FDI, wage inequality and employment in emerging economies: recent evidence from Indian manufacturing

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FDI, Wage Inequality and Employment in Emerging Economies: Recent Evidence from Indian Manufacturing;

By

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Abstract

The increased integration of developing countries with the global economy has seen a remarkable increase in foreign capital over the years. While the increasing momentum of FDI capital in the manufacturing of the emerging economies has left several questions unanswered, we focus our discussion on the trends in employment and wage inequality in context of developing economies. The empirical evidence in this regard is drawn from the Indian manufacturing by using the recent firm level panel data. It draws attention to the determinants of wage rate and employment in Indian manufacturing vis-à-vis the foreign and the domestic affiliates during the period 2001-02 to 2007-08. While empirical evidence in regard to developing countries provides a mixture of results, our analysis broadly concludes that for the entire manufacturing and the domestic affiliates, capital intensity was the most dominant factor in determining the wage rate. On the other hand the high output per worker and foreign ownership played the most prominent role in determining the wage rate of the foreign affiliates during our study period. Similarly, it is observed that the employment performance of the firm is less in high capital intensive firms, whereas the size and the rate of profit of the entire manufacturing and its subgroups are observed positive and significant in determining the employment.

Key Words: FDI; Employment; Wage; Panel data; Domestic Affiliates; Foreign Affiliates

Introduction

The effort by the emerging economies to attract foreign direct investment (FDI) in the current economic situation is well understood as a strategic weapon to upgrade technology, boost trade and achieve higher economic growth. The increasing expectation of positive benefits, such as, increase in the supply of capital and up-gradation of

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domestic technology is argued to be crucial for the developed as well as the developing country in this regard. As far the argument goes, technological up-gradation in developing countries from the inward FDI is primarily concentrated in the manufacturing sectors i.e., either in the foreign firms or by way of technological diffusion from the foreign to the domestic firms. In this regard the empirical studies on FDI are based on the notion that multinational companies use superior organizational and technological capabilities in the production process as compared to the domestic firms of underdeveloped and developing countries (Hymer, 1979). FDI is considered as the most preferred way of technology transfer as it internalizes the transfer of superior technological assets at little or no extra cost (Caves, 1974). FDI by the multinational corporations is one of the major channels in providing developing countries (and LDCs) with access to advanced technology (Robert & Oliver, 2001).

However, the increasing momentum of FDI capital in the manufacturing of the emerging economies has left several questions unanswered. One issue which has got extensive discussion and continues to be an unsettled issue virtually in every developing and labour surplus economy concerns the impact of FDI on the trends in employment and wage inequality. It can be argued that while every economy and the developing economies in particular aim at reducing poverty and trying to meet the Millennium Development Goals (MDG) by virtue of creating employment, any adverse impact would hinder the process. Unfortunately with significance level of unemployment and underemployment in a labour surplus country like India, the issue has not yet received much attention even with remarkable increase in inward FDI virtually in every sector.

FDI Impact on Wage and Employment; a General Review

The transfer of production technology to the developing economies from their potential industrialized trade partners needs to be understood from the employment and the wage perspectives. This is because the prime goal of every region, states and economy is to ensure employment with a minimum wage which would fulfill basic human needs. No doubt the emerging economies such as China, India, Brazil, Mexico, Argentina and Indonesia are trying a certain extent to turn the FDI to create employment and enhance the purchasing power of its people with higher wages. Although economic theory and

some empirical evidence suggest that developing countries can benefit from FDI-led growth, they should also assess the potential adverse effects of multinational production on wages and employment in the host economy.

