EVOLUTION OF GLOBAL PRODUCTION SYSTEMS AND THEIR IMPACT ON EMPLOYMENT IN INDIA

Amitendu Palit*

Fragmentation and geographical dispersion of production processes have had significant impacts upon domestic labour markets. This paper attempts to empirically identify some of these impacts on India’s labour market from a macro-economic perspective. The findings indicate substitution of unskilled labour by more skilled workers in relatively skill-intensive and high FDI-recipient industries such as automobile components and chemicals. The substitution effect is also noticed in less skill-intensive manufacturing segments like textiles and leather. The paper argues that substitution effects in these industries are weaker due to emphasis on volume-based output induced by high demand. Focusing closely on the auto components industry, the paper finds that though processes have become leaner, young firms have created new employment opportunities. The paper concludes by arguing that labour market effects of integration into global supply chains must be interpreted with caution as such effects vary widely across industries.

I. INTRODUCTION

The integration of Indian industries into global commodity chains (GCCs) has drawn attention to several issues regarding the impact of such integration on the domestic labour market. These issues mostly relate to the effects on employment, skill levels of the workforce and working conditions. Existing research in this area is conspicuously limited. This paper primarily attempts to examine the impact of evolution of global production systems on domestic employment. In doing so, it employs both micro and macro-level perspectives.

The paper studies the labour market impacts from a macro-economic perspective by employing empirical techniques. The paper then undertakes a case study of the Indian auto component industry for examining the impact of entry into global value chains at the firm level. This is followed by the conclusion.

II. INDIAN INDUSTRIES IN GLOBAL VALUE CHAINS: A MACRO-ECONOMIC PERSPECTIVE

In this section, an attempt is made to examine the macro-economic implications of the integration of Indian industries into GCCs on the domestic labour market. There are, however, some methodological problems in doing so. Different industries have moved into global commodity chains by different extents. On account of the unevenness characterising the

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integration of industries in global networks, it is somewhat difficult to capture the process macro-economically.

For overcoming the methodological difficulty, a proxy variable—foreign direct investment (FDI) inflows—is employed for assessing the extent of global integration experienced by different industries. Since FDI offers recipient industries the opportunity of becoming a part of global production systems, industries receiving more FDI can be presumed to have moved deeper into global value chains. The presumption, however, is subject to clarification, as industries receiving relatively less FDI can also figure in global production networks, particularly through ‘buyer-driven’ chains (for example, in textiles, leather, etc.), where multinational investment is directed towards non-production activities (for example, design, marketing, etc.), as opposed to ‘producer-driven’ chains. Multinational firms in ‘buyer-driven’ chains usually confine their presence in the host nations to sourcing output through franchisees or retail outlets. As India does not permit FDI in retail trade, the incoming FDI in various sectors is basically directed towards production-related activities and, to that extent, throws light upon integration in value chains of the ‘producer-driven’ variety (for example, automobiles, electronics, etc.).

Here emphasis is laid upon FDI flows across various segments of the manufacturing sector. Beginning from August 1991, the share of various industries in total manufacturing FDI is given in Table 1.

<table>
<thead>
<tr>
<th>Name of Industry</th>
<th>Share (in %)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Electrical equipment (including software and electronics)</td>
<td>23.78</td>
<td>1</td>
</tr>
<tr>
<td>2. Transportation</td>
<td>17.16</td>
<td>2</td>
</tr>
<tr>
<td>3. Fuels</td>
<td>14.60</td>
<td>3</td>
</tr>
<tr>
<td>4. Non-electrical machinery and equipment</td>
<td>12.65</td>
<td>4</td>
</tr>
<tr>
<td>5. Chemicals</td>
<td>9.49</td>
<td>5</td>
</tr>
<tr>
<td>6. Food processing</td>
<td>6.43</td>
<td>6</td>
</tr>
<tr>
<td>7. Drugs and pharmaceuticals</td>
<td>4.91</td>
<td>7</td>
</tr>
<tr>
<td>8. Metallurgy</td>
<td>2.95</td>
<td>8</td>
</tr>
<tr>
<td>9. Textiles</td>
<td>1.88</td>
<td>9</td>
</tr>
<tr>
<td>10. Paper</td>
<td>1.77</td>
<td>10</td>
</tr>
<tr>
<td>11. Cement</td>
<td>1.75</td>
<td>11</td>
</tr>
<tr>
<td>12. Rubber</td>
<td>1.27</td>
<td>12</td>
</tr>
<tr>
<td>13. Beverages and tobacco</td>
<td>0.43</td>
<td>13</td>
</tr>
<tr>
<td>14. Fertilisers</td>
<td>0.43</td>
<td>13</td>
</tr>
<tr>
<td>15. Leather</td>
<td>0.27</td>
<td>15</td>
</tr>
<tr>
<td>16. Vegetable oils</td>
<td>0.13</td>
<td>16</td>
</tr>
<tr>
<td>17. Sugar</td>
<td>0.10</td>
<td>17</td>
</tr>
<tr>
<td>18. Cosmetics</td>
<td>0.01</td>
<td>18</td>
</tr>
</tbody>
</table>

Source: Ministry of Commerce and Industry, SIA, Government of India.

