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## Foreign Trade and Employment Growth in Manufacturing Sector– Implication of Indian ASEAN FTA

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***W.P. No: EC - 1 8 - 3 5***

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# Foreign Trade and Employment Growth in Manufacturing Sector– Implication of Indian ASEAN FTA

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***Abstract***

*Loss of growth dynamism in manufacturing sectors has most often been identified as the reason behind stagnation in employment growth in India. While domestic production in manufacturing failed to generate adequate employment opportunities but jobs supported by exports from the manufacturing sector from India has been on the rise over the last two decades. Thus, the current study makes an attempt to understand the employment effect of India-ASEAN FTA on Indian manufacturing sector. Of the different Free Trade Agreements signed by India, India ASEAN Free Trade Agreement (IAFTA) implemented in 2010 involves one of the largest trade volumes. Using the CGE modelling framework of the GTAP database the study conducts simulations by calibrating the trade liberalization scenario as of 2018 between India and the ASEAN countries. IAFTA fetches employment growth in manufacturing. But the beneficiaries of this employment gain are the unskilled labour force who benefit both in terms of greater employment and higher wages. Higher usage of unskilled labour in conjunction with more imported inputs also fetches productivity gains for the country. However, skilled labour employment is hit. The producers too are negatively affected due to rising wage bills. However, the overall impact of IAFTA on the manufacturing sector's output, employment and welfare remain positive due to the increased trade and gains from employment generation of the unemployed unskilled workforce. But to maintain this gain the higher external demand needs to be sustained.*

***JEL Classification:*** **F13, F14, F15, F16**

***Keywords:*** **Employment Growth, Manufacturing Sector, ASEAN, Free Trade Area.**

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# Foreign Trade and Employment Growth in Manufacturing Sector– Implication of Indian ASEAN FTA

## *Introduction:*

Employment, its growth and structure has always been a critical concern among policy makers in India. The long-term employment growth in the pre-liberalization period hovered around 2 per cent. It declined in the immediate post liberalization period and picked up only towards the end of the nineties (2.8 per cent during 1999-2000 to 2004-2005 (Economic Survey 2013-2014). For the entire period (1993-1994 to 2004-2005) the growth rate averaged 1.8 per cent per annum. In the recent years 2013-14 to 2015-16, the employment situation further worsened, as total employment rather than growing, shrunk by about 0.4 per cent per annum. This is possibly the first time in independent India that the economy witnessed an absolute decline in employment (Abraham, 2017).

This stagnation in employment growth may be attributed largely to the slowdown in labour-intensive sectors, such as agriculture, manufacturing, construction and business sectors. Slowdown in agriculture and hence in agricultural employment is attributed to usual anticipated structural changes in a developing economy. But loss of growth dynamism in the employment elastic[3] manufacturing sectors is rather unexpected and this has led to much of the stagnation in employment growth in India. For the entire period 1999-2000 to 2011-2012 the overall employment elasticity in manufacturing stood at a very low figure of 0.33, with periods in between (2004-2005 to 2009-2010) when the sector even witnessed negative employment elasticity (-0.27) (Papola & Sahu, 2012).

Recent initiatives, like Make in India, which aim at enhancing manufacturing growth in the country, may result in reviving the growth dynamism of the manufacturing sector. But, with its conventionally low labour absorbing capacity, the initiative may not result in benefitting the working class of the economy. Trade

[3] Employment elasticity is measured as the percentage change in employment associated with a one percentage point change in economic growth (as measured by GDP growth).

liberalisation along with manufacturing sector growth may also bring a conflicting outcome in case of employment generation. With rising global demand, export from labour intensive sector grows and thereby gives an impetus for employment generation. In contrast, more imports and especially, parts and components which are required to enhance export productivity may reduce the net employment generation. The situation becomes more precarious when export demand goes down. Thus, generating employment in manufacturing sector in an open economy situation remains a challenge. This leads one to an important question - can trade liberalisation leading to export growth be one of the many ways to overcome some of the challenge of employment generation in manufacturing sector?

Veeramani (2016) finds that the total number of jobs supported by merchandise and service exports from India increased at the rate of 3.4 per cent per annum from 1999-00 to 2012-13 (34 million in 1999-00 to 62.6 million in 2012-13). And this was faster than the growth rate of total employment in the country. In 2003-04, manufacturing accounted for 30 per cent of these jobs. This share declined to 17.5 per cent between 2003-04 and 2007-08 when services accounted for most of the export led jobs (43 per cent). Since 2007-08 this trend got reversed as share of manufacturing in export supported jobs increased (38.5 per cent) and that of services declined (19 per cent). More recently, in 2010-11 to 2012-13, manufacturing sector accounted for as much as 75 per cent of the 13.3 million jobs that were due to exports. This is the result of increasing share of manufacturing in the country's total exports since 2000. Not only did manufacturing create direct jobs but also accounted for indirect jobs through its backward linkages to agriculture and services. Thus, exports have become an import driver of job growth in India. Particularly, manufacturing exports hold the largest potential to generate employment within the sector (direct effect) as well as in agriculture and services through the sectors backward linkage effects (Veeramani, 2016).

Among the different Free Trade Agreements signed by India, India ASEAN Free Trade Agreement (IAFTA) implemented in 2010 involves one of the largest trade volumes. In the years immediately preceding the implementation of the FTA almost 10 per cent of India's exports have been going to ASEAN while India imported around 9 per cent of its total imports from these countries. Hence the India-ASEAN FTA was expected to have a substantial impact on the level and structure of India's employment. Thus, the current study makes an attempt to study the employment effect of the India-ASEAN FTA on Indian manufacturing sector.

## *Literature Review*

Scholars in India have not given much attention to the issue of impact of trade on employment. Some of the limited attempts to address employment impact of trade are – Ghose 2000; Hasan *et al* 2003, 2007; Banga 2005; Shankaran *et al* 2007; Sen 2008; Goldar 2009; Kucera *et al* 2010; Shastri *et al* 2010; Hasan *et al* 2012; Nag and Khurana 2018.

Ghose (2000) studied the impact of trade liberalisation on manufacturing in developing countries including India and found that employment elasticity in manufacturing industries increased during the period 1981-94 due to increase in trade. However, the share of employment of export-oriented industries was found to decline in India. A similar study using industry level data disaggregated by states by Hasan *et al* (2003, 2007) also showed positive impact of trade liberalisation on labour demand elasticities for Indian manufacturing sector. The elasticities were found to be negatively related to protection levels in industries. More recently, Goldar (2009) used data for the period 1980-81 to 1997-98 and found that trade liberalisation raised labour demand elasticity.

Banga (2005) estimated the impact of liberalisation on labour markets in India. In particular, the study examined the impact of foreign direct investment (FDI), trade and technology on wages and employment in Indian organised manufacturing industries in the post reforms period. The results showed FDI, trade and technological progress as having differential impact on wages and employment. While higher extent of FDI in an industry was found to lead to higher wage rate in the industry, it did not show any impact on its employment. On the other hand, higher export intensity of an industry increased employment in the industry but had no effect on its wage rate. Technological progress was found to be labour saving but did not affect the wage rate.

