the definitive structural transformation that characterised Indian economy (See Table-1).

Year	Agricultural and allied sectors	Secondary	Tertiary sector	Manufacturing sector	Share of manufacturing sector in secondary sector GDP
1999-2000	25.33	25.42	49.25	14.74	57.91
2000-01	24.27	25.90	49.83	15.22	58.75
2001-02	24.36	25.16	50.48	14.75	58.64
2002-03	21.86	25.94	52.20	15.19	58.54
2003-04	22.18	25.74	52.01	15.00	58.26
2004-05 (E)	22.78	26.00	51.22	15.10	57.97
2005-06 (RE)	19.91	26.10	54.01	15.15	58.10

Source: Ministry of Statistics and Programme Implementation, GoI

3. Major Industries and their Significance to Manufacturing Sector

The importance of individual industries to Indian manufacturing sector is described statistically.

3.1 Engineering industry

- Engineering industry in India is worth of US\$22 billion. Directly or indirectly, this industry employs over 4m skilled and unskilled workforce in the country.
- Major strengths of this industry include strong technical capabilities in electrical machinery, process plant machinery and general purpose machinery. It is a diversified industrial base with supporting ancillary industries.

3.2 Chemical industry

- At present, chemical industry in India is valued over US\$32 billion and it contributes 1% to global chemical products. The sector is ranked 12th in global chemical production. It constitutes 1.3% of total global chemicals trade.
- The industry contributes 3% to the country's GDP.
- The net value added of chemical industry is the highest within manufacturing sector with a share of over 22% of total value added.

3.3 Pharmaceutical industry in India

- India is the world's 4th largest pharmaceutical producer with contribution of 8% to global production by volume and 1.5% by value and with a market value of over US\$8 billion in 2004-05. Indian pharmaceuticals industry is estimated to be US\$25 billion by 2010.

3.4 Steel industry

- India is the world's 8th largest producer of steel and largest producer of sponge iron.
- During 2005-06, total crude steel production in the country was 38.1 million metric tonnes with world's share of 3.37%.
- During 2005-06, total export of steel was 4.38 million metric tonnes, which has gone down by 16% as against 2004-05.

3.5 Automobile and auto components industry

- Automobile and auto components industry provides over 0.45m direct employment and over 10m indirect employment.
- Indian automobile and auto component sector possesses distinct cost advantage in terms of labour cost. Labour cost in India is 8%-9% of total sales as against 30%-35% of sales in developed economies.
- During 2005-06, automobile industry witnessed a growth rate of 13% compared to 28% growth rate of export. In the past three years, India's auto components industry is growing at CAGR of 19%. In 2005-06, auto components export registered a growth rate of 28.57% as against 2004-05.

3.6. Oil and natural gas

- In 2004-05, annual crude oil production was 36.2m tonnes; current demand stands at 115.7m tonnes.
- Refining capacity was 127.11m tonnes in 2004-05.
- There is a strong retail infrastructure comprising over 17,000 petrol stations; 6,500 kerosene depots and over 5,500 domestic LPG dealers
- Tremendous opportunities for synergy in:
 - I. Supply of crude oil and gas
 - II. LNG import and transportation
 - III. Setting up refineries, petroleum infrastructure, storage facilities and pipelines
 - IV. Marketing petroleum products including LPG, retail marketing of transportation fuels
 - V. Production-sharing contracts for oil and gas exploration under New Exploration Licensing Policy

3.7. Textile industry

- Currently, textile sector in India is growing over 18.9% per annum and export is growing around 25%. The sector accounts over 12.1% of total export earnings.
- The sector contributes around 14% to total industrial production in the country.
- India accounts for 15% of world's total cotton crop production; it is the largest producer of silk.
- India has many advantages in this sector with large pool of skilled, low-cost and technologically-experienced workers.
- Man-made fibre is the major segment, accounting for 40% share of the Indian textile

industry.

4. Trends in Performance of Secondary and Manufacturing Sectors

The performance of the industrial sector is measured by the Index of Industrial Production (IIP) and its trend. The trends in the IIP of the major sub-sectors of Indian secondary sector show that manufacturing and electricity sectors experienced higher growth in 2005-06 compared to same period of previous year. Therefore, it can be inferred that India's manufacturing sector is performing well and is one of the sectors driving growth.

The growth of the manufacturing sector in the new millennium (except 2001-02) helped the industrial sector to maintain a higher growth rate (See Table-3).

Table- 3: Annual growth rates of IIP during last decade				
	Manufacturing	Mining and quarrying	Electricity	Overall
Weight	79.4	10.4	10.2	100.0
1994-95	9.1	9.8	8.5	9.1
1995-96	14.1	9.7	8.1	13.0
1996-97	7.3	-1.9	4.0	6.1
1997-98	6.7	6.9	6.6	6.7
1998-99	4.4	0.8	6.5	4.1
1999-2000	7.1	1.0	7.3	6.7
2000-01	5.3	2.8	4.0	5.0
2001-02	2.9	1.2	3.1	2.7
2002-03	6.0	5.8	3.2	5.7
2003-04	7.4	5.2	5.1	7.0
2004-05 (Apr-Dec)	9.0	4.8	6.4	8.4
2005-06 (Apr-Dec)	8.9	0.4	4.8	7.8

Source: Economic Survey of India, 2005-06

Table-3 suggests that after close to two decades of depressed growth, the growth of manufacturing had witnessed a growth rate of 9.1% during 1994-95. The rate of growth was laudable. Further, this laudable rate of growth of manufacturing appears to have gained momentum during the subsequent years as well. It is noteworthy that since 1994-95, the manufacturing sector has pulled up the overall growth of secondary sector while the other two sectors show slump in their IIP.