Along with the enhancement of skills, technology, productivity and trade, FDI has the potential to create employment opportunity and contribute to the long term economic development of the developing country. In fact, attraction of FDI has become a key aspect of the outward oriented development strategy by many developing countries, as investment is considered a crucial element of growth and employment generation. Data in support to this reveals that an estimated 79,000 transnational corporations (TNCs) and their 790,000 foreign affiliates generated nearly 82 million jobs in 2007 compared to 70 million in 2006, registering a growth of 16.6 percent over 21.2 percent during 2006 (UNCTAD, World Investment Report- 2008). However, evidence from case studies of FDI on the employment and wage impact are controversial in nature. While findings on US manufacturing shows FDI led to an increase in wages in both the domestic and foreign firms, Venezuela and Mexican manufacturing shows a reduction in wages for the domestic firms (Atiken, 1998). Similar findings by Bronschier's (1978) conclude that FDI has increased inequality within the host country. In regard to the employment impact, the disappointing picture of Argentina reveals that the transnational corporations contributed to reduce the employment per company by 7.9 percent between 1993 and 1997. Manufacturing was the worst hit where the average decline in employment recorded 12.7 percent during the same period (Kulfas et al., 2001). Ramirez (2001) has shown that the technology transfers to Mexican economy from the parent companies are capital intensive in nature, resulting a limitation in the long term employment creation in the automobile industry. However, in contrary to negative impact, the study by Christoph Ernust (2005) shows the concern of positive employment impact on the domestic economy. Concerning chemical products, an analysis of employment data of major TNCs confirms the relatively positive employment impact compared with total manufacturing in Argentina and, to a lesser extent, Brazil. The figures are relatively less favourable for Mexico. TNCs involved in computers and, in particular, electronics, created significant employment in Mexico during the 1990s in the chemical industry but figure for the year

2000 has shown a declining trend in all the companies examined. In Indian context, Banga (2005) in its analysis for 78 three digit level industries have shown the impact of FDI, trade and technological progress on wages and employment. The findings shows that the higher extent of FDI in an industry leads to higher wage rate in the industry, it has no impact on its employment. Similarly technological progress is found to be labour saving but does not influence the wage rate. Pradhan et al (2004) studied the impact of FDI on labour and employment in Indian manufacturing for the year 2001-02. They concluded that the foreign firms do not have any adverse effect on the manufacturing employment as compared to their domestic counterparts while they significantly pay higher to their workers. Combining the positive and negative impact, UNCTAD in its report shows the direct and the indirect potential effect of FDI on the labour market as outlined in the following table.

Table-1: Potential effects of inward FDI on the quantity, quality and location of employment:

	Direct		**Indirect**	
	Positive	**Negative**	**Positive**	**Negative**
Quantity	Adds to net Capital and creates jobs in expanding industries	Acquisitions may result in rationalization and job losses	Create Jobs through forward and backward linkages and multiplier effects in local economy	Reliance on imports or displacement of existing firms results in job losses
Quality	Pays higher wages and has higher productivity	Introduces practices in e.g. hiring and promotion that are considered undesirable	Spillover of "best practice" work organization to domestic firms	Erodes wage levels as domestic firms try to compete
Location	Adds new and perhaps better jobs in areas with high unemployment	Crowds already congested urban areas and worsens regional imbalances	Encourages migration of supplier firms to areas with available labour supply	Displaces local producers, adding to regional unemployment, if foreign affiliates substitute for local production or rely on imports

Source: UNCTAD (1995).

Existing Evidence – The Case of Developing countries

This section explores briefly how foreign investment affects the labour market of the host country in bringing a change in the prevailing wage and the pattern of employment. This

discussion is focused in context to the developing countries with some empirical evidence from the existing studies in the light of theoretical arguments.

An Overview of Wage Impact

Given the significance of FDI in influencing the host country, the basic question addressed here is- how does FDI affects the wages of the host country? The answer that explains the relationship between these two in any economy or sector is not monotonic in nature. In this context Zhang and Zheng (1998) draws that most of the FDI flows in manufacturing from developing countries are relatively labour intensive in nature whereas, it is capital intensive from developed countries. Capital intensive FDI from the developed country is expected to use more skilled labour in the production process hence pays higher wages. In turn, it raises the average wage of the skilled labour of the host country. The reason being, the skilled labour supply in the developing country is assumed to be limited compared to unskilled labour and an increase in demand for the skilled labour would increase the wage rate since its supply remains more or less stable. Similarly, as the per capita labour productivity in the capital intensive industry is considered to be higher than a labour intensive industry, hence in the line of the neoclassical theory the higher marginal product of labour in the capital intensive industry would lead to higher wages. In other words, this is the "efficiency wage hypothesis" where the workers productivity depends positively on the wages which is higher than the market clearing wages. In long run as the demand for the skilled labour increases, the semiskilled and the unskilled labour gradually are trained and move with higher wages. This finally ends up in increasing the average wage rate of the developing country.