Electrical equipment (including software and electronics) and transportation (essentially automobiles and auto ancillaries) are the two largest recipient sectors of FDI. Between them,
these two industries account for more than two-fifths of the total manufacturing FDI. Other industries that have attracted relatively more FDI are fuels (petroleum and electricity), non-electrical equipment, chemicals, and food processing, which together account for roughly another two-fifths of the total manufacturing FDI. These six industries (that is, electrical equipment, transportation, fuels, chemicals, non-electrical equipment and food-processing) have drawn almost 85 per cent of the total manufacturing FDI till date. These industries can, therefore, be expected to have moved deeper into global commodity chains as compared to others.

Six more industries (that is, drugs and pharmaceuticals, metallurgy, textiles, paper, cement, and rubber), between them, account for little more than 13 per cent of the total manufacturing FDI. The remaining six industries (that is, beverages and tobacco, fertilisers, leather, vegetable oils, sugar, and cosmetics) encompass roughly 1.5 per cent of the total manufacturing FDI. The above eighteen industries are grouped in Table 1 into three categories for analytical convenience. These three groups are called ‘high FDI-receiving industries’, ‘moderate FDI-receiving industries’, and ‘low FDI-receiving industries’, respectively. The three groups are classified as follows:

(a) **High FDI-receiving Industries**: These include industries having more than a 5 per cent share in the total manufacturing FDI. The group comprises six industries (electrical equipment, transportation, fuels, chemicals, non-electrical equipment and food processing). These are ranked 1 to 6 in Table 1.

(b) **Moderate FDI-receiving Industries**: This group includes industries having shares ranging between 1 per cent and 5 per cent in the total manufacturing FDI. The group comprises six industries (drugs and pharmaceuticals, metallurgy, textiles, paper, cement and rubber) and are ranked from 7 to 12 in Table 1.

(c) **Low FDI-receiving Industries**: This group includes industries having less than a 1 per cent share in the total manufacturing FDI. The group comprises six industries (beverages and tobacco, fertilisers, leather, vegetable oils, sugar and cosmetics), which are ranked from 13 to 18 in Table 1.

The industry-wise distribution of FDI flows reveals a concentration of FDI in some particular industries. This ‘bunching’ occurs in spite of a largely uniform FDI policy followed by India, allowing foreign investment under the automatic route in practically all sectors of the economy. The sectoral discrimination exhibited by incoming FDI draws attention to the role of industry-specific characteristics in encouraging/discouraging FDI.

Empirical research on industry-specific determinants of FDI in India is limited. Evidence from this limited literature points to the concentration of FDI in advertising and skill-intensive industries (Kumar, 1987). Further, cheap skilled labour is found to be instrumental in attracting FDI to electronics and chemical industries (Gupta and Mehra, 1995). None of the existing empirical studies, however, attempts to explain the industry-wise variation in FDI flows, since the beginning of economic reforms in India in the early 1990s, in terms of specific industry characteristics such as industry size, factor-intensity, etc.
The pattern of employment is examined in eighteen manufacturing industries (as in Table 4), subsequently divided into high, moderate, and low FDI-receiving industries, over a period of time. This is done by separating the labour force in these industries into skilled and unskilled categories. This is a critical distinction, as entry into global value chains has direct implications for the skills and capabilities of the industrial workforce. For local industries gaining access to global production networks, skill enhancement is essential for sustaining value addition and moving up the chain. Indeed, the necessity for upgrading skills is likely to encourage substitution between unskilled and skilled labour. Such substitutions are expected to be reflected in the changing compositions of industrial workforces.

Data from the Annual Survey of Industries (ASI) for the period 1994-95 to 2003-04 is used for the empirical analysis. For obtaining a deeper insight on some of the industry groups, and for conformity with classifications between the ASI and SIA (the data source used in Table 4 earlier), vehicles (including heavy vehicles and two-wheelers) and transport equipment are taken to reflect the transportation industry (that is, automobiles and auto ancillaries) in Table 1, and electrical machinery and electronics, to reflect electrical equipment. Due to lack of data, the cement industry has been dropped from the analysis.

The detailed findings on the rate of growth of employment in different industries are given in Appendices 1-4. Appendix 1 contains the growth rates of employment, while Appendices 2-4 give pictorial depictions of employment trends in select industries. The main results are delineated below.

1. High FDI-Receiving Industries

(a) During the period 1994-95 to 2003-04, total employment increased for all industries in this category, except non-electrical machinery. In chemicals and transport equipment, the average annual rate of growth employment was more than 4 per cent, while in fuels, food processing, electronics, and vehicles, the growth varied between 3.5 per cent and 3.1 per cent. While the annual growth of employment in electrical machinery was around 1.6 per cent, the size of the labour force in non-electrical machinery remained virtually unchanged.