5. GDP Growth and Manufacturing Sector

Table-4: Estimated GDP growth vis-à-vis Manufacturing Growth		
GDP	10%	12%
Manufacturing	17.32%	18.8%

Note:: It is assumed that Agriculture and Service sectors grow constantly at 1.8% and 9% respectively by taking average growth rate of the last four years, **Source:** Cygnus Research

5.1 Achieving a double-digit growth rate

The following issues need to be addressed to attain and maintain high growth rate of manufacturing sector, which would in turn drive the Indian economy on the double-digit growth path.

- Product innovation - improving quality and differentiated products and up-gradation of models and developing products suited for Indian conditions; test before entering international markets.
- FDI in manufacturing sector should be substantially increased.
- Interchain innovation – moving to new and more profitable product segments
- Process Innovation – improving the efficiency of transforming inputs into outputs
- Removing all regulatory constraints
- Reducing cascading effect of taxes
- Capital availability - Enhancing flow of funds to industry including funds from Development Financial Institutions and non-recourse funding and structured finance from banks
- Exit and restructuring
- Effective synergy between internal and external reforms
- Infrastructure reforms
- Labour reform
- Enhance competitiveness Cost disability factors such as high input cost in Indian industry
- Globalise R&D by setting up facilities in emerging markets to acquire deeper customer knowledge, and to build market and distribute tailored products.
- Tailoring of talent management strategies to reap the unique benefits of employees in emerging markets, and rethink the recruitment process, develop, deploy and connect people effectively.

6. Contribution of Manufacturing Sector to Andhra Pradesh's SGDP

Andhra Pradesh is one of the fastest growing economies of the country and the manufacturing sector in the state has huge potential. The state is bestowed with huge natural resources. Table-illustrates the significance of manufacturing sector in the state's economy.

Table-5: Sectoral share of SGDP

Year	Agricultural and allied sectors	Secondary sector	Tertiary sector	Manufacturing sector	Share of manufacturing sector in secondary sector GDP
1999-2000	27.32	26.10	46.58	14.85	56.89
2000-01	28.85	24.65	46.49	13.62	55.25
2001-02	28.69	26.24	49.67	14.77	56.27
2002-03	23.94	26.89	49.17	14.82	55.12
2003-04	24.73	26.31	48.96	14.48	55.03
2004-05 (E)	23.15	26.85	50.00	15.10	54.72

Source: Ministry of Statistics and Programme Implementation, GoI

7. Outlook of manufacturing sector in India

Manufacturing sector has performed exponentially in the last few years. With the remarkable growth in the different segments of the manufacturing sector, all eyes are set on how the future of the industry will shape up in India. A realistic assessment gives confidence that there is no dramatic decline in store for the sector—whether globally or in India. In fact, there are opportunities to tap in certain sectors for both champions of productivity and participants in global value chains. But at the same time, a churning is bound to happen on a large scale. There will be success stories alongside closures. Winners and losers would get separated—across sectors and within.

7.1 Indian manufacturing industry

- India becomes a base for export to third world countries. For example, Hyundai Motors is using India as export base for foreign markets, currently exporting to eight countries and looking forward to expand the same to markets in the European Union and Latin America. The company has also set up an R&D centre at its Chennai plant.
- India has world-class R&D facilities.
- It has come out as a global manufacturing hub with presence of MNCs such as LG, Samsung, Hyundai, Pepsi, GE, General Motors, Ford and Suzuki.
- India has increased implementation of state-of-the-art IT technologies and presently, the IT usage is approximately 15%.
- The sectors showing high potential are automobiles, textiles, steel, aluminium, cement, auto ancillaries, forging and pharmaceuticals.

7.2 Sector-wise outlook

The manufacturing sector in India has been pioneering value chain as well. Whether it is in automobiles or technology, a large number of MNCs see India as favourable destination for investment. For instance, various companies in automobile industry plan to set up plants in India and those having their base plan for major expansion of their existing units. The world's leading auto part makers have relocated their product lines to India. Many leading car manufacturers are currently using India as a manufacturing and export base for their products.

