

# Structural Changes in the Indian Organised Manufacturing Sector

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# Case of Manufacturing Sector

Historically, industrialisation has been the central element of structural change

Evidence of a positive and consistent association between the rate of industrialisation and economic growth of nations (Sabillon, 2008)

Reallocation of resources towards manufacturing creates structural change bonuses (Szirmai, 2013)

Potential for technical change and productivity growth arising from the scope for specialisation, learning and product diversification within sector (Weiss & Tribe, 2016)

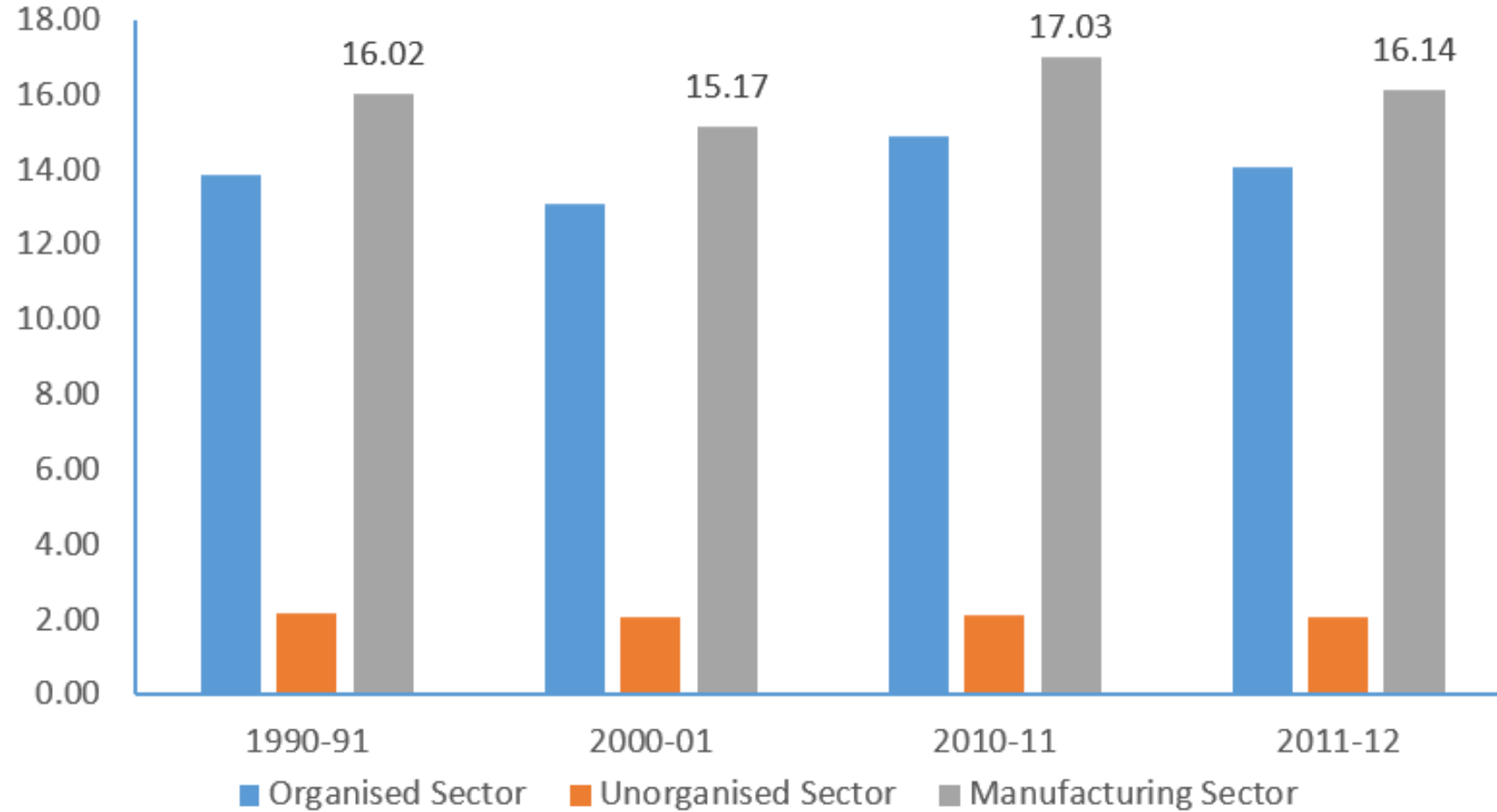
Public policy for developing strong industrial base-case of India

*Policy shift from import-substitution to outward orientation- Liberalisation and market oriented reforms since the 1990s*