Shankaran *et al* (2007) noted that while India liberalised trade, it experienced high growth but this growth was mostly jobless growth and expected that this may be somewhat explained by trade liberalisation. Thus, they explored the underlying factors behind the poor performance of the organised sector in terms of employment generation in the context of trade liberalisation. Sen (2008) employed a variety of methodological approaches like factor content, growth accounting and econometric modelling in an attempt to answer if increased trade integration in India since mid-eighties created or destroyed jobs in the country's manufacturing sector? The study concluded that the overall effect of international trade on manufacturing

employment has been minimal. Kucera *et al* (2010) estimated the effects of trade contraction on employment and incomes in India and also in South Africa during 2008-09. Using social accounting matrices (SAMs) in a Leontief multiplier model, the study came up with a very important finding that both in India as well as in South Africa employment and income declined substantially due to trade contraction with the EU and the US. Shastri *et al* (2010) too examined the changes in the employment scenario of India following the pursuance of the trade liberalisation strategy and the possible effects of further trade liberalisation. Hasan et al (2012) used state- and industry-level data on unemployment rates and trade protection from India to find little evidence to support the generally held view that unemployment increased with trade liberalisation. Rather, the analysis suggested that unemployment declined with trade liberalisation in certain contexts.

Nag and Khurana (2018) find that in exporting industries overall growth in employment is higher than the manufacturing sector as a whole. However, critical variations are seen with respect to the firm size and factor intensity. Labour intensive sectors has greater potential to hire workers, especially female workers. The study also highlights that factor intensity and export orientation does not provide a comprehensive picture since two other compelling forces like domestic value addition and total factor productivity has significant role to play. There are still a number of other studies which focus on the impact of trade liberalisation in India on the economy's wage structure and poverty levels. However, to the best of the knowledge of the present researchers there is hardly any study which in particular analyses the employment effect associated with the regional trade agreements that India had engaged in, in recent times. Studies on the impact of these trade agreements on trade and related macroeconomic variables of the country have been attempted by many, but studies with particular focus on employment effects of free trade agreements have been largely missing so far. The present study aims to fill up this gap.

## Objectives and Motivation

Among the different FTAs that India is involved in, IAFTA constitutes one of the biggest trade volumes. Hence, the impact of this agreement is expectedly large enough to influence many of the important trade related variables and their consequent impact on level of employment, wage and income distribution and the overall economic welfare of the country. Given the expected impact of export growth on the country's manufacturing growth and the urgent role that Indian manufacturing must play in bringing about the growth of productive and gainful employment in the country, the employment effect of India's trade liberalisation involving ASEAN region (one of its largest trade partners in Asia) does call for an in depth study. Thus, the present study seeks to analyse the employment effect of IAFTA on India.

It is eight years into the FTA, which has a phasing out period of nine years (December 31, 2019). Thus, the FTA implementation is nearing its completion and the countries involved have completed the tariff liberalisation with respect to products in their Normal tracks 1 & 2 and the Sensitive List[4]. To analyse in detail the impact of the FTA on the various trade variables and the consequent impact on the sectoral (particularly manufacturing sector) and overall employment in the country, this study resorts to a computable general equilibrium modelling framework.

## Methodology

The computable general equilibrium (CGE) modelling framework is one of the best possible ways to analyse ex ante the economic consequences of multilateral and bilateral trade agreements. Any comprehensive analysis of trade issues should involve an analytical framework which not only captures the inter linkages existing between the sectors of an economy but also the linkages present between these sectors and the rest of the world by way of exports and imports of final products, intermediate goods, capital goods and so on. The CGE framework integrates these linkages present at the national, regional and global level in both product and input markets.

[4] Products on Normal track 1, Normal track 2 have reduced tariff to zero by 2016; those on Sensitive track reduced to 5 per cent by 2016 and products on highly sensitive track will be reduced to either 37.5 per cent, or 45 per cent or 50 per cent by 2019. The particular rate of reduction on products on highly sensitive track have been mutually agreed upon by the countries.

A CGE model comprises of a system of equations that describe an economy and the interactions among its various parts. All equations in the model are solved simultaneously to find an economy wide equilibrium in which, at some set of prices, the quantities supplied and demanded are equal in all markets. Thus, all producers, consumers, workers and investors in the economy are satisfied with the quantities of goods they produce and consume, the number of hours they work, the amount of capital they save and invest and so on. The equilibrium in the CGE models satisfies important macroeconomic and market clearing constraints like equality of aggregate supply and aggregate demand for goods and services, full employment of labour force and capital stock and equality of national or global savings to investment. These models begin with classifying variables in the equation as exogenous and endogenous variables (Burfisher, 2012).

Experiments in CGE modelling framework involve shocking the exogenous variables, post which the model equations re-solve to yield new solution values for all the endogenous variables. The new values represent new equilibrium in which supply in all markets across the economy once gain equal demand at some new set of prices. The results obtained from the simulations are comparative static results. Thus, the models study the impact of changes in exogenous parameters (shocks) on allocation of goods among consumers and resources among productive activities and also the consequences for economic efficiency. The models do not have explicit time dimensions. They represent different time frames by changing the microeconomic elements of the closure. The results of static simulations are often interpreted as representing how an economic system would look if the new policy had been in place in the base year, after relevant adjustments had taken place (Gilbert, 2001).

The present study uses the global CGE model database developed by Global Trade Analysis Project (GTAP)[5] which provides the core data sets required by CGE models. This data includes input-output tables, bilateral trade flows, transport costs, information on tariff and non-tariff barriers and all other data that is in the Social Accounting Matrices (SAM) and used in CGE models (Burfisher. 2012).

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or 50 per cent by 2019. The particular rate of reduction on products on highly sensitive track have been mutually agreed upon by the countries.

5 Available at https://www.gtap.agecon.purdue.edu

The exogenous variables in a standard GTAP model is such that there is full employment in the factor markets. This is a neoclassical approach whereby the endowments of the productive factors are fixed allowing market prices to adjust so as to ensure full employment always.

But full employment is far from true in the real world, particularly for unskilled labour force and that too in developing countries. Thus, to capture the real-world scenario, the simulations conducted in this study replace the assumption of full employment of standard GTAP model with existence of unemployment of unskilled labour force for all the countries/regions under consideration. This is done by swapping the fixed endowment of unskilled labour in all of India, the ASEAN countries and the rest of the world with fixed real wage of unskilled labour. Thus, market prices of unskilled labour no longer adjust to establish full employment, but instead capture the unemployment with respect to unskilled labour in each of the economies. Introduction of this unemployment scenario which represents a departure from the full employment scenario of standard GTAP model is thus a novelty introduced by the present paper into the GTAP modelling framework.

To study the employment effect of the IAFTA on India, the paper conducts simulations through GTAP data by calibrating the trade liberalization scenario as of 2018 between India and the ASEAN countries.

## *Data*

The paper uses version 9 of the database which reflects the World economy in year 2011. The database is compiled for bilateral exports and imports and tariffs inclusive of other flows for 140 regions across the world and for 57 tradable commodities. The present study aggregates these 140 regions into 12 regions[6] and the 57 sectors into 20 sectors[7].

[6] India, Malaysia, Singapore, Thailand, Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Philippines, Vietnam, Rest of ASEAN, Rest of World

[7] Agriculture; Allied activities; Minerals; Food product; Textile; Wearing apparel, Leather, Wood; Paper; Petroleum products; Chemical, rubber & plastic; Ferrous metals; Other metals; Mineral products; Motor vehicles; Transport equipment; Electronic equipment; Machinery; Other manufacturing; Services

Out of these 20 sectors, sixteen sectors (food products to other manufacturing) are manufacturing sectors. Of these sixteen sectors, twelve sectors namely, textile; wearing apparel; petroleum products; chemical, rubber and plastic; ferrous metals; other metals; mineral products; motor vehicles; transport equipment; electronic equipment; machinery and other manufacturing, are identified (based on Herfindahl index for each industry, along with the resulting power of mark up over marginal cost[8]) to be sectors exhibiting increasing returns to

scale (IRS). The remaining four manufacturing sectors (food products; leather; wood and paper) are identified to be exhibiting constant returns to scale. Incorporation of increasing returns to scale is yet another departure introduced by the present study to the standard GTAP model which assumes constant returns to scale and perfect competition for all producers. In the real world there are sectors where firms exhibit IRS and hence respond to shocks like tariff liberalization by improving their productivity faster than firms with constant returns to scale.