(b) The average annual growth rates of skilled workers in transport equipment (9.3 per cent), chemicals (5.0 per cent), food processing (3.7 per cent), and electrical machinery (2.0 per cent), were more than those of unskilled workers, as well as the total industrial labour forces. In electronics and vehicles, the growth of skilled workers was around 3 per cent, and for fuels, around 2 per cent.

(c) Transport equipment experienced the sharpest growth of skilled workers. The composition of the workforce in equipments has become much more skill-intensive with more than two-fifths of the labour force comprising skilled labour in 2003-04 vis-à-vis one-fifth a decade ago. The growth rate of skilled workers in this industry shows a positive trend, while that of unskilled workers is seen to decline (see Appendix 2a). The trends underline a substitution of unskilled labour by more skilled employees.
(d) Like transport equipment, growth trends, pointing towards increasing substitution, are seen in chemicals as well (Appendix 2b). Such trends are also visible in the food processing industry (Appendix 2c), though the rate of substitution appears to have slowed considerably.

(e) The growth of unskilled workers has been the highest for fuels (4.3 per cent) and chemicals (4.2 per cent). Employment growth in fuels (comprising petroleum and refinery) has been largely driven by growth in the number of unskilled workers. The higher growth of unskilled workers (3.4 per cent and 3.1 per cent, respectively) vis-à-vis that of skilled workers (3.2 per cent and 2.9 per cent, respectively) in vehicles and electronics is somewhat unexpected. For vehicles, the results appear to have been influenced by the two-wheeler segment, which has experienced a sharp growth in the number of unskilled workers. In contrast, the growth of skilled workers has been greater for heavy vehicles.

2. Moderate FDI-receiving Industries

(a) The total employment has increased in all industries in this group. The average annual rate of growth of employment has been the highest for rubber (4.6 per cent), followed by drugs and pharmaceuticals (4.1 per cent). Textiles and paper have experienced almost similar growth rates (2.9 per cent and 3.0 per cent, respectively), while metallurgy has grown at a lower rate of 1.8 per cent.

(b) In the textiles, paper, metallurgy, and rubber sectors, the growth of skilled workers has exceeded that of unskilled workers, as well as the total labour force. Drugs and pharmaceuticals is the only industry wherein the growth of skilled workers has been lower than that of both unskilled workers and total workers.

(c) The rubber (4.7 per cent) and textiles (4.6 per cent) sectors have experienced the largest growth in the number of skilled workers. While the rubber industry has experienced an almost similar high growth of unskilled workers too, the growth of skilled workers in textiles has far outpaced that of unskilled workers (2.7 per cent). Although the textiles industry continues to be dominated by unskilled workers (roughly 15 per cent of the workforce comprises skilled workers), there is evidence of growing skill intensity, and concomitant substitution (see Appendix 3a). Interestingly, like food processing, there appears to be a convergence between the growth trends of skilled and unskilled workers in textiles as well. In metallurgy also, in spite of the growth of skilled workers (3.0 per cent) being much higher than that of unskilled workers (1.4 per cent), the growth trends appear to be converging sharply (see Appendix 3b).

(d) The growth of unskilled workers (4.6 per cent) has been much more than that of skilled workers (3.5 per cent), as well as of the total workforce (4.1 per cent), in drugs and pharmaceuticals. This might be explained by the presence of a large number of firms manufacturing low-end products like bulk drugs in the industry, which rely more on unskilled labour, as opposed to a limited number of firms producing higher value added products like formulations.
3. **Low FDI-receiving Industries**

(a) Except for the sugar industry, wherein the average annual growth in total employment has been almost negligible (0.06 per cent), employment has increased in all industries. The highest increase has been in vegetable oils (6.9 per cent), followed by beverages and tobacco (4.3 per cent), leather (3.5 per cent), cosmetics (3.1 per cent) and fertilisers (2.7 per cent).

(b) The growth of skilled workers in vegetable oils (7.2 per cent), fertilisers (3.4 per cent), leather (5.8 per cent), and cosmetics (4.9 per cent), has exceeded the corresponding growth in unskilled workers and total employment. The difference between the rates of growth of skilled and unskilled workers is particularly marked in the leather and cosmetics sectors, wherein the growth of unskilled workers has taken place at the much lower levels of 3.1 per cent and 2.6 per cent, respectively. The growth trends in these two industries reveal contrasting scenarios. While in the leather sector, the process of substitution of skilled labour for unskilled appears to have reversed, the cosmetics industry shows a different trend (see Appendices 4a and 4b).

(c) The only industry, wherein the relative growth of unskilled workers is found to be higher than that of skilled workers, and of the total employment, is that of beverages and tobacco. Unskilled worker growth is also high in vegetable oils, wherein the growth of the skilled workers’ industry has been nearly commensurate.

4. **Analysis and Interpretation of Results**

The objective in this section was to study the labour market implications of integration of Indian industries into global commodity chains from a macro-economic perspective. Accordingly, FDI flows were posited across industries as indicators of the extent by which such industries have dug into global value chains. The industries were divided into high, moderate and low FDI-receiving groups, assuming such classifications to reflect the degree of global integration achieved by the categorised industries, and an attempted was made to examine the employment patterns in each industry category with particular reference to skilled and unskilled workers.