*Several studies examined the performance of Indian manufacturing (e.g. Goldar, 2014 & 2018; Nagaraj 2003 & 2017; Erumban et al, 2019; Rijesh 2016; Thomas, 2014; Papola 2012, Topalova and Khandelwal 2011, etc...)*

This study explores the structural changes within organised manufacturing sector

### Manufacturing Sector in GDP (%) 1990-2011



**Source:** Authors compilation from National Account Statistics (CSO), various issues

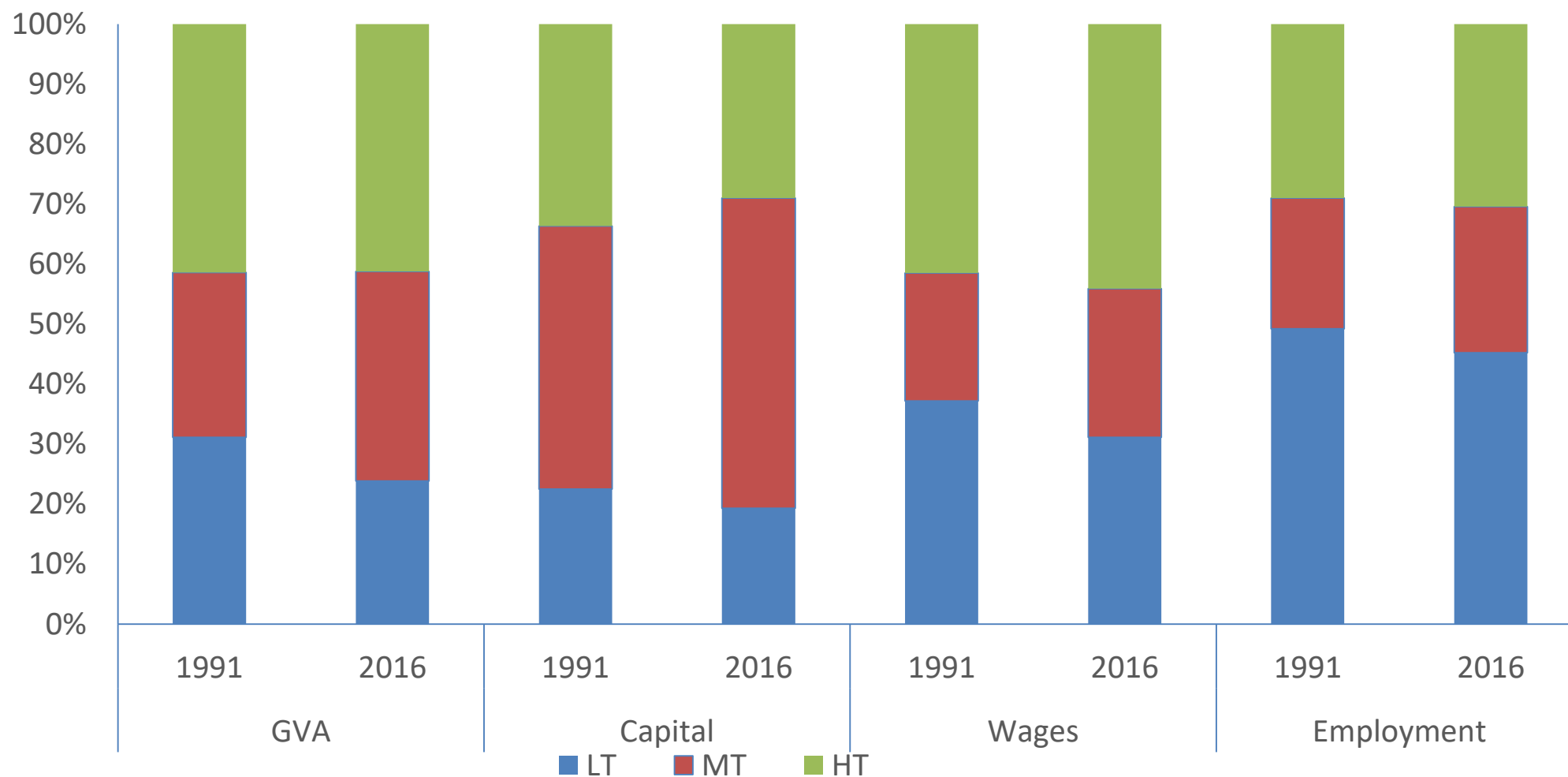
**Classification of Manufacturing Sector by Technology Intensity (NIC-2004)**