Based on the available detailed tariff commitments corresponding to specific tariff lines (eight-digit HS code) of each of the member countries of the ASEAN region and India (Government of India, Ministry of Commerce and Industry), various categories of tariff commitments have been worked out for different sectors/commodities (as aggregated in GTAP database). The base line scenario of the database represents the trade situation between the countries at the beginning of the FTA implementation. To this base line scenario, the tariff concessions as committed by different countries are applied and the resultant changes in output, export, import and employment in each of the sixteen manufacturing sectors at the end of the year 2017 is noted.

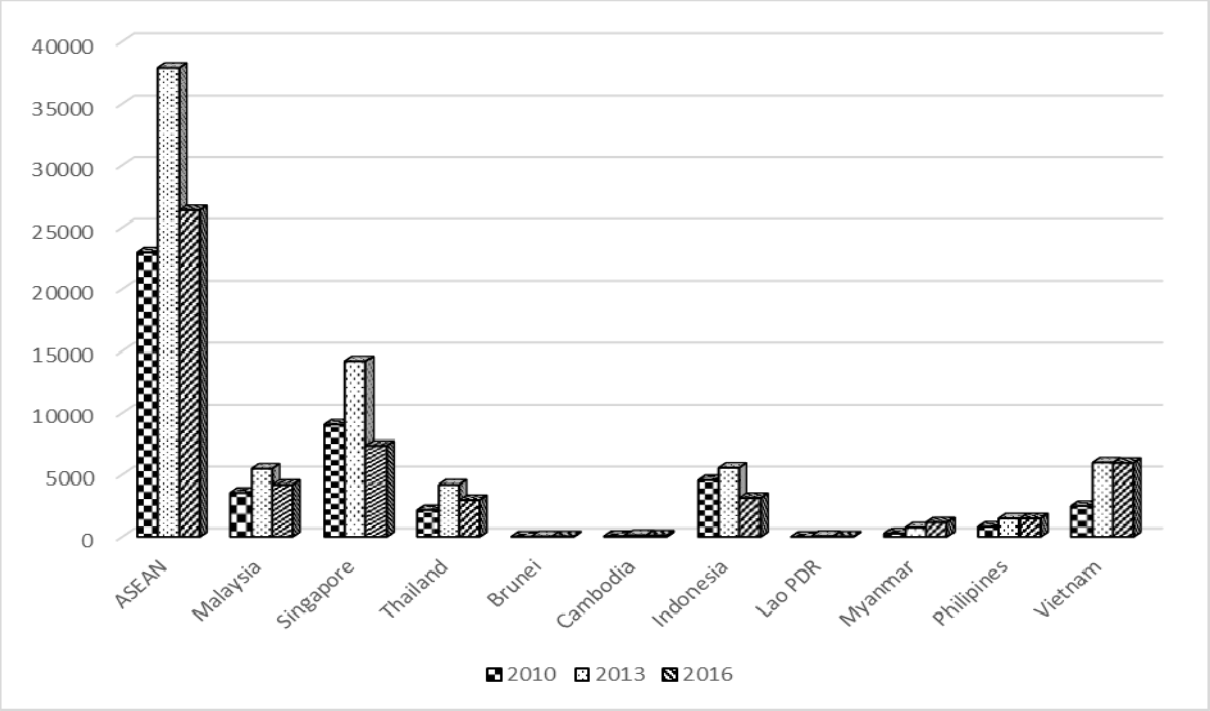
[8] Herfindahl Hirschman Index (HHI) is used as an indicator for market concentration. Higher HHI implies higher market power with a few firms that may among other things result in higher prices (OECD guidance, 2011). The highest value of HHI can go up to 10,000 which is the case of a perfect monopoly. Herfindahl indices and model-conformable benchmark number of symmetric firms were combined with perceived demand elasticity for each sector to obtain optimal mark ups as per the method used by Elbehri and Hertel (2004).

## Results and Discussions

### *Actual Trade*

The actual trade between India and ASEAN countries have increased considerably (22.8 per cent) since the FTA implementation. India's imports from the ASEAN countries increased more (29 per cent) than its exports to ASEAN region (15 per cent) (UN Comtrade database[9]). Though these import and export figures declined between 2013 and 2016; yet the initial (immediately after the FTA implementation) increase in trade between India and the region was phenomenal (52.5 per cent in the first three years) resulting in substantially higher exports and imports in 2016 as compared to 2010 (figure 1 and figure 2).

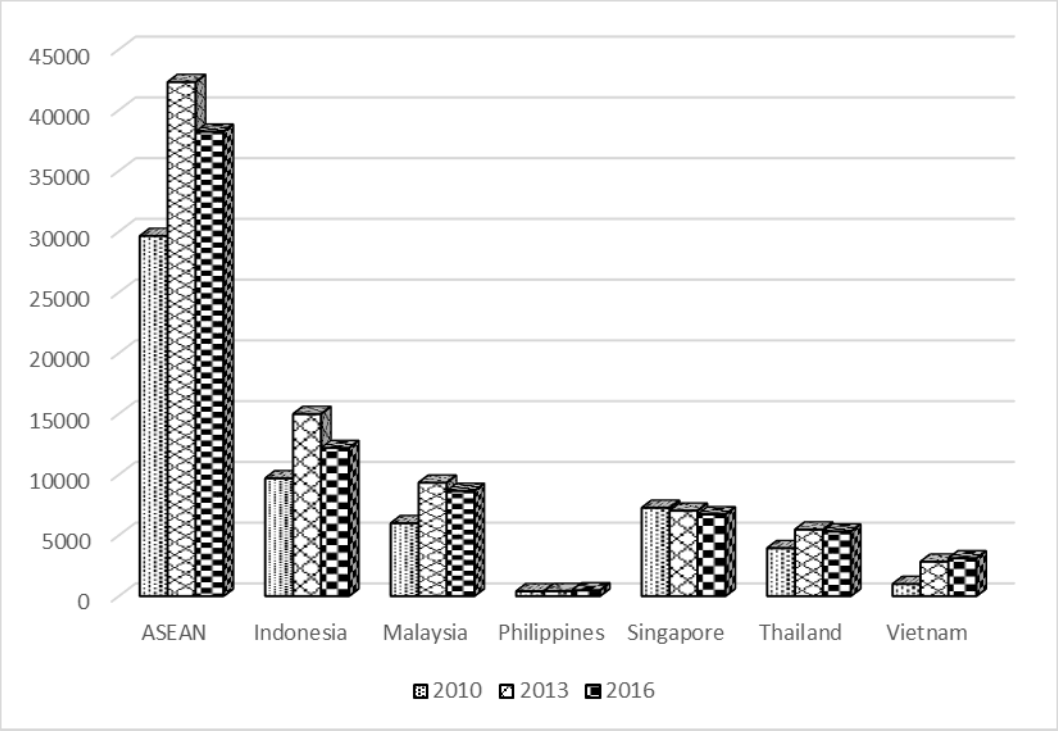
**Figure 1: India's exports to ASEAN region and individual ASEAN members (US $ million)**




Source: Based on data from UN Comtrade database.