An emergent pattern of substituting unskilled labour by skilled workers can be noticed in some industries. However, this pattern varies across industries. Among the high FDI-receiving industry segments, which are more likely to represent producer-driven commodity chains, strong substitution is noticed in transport equipment and chemicals. Such substitution, however, appears to have slackened in food processing. The same slackening is also evident in textiles and metallurgy among the moderate FDI-receiving industries. Among the low FDI-receiving industries, the process of substitution appears to have reversed in leather, but strengthened in cosmetics.

What do these contradicting trends imply? As far as high the FDI-receiving, producer-driven chain-oriented industries like automobiles and chemicals are concerned, there appears to be a clear tendency towards greater skill orientation. Increasing skill intensity might also be acting as a ‘pull’ factor for FDI in these segments. It is possible that in other high FDI-
receiving segments like passenger cars also, wherein significant global assimilation was noticed earlier, such tendencies are gaining ground. Due to the lack of data, this category could not be examined separately.

Among other industries displaying substitution, food processing, textiles, and leather, have primarily moved into chains of the ‘buyer-driven’ variety (food processing, however, is an interesting example of segmentation into both varieties). All these industries are heavily labour-intensive. Although they enjoy the size advantage, they are not intrinsically skill-, or import-intensive. As has been seen earlier, in all these industries, there is increasing emphasis on greater value addition. Local firms in these industries appear to have realised that retaining competitive advantages only through low-cost labour is untenable and have started focusing towards facilitating higher skills for value addition. In spite of these realisations, however, growing demand seems to have shifted the focus of a majority of firms in these industries towards volume, rather than value, leading to reducing rates of substitution of skilled labour for unskilled labour. Individual factors like the anticipation of higher volumes in the post-MFA quota regime (since 1 January 2005) and the urgency to build up garment stocks for responding to the expected higher global demand, a sharp increase in the demand for processed foods from various sectors of the economy fuelled by rapid urbanisation, and pollution-related difficulties affecting technology and skill upgradation for leather firms along with the continuation of small-scale reservations in tanning and some final products, may also explain the observed trends. In contrast, the cosmetics industry, which is carving out niches largely in upmarket segments, and is increasingly striving to achieve higher value through non-production activities like design, packaging and marketing, is experiencing a buoyant demand for skilled labour.

III. A CASE STUDY OF THE AUTO COMPONENT INDUSTRY

As discussed in Section II earlier, among Indian industries that have embedded deep into global production networks, the auto component industry is a leading one. The component industry in India can be divided into six broad product categories in terms of the nature of products being manufactured. The classification, as followed by the Automobile Component Manufacturers Association (ACMA) of India, along with products manufactured and the market share of each major product group, is shown in Table 2.

Engine parts constitute the largest product group in terms of market share. Most of the products in this category are hi-technology items, whose production requires adherence to strict quality norms and precision delivery. Such characteristics and requirements are relatively less in other product groups.

The growth and expansion of the components industry are intricately linked to those of the automobile industry. In recent years, the entry of a large number of global original equipment manufacturers (OEMs) in the passenger car and multi-utility vehicle segments has resulted in a manifold increase in the demand for components. While OEM requirements constitute a major source of demand for component manufacturing firms, replacement demand from vehicle owners has also augmented the overall demand for components. In addition, many
Indian component manufacturers are supplying directly to global OEMs located overseas, as well as catering to overseas replacement markets. All these developments have ushered in a phase of brisk growth and expansion for the component industry.²

### 1. Integration into Global Value Chains

Since the introduction of outward-oriented external sector policies in India, which permitted foreign participation in the domestic automobile industry, India’s auto component manufacturers have been exposed to global product standards, designs and specifications. Such exposure has brushed off positively on several manufacturers and has enabled them to upgrade their products significantly. As a result, many companies have slowly positioned themselves at commercially significant points in the supply value chains. The value chains in the automobile industry,³ which grow through interesting, and often complex strategic alliances between the lead firms (OEMs),⁴ tier 1, and tier 2 companies, have proliferated in the Indian automobile industry. These chains are not necessarily linear and unidirectional between OEMs, tier 1, tier 2, and further lower tier firms, in the mentioned order. Tier 2 firms for a particular OEM, for example, can also be tier 1 firms for other global OEMs, at the same time. The upshot of such varied linkages is the growth of diverse, heterogeneous, unique value chains, based on need-based strategic alliances.

