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India's participation in global value chains and some implications for economic and social upgrading: A case study of the automobile sector

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India's Participation in Global Value Chains and Some Implications for Economic and Social Upgrading: A case study of the Automobile Sector

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Working Paper, No. 156/2021

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Abstract

This paper maps the integration of India's automobile sector in the context of the structural transformation of contemporary capitalism, in particular with reference to what is variously described as Global Commodity Chains, Global Value Chains, Global Supply Chains etc. It explores the multiple dimensions of economic and social upgrading within the Indian auto sector as a consequence of its deepening participation in these 'chains'. The paper is divided into six sections. Section 1 provides a brief introduction; Section 2 gives a brief profile of the Indian automobile sector and also discusses briefly its major constituents, namely, original equipment manufacturers (henceforth OEM) and auto component segment, and their geographical distributions; Section 3 provides an overview of the data and methodology; Section 4 analyses India's GVCs participation, using a couple of indicators, and examines some aspects of economic and social upgrading in both the organised and unorganised sectors; Section 5 flags a few recent policies and plans adopted by India's central government in this industry; Section 6 concludes the chapter with a recap of major findings.

Keywords: Global Value Chains, Automobile Sector, Employment, Wages, Neoliberal Policy

JEL Code: F66, L62

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List of Abbreviations

ACMA	Automotive Component Manufacturers Association of India
AMP	Automotive Mission Plans
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of South East Asian Nations
ASI	Annual Survey of Industry
BEC	Broad Economic Classification
BS	Bharat Stage
DME	Directory Manufacturing Establishment
DVA	Domestic Value Addition
EASIA	Eastern Asia
EPW	Economic & Political Weekly
FDI	Foreign Direct Investment
FVA	Foreign Value Addition
GCF	Gross Capital Formation
GDP	Gross Domestic Product
GOI	Government of India
GPN	Global Production Networks
GVA	Gross Value Added
GVC	Global Value Chains
HS	Harmonised System of Product Classification
NAFTA	North American Free Trade Association
NATRIP	National Automotive Testing And R&D Infrastructure Project
NDME	Non-Directory Manufacturing Establishments
NEMMP	National Electric Mobility Mission Plan
NES	Not Elsewhere Classified
NSSO	National Sample Survey Organisation
OAE	Own Account Enterprises
OAME	Own Account Manufacturing Enterprises
OECD	Organisation for Economic Co-Operation And Development
OEM	Original Equipment Manufacturers
PF	Provident Fund
PPF	Public Provident Fund
ROW	Rest of the World
SIAM	Society of Indian Automobile Manufacturers
TIVA	Trade In Value-Added
UNE	Unincorporated Non-Agricultural Enterprises
WITS	World Integrated Trade Solution
WPI	Whole Sale Price Index
ZASI	East And South East Asia
ZSCA	South And Central America

Glossary

Average bonus per employee: Total bonuses are divided by number of employees (Contractual workers are not included as they are not paid any bonus).

Average PF & other benefits per employee: Total PF & other benefits are divided by net number of employees (Contractual workers are not included as they are not paid any bonus).

Backward linkages: foreign value-added embodied in gross exports of a country.

Contract Worker: All persons who are not employed directly by a factory owner/employer but engaged through a third party i.e. agency/ contractor, are termed as contract workers. Such agency charges from the factory for this job. Generally, these workers are not provided any social security or other supportive provisions.

DMEs: Enterprises with 6 or more total workers.

Establishment: Enterprises employing at least one hired worker on a fairly regular basis in the reference year.

Employees: Workers and persons receiving wages and holding clerical or supervisory or managerial positions engaged in administrative office, store keeping section and welfare section, sales department as also those engaged in purchase of raw materials, etc. or purchase of fixed assets for the factory as well as watch and ward staff.

Forward linkages: domestic value-added embodied in foreign exports.

Group benefits: Employer's contribution to canteen, health clinic, child care centre, etc.

GVC participation rate: ratio of total participation, Backward and Forward Linkages, to gross exports.

NDMEs: Enterprises with at least 1 hired worker and less than 6 total workers.

OAEs: Enterprises that do not employ hired workers on a fairly regular basis in the reference year.

OAMEs: Enterprises with no hired worker on a fairly regular basis.

Productivity per employee = Gross value-added divided by total persons engaged.

Profit per employee = Total profit divided by total persons engaged.

Total Persons Engaged: Employees as defined above and all working proprietors and their family members who are actively engaged in the work of the factory even without any pay, and the unpaid members of the co-operative societies who worked in or for the factory in any direct and productive capacity. The number of workers or employees is an average number obtained by dividing man-days worked by the number of days the factory had worked during the reference year.

Wages in Cash & Kind: Wages, house rent allowances, transport allowance, bonus and other individual benefits directly payable to the worker.

Worker: All persons employed directly, informally or formally or through contractor on payment of wages or salaries and engaged in any manufacturing process or its ancillary activities like cleaning any part of the machinery or any premises used for manufacturing or storing materials or any kind of work incidental to or connected with the manufacturing process.

1 Introduction

It is generally well-acknowledged that the global capitalist system has undergone a significant reconfiguration in its spatial organisation of production in almost every sector, particularly in manufacturing and services, in the last few decades. A much talked about feature of this configuration is the accelerated “trans-nationalisation” of economic activities or the growing salience of the global production networks (henceforth GPNs). The de-centring of production under neo-liberal capitalism is characterised by a shift of production from advanced capitalist countries to a handful of developing countries where metropolitan capital has strengthened its presence to take advantage of, *among other things*, relatively inexpensive labour and raw materials as well as to tap the markets. Thus, in a whole range of activities, the “value chains” underlying a manufactured good (or service) for final consumption may well criss-cross different corners of the globe before it is finally assembled (e.g., automobiles, electronic items, garments, shoes, etc.) at a particular destination.

There is no doubt that the “trans-nationalisation” of economic activities has created some opportunities for low and middle-income countries to participate in GPNs. However, there are apprehensions about whether greater integration into global value chains (henceforth GVCs) has resulted in substantial economic gains; and further, whether such gains translated into social upgrading. This paper attempts to engage with the relevant issues with a focus on the automobile industry in India and has the following core objectives:

1. Whether greater integration into GVCs by the automobile sector has resulted in the economic upgrading of the sector or not.
2. If economic upgrading has taken place in this industry, then whether this upgrading has translated into social upgrading.
3. If social upgrading has taken place, an examination of the strategies adopted by the principal agents to attain it.

The structure of the paper is as follows: Section 2 gives a brief profile of the Indian automobile sector and also discusses briefly its major constituents, namely, original equipment manufacturers (henceforth OEM) and auto component segment, and their geographical distributions; Section 3 provides an overview of the data and methodology; Section 4 analyses India’s GVCs participation, using a couple of indicators and examines some aspects of economic and social upgrading in both the organised and unorganised sectors; Section 5 flags

a few recent policies and plans adopted by India's central government in this industry; Section 6 concludes the chapter with a recap of major findings.

2 A Brief Profile and Structure of the Indian Automobile Sector

The automobile sector has emerged as one of the prominent industries of the Indian economy in recent years. It is the fourth largest in the world at present (March 2018)¹ in terms of the number of automobiles, including passenger and commercial vehicles sold. The contribution of the automobile industry in both India's gross domestic product (henceforth GDP) and employment is quite significant. In 2016, this industry contributed 7.1% of the country's GDP, 26% of industrial GDP and it accounted for 49% of the country's manufacturing GDP. Regarding employment, this industry provided, directly and indirectly, 32 million jobs in 2016 [Society of Indian Automobile Manufacturers (henceforth SIAM), 2017]. The share of the automotive industry (HS 87)² in India's total exports was around 6% in 2016. The global exports of automotive industry increased from around \$300 million in 1990 to around \$15 billion in 2016, while its global imports increased from around \$300 million to about \$5 billion during the same period (Appendix Figure A1). However, it is worth mentioning here that domestic demand of passenger vehicles (PV) in India is predominantly served by foreign firms as their share in Indian PV market has been reported at 87.7³ per cent in 2019-20⁴; this is a dramatic increase from 76.44 per cent in 2010-11.

The inception of the automobile industry in India can be traced to the 1940s through the initiative of few leading industrial houses, which led to the establishment of Hindustan Motors (Birla Group), Premier Ltd. (Walchand Group), Tata Group and Mahindra & Mahindra (Mahindra Group). However, for almost four decades after Independence, its growth rate remained quite slow before the so-called economic reforms of the early 1990s, both due to supply-side factors (e.g. regulatory regime, technological know-how, etc.) and demand-side factors (inadequate purchasing power, the narrow social basis for luxury goods in general, etc.). The most significant development in the industry was in the early 1980s when Maruti Udyog Ltd and Suzuki (Japan) signed a joint venture. After 1991, however, this industry attained

¹<https://economictimes.indiatimes.com/industry/auto/india-pips-germany-ranks-4th-largest-auto-market-now/articleshow/63438236.cms>

²HS 87 (HS is the Harmonised Commodity Description and Coding System to classify traded products): vehicles other than railway or tramway rolling stock, and parts and accessories thereof.

³ <https://auto.economictimes.indiatimes.com/news/passenger-vehicle/cars/japs-continue-to-dominate-india-car-market-as-chinese-invasion-has-just-begun/74218400>

⁴ first ten months (April 2019 - January 2020)

significant expansion with major policy changes such as de-licensing and permission for 100% foreign direct investment (henceforth FDI).

The structure of the industry changed considerably and the units within the sector could be classified into three major segments. The first segment comprises the major automobile manufacturers operating in India who dominate a significant share of the Indian market like Tata Motors Ltd., Maruti Suzuki India Ltd., Mahindra and Mahindra, Ashok Leyland Ltd., Hyundai Motor India Ltd, etc. These automobile manufactures include three types of firms which are operating in India, (i) firms whose headquarters are in foreign countries but operating in India, are termed as foreign firms such as Hyundai Motor India Ltd.; (ii) firms which started operation in India, but whose majority share now lies with foreign companies, are termed as foreign firms, such as Maruti Suzuki India Ltd and; (iii) firms which started their operations in India but their majority share lies with the Indian companies, are termed as Indian firms, such as Mahindra and Mahindra. In the two-wheeler segment, the principal manufacturers are Bajaj Auto Ltd., Hero Moto Corp Ltd., TVS Motor Company Ltd., Honda Motor Cycle & Scooters Ltd. and India Yamaha Motor Ltd. Second, there are several crucial foreign automobile manufacturers such as Fiat India Ltd., Ford India Ltd., General Motors India Ltd., Honda Cars India, Skoda India, etc. who have built-up non-mandatory joint ventures as well as their manufacturing & operations base in India. Finally, there are new automobile multi-national enterprises (henceforth MNEs) like Kia Motors, PSA Peugeot, Lexus, Genesis, Acura and Chinese manufacturers like SAIC Motors, Foton Motor and Changan automobiles who are also in the process of expanding their businesses in India. Further, typically, the auto sector is divided into ‘original equipment manufacturers’ (henceforth OEM) and ‘manufacturers of the auto component’; the quantitative profiles of these are given below.

2.1 Automobile Industry, OEM

The OEM, which contributes nearly 22% of India’s manufacturing GDP⁵, can be divided into segments such as passenger vehicles (including passenger cars, utility vehicles and vans) commercial vehicles (light, medium and heavy), two-wheelers (motorcycles, geared and ungeared scooters, mopeds) and three-wheelers (including auto-rickshaws and tractors). Within each segment India has achieved distinct position within the world market as it is the largest manufacturer of tractor and motorcycles, second-largest worldwide manufacturer of

⁵ Make in India: Sector Survey –Automobiles (<http://www.makeinindia.com/article/-/v/make-in-india-sector-survey-automobile-components>) as cited in Dash and Chanda (2017)

two-wheelers and the fifth largest manufacturer of commercial vehicles in the world. Within the Indian domestic market, in terms of numbers in the total output, the share of passenger vehicles is 13%, whereas the share of two-wheelers is as high as 81% as shown in Table 1. The overall production of the automobile sector has increased from 20.5 million units in 2012-13 to 29 million in 2017-18. During the same period, the output of two-wheelers dramatically increased from 15.7 million units to 23 million units.

Table 1: Segment-wise Volume of Production and Exports in OEM Industry (in numbers)

Category	2012-13		2017-18	
	Production	Global Exports	Production	Global Exports
Passenger Vehicles	32,31,058	5,59,414	40,10,373	7,47,287
Commercial Vehicles	8,32,649	80,027	8,94,551	96,867
Three-Wheelers	8,39,748	3,03,088	10,21,911	3,81,002
Two-Wheelers	1,57,44,156	19,56,378	2,31,47,057	28,15,016
Grand Total	2,06,47,611	28,98,907	2,90,73,892	40,40,172

Source: SIAM, 2018

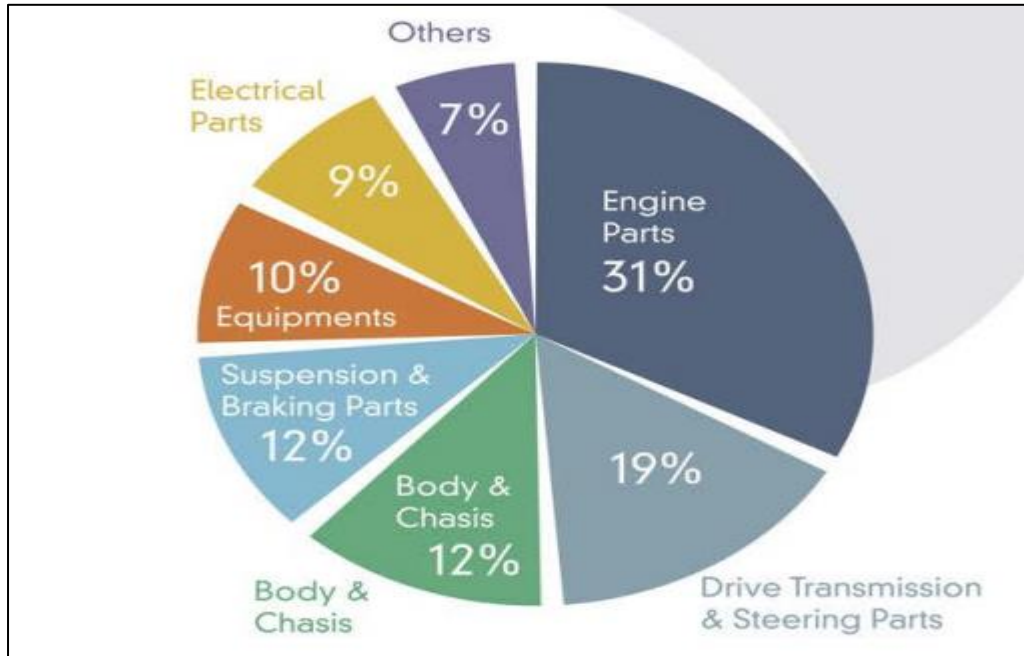
For the above noted period, the total exports of the automobile sector increased from 2.8 million units to 4 million units. Out of a total 4 million units exported, 2.8 million units (70%) were that of two-wheelers. In 2016, India's top five export destinations in motor cars and other motor vehicles (HS 8703) were Mexico (24%), South Africa (7.7%), the UK (6.8%), Italy (5.4%) and Saudi Arabia (3.4%). The motorcycles (HS 8711) were mainly exported to Sri Lanka (13%), Colombia (12%), Nepal (11%), Bangladesh (10%) and Nigeria (7%). For motor vehicles for the transport of goods (HS 8704), the top five exports destination were Bangladesh (23%), Sri Lanka (17%), Nepal (13%), South Africa (5%) and Indonesia (5%). Tractors (HS 8701) were exported to the US (22.5%), Turkey (12%), Nepal (9%), Bangladesh (7.4%) and Sri Lanka (5.3%). The top export destinations in parts and accessories of motor vehicles (HS 8708) were the US (26%), Turkey (10%), Germany (5%), Mexico (5%) and France (4.7%). Hence, we can see that India was becoming integrated into the global market for automobiles.

2.2 Auto Component Industry

The auto components industry is also a significant part of the automobile sector as it contributes 2.3% to the overall GDP and 25.6% to India's manufacturing GDP; it contributes 4% to exports and provides direct and indirect employment to 3 million people [Automotive Component Manufacturers Association of India (henceforth ACMA), 2016-17]. This industry comprises of nearly 850 firms in the organised sector and a very large unorganised sector. The primary

function of the automobile component industry is to serve the requirements of domestic OEMs. Additionally, it also serves the needs of the global economy through supplying a range of inputs such as raw materials for parts, components to chassis, brake lines and engines, etc. The export share of different components is seen in Figure 1:

Figure 1: Segment-wise Share in Production of Auto-Components in India in 2017



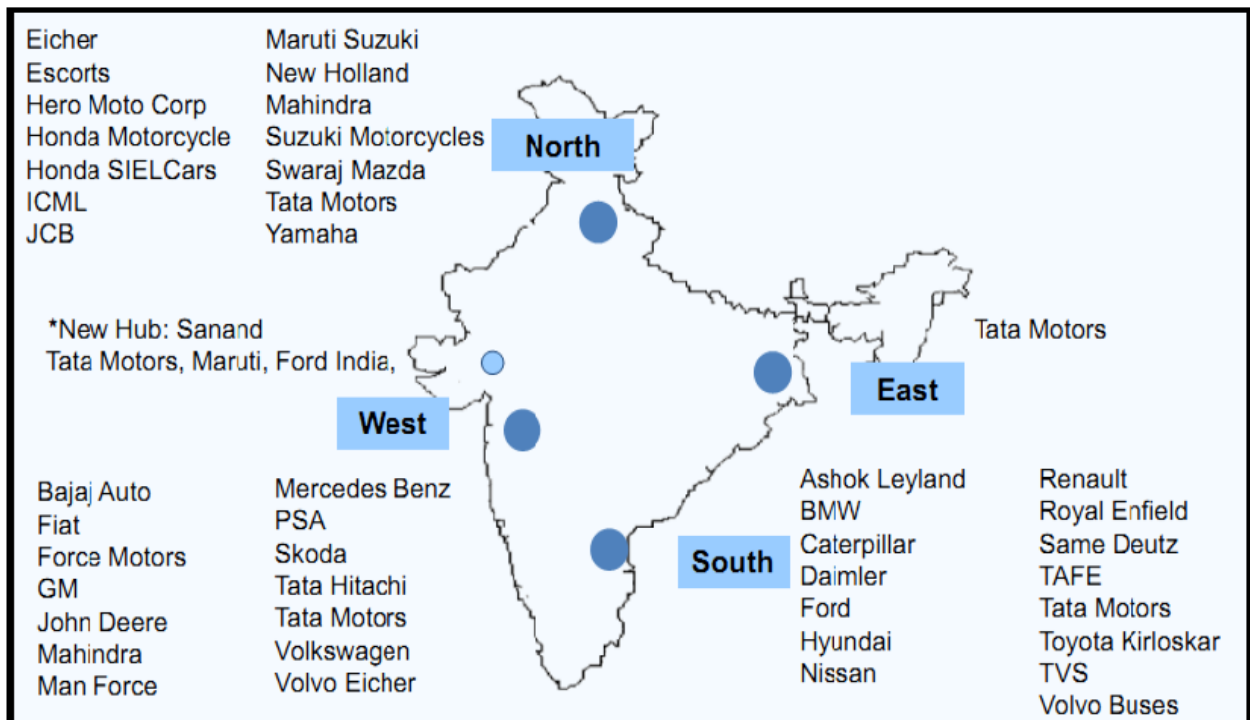
Source: Reproduced from Exim Bank Research (2017), p. 43

The range of exports shows that the Indian automobile industry is well integrated into global automobile supply chains. These supply chains are driven by a substantial unorganised sector and its development has taken place through policies that promote clusters whose geographical distribution is described below.

2.3 Geographical Distribution of the Automobile Industry in India

The development of agglomerations of automotive manufacturers and components is driven by an industrial policy that has incentivised the development of clusters to reduce costs of production and reap economies of scale through access to common labour supply pools, local markets and infrastructure. Automobile manufacturers are mainly concentrated around four large automotive clusters, namely Delhi-Gurgaon-Faridabad-Manesar in the North, Mumbai-Pune-Nasik-Aurangabad in the West, Chennai-Bengaluru-Hosur in the South and Jamshedpur-Kolkata in the East (Figure 2). In the state of Gujarat, Sanand and Halol constitute a new emerging automotive cluster. The distribution of various automobile and auto-components firms (ancillaries) is tabulated in Table 2.

Figure 2: Automotive Clusters in India (with main OEMs)



Source: ACMA as cited in Dash and Chanda (2017)

Table 2: Regional Distribution of Automakers and Ancillaries in India

REGION	OEMs	ANCILLARIES	TOTAL	DISTRIBUTION (in %)
North	14	315	329	45%
West	17	194	211	29%
South	15	143	158	22%
East	2	30	32	4%
Total			730	

Source: SIAM and ACMA Directories as cited in Dash and Chanda (2017).

Thus, we see that the development of the industry is uneven in its geographical spread, with fairly ‘developed’ states housing most of the major automobile hubs. Further, the hubs are organised into specialised zones with product specifications. It is also important to note that where the components industry is concentrated in the North and the West, thus indicating the uneven development within the industry itself. This factor needs to be kept in mind while discussing the possibilities of social and economic up-grading.

3 Data and Methodology

This paper uses simple quantitative techniques for measuring participation of the automobile industry in GVCs and its contribution to economic and social upgrading in the Indian economy.

Given the available data sources, a comprehensive mapping of GVCs is an exceedingly difficult task; nevertheless, we have used a couple of well-known indicators such as backward linkages (value addition made by other countries in India's exports of automobile industry) and forward linkages (value addition made by the Indian automobile industry in other country's exports of automobile industry) to make an overall assessment.

A comprehensive measure of economic and social upgrading is fraught with serious conceptual and empirical difficulties, some of which are insurmountable. We must confess to having opted for an easy way out in following a parsimonious approach developed by Bernhardt and Milberg (2011)⁶. Within this framework a country is said to experience economic upgrading in a particular sector when its (a) market share in global export increases, which is an indicator of the competitiveness of exports in the international market and (b) export unit value⁷ increases, which is an indicator of the production of higher-value-quality products⁸. These two indicators imitate 'product upgrading' or 'functional upgrading'. However, it is important to note that both of these indicators aren't free from limitations⁹. They suggested that both these indicators should be used together to correctly measure economic upgrading. For example, an increase in export unit value could also indicate inefficiencies in production, which in turn could result in a decline in the world market share.

The social upgrading/downgrading of a particular sector can be measured using (a) increase/decrease in employment and (b) increase/decrease in real wages indicating improvement/decline in social standards. There is no doubt that an increase in real wages is a robust indicator for measuring social upgrading. However, using an increase in employment as a measure of economic upgrading can be misleading¹⁰. The contribution of a particular sector to social well-being is measured through the rise in the number of jobs with an increase in its

⁶See also Salido and Bellhouse (2016).

⁷ Export unit values are calculated by dividing the total value of a country's exports of a particular commodity at HS six digit level in a given period by the quantity or volume of these exports.

⁸Li and Song (2011) argued in their paper that higher quality of the products is reflected by higher prices (higher export unit value). Generally, export unit values are used as proxies for prices which in turn reflect proxies for product quality (Aiginger, 1997).

⁹ Even with the decline in market share, a particular country can attain economic upgrading as production is being continuously shifted to other countries during the contemporary period or GVCs era. For Example: the decline of China's share in garment production and the shifting of its production to other countries is a sign of economic upgrading. Similarly, declining or not rising export unit value as a result of better technologies (or higher productivity) can also reflect economic upgrading. For example, in Vietnam, better technologies in the electronics industry led to falling prices and no increase in export unit value in spite of higher productivity.

¹⁰ For example: In Germany, there is no more production in garment industry as production is shifted to other countries. Although employment in the garment sector in Germany has decreased but it is a sign of economic upgrading rather than economic downgrading.

production. However, the increasing number of jobs in quantitative terms is not a sufficient indicator for measuring social upgrading. Along with the rise in employment, its quality is also relevant to our study which, in turn, can be captured through an increase in the real wages of the workers. The increase in the real wages in a particular sector reflects the distribution of value creation by the economic activity which benefits workers. Along with these two indicators, some scholars (such as Bernhardt and Milberg, 2011) also insisted on the examination of improvement in labour standards for a more nuanced understanding of social upgrading.