[9] Available at https://comtrade.un.org

**Figure 2: India's imports from ASEAN region and select individual ASEAN members (US $ million)**




Source: Based on data from UN Comtrade

Thus, the India-ASEAN FTA did increase the bilateral trade flows between the region. The impact of such increased trade flows may have had far reaching nation-wide impact on the member countries. Particularly, in view of the value of bilateral trade flow between India and the ASEAN members, such increase might have had very important effect on the macroeconomic variables of the countries. The present paper makes an attempt to analyse the plausible impact on one such important macroeconomic variable for India- employment; particularly employment in the manufacturing sector. While analysis of overall employment in the economy is a relatively easy task, analysing employment effect of a particular FTA on an economy is rather difficult. So, the paper resorts to an ex ante predictive analysis (counter factual) using the computable general equilibrium framework of GTAP model.

## *Results from GTAP simulation*

### *Effect of IAFTA on trade flows and production*

The simulation results indicate that the total trade between India and the ASEAN region increases by 22 per cent, with imports increasing by 24 per cent and exports by 17 per cent. These figures are very close to the actual figures observed. And thus, the likely impact of this changed trade on the country's employment levels and pattern may very well be reflective of the real situation in the economy.

As noted from the simulation results, IAFTA is likely to increase production in all of agriculture, allied activities, manufacturing and services. The only sector to register a fall in output is mining. Total production in India increases by 0.31 per cent. Manufacturing which records the lowest increase in output expands 0.13 per cent while non-manufacturing sector expands 0.41 per cent. Manufacturing sectors which are competitive expand more (0.19 per cent) than the sectors which enjoy scale economies. This is mainly due to the massive expansion of leather and leather products sector among the competitive sectors. Of the sectors with scale economics, transport equipment, motor vehicles, chemicals and textile register substantial expansion while the other sectors expand moderately (ranging between 0.11 per cent to 0.14 per cent) (table 1).

The interesting point to note is that, output increase in all expanding manufacturing sectors are due to increased exports. In some sectors, increase in domestic demand along with increase in exports explain the output increase. The contracting sectors of electronic equipment, machinery, other manufacturing, wood and paper contract due to fall in domestic demand (table 2). On the import front, all sectors import more after the FTA. While non-manufacturing import more of finished goods, manufacturing imports rise on account of import of intermediate goods. In particular, the contracting sectors witness substantial rise in imports than in exports and the imports are due to intermediate goods. Further, the fact that these sectors face shrinking domestic demands, clearly indicate that post the FTA, domestic firms prefer to import more of foreign inputs which were earlier bought from these domestic sectors. This is an instance of import replacing domestic demand for inputs by firms, which ultimately results in contraction of the sectors even in the face of rising exports from these sectors.

Thus, IAFTA results in increased trade flow of manufacturing goods between India and the ASEAN region. It comprises of increased exports of finished goods and higher import of intermediate goods. Increased trade along with expansion in production, hint towards greater employment opportunities in the manufacturing sectors, which IAFTA is likely to fetch for India.

Greater trade openness may result in job creation in an economy. But it may also fetch job destruction. Usually, increased exports result in expansion of domestic production and consequent expansion of employment. Greater the production expansion in labour intensive sectors greater the job creation. However, increased trade may also fetch productivity growth lowering the usage of labour per unit of output produced. This in turn, may lower employment rather than increasing it. Further, export-oriented sectors may get linked to global value chain and thereby import cheaper components and accessories from abroad and hence, this may have negative impact on import competing sectors in terms of employment generation. Thus, impact of increased trade openness on employment level of a country depends not only the nature of the trade flow, but also on a number of other factors like factor endowments, production technology, elasticity of factor substitution etc.

The following section assess the employment effect of the IAFTA on employment in India's manufacturing sector.

**Table 1: Post FTA changes (per cent) in exports, imports and output in India**

| **Sectors** | **Export (change in per cent)** | **Import (change in per cent)** | **Total trade (change in per cent)** | **Output (change in per cent)** |
|---|---|---|---|---|
| **Agriculture** | 28.4 | 116.7 | 57.4 | 0.16 |
| **Allied activities** | 29.7 | 7.4 | 9.1 | 0.42 |
| **Mining** | 50.3 | 21.9 | 22.3 | -0.24 |
| **Services** | -0.4 | 0.1 | -0.1 | 0.47 |
| **Non-manufacturing (total)** | **11.8** | **20.6** | **18.1** | **0.41** |
| **Manufacturing (total)** | **19.5** | **25.9** | **23.9** | **0.13** |
| **IRS** | | | | |
| Textile | 40.2 | 53.6 | 46.1 | 0.23 |
| Wearing apparel | 50.9 | 110.8 | 61.6 | 0.14 |

| | | | | |
|---|---|---|---|---|
| Petroleum product | 2.1 | -0.1 | 1.4 | 0.12 |
| Chemical, rubber, plastic | 24.3 | 47.3 | 40.0 | 0.37 |
| Ferrous metals | 13.5 | 24.5 | 18.5 | 0.11 |
| Other metals | 32.0 | 60.9 | 49.9 | 0.13 |
| Non-metallic minerals | 48.6 | 46.1 | 46.7 | 0.14 |
| Motor vehicles | 27.0 | 0.7 | 11.0 | 0.56 |
| Other transport equipment | 118.7 | 85.8 | 99.8 | 1.01 |
| Electronic equipment | 3.6 | 17.9 | 16.3 | -0.57 |
| Other machinery & equipment | 43.5 | 57.7 | 54.4 | -0.25 |
| Other manufacturing | 6.0 | 45.2 | 16.6 | -0.18 |
| **Total for IRS** | 22.6 | 40.7 | 34.0 | **0.12** |
| **Non-IRS** | | | | |
| Food product | 3.2 | 0.3 | 0.8 | 0.34 |
| Leather | 60.6 | 75.1 | 65.7 | 0.84 |
| Wood | 42.2 | 50.5 | 50.0 | -1.10 |
| Paper | 22.4 | 40.2 | 38.1 | -0.43 |
| **Total for non-IRS** | 7.4 | 4 | 4.6 | **0.19** |
| Total for all sectors | 17.2 | 24.2 | 22.1 | 0.31 |

Source: Based on GTAP simulation

**Table 2: Post FTA changes in output in manufacturing along with change in share of export and domestic demand in output in India**

| Output | 2011 | 2018 | US $ million | Change (per cent) | Share of domestic demand in output | Share of Export in output |
|---|---|---|---|---|---|---|
| **Manufacturing** | 1299559.6 | 1301246.7 | 1687 | 0.13 | ↓ | ↑ |
| **IRS** | | | | | | |
| Textile | 90893 | 91103.2 | 210 | 0.23 | ↓ | ↑ |
| Wearing apparel | 24058.8 | 24091.9 | 33 | 0.14 | ↑ | ↑ |
| Petroleum product | 226024.2 | 226296.7 | 272.4 | 0.12 | ↑ | ↑ |
| Chemical, rubber, plastic | 182548.4 | 183227.9 | 679.5 | 0.37 | ↓ | ↑ |
| Ferrous metals | 78183.6 | 78273 | 89.6 | 0.11 | ↓ | ↑ |
| Other metals | 88381.2 | 88494.1 | 112.8 | 0.13 | ↓ | ↑ |
| Non-metallic minerals | 47356 | 47421.4 | 65.3 | 0.14 | ↓ | ↑ |
| Motor vehicles | 50380.4 | 50662.5 | 282.1 | 0.56 | ↑ | ↑ |
| Other transport equipment | 30424.4 | 30732.6 | 308.1 | 1.01 | ↓ | ↑ |
| Electronic equipment | 37724.4 | 37509.8 | -214.6 | -0.57 | ↓ | ↑ |
| Other machinery & equipment | 148920.8 | 148543.1 | -377.7 | -0.25 | ↓ | ↑ |
| Other manufacturing | 90713.9 | 90547.9 | -166 | -0.18 | ↓ | ↓ |
| **Non-IRS** | | | | | | |
| Food product | 156526 | 157050.6 | 524.6 | 0.34 | ↑ | - |
| Leather | 11058 | 11150.9 | 92.8 | 0.84 | ↓ | ↑ |
| Wood | 10249.9 | 10136.9 | -113 | -1.10 | ↓ | ↑ |
| Paper | 26116.4 | 26004.2 | -112.2 | -0.43 | ↓ | ↑ |