In addition to this theoretical viewpoint, many studies shows the positive impact of higher wages on the workers productivity under the following grounds, these include;
Higher wages discourage shirking by raising the cost of being fired (Solow, 1979). It also encourages worker loyalty and improves the efforts of the workers and group output (Akerlof, 1982). It is expected to improve the applicant quality and hence raise the average quality of workers (Weiss, 1991). These could be few possible reasons for higher wages by the foreign firms. Along with these, there are several other versions which

elucidate the increasing desirability of the skilled labour over the unskilled one. Machin and Reenen (1998) demonstrated that new technology is complementary to skilled labour, and its introduction results in increased demand for skilled workers. Glass and Saggi (2002) explain that workers employed by the multinationals immediately get access to their superior technology. Hence these multinationals must pay a wage premium to prevent workers from moving to other companies bringing along information about this technology. In contrary to these Conyon et al (1999) and Driffield (1996) explain the entire increase in wages in foreign firms is due to the higher productivity of labour. In context of developing countries there are several studies which supported the higher wages by the foreign firms over the domestic firms, e.g. Blomstrom and Perssion (1983, on Mexican manufacturing), Haddad and Harrison (1993, on Moroccan manufacturing), Lipsey and Sjoholm (2001, on Indonesian manufacturing). In contrast to these positive findings study by Das (2001), in context of developing country finds FDI can decrease the relative wage. Similarly Grima et al (1999, on UK manufacturing) find no statistically significant effect of FDI on domestic wages. Hence the above discussions can be concluded that the impact of FDI on the domestic manufacturing wages still remains inconclusive.

An Overview of Employment Impact

Even with the increased integration of the developing countries with the global economy the issue of FDI on industrial employment is a less researched area compared to the wages. Rather, more empirical research is carried out by paying attention of trade effect on employment compared to the FDI impact on employment. The impact of FDI on employment is in line with the wage rate where the case studies show a mixture of both positive and negative potential effects. A positive employment impact on the host country is more feasible in case of Greenfield investment as they create new production capacity and increases the demand for labour rather than the acquisition of the existing firms. However it often creates negative impact as it crowds out the existing traditional local labour intensive firms by producing goods at lower cost with modern technology. Hence the job loss surpasses the job creation by the foreign investment making the net effect negative. Similarly if the technology transferred through FDI is highly capital intensive

which aim at capturing the local market by reducing the cost of production, it may end up in reducing the employment potential of the host country. In other words the reduction in overall employment of the host country may be due to the transfer of technology by FDI which is not labour augmenting rather labour saving [Nickell and Bell (1996), Pianta and Vivarelli (2000)].

Looking at the above discussion, a broad generalization of net employment effect of FDI is difficult. It may be that we might not favorably argue the net impact on employment in absence of FDI. While the direct impact of FDI on employment has inconclusive answer, FDI may create positive indirect impact on employment generation. However economists across the globe have carried out limited research on the indirect effect of FDI on employment. As the technical and technological progress of majority of economies are skill biased which reduces the demand for unskilled labour [Machin and Reenen (1998), Hanson (2001)], the case study by Jenkins (2005) on Viet Nam economy shows that despite massive inflow of foreign capital in nineties and a significant contribution of foreign affiliates to the output, the direct employment by such affiliates are still relatively low. However the estimates of impact of FDI in U.S. by Glickman and Woodward (1989) using the survey data from the Bureau of Economic Analysis (BEA) have shown a substantial increase in employment between 1982 and 1986.