It is also worth noting here that any quantitative measure ideally needs to have a well-defined time horizon (with appropriate theoretical and conceptual foundations) for it to have a degree of robustness. To estimate causal connections, a ‘short term’ time-frame will have to be determined, to rule out impacts of autonomous structural changes, significant reorientation in industrial policies, etc. This is indeed a tricky terrain but we make the simplifying assumption that for the study period, our measures are reasonable indicators.

In this paper, we measure economic upgrading of the automobile industry (HS 87) at the harmonised system of product classification (henceforth HS) six-digit levels, i.e., both export unit value and global share are analysed at HS digit level tariff line (see Appendix “Tariff Lines”). In addition to the two indicators of economic upgrading mentioned above, the share of domestic value addition in gross exports and foreign value addition or import content of gross exports is analyzed over a period of time to see whether domestic value addition has increased or decreased with the participation in GVCs. Increase in domestic value addition can be used as an indicator of economic upgrading as both output and employment increases (or at least does not decrease) with the increasing rate of domestic value addition. In contrast, domestic output and employment may decrease with the rising share of foreign value-added. The share of finished and intermediate products in gross exports are analysed to see whether an increase in the share of finished products has taken place (increase in share reflects economic upgrading). Further, we also examined the category-wise trend of a number of outputs and inputs exported by the automobile industry. Additionally, we analyze the trend of a number of factories registered, gross value added (henceforth GVA) per employee, the trend of profit per employee and gross capital formation (henceforth GCF). Over time, an increase in the number of outputs exported can be used as an indicator of product upgrading or functional upgrading. This paper uses the category-wise employment trends for mapping social upgrading. It does this by collating data on supervisory and managerial staff, directly employed workers (men and

women), contractual workers (indirectly) and other employees (clerks, accountant etc.). It also compiles trends on real wages, bonus per employee, provident fund (henceforth PF) and other benefits per employee.

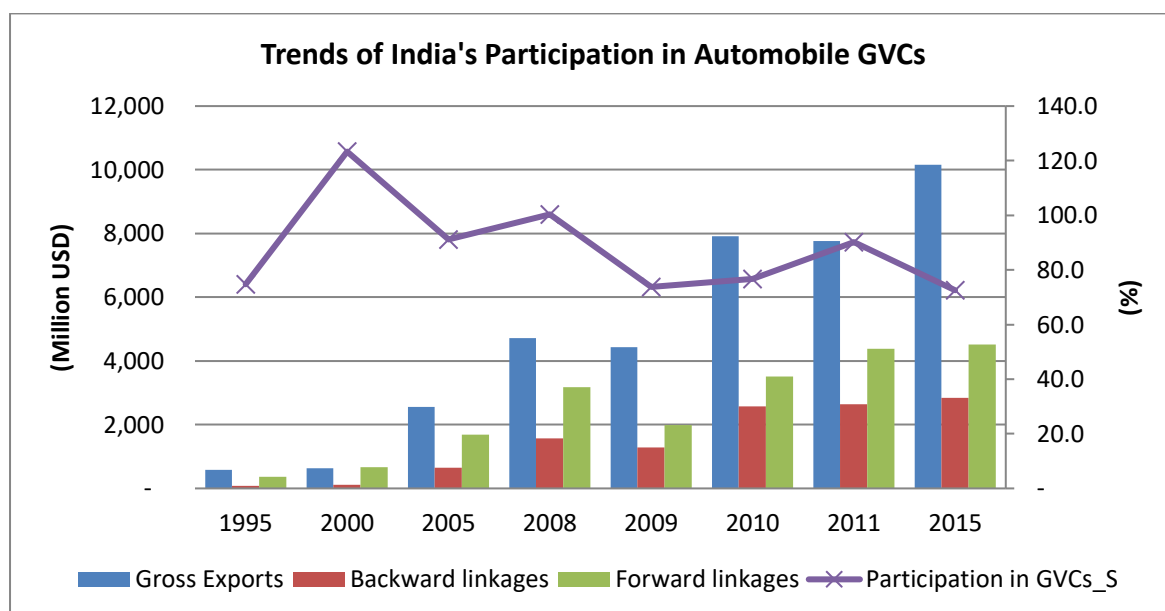
We use four databases for measuring GVCs participation, economic upgrading and social upgrading. We have used world integrated trade solution (henceforth WITS), World Bank database from 1988 to 2016 (latest) mainly for measuring economic upgrading. In order to measure economic upgrading and the participation of manufacturers in GVCs, we have used the trade in value-added (henceforth TIVA)¹¹ database of Organisation for Economic Co-operation and Development (henceforth OECD) which is available from 1995 to 2015. For measuring indicators of economic and social upgrading, we have drawn on the Annual Survey of Industries (henceforth ASI), Government of India (henceforth GOI) for the organised sector and National Sample Survey Organisation (henceforth NSSO) survey of unincorporated non-agricultural enterprises database (56th round: 2000-01, 67th round: 2010-11 and 73rd round: 2015-16) for the unorganised sector. Category-wise employment data and category-wise wages data in ASI is available from 1999-00 to 2014-15 (latest available round). The ASI data is also available from 1980-81 to 2014-15 for measuring other economic indicators. The trend of exports and imports of Auto-makers and Auto Component Industry (Parts and Accessories) at the disaggregated level are drawn from the WITS database.

4 Some Impacts of Economic and Social Upgrading

An assessment of social and economic upgrading needs to contextualise the participation of different players in automobile GVCs through an analysis of their backward linkages (i.e., foreign value added in gross exports of a country) and forward linkages (i.e., domestic value-added embodied in foreign exports). A country should aspire to contribute more to forward linkages in comparison with their participation in backward linkages to attain maximum economic gains because higher forward linkages may indicate higher output and employment generation.

¹¹For measuring GVCs participation other data sources can also be explored. For example, World Input Output Database, Asian Development Bank, multi-regional input-output tables, IDE Jetro, Asian International Input-Output Tables, EORA multi-region Input Output database etc. But we have used OECD-TiVA database extensively for measuring GVCs participation.

Figure 3: Trends of India's Participation in Automobile GVCs



Source: OECD, TIVA database (October 2019)

Note: _S denotes Secondary axis, backward linkages: foreign value added in gross exports of a country, forward linkages: domestic value-added embodied in foreign exports, GVC participation rate: ratio of total participation (backward and forward linkage) to gross exports

India's GVCs participation rate in the automobile industry (C34 - Motor vehicles, trailers and semi-trailers), defined as a ratio of total participation (backward and forward linkage) to its gross exports¹², fluctuated considerably during the study period; however it is important to note that the value of forward linkages was higher when compared with backward linkages throughout the period (1995-2015), indicating consistent rising economic gains from GVCs participation in the automobile industry (Figure 3).

With respect to trade linkages, the share of some of the major regions registered significant changes between 1995 and 2015 (Appendix Figure A2). In India's gross automobile export, the contribution of Non-OECD countries increased significantly from 5% in 1995 to 16% in 2015 via backward linkages; in contrast, the contribution of OECD countries rose from 7.8% to 12.4%. In the same period, the share of APEC¹³ and ZASI¹⁴ regions increased significantly from 5.2% & 2.6% to 15.7% & 9.5% respectively and the contribution of EASI¹⁵ and ASEAN rose by 5.1% and 1.9% respectively. Major countries contributing to Indian exports via

¹² See (UNCTAD, 2013)

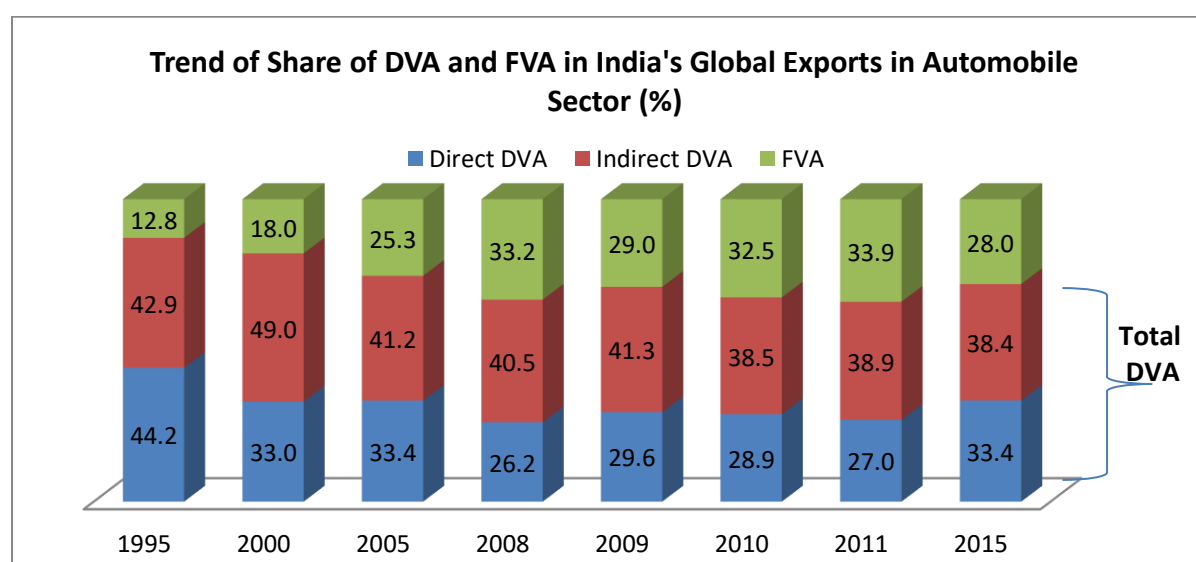
¹³ **APEC (Asia-Pacific Economic Cooperation):** Australia, Canada, Chile, Japan, Korea, Mexico, New Zealand, United States, Brunei Darussalam, China, Hong Kong (China), Indonesia, Malaysia, Philippines, Russia, Singapore, Thailand, Chinese Taipei, Viet Nam.

¹⁴ **ZASI (East and South East Asia):** Japan, Korea, Brunei Darussalam, China, Hong Kong (China), Indonesia, Cambodia, Malaysia, Philippines, Singapore, Thailand, Chinese Taipei, Viet Nam.

¹⁵ **EASIA (Eastern Asia):** Japan, Korea, China, Hong Kong (China), Chinese Taipei.

backward linkages in 2015 were China (4.5%), the USA (2.8%), Germany (1.1%), Japan (1.1%), Saudi Arabia (0.9%), Australia (1.3%) and the UK (0.9%) (Appendix Figure A3). Concerning forward linkages, the lion's share belonged to developed¹⁶ countries between 1995 and 2000; but this share came down from 87.5% to 61% in 2015. Correspondingly, over the same period, the share of developing¹⁷ countries has gone up from about 14% to more than 36% (Appendix Figure A4)¹⁸. In backward linkages of the automobile industry, there has been a significant decrease in the share of domestic value addition (henceforth DVA)¹⁹ in gross exports from 87% in 1995 to 72% in 2015; the foreign value addition (henceforth FVA) (or import content of gross exports) has experienced surge from 13% to 28% (Figure 4). There is a decline in both, direct and indirect DVA from 44% & 43% to 33% & 38% respectively during the reference period. There has been a noticeable increase in the share of both foreign manufacturing and services in exports from 8% & 5% to 18% & 10% respectively (Appendix Figure A7).

Figure 4: Share of DVA and FVA in India's Global Exports in the Automobile Sector (%)



Source: OECD, TIVA database

Note: DVA: domestic value addition and FVA: foreign value addition

¹⁶Developed countries: Japan, United States, Germany, Korea, Chinese Taipei, United Kingdom, France, Singapore, Italy, Australia, Switzerland, Canada, Spain, Netherlands, Sweden, "Hong Kong, China", Austria, Belgium, Norway, Ireland, Czech Republic, Israel, Denmark, Finland, Slovak Republic, Portugal, Greece, Luxembourg, New Zealand, Slovenia, Estonia, Lithuania, Latvia, Iceland, Cyprus and Malta.

¹⁷**Developing Countries:** China, Malaysia, Russia, Saudi Arabia, India, Indonesia, Thailand, Philippines, Brazil, Poland, Chile, Mexico, South Africa, Hungary, Turkey, Viet Nam, Romania, Colombia, Argentina, Costa Rica, Bulgaria, Brunei Darussalam, Tunisia, Croatia and Cambodia. **ROW:** Rest of the countries

¹⁸Among the developed countries, Germany, Czech Republic, Slovak Republic and Korea registered increase in share whereas USA, Belgium, Japan, Canada, France and Italy experienced decline (**Appendix Figure A5**). Likewise, within the developing countries, Mexico, China, Thailand and South Africa experienced surge in share (**Appendix Figure A6**).

¹⁹DVA itself is divided into direct (automobile) and indirect (other than automobile sectors) components.

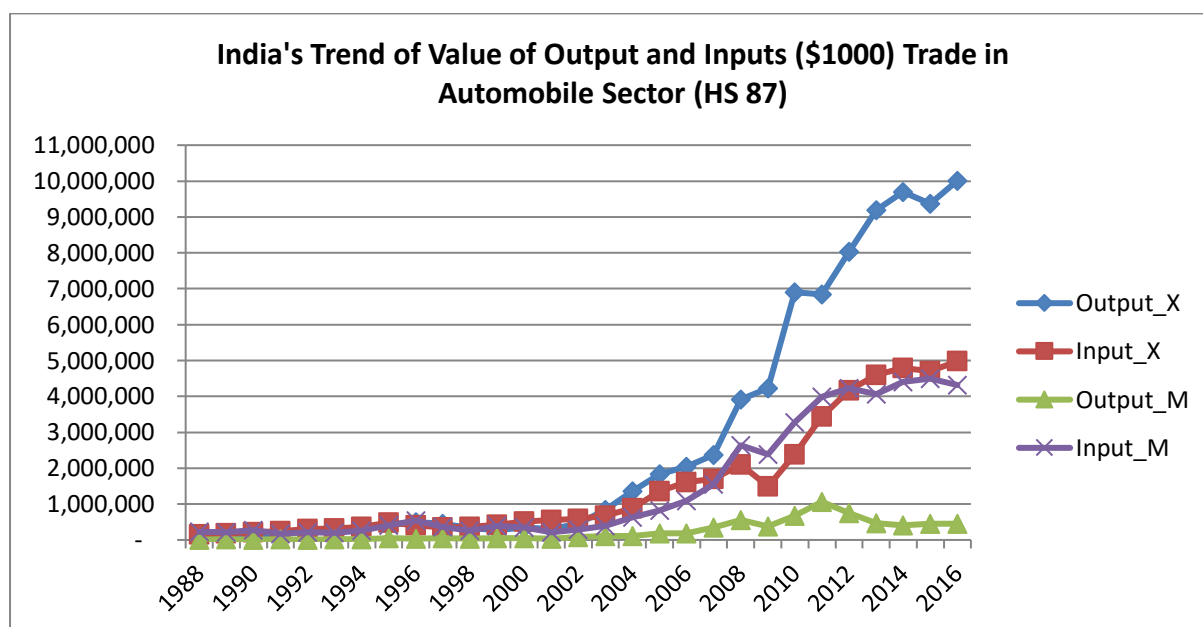
Thus it may be noted that India has made some gains through integration into global automobile GVCs; however, the worrisome development is that domestic share in value-added has tended to decline over a short period.

4.1 Economic Upgrading

From an economic upgrading point of view, over time, exports of any country should reflect more of an increase in number of outputs (or value of outputs) in comparison to number of inputs (or value of inputs). In India, compared to the value of the input (parts and accessories²⁰), the value of exported outputs, (such as capital goods (except for transport equipment), durable, goods not elsewhere specified, industrial, non-industrial and passenger motor cars), showed a significant increase during the entire period between 1995 and 2016; the rate of increase was higher in the period after 2000. The value of outputs exported has increased substantially from \$68 million in 1988 to \$10 billion in 2016 and the value of inputs exported rose from \$157 million to \$5 billion (Figure 5). Although during this period, the import value of inputs moved almost in tandem with its export value, the value of imports remained lower than the export value of outputs indicating the industry was making a trade surplus. Further, it is important to note that economic gains attained by India have diversified during the reference period as the number of outputs exported have gradually and consistently increased from 36 in 1988 to 46 in 2005 and stabilised at that level since 2005 (Appendix Figure A8). The trend of the number of outputs imported have moved in a similar direction and value of output imported has remained insignificant in comparison to its exports further confirming economic gains in this industry.

²⁰ Using BEC and concordance matrix of HS 1988/92, HS six-digit tariff lines are categorised into different outputs such as capital goods (except for transport equipment), durable, goods not elsewhere specified, industrial, non- industrial, passenger motor cars; parts & accessories are categorised as inputs (for more detail see appendix Table 2).

Figure 5: Trend of Import and Export Value of Output and Inputs (\$ 1000) Automobile Sector (HS 87)



Source: WITS, World Bank database

Note: _X denotes Exports and _M denotes Imports. For more details on Output and Input Appendix Table A2

The exports for passenger motor car have notably increased from \$14 million in 1988 to around \$6.5 billion in 2016, accounting for more than 60 per cent share in the total value of output exports in the automobile industry (Appendix Figure A9). Another important category is the non-industrial product (for example motorcycles, etc.) whose export value has increased from \$15 million to \$2 billion in 2014.²¹ The export of industrial products increased from \$36 million in 1988 to 1.5 billion in 2012 and fell to \$1 billion in the following year (2013)²². Export value of capital goods rose from \$2 million in 1988 to \$1 billion in 2016²³ (For more details on different categories see Appendix Table 2). In contrast, the value of imports for aforementioned categories, passenger motor car, non-industrial, industrial and capital goods, remained insignificant in comparison to their respective exports (Appendix Figure A10 and for details about the type of goods exported and imported as well the destinations see Appendix “Structure of exports and imports in the Automobile industry”). These figures suggest reasonable economic upgrading mainly pertaining to products whose volumes of export (Appendix Figure A11) and the prices had not come down between 1991-95 & 2011-15 (Table 3). Likewise, rise in India’s share in global export value of output from less than 0.5% in 2007 to more than 1%

²¹ In this product group category, HS 87120 (motorcycles) accounted for 92% share of non-industrial exports between 2011 and 2016.

²² This decline in exports of the industrial product group took place mainly because of reduction in exports of HS 870410 (dump trucks for off-highway use) whose exports fell from USD 711 million to 167 million.

²³ One product wheeled tractors (not elsewhere classified) (HS 870190) accounted for 99% share of capital goods exports between 2011 and 2016.

in 2016, additionally, confirms the findings in favour of limited economic upgrading (Appendix Figure A12) for these products. It may be noted that increase in global share of output has taken place largely on account of industrial and non-industrial goods, capital goods, parts & accessories and passenger motor cars (Appendix Figure A13).²⁴

Table 3: Change in Average Export Unit Value, (Nominal USD)

BEC Category	Number of Products Registered Price Decrease Between 1991-95 and 2011-15	Number of Products Registered Price Increase Between 1991-95 and 2011-15
Capital goods	1	4
Industrial		19
Non-industrial	1	9
Parts and accessories		28
Passenger motor cars	1	8
Total	3	68

Source: Authors calculation using WITS, World Bank database

There are 52 HS six-digit products which concurrently satisfy both increase in export unit value and increase in global share satisfying minimum criteria of economic upgrading approach developed by Bernhardt and Milberg (2011). These include 17 industrial products and HS 870410 category of productions which include dump trucks designed for off-highway use and HS 870490 comprising of trucks NES etc.). The other set of products included is 21 varieties of parts and accessories including HS 870600 (i.e. chassis fitted with engines for the vehicles), HS 870810 (comprising bumpers and parts for motor vehicles, HS 870899 (motor vehicle parts nes etc) and 6 products each for passenger motor cars (including HS 870321&870322 or automobiles with reciprocating piston engine etc.). It further includes non-industrial products (including HS 871120 comprising motorcycles with a reciprocating piston engine, HS 871130 i.e., motorcycles with a reciprocating piston engine and HS 871310 including wheelchairs not mechanically propelled etc.) and 2 capital goods products including HS 870190 (Wheel tractors).

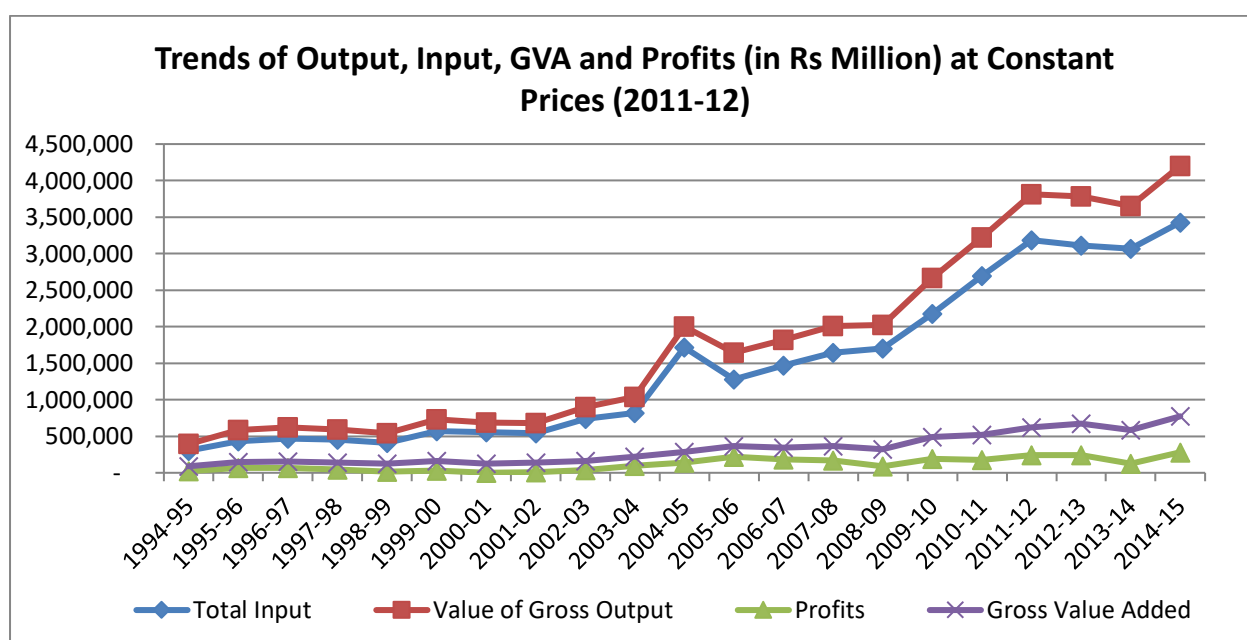
As noted earlier, some indicators of economic upgrading are also analysed using the ASI database.²⁵ Increase in the number of factories in a particular sector may reflect the

²⁴ The global share of 40 products of automobile industry has increased within a bracket of 0 to 1% between 1991-95 and 2011-15. These 40 products include 15 products of industrial, 15 products from parts and accessories, five passenger cars, four products from non-industrial and one capital good (Appendix Table A4) categories.

²⁵ ASI data does not make any distinction between factories producing for export or GVCs and factories producing for domestic demand. Therefore, we have to consider general developments as a proxy for developments in export-related production related to participation in GVCs. This is an issue given that the indicators for economic upgrading are more narrowly based on export data.

development or growth of that sector²⁶. The number of factories in the automobile industry has risen from around 1,500 in 1980-81 to approximately 6,000 in 2014-15 (Appendix Figure A14). An examination of the trends of gross output, total input and gross value added (henceforth GVA)²⁷ at constant prices (2011-12)²⁸ shows a very interesting picture (Figure 6). The value of output at constant prices has increased significantly from around Rs 393 billion in 1994-95 to Rs 4,202 billion in 2014-15.²⁹ This acceleration in the rate of increase is noticeable between 2003-04 and 2014-15. However, the pace of increasing GVA has remained quite low in comparison to the pace of growth in the value of output because of rising total input costs³⁰, which has increased concurrently with the rise in the value of output³¹. As a result, profits have remained consistently quite low throughout the period considered.

Figure 6: Trends of Output, Input, Gross Value Added (GVA) and Profits (in Rs Million) at Constant Prices (2011-12)³²



Source: Authors' calculation using EPW online database

²⁶ However, it is important to note that not only increase in the number of factories but also their size may be a good indicator of growth.

²⁷ GVA of an industry is defined as the value of output less the value of its intermediary inputs.

²⁸ Whole sale price Index of Manufactured Products is used to convert the data into constant prices.

²⁹ It is important to note that during this period exchange rate of rupee vis-à-vis dollar depreciated from around Rs 31 per \$ in 1994-95 to Rs 61 per \$ in 2014-15.