From an industry perspective, component manufacturers have had different distinct avenues for moving into global supply chains. The first, and most common among these, has been as vendors for major domestic OEMs. A large number of prominent global OEMs are now based in India.⁵ The component demand from these OEMs has acted as a major source of upgradation for local manufacturers, since these OEMs have not only pushed firms into supplying technology-intensive, quality products, but have also exerted pricing pressures, thereby forcing the local firms to strive for efficiency. At the same time, many local firms have also been supplying directly to several international OEMs, which are not located in India, through exports. Such exports have picked up sharply in recent years,⁶

#### Table 2
**A Product Profile of Auto Component Industry in India**

<table>
<thead>
<tr>
<th>Product group</th>
<th>Product</th>
<th>Market share (in terms of share in total production)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Engine parts</td>
<td>Pistons, piston rings, engine valves, carburetors, diesel-based fuel delivery systems</td>
<td>23%</td>
</tr>
<tr>
<td>2. Electrical parts</td>
<td>Starter motors and generators</td>
<td>7%</td>
</tr>
<tr>
<td>3. Drive transmission and steering parts</td>
<td>Gears, clutches, axles</td>
<td>14%</td>
</tr>
<tr>
<td>4. Suspension and braking parts</td>
<td>Brakes, leaf springs, shock absorbers</td>
<td>11%</td>
</tr>
<tr>
<td>5. Equipment</td>
<td>Headlights, dashboard instruments</td>
<td>8%</td>
</tr>
<tr>
<td>6. Others</td>
<td>Sheet metal parts, pressure die castings, tyre tube valves and cores</td>
<td>36%</td>
</tr>
</tbody>
</table>

*Note: The market shares are for the organised sector for the year 2003.
Source: Indian Credit Rating Agency (ICRA), (2005).*
primarily on account of low labour costs enjoyed by the Indian industry. According to some industry estimates, wages in India are as much as 60 per cent less than those in developed country markets.\footnote{7}

Many local firms supplying to global OEMs based in India are also catering to other OEMs overseas. Aditya Auto Products, a Karnataka-based firm manufacturing window regulators and door latches, supplies to General Motors and Maruti, two major domestic OEMs. Among international OEMs, however, it does not supply to General Motors, but to West Field Sports Car and Countax PLC Ltd in UK. At the same time, it also supplies to several overseas tier 1 companies. Amtek Auto,\footnote{8} while supplying to Honda and Daewoo in India, simultaneously supplies to Isselberg, Renault, Mitsubishi and Chrysler in other countries. Bharat Forge Ltd., one of the largest component manufacturing firms in India, supplies primarily to Maruti and Tata Motors among domestic OEMs, but has a large gamut of international customers, including Ford, Chrysler, Renault and Volvo.

It is evident from these examples that Indian component manufacturers have not relied only upon domestic OEMs for securing further access to global production networks. Rather, they have successfully carved out alliances with overseas customers independent of their domestic customers. As a result, insofar as the structure of supply chains is concerned, if such chains are examined from the perspective of component manufacturing firms, which are usually positioned at tiers 1 or 2, the upstream linkages appear to be widely diverse and spatially scattered.

A sizeable demand for automobile components also stems from replacement markets. In India, the replacement demand for components is fairly high due to a variety of factors, including poor road infrastructure, difficult driving conditions, and longer age of vehicles, which lead to fast wear and tear of components and the consequent demand for replacements. The large segment of informal manufacturers primarily cater to the domestic replacement market. However, in a significant development over the last few years, component manufacturers from India have started catering to replacement markets overseas as well. Such exports have created another opportunity for component manufacturers to figure in global supply chains. In overseas replacement markets, the Indian firms are largely meeting the maintenance demand for models that are not current since local manufacturers in these markets are focusing more on relatively current designs. Replacement exports from India are moving in several directions and are penetrating both the developed as well as emerging country markets in the US, Europe, Asia and Latin America.

Prominent Indian component firms supplying extensively to domestic, as well as international OEMs, have also entered the overseas replacement markets. Bharat Forge, one of the most established component manufacturers firms, simultaneously supplies to leading global domestic OEMs (for example, Toyota and Maruti), international OEMs (for example, Chrysler, Renault and Volvo) as well as replacement markets (for example, Sri Lanka and Dubai). Similarly, Brakes India Ltd., one of the leading firms manufacturing brake equipments and cylinders, supplies to domestic OEMs like General Motors, Honda and Toyota, international OEMs like AGCO Ltd. (UK), Chrysler (Indonesia), and Textron
(UK), and to a wide range of overseas replacement markets including Australia, Bangladesh, China, Indonesia, Kenya, Malaysia, Mauritius, Mexico, Middle East, Morocco, and New Zealand.

It is clear that for Indian firms pushing into global supply chains, the scope and nature of integration have often differed. For supplying to OEMs—both domestic and international—local firms have imbibed tough requirements and specifications, and have upgraded the technological content and applications of their products, thereby moving up the supply chains. However, replacement market demand is usually much less technology-intensive and more standardised. With many prominent firms meeting such demand as well, their product profiles have assumed interesting mixes in terms of technology intensity and specifications. Although not documented as such, it is quite likely that for meeting replacement demands in overseas markets, the larger Indian firms have been tapping local informal units at some levels, primarily because the latter provide replacements at cheaper rates and larger volumes.