Source: Based on GTAP simulation

Note: ↑ denotes increase; ↓ denotes decrease; - denotes no change

**Employment effect of IAFTA on manufacturing sector**

The manufacturing sectors that register exports and production increase are mainly labour-intensive[10] sectors, like, transport equipment, leather, wearing apparel, motor vehicles and textile. In particular, these sectors are intensive in unskilled labour. Exports and hence production also increase in some capital-intensive sectors like minerals, chemicals, metals, petroleum products, but it is mostly the labour-intensive sectors that dominate the increased share of exports and hence increased production due to the IAFTA. Thus, greater trade openness with the ASEAN region is likely to be more job creating.

As per the GTAP database, producers total purchase of labour (unskilled plus skilled) in 2011 amounts to US $ 879858 million, of which manufacturing sector accounted for US $ 120649 million[11]. Considering an average annual wage income of US $ 1926 (calculated based on wage data from Labour Bureau, Government of India and 305 working days in a year (average of manufacturing working days[12] and agricultural working days)), this expenditure on labour by firms amount to an employment figure of 456.8 million workers. This figure, too, is very close to the actual reported figure of employment in India 456.2 million (World Development Indicators data[13]). Eight years into the implementation of the trade agreement, value of purchase of labour in the economy increases by 0.54 per cent, with unskilled labour increasing by 0.52 per cent and that of skilled labour increasing by 0.57 per cent. Manufacturing sectors expenditure on unskilled labour goes up by 0.44 per cent and that on skilled labour rises by 0.35 per cent. Both these increased wage payments are due to sectors exhibiting IRS. Though the sectors with scale economies expand relatively less, yet they experience a larger increase in the wage bills.

[10] An industry is intensive in use of a particular factor that accounts for the largest share of its production cost

[11] In GTAP database labour refers to value of labour measured in US $ millions

[12] Adult workers in factories, mines, and plantations are entitled to one day off for every twenty days worked in the previous year, which generally amounts to 12 days a year. Minors are entitled to 15 days. This does not apply to employees of factories of government-owned railways, who are governed by a separate set of leave entitlements decided by the government. Leave entitlements in India generally vary among states and industries, with local governments setting minimum leave entitlements and individual companies offering their own paid leave benefits. On average, Indians receive 24 days of paid leave a year. Employees are also entitled to 15-20 paid public holidays, depending on the region.

13 Available at https://data.worldbank.org/products/wdi

Rising wage bills could be due to either of increased labour employment or rising labour wages or both. The present study assumes unemployment in unskilled labour market and full employment in skilled labour market. While skilled labour market is assumed to have full employment. Hence, faced with increased labour requirement for production, each market behaves differently to adjust quantity and price of labour. Consequently, the impact on the wage bill for each type of labour also differs. Increased demand in the unskilled labour market results in additional employment of existing unemployed labour force. Thus, total employment increases. Of this, 16 per cent increase is due to manufacturing (86 per cent in IRS sectors and 14 per cent in non-IRS sectors). The sectors with IRS which employ more of unskilled labour post the trade liberalization are – transport equipment; chemicals; textiles; motor vehicles and metal & metal products. Among the non-IRS manufacturing sectors, food products hire substantially more unskilled labour.

Employment of unemployed unskilled labour force is good news as it expands the economy's productive capacity. However, the increased demand for unskilled work force far exceeds its available excess supply, thereby pushing up the unskilled labour wage by 3.38 per cent. However, this increase in unskilled labour wage is way less than the increase in wage of skilled labour (12 per cent). In the skilled labour market, with initial full employment, the excess labour demand bids up wages substantially as the producers in different sectors compete with each other for hiring workers to meet their expanding production needs. As compared to this, the initial unemployment existing in unskilled labour market make the wages relatively sticky and do not allow them to move up much even in the face of excess demand for labour. Thus, post the export and production expansion, unskilled labour turns out to be relatively cheaper. This results in more hiring of unskilled labour (4.6 per cent more) which starts substituting some of the relatively expensive skilled labour and capital in some sectors. This substitution effect coupled with the expansion of unskilled labour-intensive sectors results in greater job creation of unskilled work force. This increased employment along with increased wage rate explains the higher unskilled labour wage bill to manufacturing and the economy as a whole.

On the contrary, the skilled labour which is now relatively expensive and hence substituted by unskilled labour registers a decline in hiring (3.6 per cent). Skilled labour employment falls in all of manufacturing sector except leather, motor vehicles and transport equipment. These are the sectors

which show the highest increase in output post the FTA. It is the positive expansion effect of these sectors on skilled labour which outweigh the negative effect of substitution by relatively cheaper unskilled labour and thereby result in increased hiring of skilled labour in these sectors. Production expansion in manufacturing as a whole do create some additional demand (0.7 per cent more) for skilled labour, but the substitution effect eventually lowers its aggregate demand in the manufacturing sector. Hence the higher wage expenditure on account of skilled labour is entirely the outcome of wage increases while employment actually falls.

After the trade liberalization between Indian and ASEAN, unskilled labour-intensive manufacturing sectors in India expand and create additional employment opportunities for the unskilled labour within the sectors. Additionally, substitution of cheaper unskilled labour for skilled labour creates jobs for unskilled work force. Besides, manufacturing as a sector has one of the highest backward linkages in India which help to generate employment in other sectors. Table 3 presents the backward linkages of sectors (based on Rasmussen Method[14]) for the Indian economy. A more detailed sectoral analysis of backward linkages of individual manufacturing sector as in table 4 clearly indicate that food, wearing apparel, electronic equipment, motor vehicles, textile, transport equipment, paper, leather, chemicals are some of the sectors with highest backward linkages. Incidentally, these are also the sectors which show the highest output expansion and are also mostly intensive in unskilled labour. Thus, the expansion effect of trade liberalization on manufacturing sector and the consequent impact on other sectors via manufacturing's strong backward linkage may very well be the reason behind additional employment opportunities for unskilled labour in these other sectors, like agriculture, allied activities and services. These are also the sectors which show the highest increases in their expenditure on hiring.

**Table 3: Backward Linkages of different sectors in India in 2011**

| **Sectors** | **Backward Linkages** |
|---|---|
| Agriculture | 1.60 |
| Allied Activities | 1.61 |
| Mining | 1.43 |
| Manufacturing | 1.97 |
| Services | 1.59 |

Source: Based on calculation from GTAP database

[14] Backward linkages mean the use by one firm or industry of produced inputs from another firm or industry (Deardorff, 2001). It is based on Leontief inverse matric of input-output matrix of an economy and is the column total of the inverse matrix. A backward linkage figure of 1.97 for manufacturing indicates that a 1 unit increase in output in manufacturing will increase demand for inputs from other sectors by 1.97 units.