³⁰ Total Input cost: comprises gross value of fuels, materials etc. consumed (as defined above) and also other inputs viz. (a) cost of non-industrial services received from others, (b) cost of materials consumed for repair and maintenance of factory's fixed assets including cost of work done by others to the factory's fixed assets, (c) cost of contract and commission work done by others on materials supplied by the factory, and (d) cost of office supplies and products reported for sale during last year & used for further manufacture during the accounting year.

³¹ ASI database doesn't provide any information on imports of Inputs.

³² Whole sale price Index of Manufactured Products is used to convert the data into constant prices.

The gross capital formation (henceforth GCF) in the automobile industry at constant prices (2011-12) has shown consistent increase after 2001-02 (Appendix Figure A15) from around Rs 27 billion in 2001-02 to around Rs 330,000 billion in 2012-13. The productivity per employee³³ at constant prices increased from Rs 381,665 in 1994-95 to Rs 865,977 in 2014-15 (Appendix Figure A16). However, the profit per employee³⁴ declined continuously between 1995-96 and 2000-01. Subsequently, it increased from Rs 650 in 2000-01 to Rs 615,891 in 2005-06 (Appendix Figure A17); subsequently also, profit per employee has remained quite volatile. Thus, most indicators, except profits and profit per employee, such as, number of factories, GVA, productivity per employee, GCF, the value of output etc. suggest economic upgrading. In sum, in an aggregate sense, the available data and information suggest a process of economic upgrading. However, it is important to highlight here that most of the gains accrued to relatively large players who could compete with global companies in terms of scale and scope.

4.2 Social Upgrading

Based on the ASI data, we flag trends relating to a couple of indicators of social upgrading, namely employment and real wages. In the automobile industry, the rate of increase in the number of workers³⁵ was quite small between 1980-81 and 2002-03 (Appendix Figure A18). It increased from around 0.15 million in 1980-81 to 0.2 million in 1996-97 and remained more or less at this level till 2002-03. But this trend has seen an upward swing since then and the total number of workers in the industry rose to around 0.7 million in 2014-15. A similar trend is observed for the number of employees³⁶, which increased from about 0.28 million in 2002-03 to 0.9 million in 2014-15.

The supervisory and managerial (henceforth S&M) staff increased from around 40,000 in 2002-03 to about 0.1 million in 2014-15 (Figure 7). In the same period, the number of other employees (clerical, etc.) rose from 30,000 to more than 0.1 million. The share of workers in total person engaged increased from 71% in 1999-00 to 77% in 2014-15. However, the share of S&M staff declined from 17% to 11%, while the share of other employees remained more or less at the same level.

³³ Gross value added divided by total person engaged

³⁴ Total profit divided by total person engaged

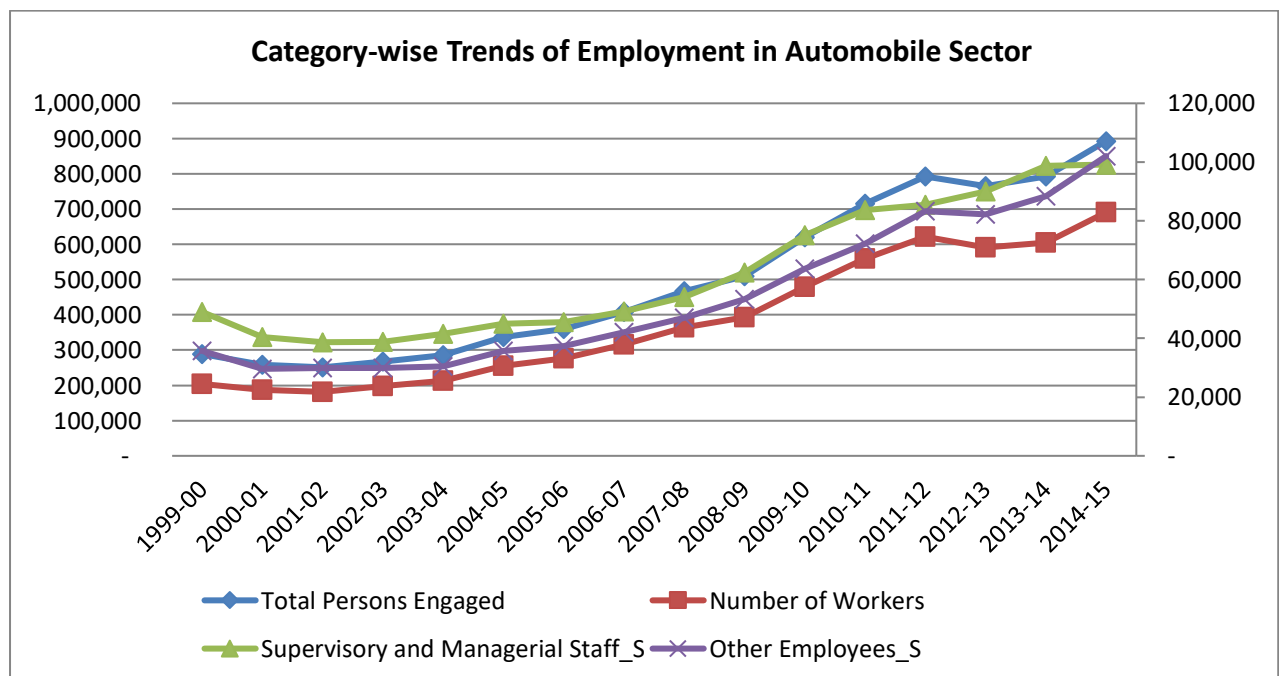
³⁵ See Glossary for the Definition of **Worker**.

³⁶ See Glossary for the Definition of Employees and Total persons Engaged.

The number of workers can be divided into directly employed workers, (both men and women) and contractual workers³⁷ (whose gender-wise break up is unavailable in ASI database). The number of directly employed men increased from around 0.15 million in 2001-02 to 0.35 million in 2014-15; in the same period the number of directly employed women increased from around 5,000 to 20,000 (Figure 8). However, over this period, the number of contract/casual workers grew faster, from 30,000 to 0.31 million, showing an increase in pace of informalisation.

In 1999-00, the shares of directly employed men, directly recruited women and contractual workers accounted for 84%, 2.5% and 13% respectively (Figure 9). In 2014-15, however, this proportion changed dramatically; the share of directly employed men declined to 51% whereas for casual workers it increased to 46% and remained stagnant at around 2% to 3% for directly employed women. This change is motivated by the employers desire to reduce labour costs since contract workers are not provided with any social security benefits and can be hired temporarily in periods of high demand, once again indicating increasing informality.

Figure 7: Category-wise Trends of Employment in Automobile Sector

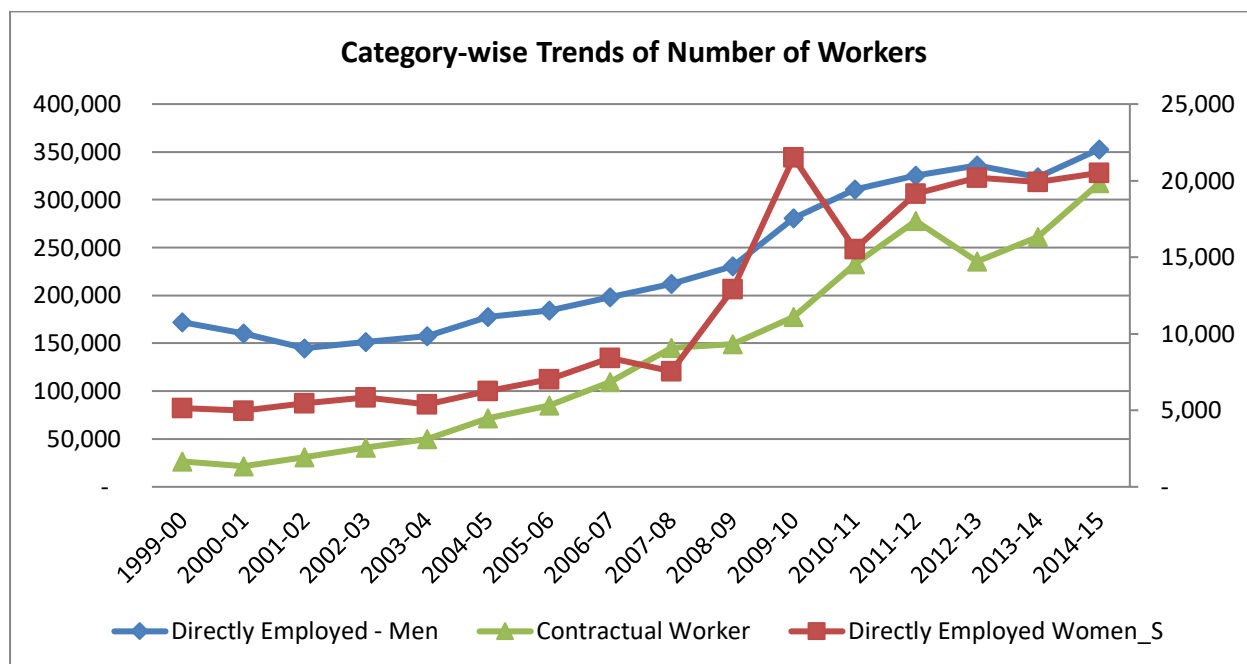


Source: EPW online database

Note: _S denotes secondary axis, Employees = Workers + other Staff (for example clerical or supervisory or managerial positions, etc.), Total persons engaged = Number of workers + Supervisory & Managerial staff + other employees + proprietors and family members

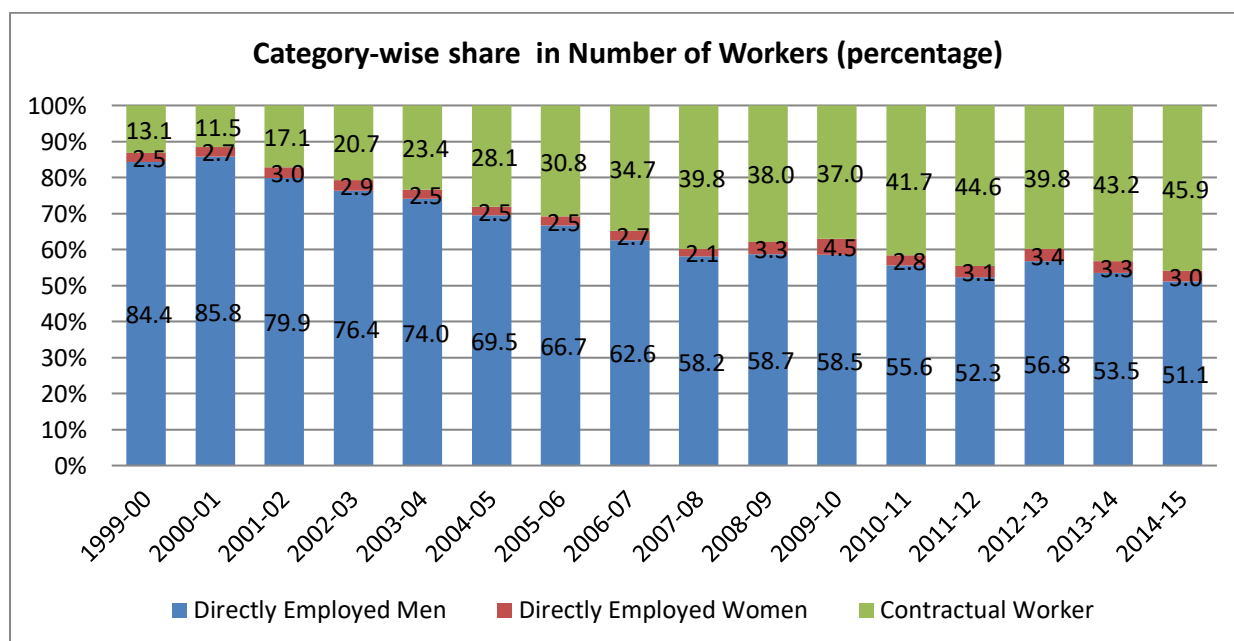
³⁷ **Contract Worker:** All persons who are not employed directly by a factory owner/employer but engaged through a third party i.e. agency/ contractor, are termed as contract workers. Such agency charges from the factory for this job. Generally, these workers are not provided any social security and other supportive provisions.

Figure 8: Category-wise Trends of Number of Workers



Source: EPW online database Note: _S denotes a secondary axis

Figure 9: Category-wise Share in Number of Workers (percentage)



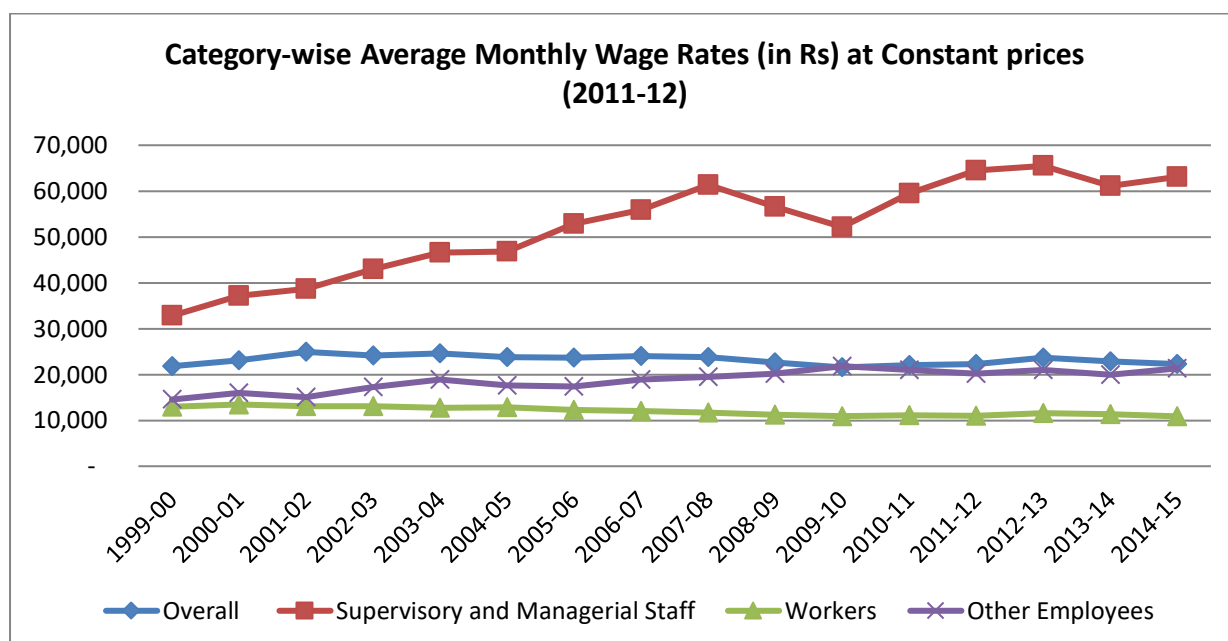
Source: EPW online database

For S&M staff, average monthly real wages (2011-12) increased from Rs 32,800 in 1999-00 to more than Rs 63,050 in 2014-15 and for other employees, they rose from Rs 14,550 to Rs 21,400 (see Figure 10). In the same period, however, the real monthly wages of workers³⁸

³⁸ The Ministry of Labour and Employment had constituted an expert committee on 17th January 2017 to review and recommend methodology for fixation of National Minimum Wage (henceforth NMW). The report has

registered a significant decline from around Rs 12,950 to Rs 10,930³⁹, partly because of changes in employment relations. On the other hand, average monthly PF & other benefits per employee⁴⁰ rose from Rs 4,850 to Rs 7,840 at constant prices, between 1999-00 and 2001-02; but this was only a short term increase because it declined after this through the entire period with the year of 2006-07 being an exception (Appendix Figure A19). Likewise, average monthly bonus per employee⁴¹ moderately increased from Rs 980 in 1999-00 to Rs 1,700 in 2007-08 at constant prices, but it has declined since then to Rs 1,180 in 2014-15.

Figure 10: Category-wise Average Monthly Wage Rates (in Rs) at Constant prices (2011-12)



Source: EPW online database

Note: other Employees: clerical, administrative office, storekeeping section and welfare section, sales department, etc.

A major limitation of the ASI data is that it is not designed to cover industry in the unorganised sector (i.e those not registered under Factories Act, 1948⁴²). It is significant that though most OEM units are in the organised sector whereas a significant portion of the components industry,

recommended to fix the need based national minimum wage for India at Rs 375 per day (or Rs 9,750 per month) as of July 2018, irrespective of sectors, skills, occupations and rural-urban locations for a family comprising of 3.6 consumption unit. It has also recommended to introduce an additional house rent allowance (city compensatory allowance), averaging up to Rs 55 per day i.e., Rs 430 per month (or Rs 11,180) for urban workers over and above the NMW. <http://pib.nic.in/PressReleaseIframePage.aspx?PRID=1564590>

³⁹ ASI database doesn't provide data on wages for contractual workers.

⁴⁰ Total PF & other benefits are divided by net number of employees (Contractual workers are subtracted)

⁴¹ Total bonus are divided by net number of employees (Contractual workers are subtracted)

⁴² Those manufacturing units having more than 10 full time workers and whose production is driven by power are eligible to be registered under this Act. In case of units working without the aid of power the number has to be at least 20 full time workers. All factories employing less than these numbers i.e. 10 in the case of power aided units and 20 in the case of non-power aided units are considered unincorporated enterprises.

in terms of the number of firms, is in the unorganised sector (as of 2015, 10,000 firms in unorganised and 700 in organised)⁴³, the organised sector accounts for approximately 85 per cent share in component industry turnover. Component enterprises within the unorganised sector largely serve as a ‘residual’ category and manufacture mostly low-value products. Given that a large number of enterprises are in unorganised sector contributing approximately 15 per cent in the turnover in 2015, findings solely based on ASI data do not give a complete picture. To address this shortcoming, we are using the National Sample Survey Organisation (henceforth NSSO) survey of unincorporated non-agricultural enterprises (henceforth UNE) of the 56th (2000-01), 67 (2010-11) and 73rd (2015-16) rounds. In the UNE NSSO 56th round, enterprises were divided into three broad categories: ‘own account manufacturing enterprises’ (henceforth OAMEs)⁴⁴, ‘non-directory manufacturing establishments’ (henceforth NDMEs)⁴⁵, and ‘directory manufacturing establishments’ (henceforth DMEs)⁴⁶. This classification changed from the NSSO 67th Round and the number of categories came down to two: i.e. Own Account Enterprises (OAEs)⁴⁷ and Establishments⁴⁸ (NDMEs & DMEs). Therefore, the data on NDMEs & DMEs in NSSO 56th round has been clubbed together to make it comparable with the other two rounds. It emerges from the data that 690,808 workers were employed in organised sector in 2014-15 whereas only 60,574 workers employed in unorganised sector in 2015-16. Out of 690,808 workers in organised sector, 317,081 were employed as formal workers and rest were employed as informal workers. Similarly, in unorganised sector, only 6,034 were employed as formal workers out of a total of 60,574 workers.

Using aforementioned NSSO data, it has been found that the estimated number of enterprises in the automobile manufacturing industry has declined from 22,300 to 18,390 between 2000-01 and 2010-11, thereafter increasing to 21,384 in 2015-16 (Appendix Figure A20). At the aggregate level, GVA per enterprise, at constant prices, increased considerably from Rs 341,856 to Rs 671,408 between 2000-01 and 2010-11; this was followed by a slight decline between 2010-11 and 2015-16 (Appendix Figure A21). At the dis-aggregated level, GVA per enterprise for ‘OAEs’ rose from nearly Rs 62,000 in 2000-01 to nearly Rs 191,000 in 2010-11 i.e. a rise of more than 200 per cent (Figure 11) and for ‘establishments’, it increased by 84 per

⁴³ <http://www.careratings.com/upload/NewsFiles/SplAnalysis/Auto%20Comp%20march%202017.pdf>

⁴⁴ OAMEs: Enterprises with no hired worker on a fairly regular basis.

⁴⁵ NDMEs: Enterprises with at least 1 hired worker and less than 6 total workers.

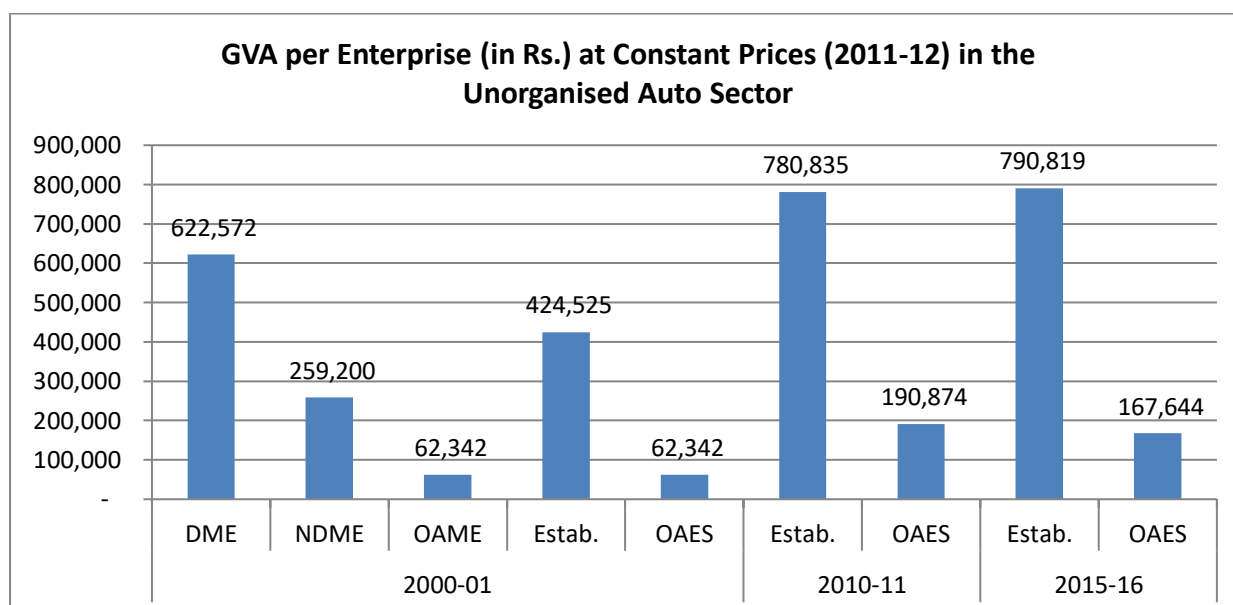
⁴⁶ DMEs: Enterprises with 6 or more total workers.

⁴⁷ OAEs: Enterprises that do not employ hired workers on a fairly regular basis in the reference year.

⁴⁸ Establishment: Enterprises employing at least one hired worker on a fairly regular basis in the reference year.

cent from nearly Rs 425,000 to Rs 781,000. However, after 2011, GVA per enterprise of ‘OAEs’ declined in absolute terms, whereas for establishments it increased marginally (1%).

Figure 11: GVA per Enterprise (in Rs.) at Constant Prices (2011-12) in the Unorganised Auto Sector



Source: Authors’ calculation using different NSSO rounds of UNE

Note: OAMEs: Enterprises with no hired worker on a fairly regular basis, NDMEs: Enterprises with at least 1 hired worker and less than 6 total workers, DMEs: Enterprises with 6 or more total workers. OAEs: Enterprises that do not employ hired workers on a fairly regular basis in the reference year, Establishment: Enterprises employing at least one hired worker on a fairly regular basis in the reference year.

As far as the status of workers is concerned, employed workers can be broadly classified into three: ‘own account worker or working owner’, ‘hired’ and ‘helper & others’ (Table 4). Almost two-thirds of the workers come under the category of ‘hired workers’, while ‘own account workers’ and ‘helper & others’ account for 29% and 7% respectively. While all categories registered a decline in employment between 2000-01 and 2010-11, there has been some increase in the two broad categories of ‘owner’ and ‘helpers & others’ after 2011. However, given that the number of hired workers constituted two thirds of all workers, continued to decline which resulted in an overall reduction in the total number of workers employed in the unorganised segment.