<b>Low Technology</b>	
NIC 15	Manufacture of food products and beverages
NIC 16	Manufacture of tobacco products
NIC 17	Manufacture of textiles
NIC 18	Manufacture of wearing apparel; dressing and dyeing of
NIC 19	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harnesses, and footwear
NIC 20	Manufacture of wood and wood products
NIC 21	Manufacture of paper and paper products
NIC 22	Publishing, printing, and reproduction of recorded media
NIC 36+37	Manufacture of furniture; manufacturing n.e.c.+ Recycling
<b>Medium-low-Technology</b>	
NIC 23	Manufacture of coke, refined petroleum products and nuclear fuel
NIC 25	Manufacture of rubber and plastics products
NIC 26	Manufacture of other non-metallic mineral products
NIC 27	Manufacture of basic metals
NIC 28	Manufacture of fabricated metal products, except machinery and equipment
<b>Medium-High and High-Technology (MHT)</b>	
NIC 24	Manufacture of chemicals and chemical products
NIC 29+30	Manufacture of machinery and equipment n.e.c.+ Manufacture of office, accounting, and computing machinery
NIC 31+32	Manufacture of electrical machinery and apparatus n.e.c.+ Manufacture of radio, television, and communication equipment and apparatus
NIC 33	Manufacture of medical, precision, and optical
NIC 34+35	Manufacture of motor vehicles, trailers+ Manufacture of other transport equipment

Note: NIC refers to National Industrial Classification.

Source: Author compilation from Weiss (2015), OECD (2011) and Rijesh (2019)

## Composition of Indian Manufacturing Sector: By Technology



**GVA of Registered Manufacturing Sector (Constant [2004-05] prices) Billion ₹**

**1991: ₹1010.9; 2016: ₹8692.65**

## Composition of Indian Organised Manufacturing Sector: By Technology Intensity (1991 & 2016) share in %

Technology Classification/Sectors	2-digit (NIC-2004)	GVA		Capital		Wages		Employment	
		1991	2016	1991	2016	1991	2016	1991	2016
<b>Low Technology Manufacturing</b>		<b>31.1</b>	<b>23.8</b>	<b>22.5</b>	<b>19.3</b>	<b>37.2</b>	<b>31.1</b>	<b>49.2</b>	<b>45.2</b>
Food & beverages	15	10.3	9.4	7.6	8.2	10.7	9.5	16.1	13.1
Tobacco	16	2.0	1.3	0.3	0.3	1.9	0.8	6.5	3.3
Textiles	17	11.2	5.1	9.3	5.7	16.7	7.5	17.4	11.1
Apparel	18	1.6	2.4	0.4	1.0	1.1	5.1	1.8	8.1
Leather	19	1.0	0.9	0.7	0.4	1.2	1.8	1.6	2.8
Wood	20	0.4	0.4	0.2	0.2	0.4	0.4	0.8	0.7
Paper	21	2.4	1.3	3.0	2.1	2.2	1.6	2.1	1.8
Print & publishing	22	1.7	0.9	0.8	0.6	2.4	1.3	2.1	1.1
Furniture; & recycling	36+37	0.6	2.2	0.2	0.8	0.7	3.0	0.8	3.2
<b>Medium Technology Manufacturing</b>		<b>27.5</b>	<b>34.9</b>	<b>43.9</b>	<b>51.7</b>	<b>21.3</b>	<b>24.8</b>	<b>21.8</b>	<b>24.4</b>
Refined Petroleum	23	3.6	13.6	4.2	14.9	1.5	3.0	0.8	1.1
Rubber & plastic	25	3.2	4.2	2.7	3.3	2.5	4.0	2.6	4.6
Non-metallic mineral	26	7.2	5.3	7.4	7.1	4.6	4.4	6.5	7.1
Basic metals	27	10.4	8.6	28.0	23.8	9.3	8.9	8.5	6.7
Fabricated metals	28	3.1	3.2	1.6	2.5	3.4	4.5	3.4	4.9
<b>High Technology Manufacturing</b>		<b>41.4</b>	<b>41.2</b>	<b>33.7</b>	<b>29.0</b>	<b>41.5</b>	<b>44.1</b>	<b>29.0</b>	<b>30.4</b>
Chemicals	24	16.3	18.0	18.6	14.4	12.1	14.0	8.6	10.2
Non-electrical machinery	29+30	8.3	6.4	4.7	3.3	9.3	9.2	6.8	5.7
Electrical machinery	31+32	8.0	4.0	4.3	2.1	7.8	4.8	5.1	3.8
Medical optics	33	0.8	2.1	0.7	0.7	0.9	2.3	0.7	1.5
Transport equipments	34+35	8.0	10.7	5.4	8.5	11.5	13.8	7.7	9.2
<b>Manufacturing Sector</b>	<b>All</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Author calculation based on Annual Survey of Industries (Vol 1), various issues