FDI Impact on Wage and Employment: the case of Indian Economy

Looking at the above discussions in context to the developing country the present section deals in detail the wage and employment separately for the foreign and the domestic affiliated firms[2] of the Indian manufacturing. We first look in detail the wage and employment trend of Indian manufacturing separately for the foreign and domestic firms before analyzing empirically the role of several explanatory variables in influencing

[2] The Companies Act 1956 identified a company as foreign subsidiary if more than 50 percent of the equity capital is held by a single foreign company. The Reserve Bank of India (RBI) in its study on finances of joint stock companies used a cutoff of 25 per cent of equity held by a single foreign company or if 40 per cent is held in one foreign country to designate a firm as foreign - controlled. However since 1992, the RBI has been following the guideline for identifying foreign direct investment enterprises as prescribed by the IMF in its Balance of Payments Manual (1993). i.e. the guideline of 10 percent promoter holdings for identifying FDI enterprise. In the present study, we follow the IMF guideline and classify foreign and domestic firms accordingly.

these. Along side we also look whether the wage gap between the foreign and the domestically owned firms have increased or narrowed down over the years. In this regard a distinct perception in a country like India expose that the increased wage of the foreign firms in turn has raised the relative wages of the domestic firms over the years. A number of studies have also analyzed how the productivity and wage advantages of foreign firms have influenced the productivity and/or wages of other firms, e.g., Haddad and Harrison (1993), Haskel et al. (2002), Almeida (2003) and Javorcik (2004) etc. The formal empirical evidence in this regard explains that whatever the extent and direction of spillovers to domestically- owned plants, the effect of foreign firms' presence is to raise the average level of wages.

The data related to both wage and employment is collected from the PROWESS database supplied by Center for Monitoring Indian Economy (CMIE). The data on the employment for a substantial number of companies is given from the year 2001-02 onwards. Due to the non-reporting of data prior to 2001-02 by the companies, the present study considers the period 2001-02 to 2007-08 for the empirical analysis. This is because the employment data relating to previous years are not available as per the provisions of the Companies Act, 1956 and the companies' rules, 1975 never required the companies to reveal their total number of employees. Later the amendment in 2000 made it mandatory for the companies to reveal their total number of employees. The study takes an unbalanced panel data during the period for analysis purpose.

First, the wage rate for the entire manufacturing and for each major industry group will be estimated by taking the weighted average of firms wage rate using number of employees as the weight. In the next stage, to study systematically the factors affecting the wage behavior of both the group of firms, we consider a wage determination model of the following form.

$$\mathbf{WAGE}_{it} = \beta_1 + \beta_2\, \mathbf{OP}_{it} + \beta_3\, \mathbf{CAP}_{it} + \beta_4\, \mathbf{Fown}_{it} + \beta_5\, \mathbf{Size}_{it} + \mathbf{B}_6\mathbf{Prof}_{it} + \eta_i \qquad \text{---------- (1)}$$

These explanatory variables are estimated from the database as follows:

$WAGE_{it}$ **:** Wages per worker paid by the i^{th} firm in t^{th} time period. (Rs million). i.e. total salaries and wages to the number of workers.

OP_{it} **:** Output per worker in the i^{th} firm in t^{th} time period (Rs. million). It's the ratio of GVA[3] to the number of workers.

CAP_{it} **:** Capital intensity[4] of i^{th} firm in t^{th} time period (Rs. million). It's the ratio of capital to the number of workers.

$Fown_{it}$ **:** Percentage share of foreign ownership of the i^{th} firm in t^{th} time period.

$Size_{it}$ **:** Total sales of i^{th} firm during t^{th} time period (in Rs million).

$Prof_{it}$ **:** Profit of i^{th} firm at time t.

η_i **:** The random disturbance term.

The above equation is the base for calculating the determinants of wages for the entire manufacturing and for the foreign manufacturing groups. However while estimating the wage determinants for the domestic manufacturing firms the independent variable $Fown_{it}$ is dropped from the equation as the share of foreign ownership in the domestic firm is zero or negligible.