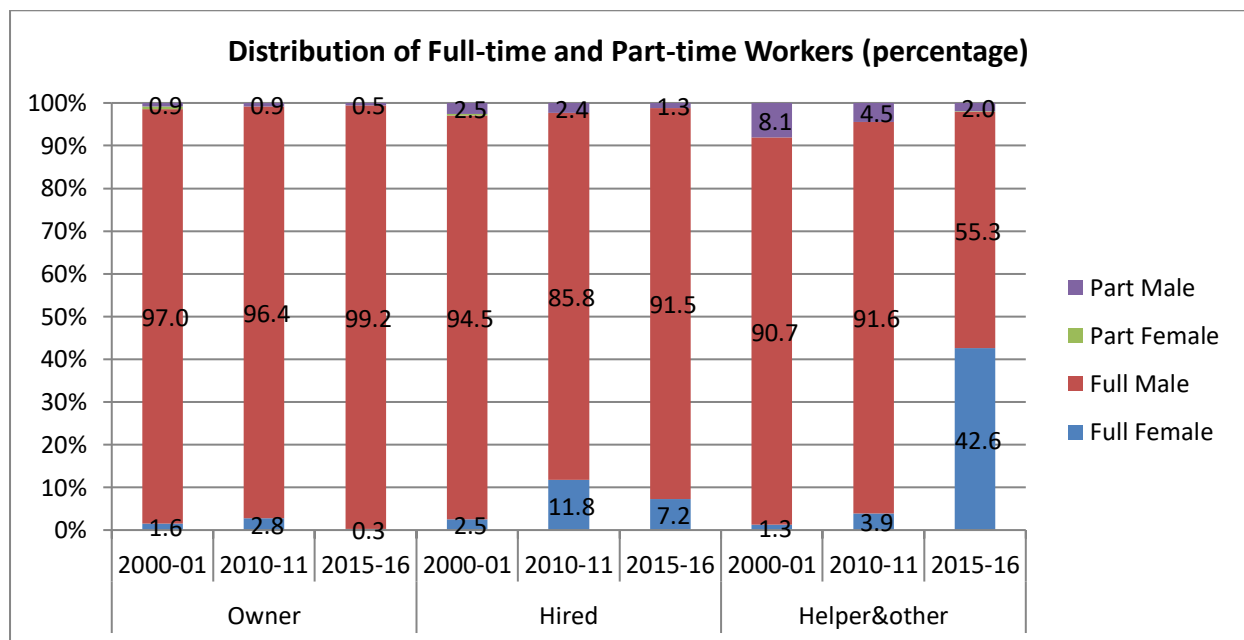
Table 4: Distribution of Workers in Different Categories (absolute numbers)

Category	2000-01	2010-11	2015-16
Working Owners	26,703	21,512	27,509
Hired	73,096	68,613	60,574
Helper & others	7,400	5,520	6,909
Total	107,200	95,645	94,991

Source: Authors’ calculation using different NSSO rounds of UNE

These three broad categories can be further sub-classified into ‘full-time’ and ‘part-time’ workers (Figure 12). The automobile industry, in general, has been historically dominated by full-time male workers (90%) in all types of workers. The share of full-time own account male workers has increased from 97% in 2000-01 to 99% in 2015-16. However, in the other two broad categories of ‘hired’ and ‘helpers’, the share of full-time male workers declined during the same period; in fact in the latter, it declined sharply from around 90.7% to 55.3%. This indicates the growing dependence on family labour in own account enterprises which is reflected in the dramatic increase of female workers in ‘helpers and others’ from 1.3 to 45.6 per cent between 2000-01 to 2015-16. Such a trend also signifies a greater level of informalisation within the sector, especially after the policy-driven push towards marketing India as a components hub in the GVC (as discussed in the next section).

Figure 12: Distribution of Full-time and Part-time Workers (percentage)



Source: Authors’ calculation using different NSSO rounds of UNE

Enterprise-wise hired workers in ‘establishments’ are analysed separately in Table 5 and Figure 13. ‘Establishment’ accounts for almost 100% share of total hired workers in all three rounds of NSSO. In UNE 67th Round (2010-11) and 73th Round (2015-16), hired workers are sub-divided into formal and informal workers⁴⁹, with the latter accounting for nearly 90% of which 80 per cent are men and 10 per cent are women informal hired workers. Only 10% constitute formal category in both the NSSO rounds (2010-11 and 2015-16).

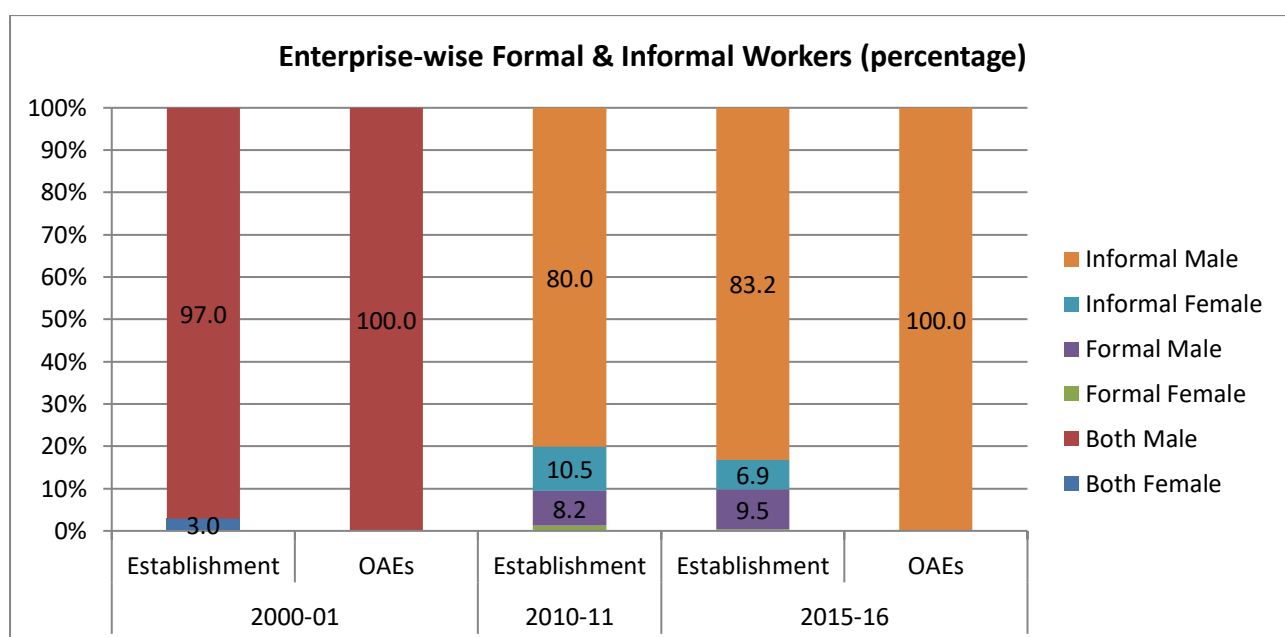
⁴⁹ Distinction between formal and informal workers is made on basis of whether they are receiving the benefit of public provident fund (PPF) or not. Only, formal workers receive the benefit of PPF.

Table 5: Enterprise-wise and Gender-wise Distribution of Hired Full Time and Part Time Workers (in absolute numbers)

	2000-01		2010-11	2015-16	
Hired Worker	Establishment	OAEs	Establishment	Establishment	OAEs
Full-time Female	1,863		8,092	4,384	
Full-time male	68,555	542	58,896	55,199	233
Part-time Female	280				
Part-time male	1,856		1,625	757	
Total	72,554	542	68,613	60,341	233

Source: Authors' calculation using different NSSO rounds of UNE

Figure 13: Enterprise-wise Formal & Informal Workers (percentages)



Source: Authors' calculation using different NSSO rounds of UNE

Since the 67th Round, data on annual emoluments per hired worker are divided into cash & kind⁵⁰, public provident fund (henceforth PPF)⁵¹ and group benefit⁵², whereas in the 56th Round these are only classified into cash& kind and group benefit since PPF is only available to workers in formal employment. In the automobile industry, real wages in cash & kind for all hired workers (formal and informal) increased from nearly Rs 53,400 per year in 2000-01⁵³ to nearly Rs 79,200 per year in 2015-16. During the same period, however, the annual value of

⁵⁰Cash & Kind include: salary / wages, house rent allowances, transport allowance, bonus and other individual benefits directly payable to the worker.

⁵¹ PPF: contribution to insurance, provident fund and other social security schemes.

⁵² Group benefit: Employer's contribution to canteen, health clinic, child care centre, etc.

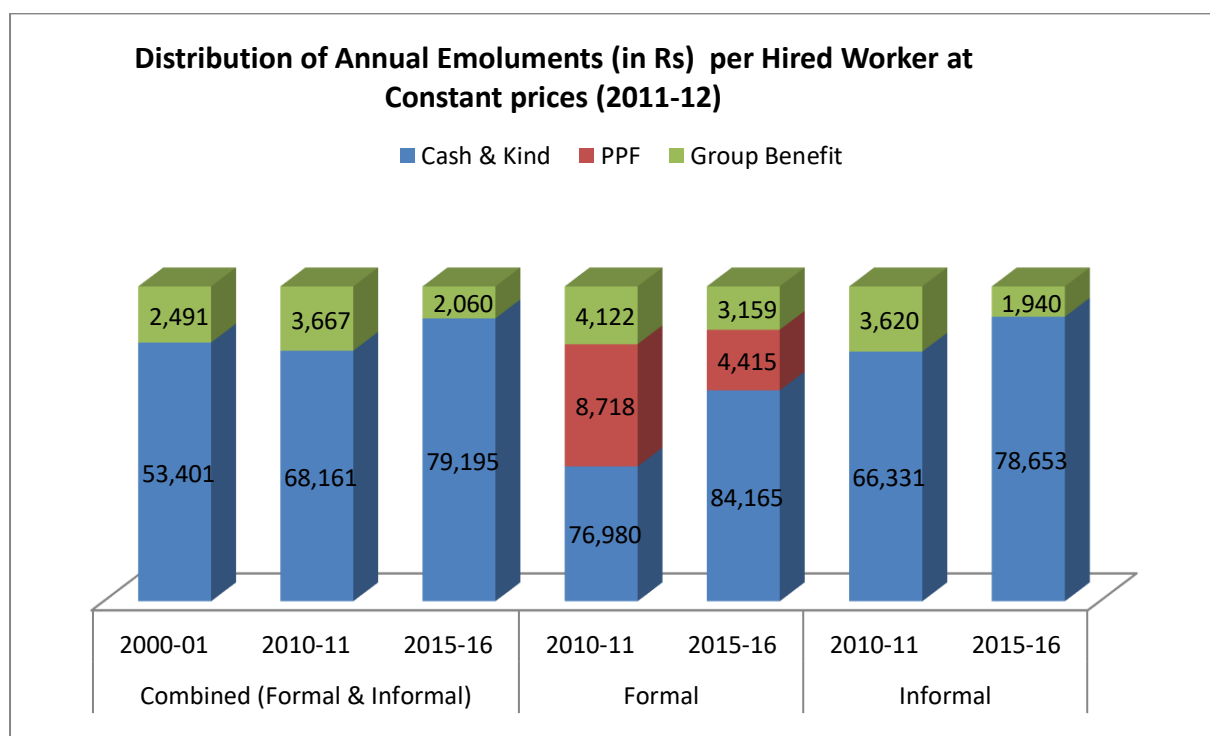
⁵³ Combined cash & kind (formal and Informal) for 67 and 73 round is calculated by adding formal & informal cash & kind and PPF and Combined group benefit is calculated by adding group benefit of formal and informal.

group benefit in rupee terms declined from nearly Rs 2,500 to nearly Rs 2,000 at constant prices. Real wages of formal hired workers paid in cash & kind increased from approximately Rs 77,000 to Rs 84,000 between 2010-11 and 2015-16; it is significant that there was a decline in value of group benefit (from Rs 4,100 per year to Rs 3,100 per year) and PPF (from Rs 8,700 to Rs 4,400 per year) for formal hired workers in the same period. Real wages of informal hired workers paid in cash & kind increased from nearly Rs 66,330 per year to Rs 78,600 per year between 2010-11 and 2015-16, but their group benefit declined. It is important to note that the difference between annual emolument of a formal hired worker and the informal hired worker has decreased significantly from around Rs 19,900 per year in 2010-11 to around Rs 11,150 per year in 2015-16 (Figure 14).

In OAEs, real wages in cash & kind per hired worker (formal and informal) have increased from nearly Rs 36,000 to Rs 55,500 per year between 2000-01 and 2015-16⁵⁴ (Figure 15). In 2000-01, hired workers of OAEs were receiving group benefit of Rs 497 at constant prices but in 2015-16 received no benefit. In establishments, real wages in cash & kind per hired worker (formal and informal) have increased from nearly Rs 53,500 to Rs 79,300 per year in the same period. The difference in real wages between OAEs and establishment workers increased from Rs 19,500 to Rs 25,800. In real terms, the value of group benefits for hired workers in establishments increased from nearly Rs 2,500 per year to Rs 3,700 per year between 2000-01 and 2010-11, but, since then they declined to Rs 2,000 per year.

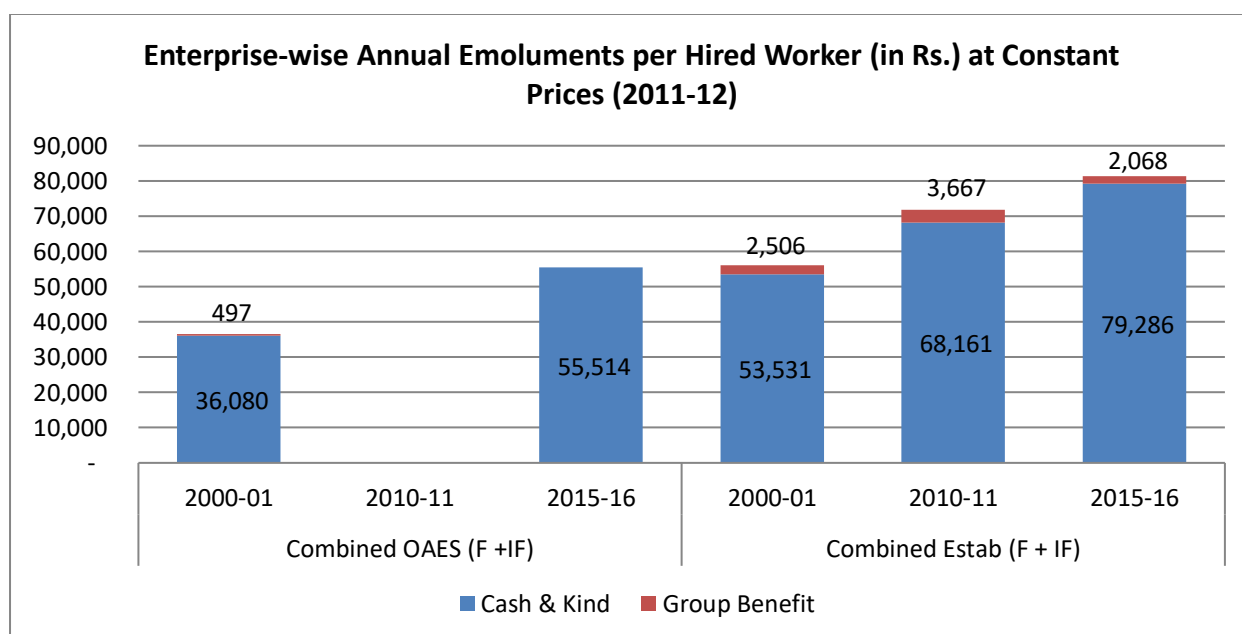
⁵⁴ Wage data for OAEs hired worker in 2010-11 isn't available as they aren't any worker employed by these enterprises during this time.

Figure 14: Distribution of Annual Emoluments (in Rs) per Hired Worker at Constant prices (2011-12)⁵⁵



Source: Authors' calculation using different NSSO rounds of UNE

Figure 15: Enterprise-wise Annual Emoluments per Hired Worker (in Rs.) - Constant Prices (2011-12)

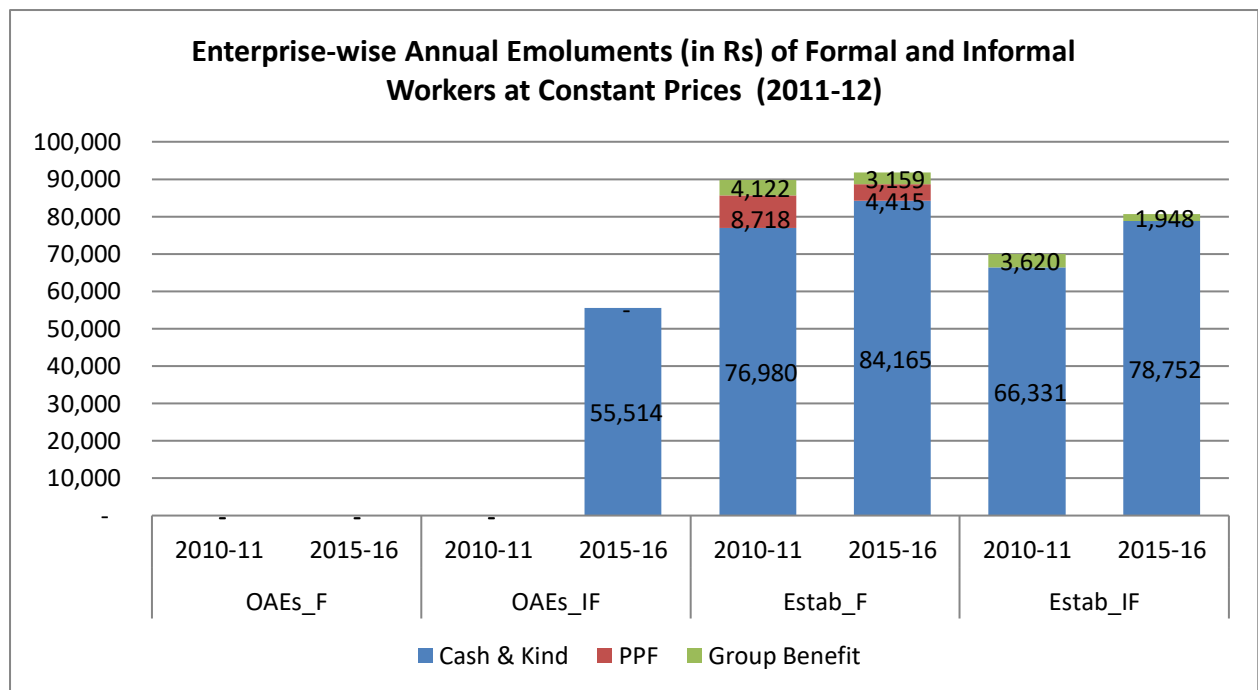


Source: Authors' calculation using different NSSO rounds of UNE, Note: F denotes for formal and IF denotes for Informal

⁵⁵ To facilitate comparison, PPF of formal workers are included in the group benefits

Annual emoluments of formal and informal hired workers at constant prices in establishments increased from Rs 89,800 and Rs 70,000 in 2010-11 to Rs 91,750 and Rs 80,700 in 2015-16 respectively (Figure 16); though the difference in the wages of formal and informal workers declined from nearly Rs 20,000 to nearly Rs 11,000 in the same period, the gap in group benefits increased from around Rs 500 to around Rs 1,200, although the value of group benefits for both categories of worker declined.

Figure 16: Enterprise-wise Annual Emoluments (in Rs) of Formal and Informal Workers at Constant Prices (2011-12)



Source: Authors' calculation using different NSSO rounds of UNE

Note: F denotes Formal and IF denotes Informal.

As should be evident from the foregoing discussion, different segments of the auto sector have undergone limited economic upgrading. However, with respect to trends and conditions of employment, and to some extent wages, the overall picture has been that of very little positive outcomes. In particular, there has been accelerated informalisation of working conditions which is easy to comprehend in the overall context of policy changes since the early 1990s.

5 Policy and Regulatory Framework

As indicated earlier, outcomes in the automobile sector during the last three decades need to be contextualised in the broader strategy of so-called economic reforms. As is well known, since the early 1990s, there has been a very significant restructuring of economic regime in the country which is generally accepted as a transition from a *dirigiste* to a market-led paradigm.

Although some of the changes at an incremental pace started in the 1980s itself, it is the period since 1991 in which very dramatic changes to the regime have materialised.

As regards, the automobile sector there was some concerted attention to it during the 1980s with the introduction of certain manufacturing policies which assisted in boosting local component industries through imposing condition of raising the proportion of local inputs on domestic OEMs which remained until 1992 (Miglani, 2019). With the progressive opening up after 1991, FDI and external collaborations were facilitated on a significant scale. For instance, in 1997, the Central Government approved FDI investments of up to 51% through the automatic route; this limit was raised to 100% in 2001. These changes resulted in progressive delicensing and tariff elimination on imports of inputs resulting in considerable competition within the sector leading to significant changes such as process and product up-gradation, technology innovation and improvements in the component industry (ibid). In fact, the automotive sector is among the few which experienced important changes through the aggressive promotion of India as a potential global hub of the auto sector as a whole. The country was marketed as a setting that had the capacity and resources to provide cost-effective assembly and hubs for production of parts. The development of clusters, as noted earlier in this paper, became one of the thrust areas of the government's manufacturing policy, which has been quite conducive to the strengthening of the supply chains. Subsequent policy initiatives such as the National Manufacturing Policy (2011) and the Make in India programme⁵⁶ have tended to deepen such an orientation.

It is worth noting that a major thrust of the policy regime has been to make the automobile sector technologically competitive so that it meets global environmental and safety standards⁵⁷. These initiatives at upgrading have been spearheaded through R&D and clean fuel initiatives in collaboration with automobile majors. The Government of India initiated an Automotive Mission Plan (henceforth AMP) 2006-16 to outline a targeted growth-oriented roadmap for attaining technological competence, world-class status in automotive manufacturing and to promote forward and backward linkages for sustainable automotive growth. As per government's own assessment many of the goals of this plan have already been accomplished⁵⁸

⁵⁶ For more details see Jha (2018).

⁵⁷ SIAM (2017)

⁵⁸ As per the SIAM (2017), the objectives of AMP 2006-16 have been accomplished quite well such as production of vehicles. Production of ll vehicles was recorded at 142 million, against the goal of 192 million, production for commercial vehicles was 7.1 million units, against the goal of 6.7 million, sale of passenger vehicles was recorded at 27.91 million units, against the target of 27.75 million units, etc. Apart from this, India has become an important destination of choice in the world for automotive engineering and design.

with the support of automobile majors who have been active collaborators in different policy initiatives, including in the National Electric Mobility Mission Plan (henceforth NEMMP) 2020 which was launched in 2013.⁵⁹

A recent policy initiative is the AMP 2016-26, which apart from setting targets for production and growth, also sets targets for minimising carbon footprints and attaining a high level of technological competence & maturity. In order to facilitate increasing technological maturity in this sector, the government has provisioned for an R&D hub aimed at innovations in this sector under the National Automotive Testing and R&D Infrastructure Project (henceforth NATRiP), which involves a network of publicly funded research institutes and laboratories.⁶⁰ The Green Urban Transport Scheme (henceforth GUTS) has also been launched under this larger project to encourage low-carbon sustainable public transport systems. The GUTS will focus on setting-up non-motorised transport infrastructure and will facilitate the adoption of intelligent transport systems (henceforth ITS), leading to increasing access to public transport and use of clean technologies. It is worth emphasising here again that these measures have important implications not only for a 'cleaner' auto industry but also for the overall global economic prospects of this sector, for instance through greater acceptance in external markets. These have been supplemented by the NITI Aayog's proposals for 100% electric vehicles by 2020 to promote sustainable development and clean fuels, to decrease the oil import bills and also promote fuel efficiency.⁶¹

These policy initiatives have been backed by regulatory frameworks that follow the European and other multilateral standards for promoting a climate-friendly transportation system, an essential feature of an export-oriented strategy. Hence successive governments have regulated

⁵⁹ To raise the domestic manufacturing capabilities and ensuring ecological and energy security, NEMMP 2020 was introduced in 2013. The primary focus of NEMMP is to attain efficient, environmentally friendly, affordable electric vehicles by 2020. As per the SIAM report, the introduction of NEMMP 2020 would reduce vehicular emissions and CO₂ by 1.3% to 1.5% by 2020. Major automobile manufacturers like Mahindra & Mahindra, Maruti Suzuki, Ashok Leyland, Hyundai, Tata Motors, Hero Motors Corp, TVS Motors Company, Honda Motor Cycle & Scooters are already in the process of developing types of electric vehicles. Recently, the memorandum of understanding has been signed between Indian Space Research Organization (ISRO) and BHEL to establish a low-cost production plant of lithium-ion batteries for electric vehicles.