**Table 4: Backward Linkages of manufacturing sectors in India in 2011**

| **Sectors** | **Backward Linkages** |
|---|---|
| **Manufacturing sector** | **1.97** |
| **IRS** | |
| Textile | 2.16 |
| Wearing apparel | 2.21 |
| Petroleum product | 1.49 |
| Chemical, rubber, plastic | 2.01 |
| Ferrous metals | 1.90 |
| Other metals | 1.84 |
| Non-metallic minerals | 1.94 |
| Motor vehicles | 2.17 |
| Other transport equipment | 2.10 |
| Electronic equipment | 2.23 |
| Other machinery & equipment | 2.00 |
| Other manufacturing | 1.82 |
| **Non-IRS** | |
| Food product | 2.28 |
| Leather | 2.04 |
| Wood | 1.78 |
| Paper | 2.10 |

Source: Based on calculation from GTAP database

**Welfare implication due to change in employment under IAFTA**

Increased employment of unskilled labour in manufacturing and other sectors of the economy have positive welfare[15] implications for India. The total welfare gain accruing to India due to the FTA with the ASEAN region is US $ 5271 million (table 5). Endowment gain which amounts to US $ 1767 million accounts for the one of largest share of this gain (33.5 per cent). With employment of all other factors falling, it is obvious to think that this endowment gain is mainly due to increased unskilled labour employment.

The welfare gain from trade liberalization or any other policy shocks can be represented by or measured equivalently to return to factors, especially labour, i.e., employment income. Under this presumption, the changes in the value of endowment purchased by firms at agents' prices are calculated so as to indicate the income effects of the tariff liberalization under IAFTA. Firms' purchase of total labour increases by 0.54 per cent. This represents the income effect of the tariff reductions under the IAFTA. The changes in the value of labour purchased by the firms in different sectors as presented in table 6 indicate this income effect. Overall, the value of gain in employment income in India is US $ 4765 million, of which US $ 2152 million accrues to skilled labour and US $ 2613 million goes to unskilled labour. As mentioned earlier this employment income increase of skilled labour is entirely the result of wage increase while its employment actually falls. For unskilled labour, the increased wage bill is due both to increased wage and increase in employment.

**Table 5: Welfare gains to India**

| **Welfare Gains** | **(US $ million)** |
|---|---|
| Allocative Efficiency | 1256.3 |
| Endowment Gains | 1766.6 |
| Technology Effect | 2209.4 |
| Terms of Trade | 38.9 |
| Total | **5271.2** |

Source: Based on GTAP simulation

[15] Welfare change in standard GTAP model estimates the change in aggregate per capita utility in the region due to distortions such as a policy shock. The aggregate utility function for the region is specified over per capita private household consumption, per capita government spending and per capita savings. The welfare changes which is computed as a money metric equivalent of this utility change is given in US $ million and is decomposed into: allocative efficiency effect, endowment effect and terms of trade effect. Normally, welfare improvement associated with a policy shock in the form of trade liberalization may be due to - more favourable terms of trade, improved allocation of existing resources, additional resources, improvement in technology and improvement in employment of factor resources.

At the sectoral level, the bulk of the increases in employment income is within the service sectors. This is attributed to the increase in hiring as output expands in the service sector. Service sector is beyond the scope of the FTA, yet the output expands in this sector via linkage effect of other sectors which experience output and export growth. Within the manufacturing sector the equivalent employment income (income effect of tariff liberalization) amounts to US $ 518 million (10.8 per cent of total increase), of which US $ 62.2 million goes to hire skilled labour and US $ 455.8 million is spent on hiring unskilled labour. The share of IRS in this increased equivalent labour income is 83 per cent. It is important to note that the employment income equivalent of the welfare gain shows that unskilled labour reaps most of the benefits. This is consistent with the high proportion of surplus unskilled labour in the Indian economy and their high response to changes in production and trade in the country due to the Indian ASEAN FTA.

**Table 6: Equivalent employment income gain by sector (in million USD)**

| Manufacturing Sectors | Expenditure on labour purchased by firms (US $ million) | | |
|---|---|---|---|
| | Skilled labour | Unskilled labour | Total labour |
| Food products | 13.3 | 84.1 | 97.4 |
| Textile | 8 | 56.6 | 64.6 |
| Wearing apparel | 17.6 | 15.6 | 17.6 |
| Leather | 3.6 | 22.7 | 26.3 |
| Wood | -5.1 | -26.3 | -31.4 |
| Paper | -1 | -1.9 | -2.9 |
| Petroleum product | 0.7 | 4.6 | 5.3 |
| Chemicals, rubber & plastic | 8.4 | 59.5 | 67.8 |
| Ferrous metals | 3.3 | 23.8 | 27.1 |
| Other metals | 6 | 43.7 | 49.7 |
| Non-metallic minerals | 2.9 | 20.9 | 23.8 |
| Motor vehicles | 6.8 | 44.6 | 51.3 |
| Transport equipment | 8.1 | 50.7 | 58.9 |
| Electronics | -0.2 | 0.6 | 0.4 |
| Machinery | 3.4 | 32.4 | 35.9 |
| Other manufacturing | 1.6 | 23.9 | 25.5 |
| **Total** | **62.2** | **455.8** | **518** |

Source: Based on GTAP simulation

The largest component (42 per cent) of welfare gain is, however, the technology effect which indicates that there is a welfare gain on account of improvement in productivity[16]. In the scenario of trade liberalization under the IAFTA, there is no exogenous shock to productivity. With increase in exports, output expands in manufacturing and in other sectors increasing employment (both direct and indirect) for unskilled labour. This is likely to add to the productive capacity of the economy but not to its productivity. Expansion effect also increases demand for skilled labour and capital, but the excess demand bids up their prices also, resulting in increase in cost of production of manufacturing and other sectors towards hiring these factors. As a result, both skilled labour and capital gets substituted by unskilled labour post the FTA. Thus, there is no scope for productivity increase due to either of skilled labour or capital. So, the technology effect of welfare change could only be attributed to greater use of unskilled labour. But there is no explicit change in the course of the FTA that might make the unskilled work force more productive.