# Growth Profile of Manufacturing Sector: By Technology



**Source:** Authors compilation from Annual Survey of Industries (CSO), various issues

**Growth Performance of Organised Manufacturing Sector: 1991-2016 (%)**



Note: HT=High Technology, MT=Medium Technology, LT=Low Technology

**Source:** Authors compilation from Annual Survey of Industries (CSO), various issues



**Growth of Manufacturing Sector: Select Indicators (2-digit NIC) 1991-2016 (%)**

Sectors	2-digit (NIC-2004)	Gross Output	Gross Value Added	Fixed Capital	Wages	Employment	Productivity
<b>Low Technology Manufacturing</b>							
Food & beverages Sector	15	7.9	6.7	10.6	4.6	1.7	5.0
Tobacco Sector	16	2.3	3.6	9.3	1.4	-0.5	4.1
Textile Sector	17	7.6	6.2	7.9	1.7	0.8	5.4
Apparel Sector	18	10.3	9.7	13.3	11.2	8.3	1.4
Leather & Leather Products	19	8.0	8.0	8.9	7.3	5.2	2.8
Wood & Wood Products	20	8.3	6.2	10.4	5.6	1.4	4.7
Paper & Paper Products	21	7.4	5.9	8.4	4.1	2.2	3.7
Print & Publishing Products	22	3.3	2.6	9.5	2.6	0.4	2.2
Furniture; & Recycling	36+37	16.6	12.5	15.4	10.9	8.0	4.5
<b>Medium Technology Manufacturing</b>							
Refined Petroleum Sector	23	9.4	8.9	15.0	8.0	3.2	5.7
Rubber & Plastic Products	25	11.0	10.5	10.0	7.0	5.0	5.5
Non-Metallic Mineral Products	26	8.4	8.4	10.5	6.0	3.9	4.5
Basic Metal Products	27	8.3	6.4	10.3	5.1	2.3	4.1
Fabricated Metal Products	28	9.4	9.0	12.2	7.2	4.9	4.1
<b>High Technology Manufacturing</b>							
Chemicals & Chemical Products	24	7.8	7.3	7.8	5.6	3.0	4.3
Non-Electrical Machinery Products	29+30	9.7	9.4	9.1	5.5	1.8	7.6
Electrical Machinery Products	31+32	10.3	8.5	7.1	3.2	1.4	7.1
Medical Optical Products	33	15.3	13.7	12.8	10.4	6.5	7.1
Transport Equipment Products	34+35	12.5	10.9	12.4	5.8	3.4	7.5
<b>Manufacturing Sector</b>		<b>9.4</b>	<b>8.6</b>	<b>10.9</b>	<b>5.6</b>	<b>3.0</b>	<b>5.5</b>

Note: The growth rate is derived from the *log-lin* specification of the time series data.

Source: Author calculation based on Annual Survey of Industries (Vol 1), various issues and Price Statistics from the Office of Economic Advisor, Ministry of Commerce

## High Technology Manufacturing Sector

Relatively higher GVA growth among medical optics (13.7%), transport equipment (10.9%) and non-electrical machinery (9.4%)- Chemical sector grew at 7.3% p.a.

Output growth is accompanied by increased labour efficiency (growth in the range of 7% to 7.6%)

However, no corresponding increase in employment in key industries like machinery (only 2%)

Wage growth is similar to the all-India level- Growth of output Per capita is largely propelled by higher capital formation

## Medium Technology Manufacturing Sector

Significant growth in GVA among rubber & plastics (10.5%), fabricated metal products (9%) and refined petroleum products (8.9%)

Significant growth in capital input over time

Moderate improvement in labour productivity (growth rates in the range of 4.1% to 5.7%)

All sectors witnessed considerable growth in wages (above aggregate manufacturing wage growth of 5.6%), except basic metals

Recent performance of refined petroleum manufacturing in terms of GVA, wages and labour productivity is notable

## Low Technology Manufacturing Sector

Performance is relatively poor compared to other technology-intensive segments

Only three industries (out of nine) registered higher growth of value added, namely: Apparel, leather and furniture & recycling

Considerable capital-deepening over time

Low productivity performance among majority of industries

Except the above three industries, rest of them had insignificant growth in employment and wages

Low absorption of workers post liberalisation

*Thank You*