⁶⁰ The Government has initiated NATRiP to set-up testing, validation and R&D infrastructure at different locations in the country. So far following centers have been established to undertake testing and certification for emission standards, vehicle safety and performance (1) Automotive Research Association of India (ARAI), Pune (2) National Automotive Test Tracks (NATRAX), Indore (3) Vehicle Research and Development Establishment (VRDE, an organization under the Ministry of Defence), Ahmednagar (4) International Centre for Automotive Technology (ICAT), Manesar (5) National Institute for Automotive Inspection, Maintenance and Training (NIAIMT), Silchar (6) National Center for Vehicle Research & Safety (NCVRS), Rae-Bareilly (7) Global Automotive Research Center (GARC), Chennai.

⁶¹ See NITI Aayog (2017). Apart from this there is an effort to promote hybrid vehicles.

emission norms and tightened standards since 1991. In 1991-92, Bharat Stage (henceforth BS) emission standards⁶² were introduced to improve the air quality of our cities and towns. Since then, gradually, further stringent norms have been adopted. In 2000-01, BS-II norms were applied in Delhi, Kolkata, Mumbai and Chennai and BS-I norms were implemented in other states. In 2010, BS-IV norms were introduced in 13 major cities and BS-III norms were made compulsory in the entire country. In 2016, the government decided to skip the BS-V norms and go for BS-VI Emission Norms for vehicles (with 10 ppm Sulphur fuel) by 2020 because of rising pollution in cities. As per SIAM report (2017), leapfrogging to BS-VI norms by 2020 would result in a decrease of 82% of emissions of particulate matter and 68% in NOx emission in diesel cars. However, the maximum benefits are expected in the heavy-duty diesel vehicles segment. This is complemented by fuel efficiency norms introduced in April 2017, the government of India implemented new fuel efficiency standards which are notified for petrol, diesel, liquefied petroleum gas (LPG) and compressed natural gas (CNG) passenger vehicles. These new fuel efficiency standards are based on a Corporate Average Fuel Consumption (CAFC) system which are likely make cars more fuel-efficient (by about 17%) between 2017 and 2022. It is important to note that, with respect to absorption of global best practices, the Chinese firms provide a good example because they adopted strategies that were based on prompt and extensive technological learning (Miglani, 2019).⁶³

However, it is important to highlight that the overall policy regime for this sector has tended to rely largely on the big economic actors, mostly large corporates, which has resulted in very uneven distribution of gains, with a few big firms cornering a major portion of the profits (Narayanan & Vashisht, 2008).⁶⁴ As per the recent statistics, in 2018, the top five companies controlled 85.4 per cent of the production in the commercial vehicle segment; 87.4 per cent in the passenger vehicle category; 99.6 and 93.5 per cent of production in two and three-wheeler categories respectively.

6 Major Findings and Conclusions

This paper has provided a brief overview of some of the major issues and outcomes, in the context of accelerated integration of India's automobile sectors participation in global value

⁶² "The Bharat Stage emission standards are standards instituted by the government to regulate the output of air pollutants from motor vehicles from internal combustion engine equipment, including motor vehicles" <https://indianexpress.com/article/explained/what-are-bharat-stage-emissions-standards/>

⁶³ Sutton John (2004) as cited in Miglani (2019).

⁶⁴ Footnote 15 of (Narayanan & Vashisht, 2008) at page 15.

system. This participation was driven by a macroeconomic regime characterised by the growing importance of foreign capital and the deepening penetration of MNCs since the early 1990s. Although, for the manufacturing sector as a whole the outcomes during the last three decades have been largely disappointing, with stagnant shares in GDP and employment, the automobile sector has performed relatively better. In fact during this relatively static phase of manufacturing in terms of contribution to the GDP and employment, the automobile industry has been a reasonable success story in terms of its contribution to both GDP and employment, and its improved performance in the world economy with respect to the number of automobiles, including passenger and commercial vehicles sold (Section 1).

As noted at the outset, the participation in GVCs began when public and private sector companies entered into joint ventures with transnational enterprises since the mid-1980s. However, as noted earlier, this trend has gained momentum since the early 1990s through policy measures discussed earlier. In fact, during the last couple of decades, the automobile sector has attracted a relatively high share of FDI coming to the country, which has contributed to its improved functioning along different economic parameters (Miglani 2019). The development of GVCs, regional and global, created a number of changes in the structure of the industry. On the all domestic producers, including foreign firms producing in India, benefited more than trans-national enterprises, as the value of forward linkages remained comparatively high vis-à-vis the backward linkages throughout this period. It is however, difficult to get information for the proportion of Indian and foreign firms operating in India. Further, it important to note that the gap between the two, forward and backward linkages, has widened in recent times (2015-16) indicating consistent rising economic gains from the GVCs. However, inspite of the forward linkages being higher, the share of foreign contribution in value-added of exports increased significantly during the recent years (as shown in Section 4).

Using Bernhardt and Milberg (2011) approach of measuring economic upgrading, we note that the share of Indian auto sector in total global output and value of exports increased as shown in section 4. Furthermore, based on the ASI data we find that the number of factories, GVA, productivity per employee, GCF, the value of output etc. have increased within the organised sector of this industry. However, it is significant to note that profits and profit per employee have tended to remain low during the period of the study. The rising inputs cost, increased competition, increased investments in technology, innovations and R&D etc. maybe some of the reasons for low and relatively volatile profits. Further as noted earlier, most of the economic

gains have eluded the unorganised sector, for which GVA per enterprise has shown a declining trend, especially after 2010-11.

With respect to the impacts on employment and labour relations within the sector, the gains have been at best modest, if not disappointing as has been highlighted in the discussion on social up-gradation (Section 4.2). On the whole, there is a deepening of informality in employment and work relations, both in the organised and unorganised sectors, with serious implications for the wellbeing of workers within GVCs. Clearly their bargaining power has been seriously compromised with growing casualisation, contractualisation etc. Although, a section of workers in the unorganised sector have experienced an increase in real wages, which is somewhat surprising and needs further investigation, in the organised sector, the real wages have declined. However different components of social protection for both segments, organised and unorganised, have been compressed during the study period. Thus, a summary assessment of the increased integration of India's auto sector in GVCs, would be that there have been limited and uneven economic gains; as regards most indicators for social upgrading it is difficult to find positive stories.

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Appendix

Tariff Lines

Chapter 87 includes 76 HS six digit tariff lines. For keeping data analysis simple, these 76 HS six-digit tariff lines are categorised under different groups using broad economic classification (henceforth BEC) and concordance matrix of HS 1988/92. These groups are categorised as capital goods (except for transport equipment), durable, goods not elsewhere specified, industrial, non-industrial, passenger motor cars and parts & accessories (Appendix Table A1). In total there are 76 HS six-digit tariff lines for the automobile industry, of which thirty cover parts and accessories, twenty cover industrial and ten non-industrial goods, whereas nine classifications cover motor cars. Apart from this five categories cover all types of capital goods (except for transport equipment), and one category each is applicable for durable, 1 and other goods not elsewhere specified (for detail see Appendix Table A2). These seven product groups are further classified into output and inputs. Capital goods (except for transport equipment), durable, goods not elsewhere specified, industrial, non-industrial and passenger motor cars are classed as ‘output’, whereas parts & accessories are classified as ‘inputs’.

Table A1: BEC Category-wise number HS 6 digit products of the Automobile Industry

S.No.	BEC Description	Number of HS 6 tariff line
1	Capital goods (except for transport equipment)	5
2	Durable	1
3	Goods not elsewhere specified	1
4	Industrial	20
5	Non-industrial	10
6	Parts and accessories	30
7	Passenger motor cars	9
	Total	76

Source: Authors calculation using WITS, World Bank database

Table A2: Concordance of BEC categories and HS Classification for the Automobile Industry

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Export	Capital goods (except for transport equipment)	870110	SINGLE AXLE TRACTORS	1,402	0.2
Export	Capital goods (except for transport equipment)	870130	TRACK-LAYING TRACTORS	4,558	0.5
Export	Capital goods (except for transport equipment)	870190	*OTHER TRACTORS	848,538	99.1
Export	Capital goods (except for transport equipment)	870911	ELECTRICAL VEHICLES OF HEADING 8709	350	0.0
Export	Capital goods (except for transport equipment)	870919	OTHER VEHICLES OF HEADING 8709	1,108	0.1

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Export	Durable	871500	BABY CARRIAGES AND PARTS THEREOF	559	100.0
Export	Goods not elsewhere specified	871000	TANKS AND OTHR ARMORD FIGHTNG VHCLS,MOTRSD, W/N FTD WTH WEAPONS AND PRTS OF SUCH VHCLS	40,526	100.0
Export	Industrial	870120	ROAD TRACTORS FOR SEMI-TRAILERS	27,936	2.4
Export	Industrial	870210	WITH ONLY COMPRESSION-IGNITION INTERNAL COMBUSTION PISTON ENGINE (DIESEL OR SEMI-DIESEL):	223,995	19.2
Export	Industrial	870290	OTHER	8,693	0.7
Export	Industrial	870410	DUMPERS DESIGNED FR OFF-HIGHWAY USE	298,616	25.6
Export	Industrial	870421	GOODS VHCLS,WTH CMPRSN IGNTN INTRNL CMBSTNPSTN ENGN(DIESEL/SEMI DIESEL),G.V.W.<=5TON	279,086	23.9
Export	Industrial	870422	GOODS VHCLS,WTH CMPRSN IGNTN INTRNL CMBSTNPSTN ENGN G.V.W.>5 TONS BT <=20 TONS	180,156	15.4
Export	Industrial	870423	MOTOR VHCLS WTH CMPRSN IGNTN INTRNL CMBSTNPSTN ENGN(DIESEL ETC),G.V.W.>20 TONS	75,076	6.4
Export	Industrial	870431	MOTOR VHCLS,WTH SPARK-IGNTN INTRNL CMBSTN PISTON ENGINE WITH G.V.W. NOT EXCDNG 5TONS	2,889	0.2
Export	Industrial	870432	MOTOR VHCLS,WTH SPARK-IGNITION INTERNAL COMBUSTION PISTON ENGINE,G.V.W.>5 TONS	1,396	0.1

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Export	Industrial	870490	OTHR MOTOR VEHICLES FR TRNSPORT OF GOODS	20,374	1.7
Export	Industrial	870510	CRANE LORRIES	906	0.1
Export	Industrial	870520	MOBILE DRILLING DERRICKS	2,039	0.2
Export	Industrial	870530	FIRE FIGHTING VEHICLES	5,700	0.5
Export	Industrial	870540	CONCRETE-MIXER LORRIES	7,724	0.7
Export	Industrial	870590	OTHR SPCL PURPOSE MOTOR VEHICLES	22,046	1.9
Export	Industrial	871620	SELF-LOADING OR SELF-UNLOADING TRAILERS AND SEMI-TRAILERS FOR AGRICULTURL PURPOSES	3,069	0.3
Export	Industrial	871631	TANKER TRAILERS AND TANKER SEMI-TRAILERS	2,249	0.2
Export	Industrial	871639	OTHR TRLRS AND SEMI-TRLR FR TRNSPRT OF GOODS	1,488	0.1
Export	Industrial	871640	OTHER TRAILERS AND SEMI-TRAILERS	2,420	0.2
Export	Industrial	871680	OTHER VEHICLES :	2,761	0.2
Export	Non-industrial	871110	MOTOR CYCL ETC WTH RCPRCTNG INTRNL CMBSTN PISTON ENGN OF CYLNDR CPCTY<=50 CC	1,687	0.1
Export	Non-industrial	871120	MOTOR CYCL ETC WTH RCPRCTNG INTRNL CMBSTN PSTN ENGN OF CYLNDR CPCTY>50 CC TO 250 CC	1,509,453	92.3
Export	Non-industrial	871130	MOTOR CYCL ETC WTH RCPRCTNG INTRNL CMBSTN PSTN ENGN OF CYLNDR CAP>250 C TO 500 CC	46,867	2.9
Export	Non-industrial	871140	MOTOR CYCL ETC WTH RCPRCTN INTRNL CMBSTN PSTN ENGN OF CYLNDR CPCTY>500 CC TO 800 CC	12,110	0.7

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Export	Non-industrial	871150	MOTOR CYCL ETC WTH RCPRCTNG INTRNL CMBSTN PISTON ENGINE OF CYLNDR CAPACITY>800 CC	272	0.0
Export	Non-industrial	871190	OTHER:	966	0.1
Export	Non-industrial	871200	BICYCLES AND OTHERCYCLES(INCL DELIVERY TRICYCLES),NOT MOTORISED	48,653	3.0
Export	Non-industrial	871310	INVALID CARRIAGES NT MCHNCLY PRPLD	14,183	0.9
Export	Non-industrial	871390	OTHR INVALID CARRIAGES	367	0.0
Export	Non-industrial	871610	TRLRS AND SEMI-TRLRS OF CARAVAN TYPE	294	0.0
Export	Parts and accessories	870600	CHASSIS FITED WTH ENGINES,FOR MOTOR VEHICLES OF HEADINGS NOS 8701 TO 8705	321,389	7.2
Export	Parts and accessories	870710	BODIES FOR VEHICLS OF HDG NO 8703	1,071	0.0
Export	Parts and accessories	870790	OTHER BODIES	15,937	0.4
Export	Parts and accessories	870810	BUMPERS AND PRTS THEREOF	212,207	4.8
Export	Parts and accessories	870821	SAFETY SEAT BELTS	10,249	0.2
Export	Parts and accessories	870829	OTHR PRTS AND ACCSSRS OF BODIES (INCL CABS)	58,676	1.3
Export	Parts and accessories	870839	Brake system parts nes for motor vehicles	202,171	4.5
Export	Parts and accessories	870840	GEAR BOXES	279,817	6.3
Export	Parts and accessories	870850	DRIVE AXLES WITH DIFFERENTIAL W/N PROVIDEDWITH OTHER TRANSMISSION COMPONENTS	164,709	3.7
Export	Parts and accessories	870870	ROAD WHEELS AND PRTS AND ACCSSRS THEREOF	92,607	2.1
Export	Parts and accessories	870880	SUSPENSION SHOCK ABSORBERS	100,992	2.3
Export	Parts and accessories	870891	RADIATORS	38,988	0.9

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Export	Parts and accessories	870892	SILENCERS AND EXHAUST PIPES	24,540	0.6
Export	Parts and accessories	870893	CLUTCHES AND PRTS THEREOF	33,687	0.8
Export	Parts and accessories	870894	STERNG WHEELS, STERNG COLUMNS AND STERNG BOXS	37,482	0.8
Export	Parts and accessories	870899	OTR PRTSANDACSSRS OF VHCLS OF HDG 8701-8705	2,425,905	54.6
Export	Parts and accessories	870990	PARTS OF THE VEHICLES OF HDG 8709	7,726	0.2
Export	Parts and accessories	871411	Motorcycle saddles	925	0.0
Export	Parts and accessories	871419	Motorcycle parts nes	122,641	2.8
Export	Parts and accessories	871420	PRTS AND ACCSSRS OF INVALID CARRIAGES	29,435	0.7
Export	Parts and accessories	871491	FRAMES,FORKS AND PRTS THEREOF	44,782	1.0
Export	Parts and accessories	871492	WHEEL,RIMS AND SPOKES	13,368	0.3
Export	Parts and accessories	871493	HUBS,EXCL COASTER BRKNG HUBS AND HUB BRAKES,AND FREE-WHEEL,SPROCKET-WHEELS	27,228	0.6
Export	Parts and accessories	871494	BRAKES,INCL COASTER BRAKING HUBS AND HUB BRAKES AND PRTS THEREOF	20,545	0.5
Export	Parts and accessories	871495	SADDLES OF BICYCLES AND OTHER CYCLES	6,163	0.1
Export	Parts and accessories	871496	PEDALS AND CRANK-GEAR AND PRTS THEREOF	20,348	0.5
Export	Parts and accessories	871499	OTHR PRTSANDACSSRS OF BICYCLESAND OTHR CYCLES	100,455	2.3
Export	Parts and accessories	871690	PARTSANDACCESSORIES OF VEHICLES OF HDG 8716	31,056	0.7
Export	Passenger motor cars	870310	VHCL FR TRVLNG ON SNOW;GOLF CAR AND THE LIKE	594	0.0

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Export	Passenger motor cars	870321	VHCL WTH SPRK-IGNTN INTRNL CMBSTN RCPRCTNGPISTON ENGENE OF CYLNDR CPCTY<=1000CC	1,185,581	23.0
Export	Passenger motor cars	870322	VEHICLES WITH SPARK-IGNITION INTERNAL COMBUSTION RECIPROCATING PISTON ENGINE OF CYLINDER CAPACITY>1000CC BT NT>1500CC	2,983,875	57.8
Export	Passenger motor cars	870323	VEHICLES WITH SPARK-IGNITION INTERNAL COMBUSTION RECIPROCATING ENGINE OF A CYLINDER CAPACITY>1500 CC BT<=3000	647,277	12.5
Export	Passenger motor cars	870324	VHCL WTH SPRK-IGNTN INTRNL CMBSTN RCPRCTNGPSTN ENGN OF CYLNDR CPCTY>3000 CC	2,816	0.1
Export	Passenger motor cars	870331	OTHR VHCLS,WTH CMPRSN IGNTN INTRNL CMBSTN PISTON ENGINE(DIESEL/SEMI-DISESEL), OF A CYLINDER CAPACITY<=1500 CC	236,941	4.6
Export	Passenger motor cars	870332	VHCLS,WTH CMPRSN/IGNTN INTRNL CMBSTN PSTN WTH CYLNDR CPCTY>1500 CC BT<=2500 CC	70,785	1.4
Export	Passenger motor cars	870333	VHCLS,WTH CMPRSN IGNTN INTRNL CMBSTN PSTN ENGINE OF CYLINDER CAPACITY>2500 CC	13,787	0.3

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Export	Passenger motor cars	870390	OTHR MOTOR CARS AND MOTOR VHCLS PRNCPLY FOR THE TRNSPRT OF PERSONS,INCLD STN WAGN ETC	16,643	0.3
Import	Capital goods (except for transport equipment)	870110	SINGLE AXLE TRACTORS	194	0.6
Import	Capital goods (except for transport equipment)	870130	TRACK-LAYING TRACTORS	181	0.5
Import	Capital goods (except for transport equipment)	870190	*OTHER TRACTORS	23,940	68.2
Import	Capital goods (except for transport equipment)	870911	ELECTRICAL VEHICLES OF HEADING 8709	2,204	6.3
Import	Capital goods (except for transport equipment)	870919	OTHER VEHICLES OF HEADING 8709	8,642	24.6
Import	Durable	871500	BABY CARRIAGES AND PARTS THEREOF	5,461	100.0
Import	Industrial	870120	ROAD TRACTORS FOR SEMI-TRAILERS	1,391	1.4
Import	Industrial	870210	WITH ONLY COMPRESSION-IGNITION INTERNAL COMBUSTION PISTON ENGINE (DIESEL OR SEMI-DIESEL):	3,929	3.8
Import	Industrial	870290	OTHER	1,442	1.4
Import	Industrial	870410	DUMPERS DESIGNED FR OFF-HIGHWAY USE	25,483	24.9
Import	Industrial	870421	GOODS VHCLS,WTH CMPRSN IGNTN INTRNL CMBSTNPSTN ENGN(DIESL/SEMI DIESEL),G.V.W.<=5TON	4,896	4.8
Import	Industrial	870422	GOODS VHCLS,WTH CMPRSN IGNTN INTRNL CMBSTNPSTN ENGN G.V.W.>5 TONS BT <=20 TONS	1,890	1.8
Import	Industrial	870423	MOTOR VHCLS WTH CMPRSN IGNTN INTRNL CMBSTNPSTN ENGN(DIESL ETC),G.V.W.>20 TONS	13,578	13.3

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Import	Industrial	870431	MOTOR VHCLS,WTH SPARK-IGNTN INTRNL CMBSTN PISTON ENGINE WITH G.V.W. NOT EXCDNG 5TONS	37	0.0
Import	Industrial	870432	MOTOR VHCLS,WTH SPARK-IGNITION INTERNAL COMBUSTION PISTON ENGINE,G.V.W.>5 TONS	22	0.0
Import	Industrial	870490	OTHR MOTOR VEHICLES FR TRNSPORT OF GOODS	963	0.9
Import	Industrial	870510	CRANE LORRIES	1,784	1.7
Import	Industrial	870520	MOBILE DRILLING DERRICKS	367	0.4
Import	Industrial	870530	FIRE FIGHTING VEHICLES	16,915	16.5
Import	Industrial	870540	CONCRETE-MIXER LORRIES	387	0.4
Import	Industrial	870590	OTHR SPCL PURPOSE MOTOR VEHICLES	11,804	11.5
Import	Industrial	871620	SELF-LOADING OR SELF-UNLOADING TRAILERS AND SEMI-TRAILERS FOR AGRICULTURL PURPOSES	276	0.3
Import	Industrial	871631	TANKER TRAILERS AND TANKER SEMI-TRAILERS	219	0.2
Import	Industrial	871639	OTHR TRLRS AND SEMI-TRLR FR TRNSPRT OF GOODS	5,240	5.1
Import	Industrial	871640	OTHER TRAILERS AND SEMI-TRAILERS	5,874	5.7
Import	Industrial	871680	OTHER VEHICLES :	6,059	5.9
Import	Non-industrial	871110	MOTOR CYCL ETC WTH RCPRCTNG INTRNL CMBSTN PISTON ENGN OF CYLNDR CPCTY<=50 CC	38	0.0
Import	Non-industrial	871120	MOTOR CYCL ETC WTH RCPRCTNG INTRNL CMBSTN PSTN ENGN OF CYLNDR CPCTY>50 CC TO 250 CC	3,086	4.0

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Import	Non-industrial	871130	MOTOR CYCL ETC WTH RCPRCTNG INTRNL CMBSTN PSTN ENGN OF CYLNR CAP>250 C TO 500 CC	2,508	3.2
Import	Non-industrial	871140	MOTOR CYCL ETC WTH RCPRCTN INTRNL CMBSTN PSTN ENGN OF CYLNR CPCTY>500 CC TO 800 CC	4,191	5.4
Import	Non-industrial	871150	MOTOR CYCL ETC WTH RCPRCTNG INTRNL CMBSTN PISTON ENGINE OF CYLNR CAPACITY>800 CC	20,284	26.1
Import	Non-industrial	871190	OTHER:	1,754	2.3
Import	Non-industrial	871200	BICYCLES AND OTHERCYCLES(INCL DELIVERY TRICYCLES),NOT MOTORIZED	36,447	46.9
Import	Non-industrial	871310	INVALID CARRIAGES NT MCHNCLY PRPLD	4,195	5.4
Import	Non-industrial	871390	OTHR INVALID CARRIAGES	5,092	6.6
Import	Non-industrial	871610	TRLRS AND SEMI-TRLRS OF CARAVAN TYPE	128	0.2
Import	Parts and accessories	870600	CHASSIS FITED WTH ENGINES,FOR MOTOR VEHICLES OF HEADINGS NOS 8701 TO 8705	29,569	0.7
Import	Parts and accessories	870710	BODIES FOR VEHICLS OF HDG NO 8703	47,923	1.1
Import	Parts and accessories	870790	OTHER BODIES	53,369	1.3
Import	Parts and accessories	870810	BUMPERS AND PRTS THEREOF	42,818	1.0
Import	Parts and accessories	870821	SAFETY SEAT BELTS	11,976	0.3
Import	Parts and accessories	870829	OTHR PRTS AND ACCSSRS OF BODIES(INCL CABS)	350,875	8.3
Import	Parts and accessories	870839	Brake system parts nes for motor vehicles	141,683	3.3
Import	Parts and accessories	870840	GEAR BOXES	573,940	13.5

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Import	Parts and accessories	870850	DRIVE AXLES WITH DIFFERENTIAL W/N PROVIDED WITH OTHER TRANSMISSION COMPONENTS	188,102	4.4
Import	Parts and accessories	870870	ROAD WHEELS AND PRTS AND ACCSSRS THEREOF	127,366	3.0
Import	Parts and accessories	870880	SUSPENSION SHOCK ABSORBERS	63,304	1.5
Import	Parts and accessories	870891	RADIATORS	27,308	0.6
Import	Parts and accessories	870892	SILENCERS AND EXHAUST PIPES	43,250	1.0
Import	Parts and accessories	870893	CLUTCHES AND PRTS THEREOF	93,013	2.2
Import	Parts and accessories	870894	STERNG WHEELS, STERNG COLUMNS AND STERNG BOXS	173,312	4.1
Import	Parts and accessories	870899	OTR PRTS AND ACCSSRS OF VHCLS OF HDG 8701-8705	1,754,458	41.3
Import	Parts and accessories	870990	PARTS OF THE VEHICLES OF HDG 8709	2,211	0.1
Import	Parts and accessories	871411	Motorcycle saddles	60	0.0
Import	Parts and accessories	871419	Motorcycle parts nes	277,352	6.5
Import	Parts and accessories	871420	PRTS AND ACCSSRS OF INVALID CARRIAGES	10,976	0.3
Import	Parts and accessories	871491	FRAMES, FORKS AND PRTS THEREOF	13,602	0.3
Import	Parts and accessories	871492	WHEEL, RIMS AND SPOKES	91,639	2.2
Import	Parts and accessories	871493	HUBS, EXCL COASTER BRKNG HUBS AND HUB BRAKES, AND FREE-WHEEL, SPROCKET-WHEELS	2,311	0.1
Import	Parts and accessories	871494	BRAKES, INCL COASTER BRAKING HUBS AND HUB BRAKES AND PRTS THEREOF	4,664	0.1
Import	Parts and accessories	871495	SADDLES OF BICYCLES AND OTHER CYCLES	807	0.0