The links between the formal and informal sectors are arguably higher in the domestic replacement market. Quite a few tier 1 and tier 2 firms serve the replacement market. These firms usually supply spares for replacing parts in vehicles produced by the OEMs. Several organised sector tier 1 and tier 2 firms, supplying such spares, are probably sourcing both finished products as well intermediates from small informal enterprises, thereby creating direct backward linkages between higher tier firms and the informal sector. The informal sector firms are also supplying directly to the price-elastic replacement market, wherein the sector enjoys distinct advantages in terms of both value and volume.

Both the domestic and overseas demand has enabled component manufacturers to penetrate into global production networks. However, such inroads would not have been possible in the absence of effective collaborations, mostly technical, with foreign counterparts. Almost all notable component manufacturers have collaborations with foreign firms with Japanese firms enjoying the largest number of tie-ups with Indian firms. This is, of course, not surprising, since Maruti Udyog Ltd.—one of the earliest joint ventures in the automobile industry between Maruti Udyog of India and Suzuki of Japan—played a key role in upgrading the quality of sourced components from local vendors in line with specifications delineated by sophisticated Japanese processes. As mentioned in Section II earlier, the components cluster in Gurgaon in Haryana has been a major beneficiary of the growth of Maruti, along with firms that upgraded subsequently by catering to Japanese OEMs like Mitsubishi and Toyota.

2. Results Revealed by Study of a Select Sample

In order to study the impact of the entry into global supply chains on component manufacturers, a group of manufacturers was selected from different segments of the component industry. The main criteria behind the selection of the sample was supplying to two major global OEMs located in India—Hyundai and Ford. It was felt that component manufacturers supplying to both these OEMs are integral parts of the cross-border production chains run by the latter. There are twenty-two such vendors in all, located in different parts of India. All these
manufacturers belong to the organised segment of the component industry and are registered with the Automotive Component Manufacturers Association of India (ACMA).

The main conclusions drawn from a close study of the sample are as follows:

(a) Mostly large and medium firms supply to Hyundai and Ford. In the entire sample, there are only three small firms,\(^{10}\) while there are eight large firms comprising around 35 per cent of the sample size and eleven medium firms accounting for 47 per cent of the sample size.

(b) Age-wise, the firms present an interesting mix. Among large firms, four are relatively young (between 8-14 years old), while among the rest, three are more than four decades old and another is almost three decades old. Similarly, among medium vendors, only four are relatively young. The small firms, however, are relatively young.

(c) Out of eight large firms, three supply only to OEMs in India. The other five also supply overseas, out of which only one firm caters to international OEMs, tier 1 companies, as well as the replacement market. Two other firms serve international OEMs as well as replacement markets.

(d) Except two, all medium-sized vendors of Hyundai and Ford are supplying overseas. Five of these supply to replacement markets, out of which three cater to international OEMs, including tier 1 companies. The remaining four firms supply only to domestic and international OEMs.

(e) None of the small vendors of Hyundai and Ford supply to international OEMs. However, two of these are active in overseas replacement markets.

(f) All large firms, except one, have foreign collaborations, out of which two have multiple collaborations. Apart from Japanese partners, the local firms have technical and financial tie-ups with American, British, German, Korean and Spanish partners. Only one large firm has a collaboration with a majority foreign stake, one medium-sized firm has a majority foreign stake, while the medium firms have tie-ups with American, Korean, Japanese and Swedish firms. Three medium firms do not have any collaboration. Among small firms, only one has a technical tie-up with a Japanese company.

(g) For all firms, irrespective of size, supplying to domestic OEMs continues to remain the biggest market.

(h) Employment is seen to vary widely across firms. Among large firms, the number of employees varied from 86 to 2141. For medium-sized firms, the variation was from 89 to 1360. The small firms, on an average, employed around 200 persons.

3. Analysis and After-thoughts

Over the last couple of decades, India’s auto component manufacturing industry has slowly and steadily moved into global supply chains. The movement started with the growth of foreign collaborations in India’s automobile industry, which kicked off with the tie-up between
Maruti and Suzuki. Over time, more global OEMs have entered India. The presence of these OEMs has created the demand for a capable and quality vendor base, which is supplying components to the OEMs in line with global designs and standards. Many Indian firms have met the requirements successfully. In the process, they have undergone exhaustive technological upgradation. Such upgradations and improvement in production efficiency have helped them in reaching out to overseas markets as well with many global OEMs across the world beginning to source components directly from Indian firms.

There is, however, a clear trend within the auto-component industry, which was revealed by the analysis undertaken earlier in this paper as well, towards the vendor base for global OEMs becoming dominated by large and medium firms. Indeed, the ‘size’ factor, as revealed by the study of suppliers for Hyundai and Ford, is overwhelmingly predominant with a very limited number of small firms featuring among vendors. The latter few, again, have no international presence. On the other hand, the relatively larger firms, presumably on account of their scale efficiencies, have been able to cater to overseas OEM and replacement demands as well. It appears that the component industry is heading for a consolidation at the upper end, which will be dominated by larger firms striving to push up the supply chains. While some small firms might still aspire to reach such levels, the majority of them, and particularly those in the informal sector, are likely to get relegated to supplying to the local replacement market. However, some opportunities for small and informal enterprises are likely to arise as the bigger firms sense more scope in overseas replacement markets and take to meeting the greater demand for aging vehicles in those countries. Since volume and price will be the main determinants in these markets, India’s small component manufacturers might get to gather a peek at some, arguably, lower nodes of global supply chains.