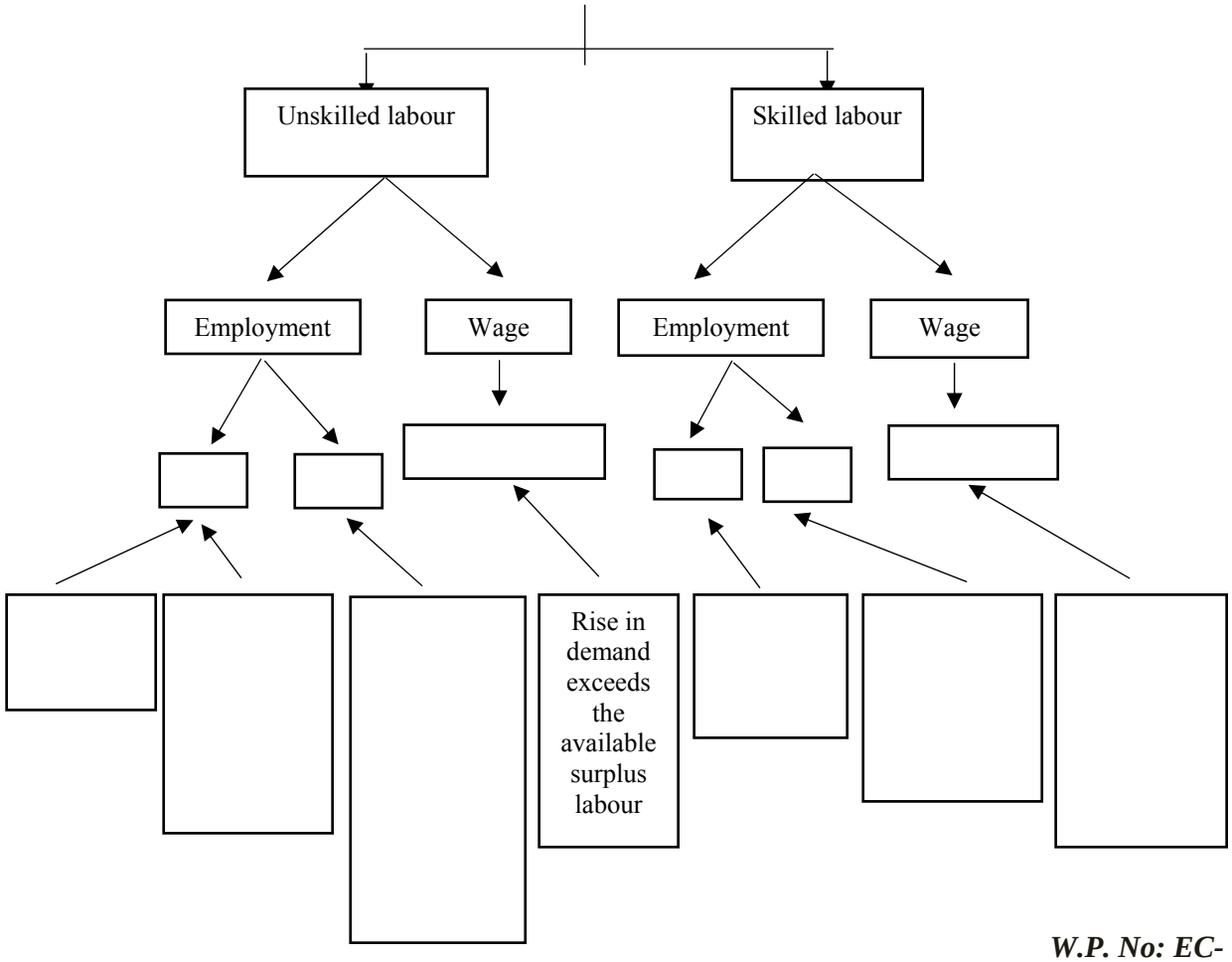
The sectors which contribute to technology effect of welfare are manufacturing sectors, namely, chemicals, petroleum product, textile, motor vehicles, transport equipment, metals and non-metallic minerals. Some common features of these sectors are they enjoy scale economies, they expand with trade liberalization and they substitute unskilled labour for capital and skilled labour to meet the needs of production expansion. With the exception of petroleum products, these are also the sectors which import large quantity of intermediate inputs from the ASEAN region post the FTA. So, a possible explanation for productivity gains from IAFTA could be the greater usage of imported inputs which are combined with more unskilled rather than skilled labour and capital. Sectors like electrical equipment, machinery, other manufacturing also enjoy scale economies and import more of inputs from ASEAN region but fail to reap productivity gains due to contraction in production. Also, the sectors contributing to productivity gains are by and large labour intensive. Thus, the productivity gains, primarily accrue to labour-intensive sectors which use more of unskilled labour and substitute for skilled labour and capital and this reduction in use of skilled labour and capital is possibly due to use of imported inputs which are technologically better than the domestic inputs.

[16] The other components of gains (other than endowment effect and technology effect) are allocative efficiency (23.8 per cent) and terms of trade gains (0.7 per cent). The increased trade between India and the ASEAN region improves India's production efficiency (US $ 1256.3) and fetches relatively lower import prices from the ASEAN countries and India gains on account of terms of trade.

Thus, India ASEAN FTA results in general expansion of manufacturing sector and its exports which in turn increases employment of unskilled labour. However, it fails to boost the employment of skilled labour. Rather reduces it. Productivity gains, which is generally feared to be having a negative impact on employment does not lower employment as a whole. Rather, productivity gains happen mostly in labour intensive sectors which employ more of unskilled labour, which is more productive after trade liberalization due to the improved access of the sectors, with scale economies, to technologically better intermediate inputs. However, this productivity gain too comes at the cost of skilled labour employment. The labour-intensive sectors enjoying scale economies now find it more profitable to replace some of its skilled labour and combine more of unskilled labour with the imported inputs.

The employment effect of IAFTA may in a snap shot be presented as follows:

**Change in Employment scenario in manufacturing sectors and its implication**

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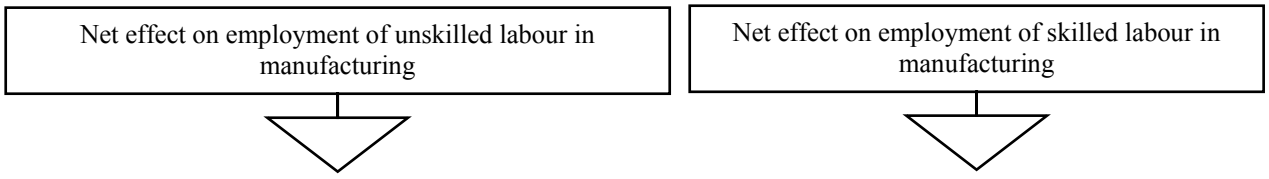

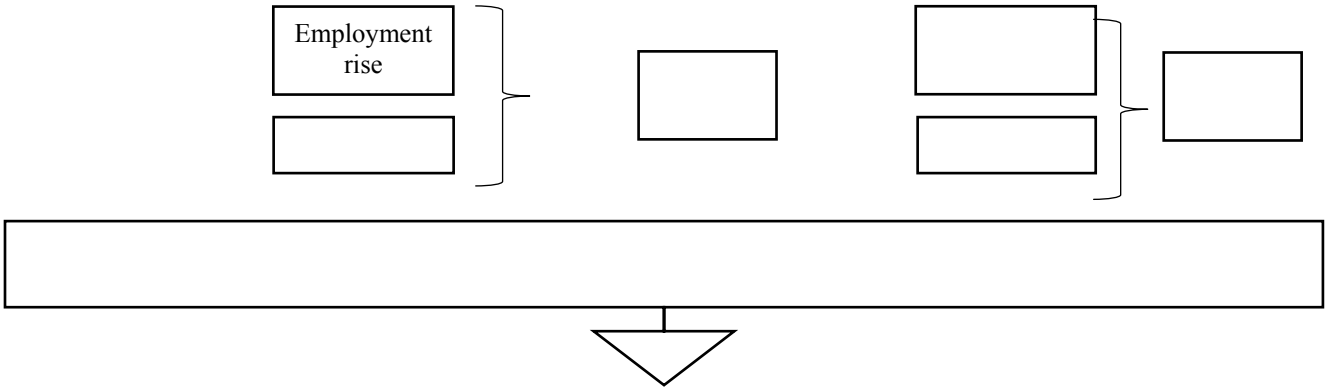


Increase in unskilled labour employment due to expansion of exports and production of unskilled labour-intensive manufacturing

- Endowment Gain ←

- Technology/productivity Gain ← Increased usage of imported inputs along with substitution of unskilled labour for skilled labour and capital in the labour-intensive sectors with scale economies

## *Conclusion*

The India ASEAN FTA fetches greater trade openness for India with the ASEAN region which is already an important trade partner for the country. After the FTA implementation, the total trade flow involves greater exports and even greater imports. The manufacturing sector too gains from the IAFTA. In fact, it registers higher export and import growth than any other non-manufacturing sector of the country. Thus, manufacturing dominates a larger share of India's trade with the region. This is line with the general trend observed for India's foreign trade over the last two decades. However, the scenario on the production front is just the opposite. Of all the production sectors, manufacturing expands the least. Nevertheless, the overall impact of IAFTA on the manufacturing sector is positive with the sector expanding mainly due to rising exports. Most importantly the labour-intensive, particularly unskilled

labour intensive, sectors are the ones which benefit the most due to expansion effect of higher exports. Thus, surplus unskilled labour force gains employment and joins the productive labour force of the country. Further, their wages also increase due to increased demand and this together with increased employment fetches substantial welfare gain to the large pool of unskilled labour in India. Increased trade, output and greater usage of unskilled labour also fetches productivity gains to the country. And fortunately, this is not at the cost of lowering total labour per unit of output as expected. The productivity gain is due to the usage of more unskilled labour in conjunction with more imported inputs for production. However, reaping such gains is only feasible if the sectors in question can exercise and exploit scale economies to their advantage when the economy opens up and enables import of technologically better inputs than otherwise available domestically.