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Import	Parts and accessories	871496	PEDALS AND CRANK-GEAR AND PRTS THEREOF	1,044	0.0
Import	Parts and accessories	871499	OTHR PRTSANDACCSRS OF BICYCLESAND OTHR CYCLES	89,993	2.1
Import	Parts and accessories	871690	PARTSANDACCESSORIES OF VEHICLES OF HDG 8716	28,676	0.7
Import	Passenger motor cars	870310	VHCL FR TRVLNG ON SNOW;GOLF CAR AND THE LIKE	2,597	0.7
Import	Passenger motor cars	870321	VHCL WTH SPRK-IGNTN INTRNL CMBSTN RCPRCTNGPISTON ENGINE OF CYLNDR CPCTY<=1000CC	507	0.1
Import	Passenger motor cars	870322	VEHICLES WITH SPARK-IGNITION INTERNAL COMBUSTION RECIPROCATING PISTON ENGINE OF CYLINDR CAPACITY>1000CC BT NT>1500CC	3,626	1.0
Import	Passenger motor cars	870323	VEHICLES WITH SPARK-IGNITION INTERNAL COMBUSTION RECIPROCATING ENGINE OF A CYLINDER CAPACITY>1500 CC BT<=3000	35,386	9.3
Import	Passenger motor cars	870324	VHCL WTH SPRK-IGNTN INTRNL CMBSTN RCPRCTNGPSTN ENGN OF CYLNDR CPCTY>3000 CC	61,406	16.2
Import	Passenger motor cars	870331	OTHR VHCLS,WTH CMPRSN IGNTN INTRNL CMBSTN PISTON ENGINE(DIESEL/SEMI-DISESEL), OF A CYLINDER CAPACITY<=1500 CC	5,022	1.3

Trade	BEC	HS code	HS Description	Average Exports or Imports (2011-16) (\$ 1000)	Share (2011-16)
Import	Passenger motor cars	870332	VHCLS,WTH CMPRSN/IGNTN INTRNL CMBSTN PSTN WTH CYLNDR CPCTY>1500 CC BT<=2500 CC	73,536	19.4
Import	Passenger motor cars	870333	VHCLS,WTH CMPRSN IGNTN INTRNL CMBSTN PSTN ENGINE OF CYLINDER CAPACITY>2500 CC	106,660	28.2
Import	Passenger motor cars	870390	OTHR MOTOR CARS AND MOTOR VHCLS PRNCPLY FOR THE TRNSPRT OF PERSONS,INCLD STN WAGN ETC	90,000	23.8

Source: Source: WITS, World bank database

Structure of exports and imports in the Automobile industry

In 1990, the share of parts and accessories (HS 8708 & HS 8714) in India's global exports was around 54 per cent (Appendix Table A3). These included parts and accessories of tractors (HS 8701), public-transport (HS 8702), motor cars (HS 8703), motor vehicles (HS 8704), special purpose motor vehicles (HS 8705), motorcycle (HS 8711), bicycles (HS 8712) and invalid carriages (HS 8713). India largely exported parts and accessories of motor vehicles (HS 8708) to the US, the UK, Singapore, and the Soviet Union. The parts and accessories of motorcycle, bicycles and invalid carriages (HS 8714) were mainly exported to Mexico, Nigeria, Singapore, Tanzania and Sri Lanka. Other essential products in India's export basket of automobiles included public transport passenger motor vehicles (HS 8702), Chassis fitted with engines (HS 8706), motor cars and other motor vehicles for transport (HS 8703) and motorcycles (HS 8711). The public transport passenger motor vehicles (HS 8702) mainly exported to Sri Lanka; Chassis fitted with engines (HS 8706) exported mostly to Malaysia, Sri Lanka, Bangladesh etc.; other motor vehicles for transport (HS 8703) majorly exported to Hungary and France; and motorcycles (HS 8711) were primarily exported to Bangladesh and Sri Lanka.

Again during 2000, parts and accessories of motor vehicles (HS 8708) and parts and accessories of motorcycle, bicycles and invalid carriages (HS 8714) dominated global exports of India in the automobiles industry. The share of parts and accessories of motor vehicles (HS 8708) in Indian global exports of automobiles increased from around 27 per cent in 1990 to 30 per cent in 2000 while the share of parts and accessories of motorcycle, bicycles and invalid carriages (HS 8714) declined from 27 per cent to 21 per cent during the same period. Between 1990 and 2000, the share of the US (34%) and the UK (9%) in parts and accessories of motor vehicles (HS 8708) exports of India increased from around 30 per cent to about 43 per cent. In comparison to 1990, the significant change in automobile exports of India is noticed in 2000 that the share of motor cars and other motor vehicles for transport (HS 8703) and motor vehicles for the transport of goods (HS 8704) increased from around 7% and 3% to 12% and 7%

respectively. The top exporting destination for these two HS products was European countries. In automobile exports the share of Chassis fitted with engines (HS 8706) declined from around 10 per cent to 6 per cent during the same period. This product chiefly exported to South Asia (Bangladesh, Sri Lanka and Nepal).

In 2010, the Indian automobile industry showed significant turnaround as the final products i.e., motor cars and other motor vehicles for transport (HS 8703), motorcycles (HS 8711), motor vehicles for the transport of goods (HS 8704) and tractors (HS 8701) accounted more than 70 per cent share in total automobile exports of India while the share of parts and accessories (HS 8708 and HS 8714) declined to 23 per cent. The share of motor cars and other motor vehicles for transport (HS 8703) increased significantly from around 12 per cent in 2000 to 49 per cent in 2010. The top five export destinations of this product group were Indonesia (8.6%), Algeria (7.6%), the UK (7.5), South Africa (7.5) and Sri Lanka (5.2%). Sri Lanka (37.3%) and Singapore (15.7%) accounted for 53 percent share of motor vehicles for the transport of goods (HS 8704) exports of India. Tractors (HS 8701) mostly exported to the US as it accounted 31 percent share of total exports of this product group. The top exports destination for parts and accessories of motor vehicles (HS 8708) remained mostly the same as it was in 2000 (US, Italy and Germany).

Between 2010 and 2016, global exports by India followed the same trend. The motor cars and other motor vehicles for transport (HS 8703), motorcycles (HS 8711), motor vehicles for the transport of goods (HS 8704) and tractors (HS 8701) accounted 65 per cent share in total automobile exports, while the share of parts and accessories (HS 8708 and HS 8714) accounted 29 per cent share of automobile exports from India.

Between 1990 and 2016, India mainly imported part and accessories of motor vehicles (HS 8708) consistently (Appendix Table A4). The share of this product group remained more than 70% throughout the period considered. In 1990, India imported part and accessories of motor vehicles mainly from Japan (82%). In 2000, the share of Japan in India's import of parts and accessories declined significantly to 57%. The other notable sources are Italy (7.9%), Germany (7.5%), Brazil (5.7%) and Korea, Rep. (4.9), whereas there has been a significant decline in the share of Japan to 13.6% in the same period. The shares of other countries like the Korean Republic. (26.4%), Germany (11.4%), China (10.5%), and the Czech Republic (6.6%)] increased to 66% of total imports in parts and accessories in the year 2000. In 2016, though the combined share of imports of parts and accessories these countries remained at 66%, the individual share of the Korean Republic came down (18.3%), whereas imports from China (17.2%), Germany (16.9%) and Japan (13.6%) increased.

Another significant head in India's import basket of the automobile is HS 8714 (parts and accessories of motorcycle, bicycles and invalid carriages) whose share varied between 9% and 11% between 1990 and 2016, although it declined sharply to 4.5% in 2000. In 1990, 84% of parts and accessories of the motorcycle, bicycles and invalid carriages were imported mainly from Japan, which was replaced by China in 2016 which constituted 85% of the imports. After 2000, imports of motor cars and other motor vehicles for transport (HS 8703) also gained significance. Between 2000 and 2016 the average share of this segment was around 4.5%, although there was a spike to 12% in 2010. Whereas in 2000, Japan (37.4%), the United Arab Emirates (18.8%), the United Kingdom (15.5%), Germany (10.8%) were significant contributors to imports in this product basket (HS 8703), by 2016 the respective shares for Germany (37%) and the United Kingdom (26.2%) went up significantly.

Table A3: Trend of India's Exports of main items and their Top destination at HS four-digit level

Year	HS 4 digit	Description	Share	India's Top Five Destination
1990	8708	PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEADINGS 8701 TO 8705	27.3	United States (12.9), United Kingdom (11.7), Singapore (9.3), Soviet Union (7.3), Nigeria (5.4)
1990	8714	PRTS AND ACCESS OF VHCLS OF HDG 8711-8713	26.9	Mexico (10.9), Nigeria (6.4), Singapore (4.8), Tanzania (4.3), Sri Lanka (4.3)
1990	8702	PUBLIC-TRNSPRT TYPE PASSENGER MOTOR VHCLS	11.9	Sri Lanka (60.1), United Arab Emirates (8.4), Ghana (7.3), Madagascar (4.8), Tanzania (3.4)
1990	8706	CHASSIS FITTED WITH ENGINES, FOR THE MOTOR VEHICLES OF HEADINGS 8701 TO 8705	9.8	Malaysia (38.1), Sri Lanka (20.2), Bangladesh (12.1), Nepal (7), Zambia (4.4)
1990	8703	MOTR CARS AND OTHR MOTR VHCLS FR TRNSPRT OF PERSONS(EXCL OF 8702)INCL RCNG CARS ETC	7.3	Hungary (26.9), France (11.4), Iran, Islamic Rep. (10), Australia (9.3), Greece (6.7)
1990	8711	MOTORCYCLES (INCLUDING MOPEDS) AND CYCLES FITTED WITH AN AUXILIARY MOTOR, WITH OR WITHOUT SIDE-CARS;	7.3	Bangladesh (24.3), Sri Lanka (18.8), Nepal (6.8), Turkey (6.5), Mauritius (6.5)
2000	8708	PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEADINGS 8701 TO 8705	30.1	United States (33.7), United Kingdom (9), Germany (5.6), Italy (5), United Arab Emirates (3.3)
2000	8714	PRTS AND ACCSSRS OF VHCLS OF HDG 8711-8713	21.1	Nigeria (11.4), Mexico (4.6), Sri Lanka (4.2), Brazil (3.5), Egypt, Arab Rep. (3.2)
2000	8703	MOTR CARS AND OTHR MOTR VHCLS FR TRNSPRT OF PERSONS(EXCL OF 8702)INCL RCNG CARS ETC	11.9	Netherlands (18.4), Italy (9.1), United Kingdom (8), Indonesia (6), Portugal (4.9)
2000	8702	PUBLIC-TRNSPRT TYPE PASSENGER MOTOR VHCLS	9.3	Sri Lanka (35), United Kingdom (10.8), Spain (9.2), Italy (8.4), United Arab Emirates (7.8)
2000	8711	MOTORCYCLES (INCLUDING MOPEDS) AND CYCLES FITTED WITH AN AUXILIARY MOTOR, WITH OR WITHOUT SIDE-CARS;	7.3	Sri Lanka (23.3), Bangladesh (13.1), Fm Sudan (6.7), Egypt, Arab Rep. (5.1), Turkey (4.9)
2000	8704	MOTOR VEHICLES FOR THE TRANSPORT OF GOODS	7.2	Italy (17.7), Turkey (17.2), United Kingdom (10.9), Sri Lanka (5.8), Spain (5)
2000	8706	CHASSIS FITTED WITH ENGINES, FOR THE MOTOR VEHICLES OF HEADINGS 8701 TO 8705	5.8	Bangladesh (49.5), Sri Lanka (26.6), Nepal (6.3), Malaysia (3.3), Poland (2)
2010	8703	MOTR CARS AND OTHR MOTR VHCLS FR TRNSPRT OF PERSONS(EXCL OF 8702)INCL RCNG CARS ETC	48.6	Indonesia (8.6), Algeria (7.6), United Kingdom (7.5), South Africa (7.5), Sri Lanka (5.2)

Year	HS 4 digit	Description	Share	India's Top Five Destination
2010	8708	PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEADINGS 8701 TO 8705	20.7	United States (26.4), Thailand (8.5), Turkey (7.8), Italy (5.6), Germany (5.5)
2010	8711	MOTORCYCLES (INCLUDING MOPEDS) AND CYCLES FITTED WITH AN AUXILIARY MOTOR, WITH OR WITHOUT SIDE-CARS;	8.1	Nigeria (15.4), Sri Lanka (14.9), Colombia (14.2), Bangladesh (10.1), Philippines (6.7)
2010	8704	MOTOR VEHICLES FOR THE TRANSPORT OF GOODS	7.6	Sri Lanka (37.3), Singapore (15.7), South Africa (7.6), Bangladesh (4.8), Indonesia (4)
2010	8701	TRACTORS (OTHER THAN TRACTORS OF HEADING 8709)	5.8	United States (31.3), Turkey (8.2), Nepal (6.8), Bangladesh (6), Sri Lanka (6)
2016	8703	MOTR CARS AND OTHR MOTR VHCLS FR TRNSPRT OF PERSONS(EXCL OF 8702)INCL RCNG CARS ETC	42.5	Mexico (24), South Africa (7.7), United Kingdom (6.8), Italy (5.4), Saudi Arabia (3.4)
2016	8708	PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEADINGS 8701 TO 8705	26.8	United States (25.6), Turkey (10.2), Germany (5), Mexico (4.9), France (4.7)
2016	8711	MOTORCYCLES (INCLUDING MOPEDS) AND CYCLES FITTED WITH AN AUXILIARY MOTOR, WITH OR WITHOUT SIDE-CARS;	10.7	Sri Lanka (13), Colombia (11.8), Nepal (10.7), Bangladesh (9.7), Nigeria (6.7)
2016	8701	TRACTORS (OTHER THAN TRACTORS OF HEADING 8709)	6.1	United States (22.5), Turkey (11.9), Nepal (9.2), Bangladesh (7.4), Sri Lanka (5.3)
2016	8704	MOTOR VEHICLES FOR THE TRANSPORT OF GOODS	5.1	Bangladesh (22.6), Sri Lanka (16.6), Nepal (12.9), South Africa (5.2), Indonesia (5)

Source: Source: WITS, World bank database

Note: Figures in parenthesis are percentages

Table A4: Trend of India's major Global Imports share and Top Exporters at HS four-digit level

Year	HS 4 digit	Description	Share	India's Top Destination
1990	8708	PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEADINGS 8701 TO 8705	83.2	Japan (82), United States (5.2), German Democratic Republic (5.2), Czechoslovakia (2.4), United Kingdom (1.6)
1990	8714	PRTS AND ACCSSRS OF VHCLS OF HDG 8711-8713	11.1	Japan (87), Italy (5.9), Other Asia, nes (2.5), France (1.5), United Kingdom (1.4)
2000	8708	PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEADINGS 8701 TO 8705	82.9	Japan (57.2), Italy (7.9), Germany (7.5), Brazil (5.7), Korea, Rep. (4.9)
2000	8709	WRKS TRUCKS,USD IN FCTRS,DOCK AREA/AIRPORTETC FR SHRT DSTNC TRNSPRT OF GOODS;TRCTRS USD ON RLWAY PLTFORMS;PRTS OF THE AB	4.5	United Kingdom (96.4), France (1.4), Slovak Republic (0.4), Korea, Dem. Rep. (0.4), United Arab Emirates (0.3)

Year	HS 4 digit	Description	Share	India's Top Destination
2000	8703	MOTR CARS AND OTHR MOTR VHCLS FR TRNSPRT OF PERSONS(EXCL OF 8702)INCL RCNG CARS ETC	4.4	Japan (37.4), United Arab Emirates (18.8), United Kingdom (15.5), Germany (10.8), United States (2.7)
2000	8714	PRTS AND ACCSSRS OF VHCLS OF HDG 8711-8713	4.1	Japan (69.2), Other Asia, nes (7.6), China (6.3), Singapore (5.1), Korea, Rep. (3.4)
2010	8708	PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEADINGS 8701 TO 8705	72.0	Korea, Rep. (26.4), Japan (14.6), Germany (11.4), China (10.5), Czech Republic (6.6)
2010	8703	MOTR CARS AND OTHR MOTR VHCLS FR TRNSPRT OF PERSONS(EXCL OF 8702)INCL RCNG CARS ETC	11.7	Germany (49.6), United Kingdom (13.4), Japan (12.8), United States (9.6), Korea, Rep. (6.1)
2010	8714	PRTS AND ACCSSRS OF VHCLS OF HDG 8711-8713	9.0	China (83.3), Japan (8.4), Thailand (2.4), Indonesia (1.2), Other Asia, nes (0.8)
2016	8708	PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEADINGS 8701 TO 8705	77.0	Korea, Rep. (18.3), China (17.2), Germany (16.9), Japan (13.6), Thailand (9.5)
2016	8714	PRTS AND ACCSSRS OF VHCLS OF HDG 8711-8713	10.5	China (84.7), Thailand (4.2), Japan (2.7), Malaysia (1.8), Indonesia (1.6)
2016	8703	MOTR CARS AND OTHR MOTR VHCLS FR TRNSPRT OF PERSONS(EXCL OF 8702)INCL RCNG CARS ETC	4.4	Germany (37), United Kingdom (26.2), Sweden (8.1), Japan (6.4), Belgium (5.8)

Source: Source: WITS, World bank database

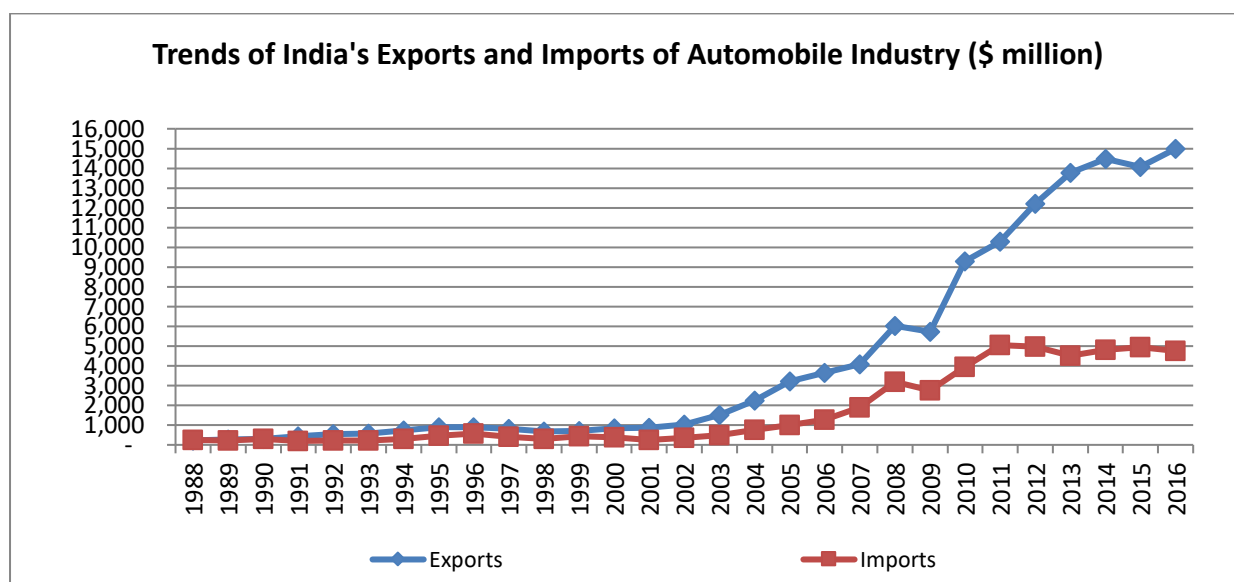
Note: Figures in parenthesis are percentages

Table A5: Category-wise Number of Products Registered Change in India's Global share between 1991-95 and 2011-15

BEC Category	No. of Products Registered Change in India's Global share Between 1991-95 and 2011-15 (%)							
	Less than Zero	0 to 1%	1% to 2%	2% to 3%	3% to 4%	4% to 5%	10% to 15%	15% to 20%
Capital goods (except for transport equipment)	3	1				1		
Durable	1							
Goods not elsewhere specified			1					
Industrial	2	15	1		2			
Non-industrial	3	4	1	1			1	
Passenger motor cars	2	5				2		
Parts and accessories	9	15	3	2	1			
Export Total	20	40	6	3	3	3	1	

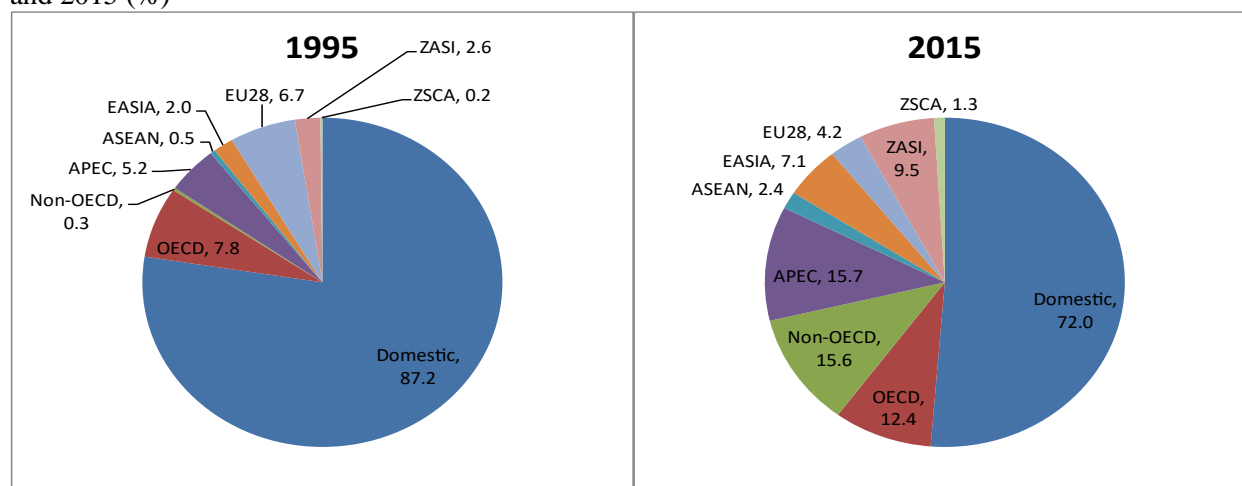
Source: Authors calculation using WITS, World Bank database

Figure A1: Trends of India's Exports and Imports of the Automobile Industry (\$ million)



Source: WITS, World Bank database

Figure A2: Region-wise⁶⁵ Contribution in India's Gross Exports of the Automobile Sector in 1995 and 2015 (%)



Source: OECD, TIVA database

Note: Domestic represents contribution of India

⁶⁵ **APEC (Asia-Pacific Economic Cooperation):** Australia, Canada, Chile, Japan, Korea, Mexico, New Zealand, United States, Brunei Darussalam, China, Hong Kong (China), Indonesia, Malaysia, Philippines, Russia, Singapore, Thailand, Chinese Taipei, Viet Nam.

ASEAN (Association of South East Asian Nations): Brunei Darussalam, Indonesia, Cambodia, Malaysia, Philippines, Singapore, Thailand, Viet Nam.

EASIA (Eastern Asia): Japan, Korea, China, Hong Kong (China), Chinese Taipei.