Regarding the impact of value chain entry on employment levels, no clear evidence is available. However, across the board, the Indian component industry is showing a distinct inclination of moving towards a leaner manufacturing process. In recent years, with material costs increasing, manufacturers have taken to cutting costs elsewhere, including staff costs. Indeed, studies do reveal that most manufacturers are re-organising production processes for trimming the extra flab from their labour force with the objective of making them more productive (ICRA, 2005). The OEMs are also playing an active role in this regard. Following the results presented earlier in this paper, which suggest a strong substitution of unskilled labour for skilled labour in transport equipments, it is quite likely that among the larger and more technologically advanced component manufacturing firms, the relatively unskilled labour force will gradually make way for a limited skilled set of people. The displaced segments are likely to move to the lower end of the industry, particularly the informal sector. Whether the latter will have enough opportunities for sustaining the latter, of course, is the subject of a different debate altogether.

One issue, in the larger perspective of employment in the components industry, however, is worth noting. The sample results indicate that half of the selected vendor base comprises relatively young firms (8–15 years old), irrespective of size. These are firms, which, in
Globalisation has created both new opportunities and challenges for the Indian industry. The process of integration into global value chains underlines an interesting combination of both these aspects. While the opportunities entail the potential enlargement of business frontiers, the challenges pertain to the ability of Indian companies to exploit opportunities on a sustained basis.

Industries like automobiles, pharmaceuticals, information technology (IT), textiles, food processing, and leather, are gradually enmeshing into global production systems. These systemic assimilations have influenced the domestic labour market. While new employment opportunities have been created, particularly in auto components, IT, textiles, leather, and food processing, there have been accompanying structural changes as well. Technology-intensive industries like automobiles, pharmaceuticals, and IT, are placing high premiums on skilled labour. The outcome is a perceived polarisation of the workforce between the skilled and unskilled categories. In more labour-intensive industries (such as textiles, leather, food processing), however, demand pressures have led to expansion of the labour force primarily through unskilled workers. These industries, along with the business process outsourcing (BPO) segment of the IT industry, have witnessed significant feminisation of the workforce, which, however, appears to have been motivated essentially by the trend of paying low wages to female workers.

While there is little doubt that different Indian industries are slowly moving into global value chains, securing durable welfare gains through such movements appears to depend critically upon the abilities of individual firms to ‘learn’ and upgrade. Larger firms are definitely better placed in this regard. Barring some limited evidence from automobile components and textiles, the survey undertaken for this paper does not indicate a meaningful upgradation on part of the relatively smaller firms. Large firms have been able to move on the ‘learning curve’ much faster than their smaller counterparts.

Compositions of individual industry workforces are experiencing interesting changes. Strong substitution effects favouring skilled labour in producer-driven chain industries like transport equipment and chemicals are accompanied by a reduction of the intensity of such effects, or reverse substitution, in buyer-driven industries like food processing, textiles, and leather. The substitution trends, however, need to be interpreted with caution, given their uneven occurrence. A prominent, high FDI-attracting, producer-driven chain industry like electronics, does not produce evidence of skilled labour substitution. On the other hand, a low FDI-receiving, buyer-driven chain industry like cosmetics shows
strong substitution. It is evident that the aggregation of industry groups masks many distinct changes taking place within individual industries. Given such concealment, discerning the effects of evolving global commodity chains on the domestic labour market in unambiguous terms is not only somewhat infructuous, but also probably premature at this juncture. For most Indian industries, integration into global production networks is still in the nascent stages. Such integration is proceeding at varying paces in different industries. The concomitant effects are only partially visible and are indeed difficult to view through the macro-economic prism.

Notes

1. India’s food processing industry is an interesting example of a complex process of integration into global production networks. The industry has experienced sizeable FDI in manufacturing with the entry of global food giants like Coke, Heinz, Kelloggs, and Pepsi, in the processed food segment. With these companies setting up production facilities and sourcing from Indian firms, the latter has had the scope of moving into a chain of the ‘producer’ variety. On the other hand, the entry of large retailers like Metro Cash and Carry GmBh, Nanz AG, and Wal Mart, has created the opportunity for integration in the ‘buyer-driven’ variety as well. Indeed, food processing is one high FDI-receiving industry, which differs from the rest in the group (for example, electrical equipment, automobiles, fuels, electrical machinery, chemicals, etc.) in terms of its relatively low import-intensity and skilled labour intensity. While the latter are positively significant determinants of incoming FDI in India as mentioned earlier, food processing appears to be attracting FDI principally on account of its growing size.

2. During the period 1999-2004, the growth in production crossed a year-on-year level of 20 per cent in two years. During this period the year-on-year growth rates in production were 8.0 per cent, 25.8 per cent, 9.2 per cent, 17.7 per cent, and 21.5 per cent, respectively (ICRA, 2005).