- Indian textile industry is all set for a big leap in the global market and is in a very buoyant mood. In 2005, an additional Rs20,000 crore was invested in the industry and in 2006, a further Rs30,000 crore is expected to be invested, which means the textile entrepreneurs can foresee a very bright future.
- According to World Trade Organisation, 2005 onwards, India will grant product patent recognition to all new chemical entities ie, bulk drugs. The Indian Government's decision to allow 100% foreign direct investment into the drugs and pharmaceutical industry is expected to aid the growth of contract research in the country. Apart from manufacture of drugs, the pharmaceutical industry offers huge scope for outsourcing of clinical research. India has enormous opportunities in exports, and the potential to become a global hub in the area of R&D-based clinical research outsourcing, particularly in biotechnology. The Indian pharmaceutical industry is also getting increasingly FDA-compliant to harness the growth opportunities in areas of contract manufacturing and research. Indian pharmaceutical companies are increasingly focusing on tapping US generic market, which is expected be more than US\$51.7 billion by 2010 from US\$28.1 billion in 2005.

- Electronic Manufacturing Service (EMS) is another sector that has been witnessing a lot of developments over the last couple of years. The EMS market in India is estimated to reach US\$4.57 billion by 2010.

7.3. Current Scenario: Indian manufacturing industry

Table- 5.1 Facts: Manufacturing Sector in India	
GDP (2005-06E at current prices)	US\$711 billion
GDP growth rate (Real GDP)	8.4% (2005)
GDP composition by sector (2005-06)	Agriculture – 19.9%
	Industry – 26.1%
	Services – 54%
Average Annual Growth Rate (Manufacturing Sector)	9% (2005)

Source: Central Statistical Organisation, GoI

8. Enhancement of Manufacturing Competitiveness

Manufacturing competitiveness can be achieved through adoption of some of the following philosophies:

8.1 Lean manufacturing

Benefits of implementing lean manufacturing

- The benefits of lean manufacturing come out as the cycle of analysis, development and refinement of processes repeated again and again.
- It helps in quality enhancement and in reduction of inventory costs which are basic areas of visible improvement in terms of performance measures.
- Not only does reduced capital spending for every rupee of sales help drive margin improvement over time but reduced manufacturing costs should come as a benefit of successful implementation of lean manufacturing. Through the implementation of Lean Manufacturing it has been observed that on an average benefits have been derived in the range as detailed below:
 - Labour needed for given level of output down 50%-75%.
 - Throughput time in plant (and WIP) down 90%
 - Throughput time in product development down 50%-75%
 - Defects in process and reaching customer down 90%
 - Ship-on-time without expediting rises from 50%-75% to 90+%
 - Injuries to workers fall by 90%
 - Plant space needed for a given level of output falls 50%
 - Capital needed for given level of output falls 50%

8.2 Just-in-time manufacturing

Benefits of JIT

- JIT eliminates waste by providing the environment to perfect and simplifying the processes. JIT is a collection of techniques used to improve operations. It can also be a new production system that is used to produce goods or services.
- When the JIT principles are implemented successfully, significant competitive advantages are realised. JIT principles can be applied to all sections of an organisation: Order taking, purchasing, operations, distribution, sales, accounting and design.

8.3 Six Sigma

Benefits of Six Sigma

- Six Sigma saves time and money and enhances customer satisfaction
- Improving the quality and delivery performance not ten fold but a hundred fold
- The Six Sigma target of 3.4 Defects Per Million Opportunities is equivalent to a performance of 99.99966%
- Bottom line cost savings (5%-20% of turnover per annum)
- Saves up to 1.2%-4.5% of a company's revenue
- Improved quality of product or service as perceived by the customer (internal and external customers)
- Reduction in process cycle times
- Development of staff skills
- Common language throughout the organisation
- World-class standard

8.4 Technology and manufacturing sector

- Enhance productivity, flexibility and customer responsiveness
- Enable new business and growth strategies
- Eliminate costs and inefficiencies
- Expand knowledge of key business data
- Extend business using the Internet
- Enhance customer relationship
 - Opportunities and Leads
 - Integrated Contact Management
 - Quoting and Sales Orders
 - Comprehensive Sales Reporting

9. Need of the hour

To achieve a double-digit GDP growth, it is important that manufacturing sector grows at about or over 18% annually, even when agriculture growth picks up close to 1.8% and services at 9% annually.

Following steps must be taken for achieving the growth in Indian manufacturing industry:

Increase Demand

- Generate higher demand by reducing prices
- Increase purchasing power of the consumer
- Gradually reduce direct and indirect tax incidence

Resolving Supply Constraints

- Reduce needless costs borne by the industry
- Improve competitiveness of Indian industry

Flow of funds to the manufacturing sector

- Range bound prime lending rates(PLR) to large enterprises, medium and small scale enterprises
- Reducing spread on borrowing and lending rates

Development of infrastructure

- Un-interrupted power supply at reasonable rates
- Allow duty-free import of fuel for captive power generation
- Cargo handling efficiency and reduce waiting time at Indian ports
- Improve surface transport facilities

Simplify labour laws

- Flexibility in hiring contract labour for export related activities.
- Simplify laws relating to retrenching labour at the time of closure of an enterprise.

Simple Procedures to facilitate exit and restructuring

Reduce transaction costs

Expectations of CEOs from Manufacturing Sector

Last but not the least, the senior management of some of the major organisations across industry will let us know what the CEOs are expecting from manufacturing. This will set the context for both non-manufacturing organisations and the manufacturing organisations to understand the value that manufacturing sector needs to deliver.