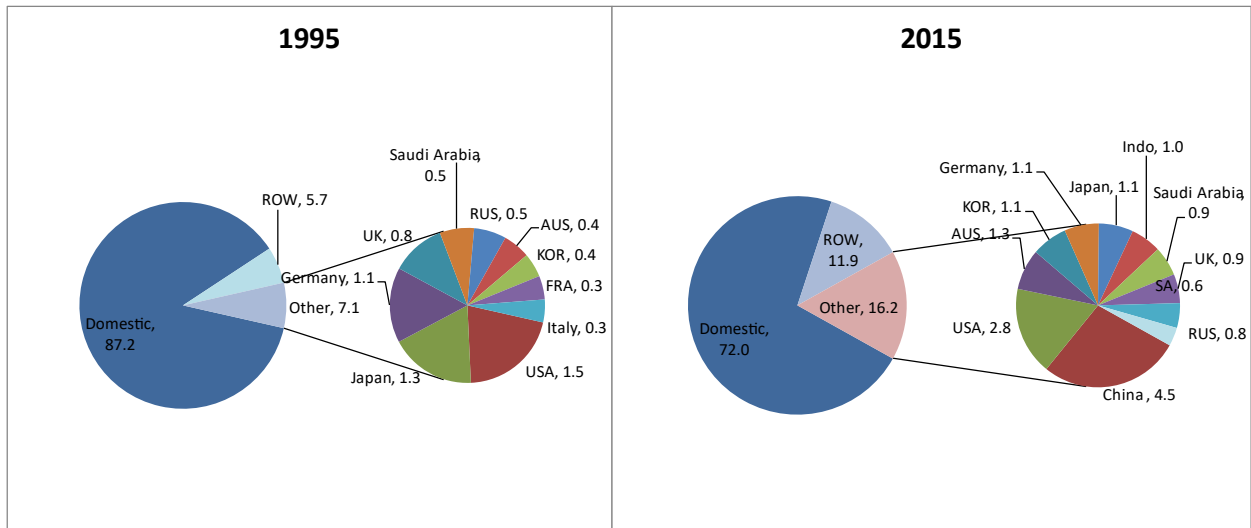
NAFTA (North American Free Trade Association): Canada, Mexico and the United States.

EU28: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom, Czech Republic, Estonia, Hungary, Poland, Slovak Republic, Slovenia, Bulgaria, Cyprus, Croatia, Lithuania, Latvia, Malta, Romania.

ZASI (East and South East Asia): Japan, Korea, Brunei Darussalam, China, Hong Kong (China), Indonesia, Cambodia, Malaysia, Philippines, Singapore, Thailand, Chinese Taipei, Viet Nam.

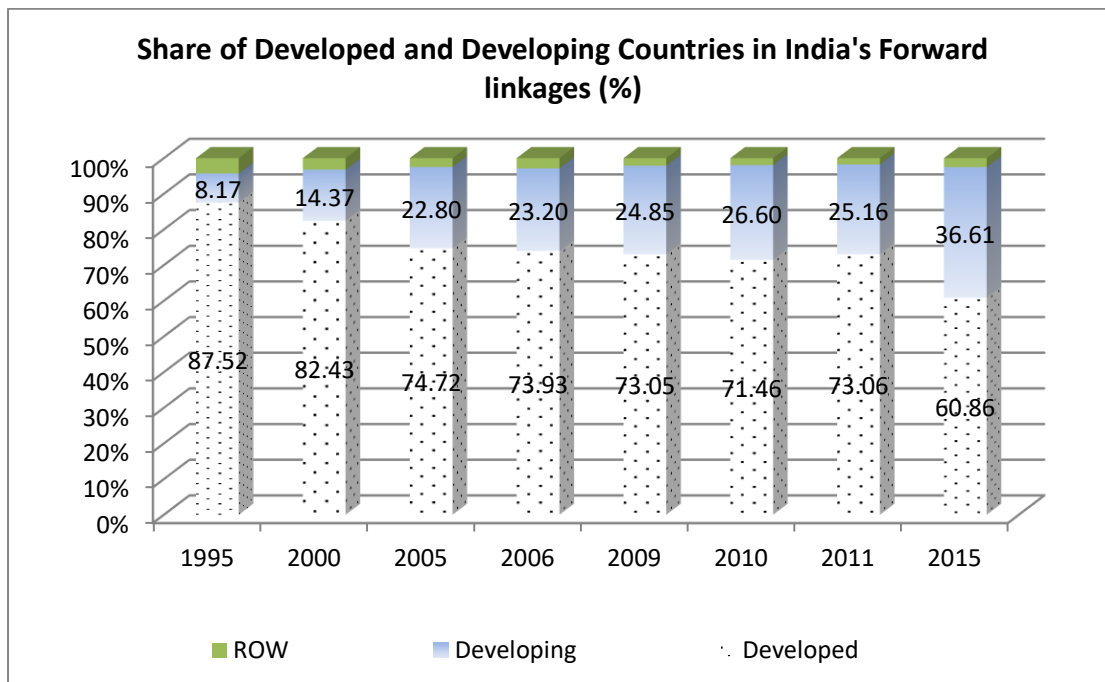
ZSCA (South and Central America): Argentina, Brazil, Chile, Colombia and Costa Rica.

Figure A3: Country-wise (Top) contribution in India's Gross Exports of the Automobile Sector in 1995 and 2015 (%)



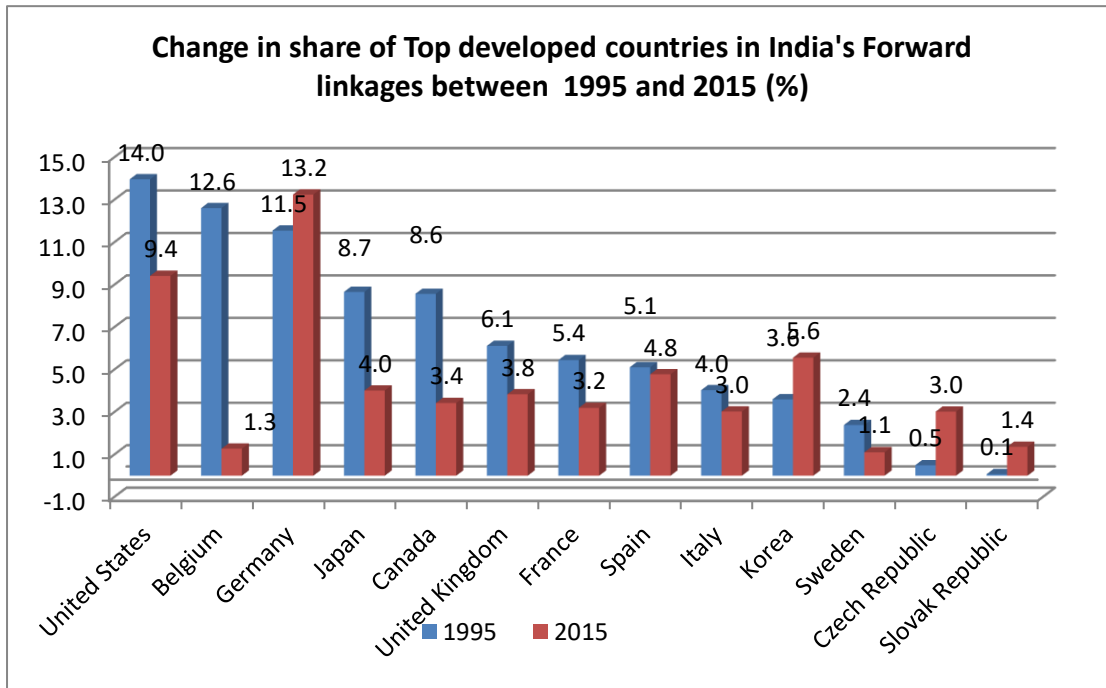
Source: OECD, TIVA database

Figure A4: Share of Developed and Developing Countries in India's Forward linkages (%)



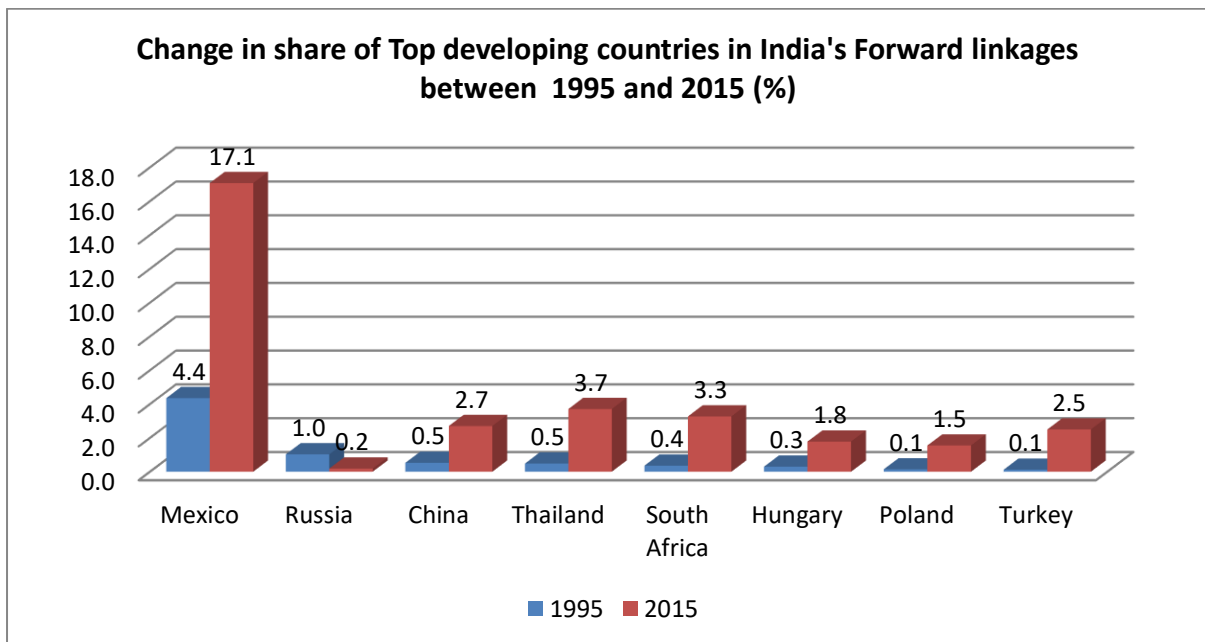
Source: OECD, TIVA database

Figure A5: Change in Share of Top Developed Countries in India's Forward linkages between 1995 and 2015 (%)



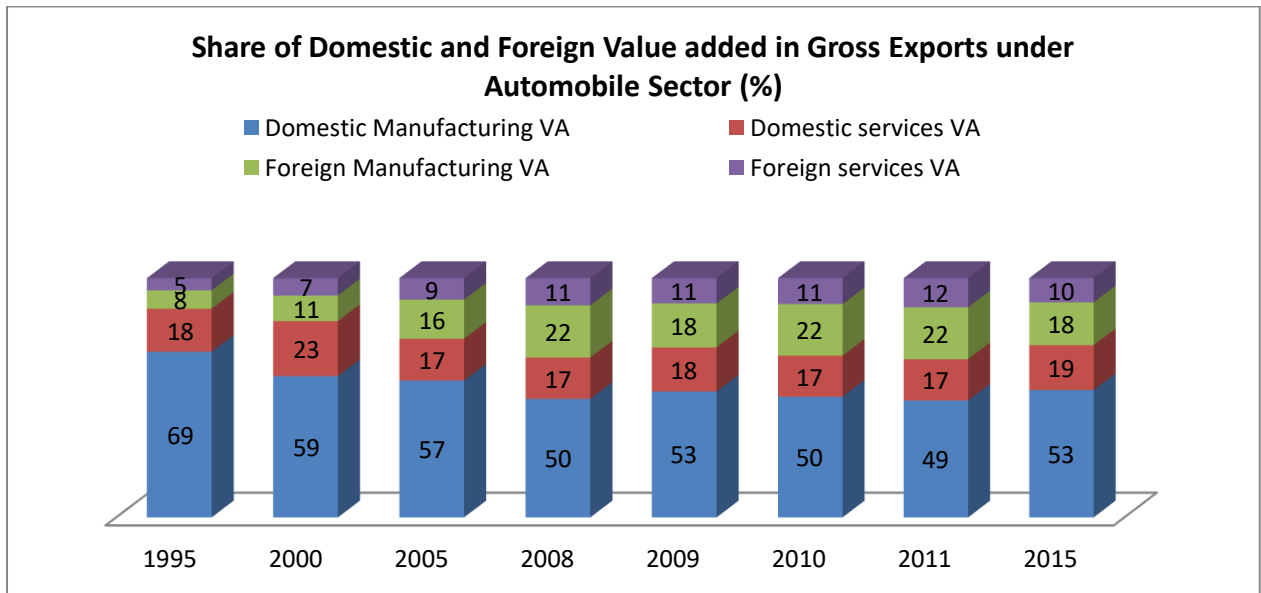
Source: OECD, TIVA database

Figure A6: Change in share of Top developing countries in India's Forward linkages between 1995 and 2015 (%)



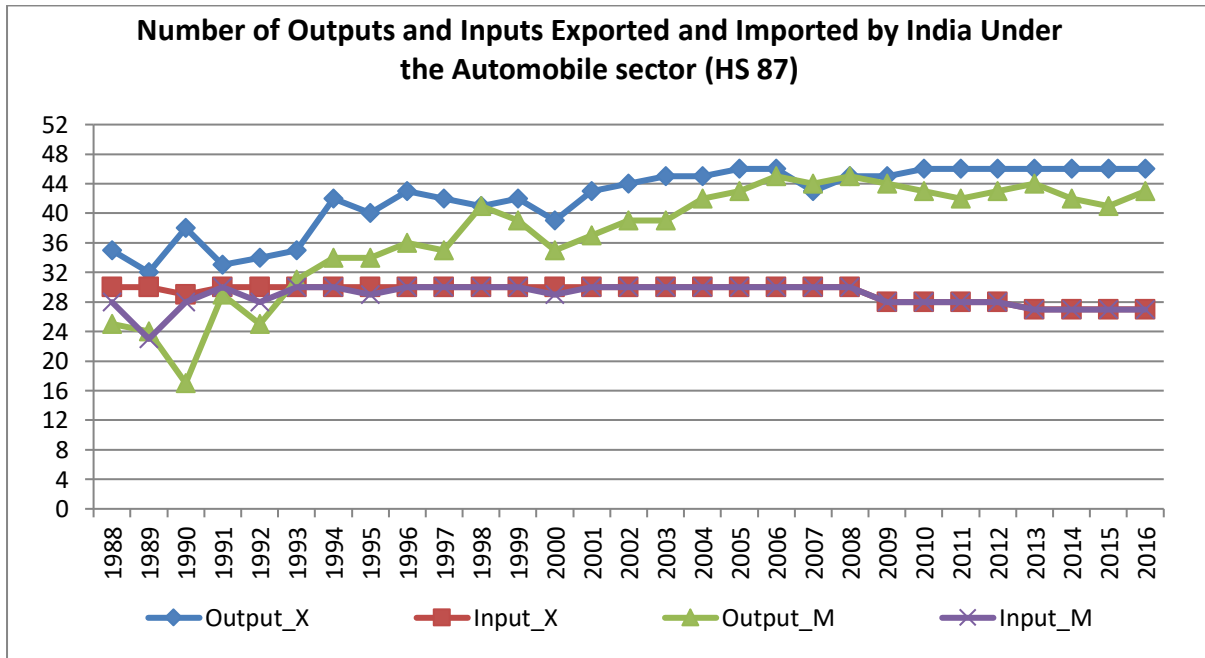
Source: OECD, TIVA database

Figure A7: Share of Domestic and Foreign Value added in Gross Exports in Automobile Sector (%)



Source: OECD, TIVA database

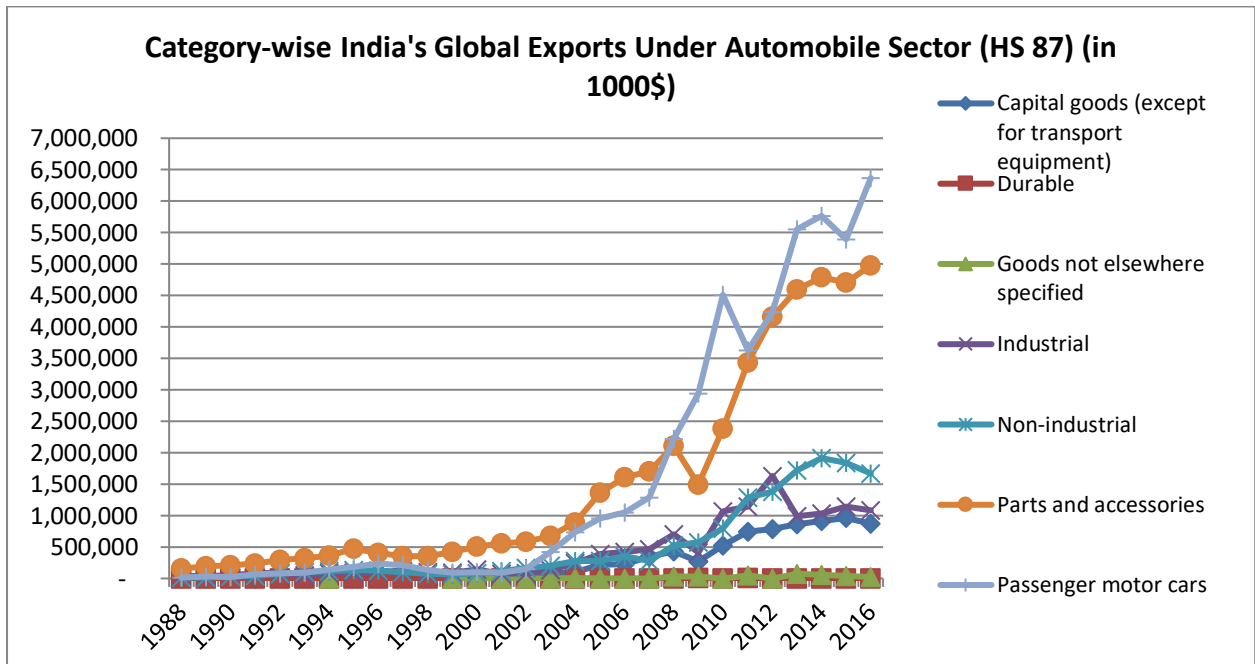
Figure A8: Number of Outputs and Inputs Exported and Imported by India under the Automobile sector (HS 87)



Source: WITS, World Bank database

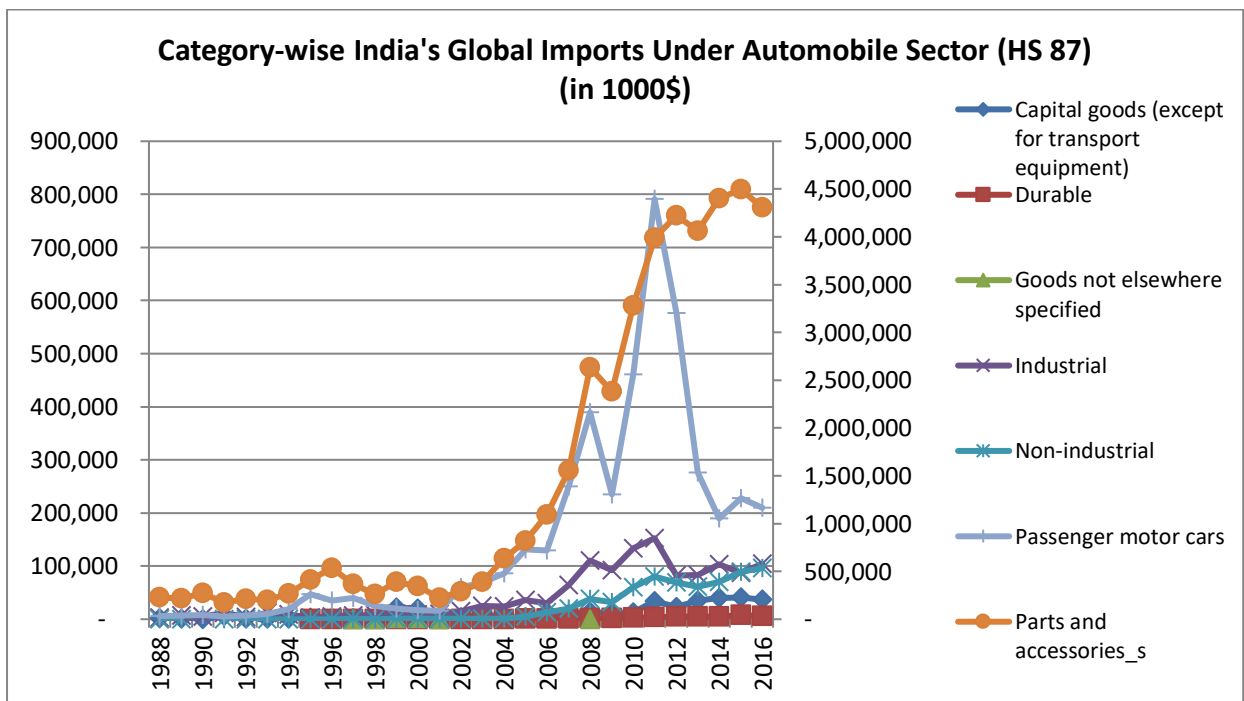
Note: _X denotes Exports and _M denotes Imports

Figure A9: Category-wise India's Global Exports Under Automobile Sector (HS 87) (in 1000\$)



Source: WITS, World Bank database

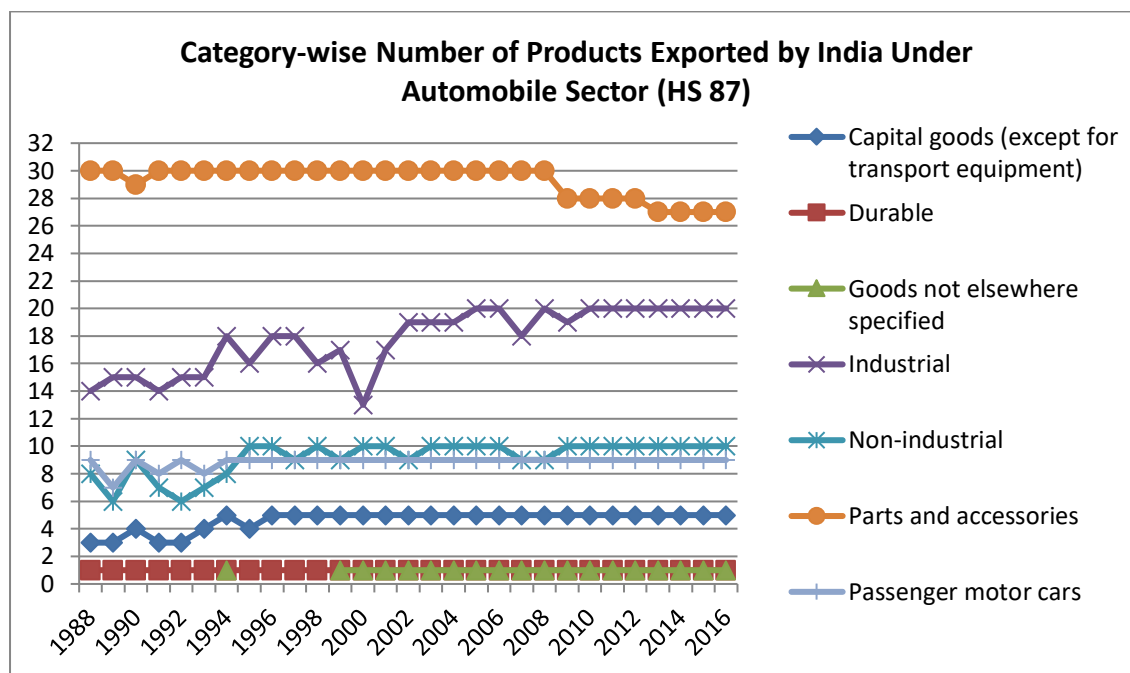
Figure A10: Category-wise India's Global Imports Under Automobile Sector (HS 87) (in 1000\$)