3. The various folds of a typical automobile industry value chain are shown in Figure 1.

4. The terms ‘OEM’, ‘assemblers’, and ‘automobile manufacturers’, are often used interchangeably.

5. The prominent global OEMs in India include Daewoo, General Motors, Ford, Honda, Hyundai, Mitsubishi, Toyota, Piaggio, Volvo, etc. Maruti Udyog Ltd., which is India’s largest player in the passenger car segment, now has a majority stake held by Suzuki of Japan. All the manufacturers are running light vehicle assembly plants in India. Most of them have joint ventures with Indian partners (for example, Fiat–Premier Automobiles Limited (PAL), Ford–Mahindra, Honda–Shriram, Mitsubishi–Hindustan Motors Limited (HML), and Toyota–Kirloskar.

6. America and Europe constitute the largest overseas markets for component exports, accounting for roughly 60 per cent of the total exports. Asia and Africa account for another one-third of the exports. Among components, engines and engine parts have the largest share.

7. While Dana Corp, a leading global component manufacturer spends nearly two-fifth of its revenues on wages, Bharat Forge, one of India’s largest component manufacturing firms spends only 6-7 per cent. (ICRA, 2005).

8. A Delhi-based firm manufacturing hydraulic components, forgings and castings.

9. There are some notable exceptions as well. Fenner (India) Ltd., a Chennai-based automotive and industrial belts manufacturing firm, is one of the largest firms in terms of number of employees (2800 in 2003-04), with sales and export turnovers of US$64.6 million and 12.8 million, respectively, in 2003-04. The firm supplies to almost all major OEMs in India, including foreign OEMs like Honda and Piaggio. It has a strong domestic tier 1 customer base, as well as extensive reach to international customers in Europe, Latin America and China. The company, however, does not have any foreign collaboration in production.

10. In contrast with the number of employees used as the criterion for determining plant size, in India, it is
the investment in fixed assets (that is, plant and machinery), which is employed as the criterion.

References


Appendix 1

Industry-wise Average Annual Growth Rate of Skilled and Unskilled Workers
(1994-95—2003-04)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Skilled workers (%)</th>
<th>Unskilled workers (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical machinery</td>
<td>1.99</td>
<td>1.44</td>
<td>1.59</td>
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<tr>
<td>Electronics</td>
<td>3.22</td>
<td>3.44</td>
<td>3.12</td>
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<td>Vehicles</td>
<td>2.92</td>
<td>3.18</td>
<td>3.10</td>
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<td>Transport equipment</td>
<td>9.31</td>
<td>2.65</td>
<td>4.05</td>
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<tr>
<td>Fuels</td>
<td>2.07</td>
<td>4.36</td>
<td>3.57</td>
</tr>
<tr>
<td>Chemicals</td>
<td>5.03</td>
<td>4.21</td>
<td>4.31</td>
</tr>
<tr>
<td>Non-electrical machinery</td>
<td>0.21</td>
<td>0.24</td>
<td>0.21</td>
</tr>
<tr>
<td>Food processing</td>
<td>3.71</td>
<td>3.36</td>
<td>3.41</td>
</tr>
<tr>
<td>Drugs and pharmaceuticals</td>
<td>3.52</td>
<td>4.62</td>
<td>4.15</td>
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<td>Textiles</td>
<td>4.59</td>
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<tr>
<td>Metallurgy</td>
<td>3.01</td>
<td>1.41</td>
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<td>Paper</td>
<td>3.81</td>
<td>2.76</td>
<td>3.02</td>
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<tr>
<td>Rubber</td>
<td>4.68</td>
<td>4.58</td>
<td>4.59</td>
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<tr>
<td>Sugar</td>
<td>1.23</td>
<td>0.38</td>
<td>0.65</td>
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<td>Vegetable oils</td>
<td>7.23</td>
<td>6.89</td>
<td>6.94</td>
</tr>
<tr>
<td>Fermentation</td>
<td>1.41</td>
<td>4.71</td>
<td>4.31</td>
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<tr>
<td>Leather</td>
<td>5.81</td>
<td>3.19</td>
<td>3.54</td>
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<tr>
<td>Fertilisers</td>
<td>3.45</td>
<td>2.36</td>
<td>2.73</td>
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<tr>
<td>Cosmetics</td>
<td>4.95</td>
<td>2.68</td>
<td>3.16</td>
</tr>
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</table>
Appendix 2

Growth Rates of Skilled and Unskilled Workers in Some High FDI-receiving Industries

2a: Transport Equipment:
Annual Growth Rate of Skilled and Unskilled Workers (1995-96–2003-04)

2b: Food Processing
Growth Rate of Skilled and Unskilled Workers (1995-96–2003-04)
Appendix 3
Growth Rates of Skilled and Unskilled Workers in Some Moderate FDI-receiving Industries


Appendix 4
Growth Rates of Skilled and Unskilled Workers in Some Low FDI-receiving Industries

4a: Leather: Growth Rates of Skilled and Unskilled Workers (1995-96–2003-04)