The ultimate employment gains to the manufacturing sector from the India-ASEAN FTA lies with sectors which are intensive in unskilled labour, enjoy scale economies and which allow for substitution of unskilled labour for skilled labour and capital. In the process, skilled labour employment is largely hit due to substitution by unskilled labour. Only a few major expanding manufacturing sectors, like transport equipment, motor vehicles, leather etc. employ more of them. Thus, the current trade and production structure in India supports employment of more unskilled labour at the cost of skilled labour, especially when trade expands. Unskilled labour force benefits from trade expansion both in terms of greater employment and higher wages. However, the increased wage bill hits the sectors by increasing their cost of production. In spite of this negative impact on skilled labour employment and the profitability of the sectors, yet, the overall impact of IAFTA on manufacturing sector's output, employment and welfare remains positive due to the increased trade and gains from employment generation of the unemployed unskilled work force. Thus, higher external demand needs to be sustained to maintain this gain in unskilled employment in India.

Greater openness and integration with the rest of the world is likely to expose India to more machine learning and other technological advancements, thereby exposing skilled labour to the risk of losing jobs. So, while skilled labour has the fear of losing jobs, unskilled labour has to get the job first. With concepts like artificial intelligence gaining prominence, the service sector may not be able to generate

the number of jobs it has in the recent times. So, India could end up with huge mass unemployment if it fails to grow its manufacturing sector and fails to create jobs to match the projected growth in its demography (Krugman, 2017). The fact that the share of manufacturing in exports is on the rise is possibly a positive point in this respect. Encouraging integration with the world might see greater export from the country which might provide the much-needed boost to the manufacturing sector and the employment generated therein. The present study which analyses the employment effect of IAFTA clearly indicates that manufacturing sector may contribute to employment generation via greater trade openness. If not for the entire labour force, at least the large pool of unskilled labour force stands to benefit from the FTA.

**References:**

Abraham, V. (2017) 'Last Three Years May Have Been the Worst Stagnant Employment Growth', *Economic and Political Weekly*, Vol. 52, No. 38, pp 13-17.

Banga, R. (2005) 'Impact of liberalisation on wages and employment in Indian manufacturing industries', *Indian Council for Research on International Economic Relations (ICRIER) Working Paper No. 153.*

Deardorff, A.V. (2001) 'Deardorffs' Glossary of International Economics'. http://www-personal.umich.edu/~alandear/glossary/. Accessed 15 April 2018.

Economic Survey (2013-2014) Various Issues. http://indiabudget.nic.in/. Accessed 5 March 2018.

Elbehri, A and T. Hertel (2004) 'A Comparative Analysis of the EU-Morocco FTA vs. Multilateral Liberalization', GTAP Working Paper No. 30

Ghose, A.K. (2000) 'Trade liberalisation and manufacturing employment', *Employment Paper No. 2000/3, Geneva, International Labour Office.*

Gilbert, J.P. (2001) 'Appendix: GTAP Model Analysis: Simulating the effect of a Korea –US FTA using Computable General Equilibrium techniques in Free Trade Between Korea and the United States?', *Policy Analyses in International Economics 62, Institute for International Economics.*

Goldar, B. (2002) 'Trade liberalisation and manufacturing employment: The case of India', *International Labour Organization, Employment Paper 2002/34*.

Goldar, B. (2009) 'Trade Liberalisation and Labour Demand Elasticity in Indian Manufacturing', *Economic and Political Weekly*, Vol. XLIV, No. 34, August 22.

Hasan, R., D. Mitra and K.V. Ramaswamy (2007) 'Trade Reforms, Labor Regulations, and Labor-Demand Elasticities: Empirical Evidence from India', NBER Working paper series, No. 9879 http://www.nber.org/papers/w9879. Accessed 15 December 2017.

Hasan, R., D. Mitra and K.V. Ramaswamy (2007) 'Trade Reforms, Labor Regulations, and Labor-Demand Elasticities: Empirical Evidence from India', *The Review of Economics and Statistics*, Vol. 89, No. 3, pp 466-481.

Hasan, R., D. Mitra, P. Ranjan and R.N. Ahsan (2012) 'Trade liberalisation and unemployment: Theory and evidence from India', *Journal of Development Economics*, Vol. *97, No.* 2, pp 269-280.

Kucera, D., L. Roncolato and E.V. Uexkull (2010) 'Trade contraction in the global crisis: Employment and inequality effects in India and South Africa', *Employment Sector. Employment Working Paper No. 54*, Geneva, International Labour Office.

Krugman, P. (2018) 'India's Story Can Either be Next Wave of Globalization or Mass Unemployment', News18 Rising India Summit. https://economictimes.indiatimes.com/news/economy/indicators/nobel-winner-paul-krugman-warns-india-story-could-end-with-mass unemployment/articleshow/63344124.cms. Accessed 30 April 2018.

Labour Bureau, Government of India. '*NSS 68$^{th}$ round*', http://mospi.nic.in/Mospi_New/site/inner.aspx. Accessed 15 March 2018.

Nag Biswajit and Saloni Khurana (2018) 'India's Trade Sensitive Employment : Analysis at the Sectoral Level', paper presented at the Workshop on *Jobless Growth in South Asia* at Indian Statistical Institute, Delhi Centre; Organised by World Bank and Indian Statistical Institute, March 8, 2018; https://sites.google.com/site/delhimacrowg/workshop-on-jobless-growth-in-south-asia. Accessed 1 May, 2018.

OECD Guidance, Competition Assessment Toolkit, OECD 2011, Vol. 2, Version 2.0 http://www.oecd.org/daf/competition/45544507.pdf. Accessed 1 September, 2017)

Papola, T. S. and P.P. Sahu (2012). 'Growth and Structure of Employment in India', A Study Prepared as a part of a Research Programme Structural changes, Industry and Employment- Macro-Economic Implications of Emerging Pattern. *Institute for Studies in Industrial Development, New Delhi*.

Sankaran, U., V. Abraham and K.J. Joseph (2007) 'Impact of Trade Liberalisation on Employment: The Experience of India's Manufacturing Industries', *Centre for Development Studies, Trivandrum*.

Sen, K, (2008) 'International trade and manufacturing employment outcomes in India: A comparative study', *No. 2008.87. Research paper/UNU-WIDER*.

Shastri, R. K., R. Tripathi, R and A. Singh: (2010) 'Impact of liberalisation on employment in India', *International Journal of Vocational and Technical Education*, Vol. 2, No. 3, pp 33-35.

Veeramani, C. (2016) 'Interlinkages between Exports and employment in India', *Export-Import Bank of India, Occasional Paper No. 179*.

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