Source: WITS, World Bank database

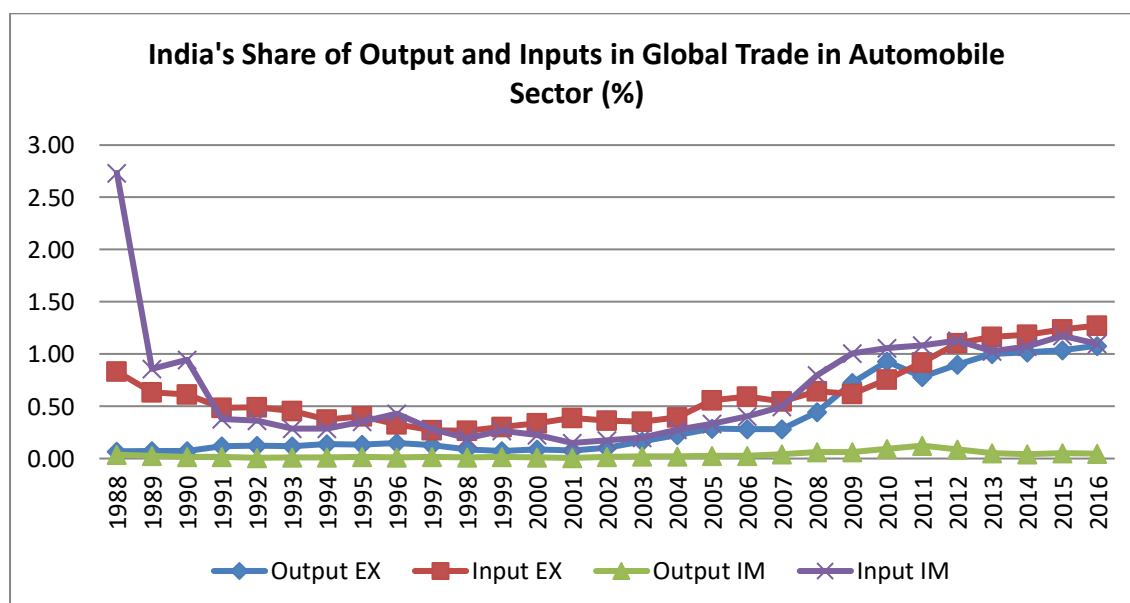
Note: for more details on different categories see Appendix table A1 and _S denotes for secondary axis

Figure A11: Category-wise Number of Products Exported by India under Automobile Sector (HS 87)



Source: WITS, World Bank database

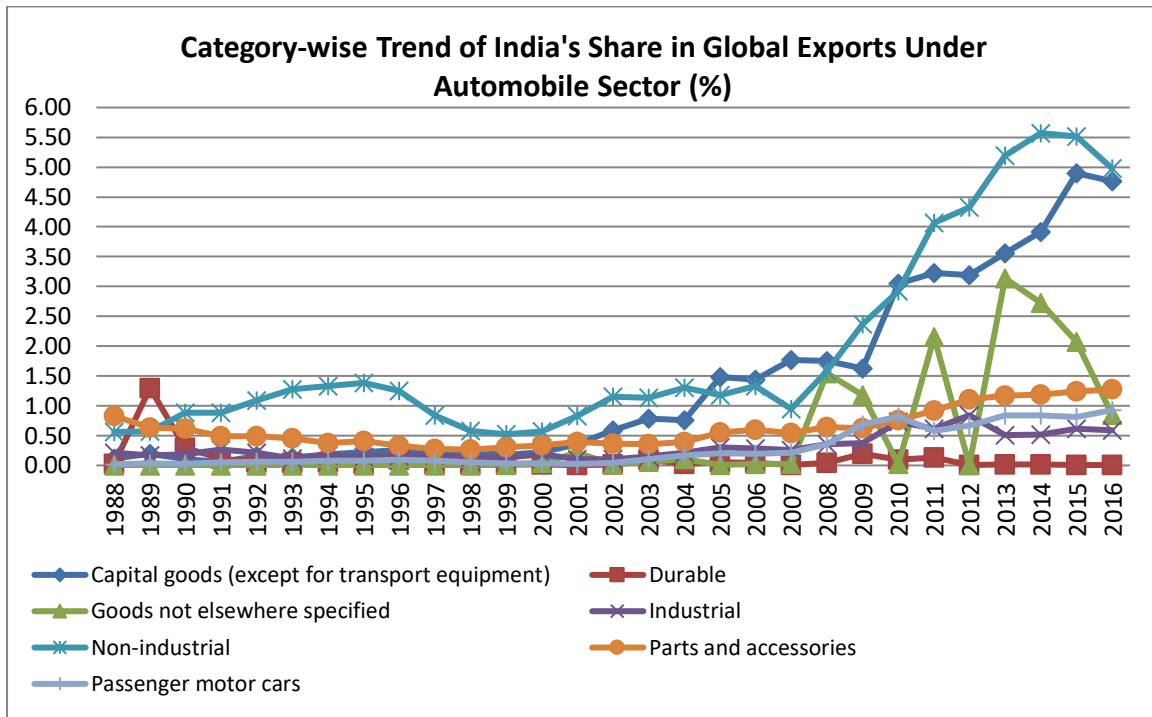
Figure A12: Trends of Share in Global Outputs and Inputs, Automobile Sector (%)



Source: WITS, World Bank database

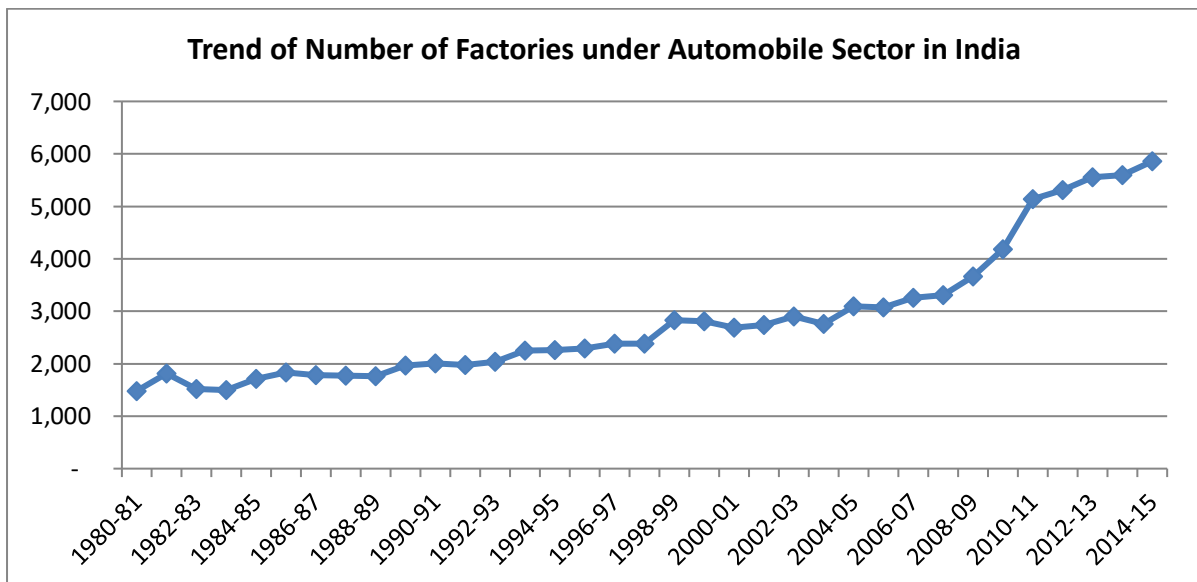
Note: EX denotes Exports and IM denotes Imports

Figure A13: Category-wise Trend of India's Share in Global Exports in the Automobile Sector (%)



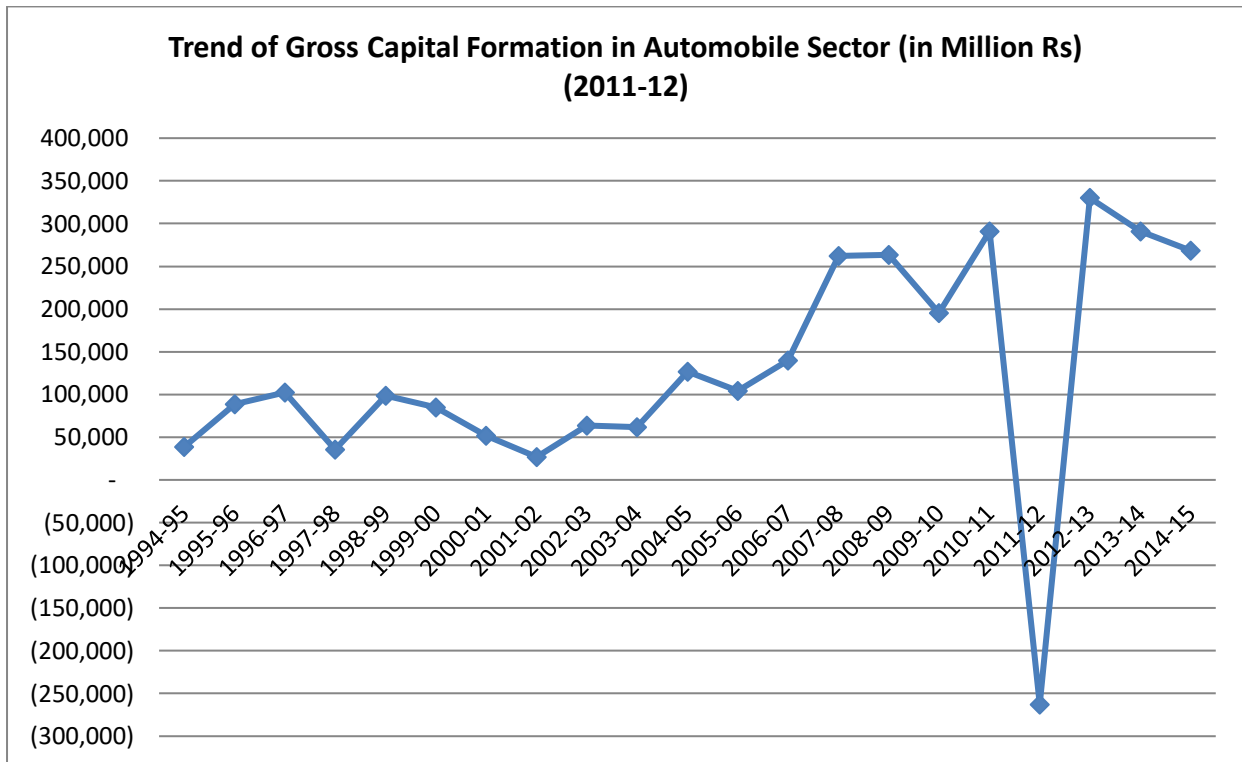
Source: WITS, World Bank database

Figure A14: Trend of Number of Factories under Automobile Sector in India



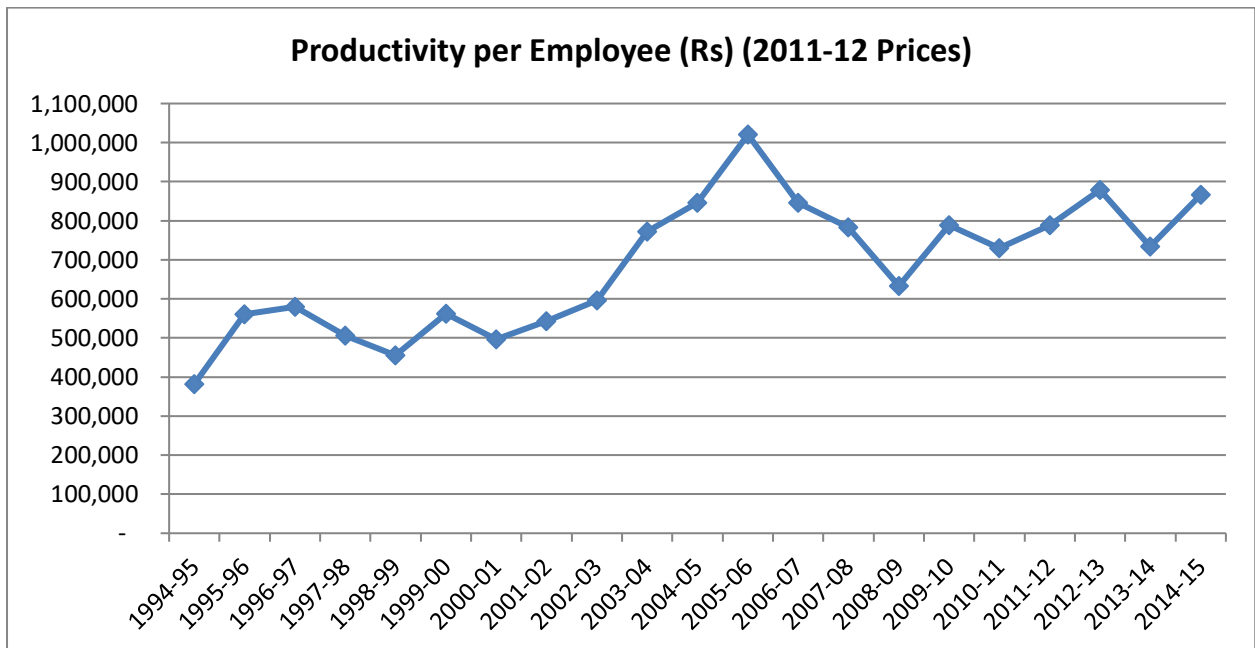
Source: Authors' calculation using EPW online database

Figure A15: Trend of Gross Capital Formation in Automobile Sector (in Million Rs) (2011-12)



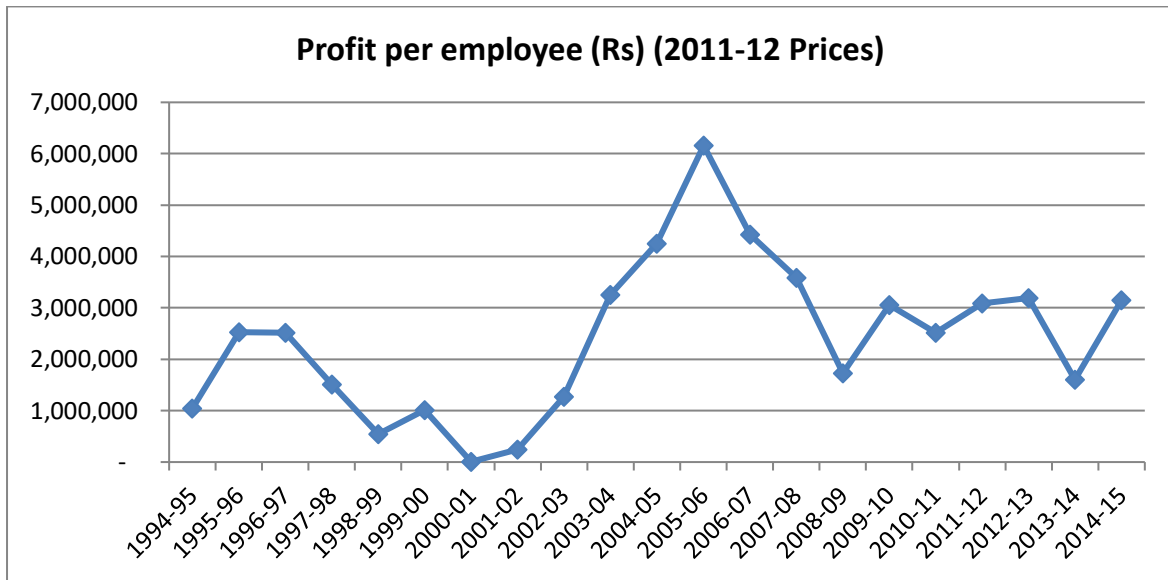
Source: Authors' calculation using EPW online database

Figure A16: Trend of Productivity per Employee (in Rs) (2011-12 Prices)



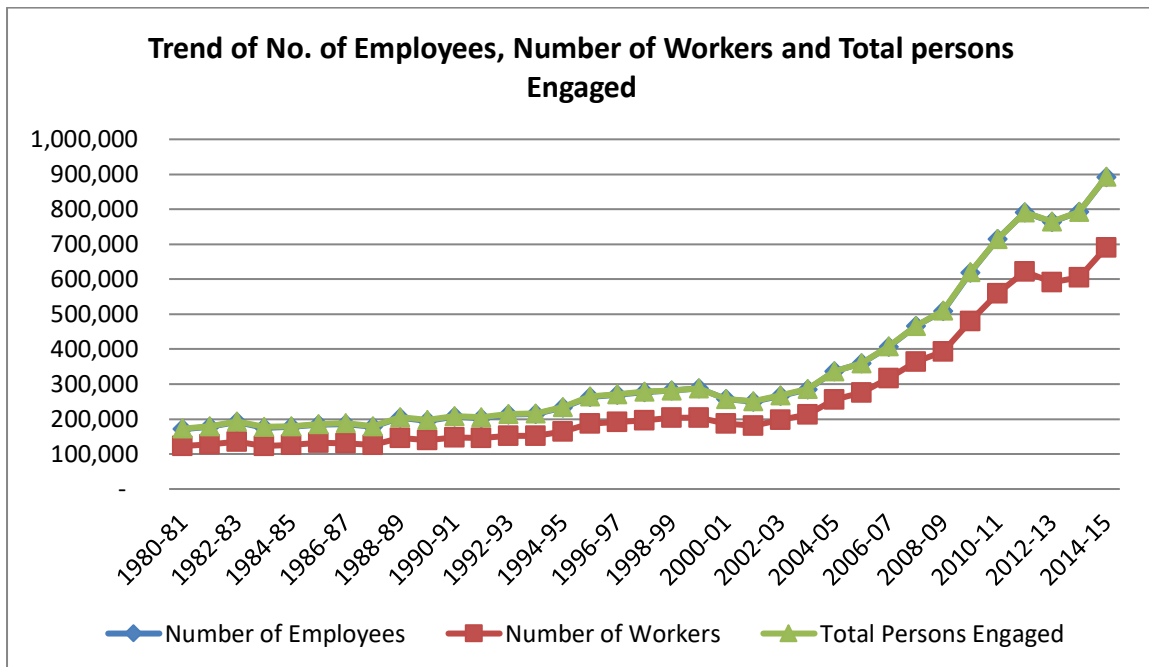
Source: Authors' calculation using EPW online database

Figure A17: Trend of Profit per Employee (in Rs) (2011-12 Prices)



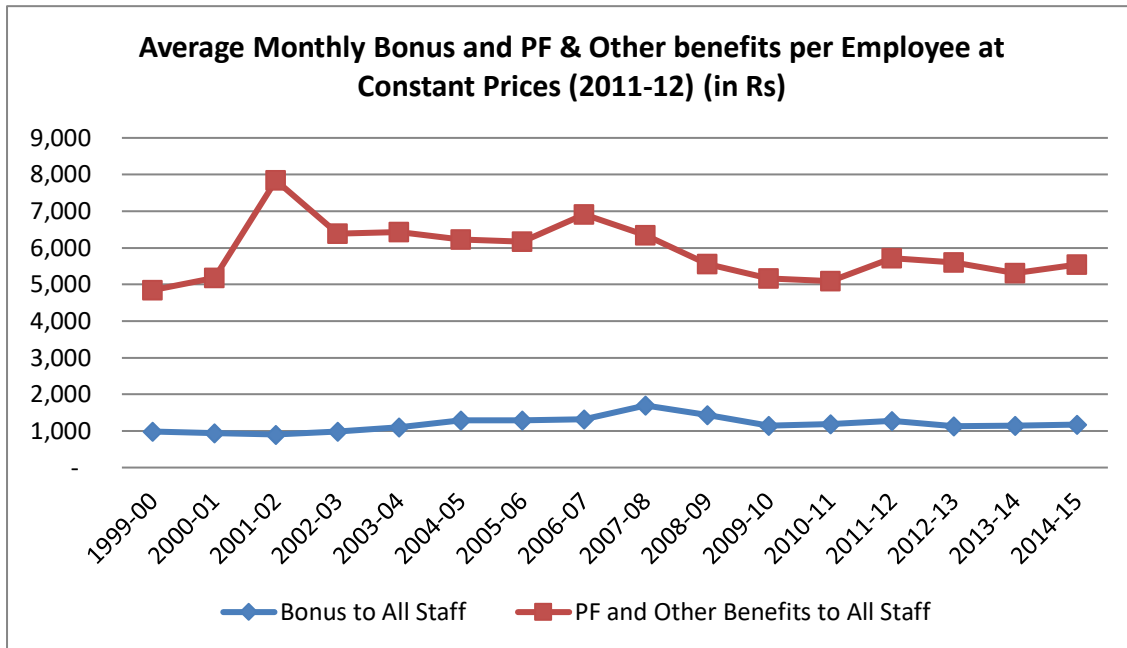
Source: Authors' calculation using EPW online database

Figure A18: Trend of No. of Employees, Number of Workers and Total persons Engaged



Source: EPW online database

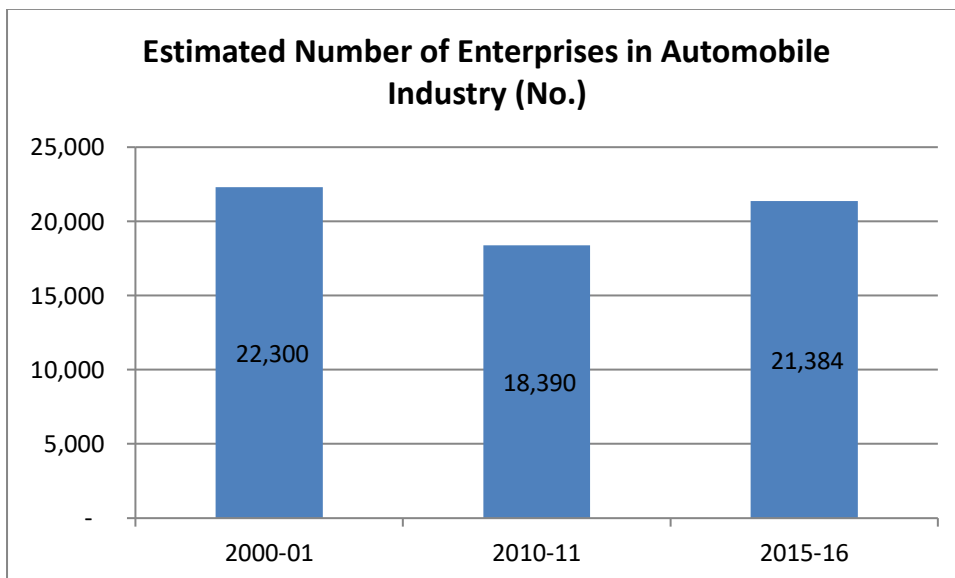
Figure A19: Average Monthly Bonus and PF & Other Benefits per Employee at Constant Prices (2011-12) (in Rs)



Source: EPW online database

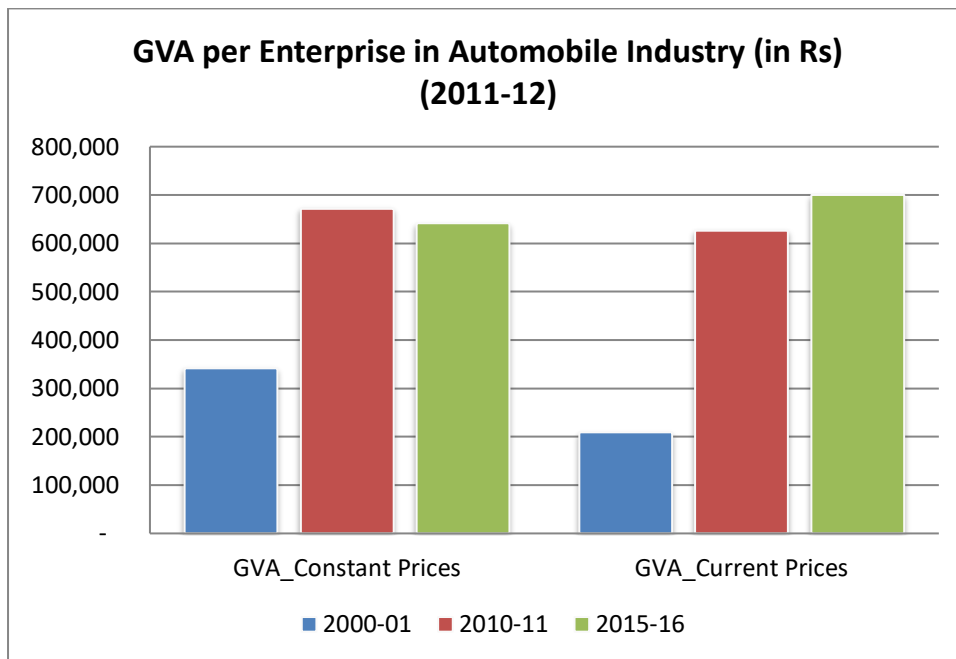
Note: All Staff: Directly employed Workers + Supervisory and managerial Staff + Other employees

Figure A20: Estimated Number of Enterprises in the Automobile Industry (No.)



Source: Authors' calculation using different NSSO rounds of UNE

Figure A21: GVA per Enterprise in the Automobile Industry (in Rs) (2011-12)



Source: Authors' calculation using different NSSO rounds of UNE

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