The model for determining the wage for the domestic firms will be as follows:

$$\mathbf{WAGE_{it} = \beta_1 + \beta_2\, OP_{it} + \beta_3\, CAP_{it} + \beta_4\, Size_{it} + B_5 Prof_{it} + \eta_i} \quad \text{---------- (2)}$$

Once the coefficients of the independent variables are obtained, we compute the standardized coefficient of each explanatory variable by employing the following formulae –

$$C_s = C_{us} * (Sd_x / Sd_y) \quad \text{---------- (3)}$$

Where-

C_s is the standardized coefficient

[3] While the net value added concept may be theoretically appropriate, but the depreciation figure reported in Prowess/ASI do not correctly represent the true capital consumption and also due to measurement problem associated with other input like capital stock, the gross value added has been preferred to net value added as a measure of output. In the present study the Gross Value Added (GVA) is derived in adding the expenditure on the wages and salaries to gross profit (i.e. profit before tax) and the interest payment.

[4] The measurement of capital, i.e. the gross capital stocks at the firm level across all sectors is computed by an approximation on using the methodology shown in Basant and Fikkert (1996). The conversion into the real capital stock is worked out on using the Perpetual Inventory Method (See Appendix-A).

C_{us} is the estimated coefficients of the explanatory variables:

Sd_x is the standard deviation of the independent variable, say out put per worker

Sd_y is the standard deviation of the dependent variable i.e. wage rate.

The second part of the analysis studies the employment behaviour of the Indian manufacturing along with the foreign and domestic firms. As part of the analysis we control the impact of extraneous factors to draw the inference on the factors that determine the employment behaviour of the manufacturing as a whole as the foreign and domestic shareholding firms. To determine this we take a semi log function where the log of employment is regressed upon some explanatory variables such as wage paid, capital intensity, export intensity, size and profit of the firm. The purpose of taking a semi log function is to bring linearity in the database. The model is as follows.

$$\mathbf{Ln\ Emp_{it} = \beta_1 + \beta_2 Wage_{it} + \beta_3 CAP_{it} + \beta_4 Expin_{it} + \beta_5 Fown_{it} + \beta_6 Ln\ Size_{it} + B_7\ Ln\ Prof_{it} + \gamma_i} \quad \text{----------(4)}$$

Where Ln represents the natural log and the explanatory variables are as per the equation-1 including the

Emp_{it}: log of employment of the i^{th} firm in t^{th} time period.

$Expin_{it}$: export as percentage of sales of the i^{th} firm in t^{th} time period.

The above equation is the base for estimating the employment determinants of the manufacturing as well as at the subgroups level. However the model does not include the share of foreign ownership in the estimation process while calculating the employment determinants of the entire manufacturing and the domestic firms.

Impact of FDI on Wage: Foreign Vs. Domestic

This section is concerned with the change in relative wages of the Indian firms' vis-à-vis the foreign and the domestic owned firms. One perception in the findings of most of the earlier literature, the foreign firms pay higher wages to its employees than the domestic firms. A related question arises; do higher wages of foreign firms affect the wage structure of the domestic firms? In other words do the domestic firms follow an increase

in wage payment to their workers too? Undoubtedly many findings supported this under different grounds. On the other hand Lipsey (2002) stated that the wage rate in the host economy can also increases without any wage differential between foreign – owned and domestically- owned operations if labor markets were sufficiently competitive and the rise in demand for labor from foreign- owned operations forced all firms to raise their wage levels equally. In contrary another argument insist that, even if the foreign firms pay higher wages, there might be no overall impact on wage levels if the higher wages simply reflected the selection by foreign firms among workers, plants, or locations. They might select superior workers who would command high wages from any employer, or acquire higher wage plants or firms, or concentrate their activities in high-wage industries or regions of a country.

In the backdrop of above arguments the study first attempts to estimate the wage differentials of the foreign and the domestic firms during the above said period for the entire manufacturing and for each major industry groups. Second, the study attempts to find whether the difference in wages has widened or narrowed down over the years.

Wage Rate: Entire Manufacturing

For the year 2001-02 a total number of 332 manufacturing firms are taken for analyzing the wage differential of the domestic and the foreign firms. During 2001-02 the share of foreign firms reporting the number of labour was 21.1 percent which increased gradually to 24.2 percent in 2006-07 before it settles down at 23.4 percent during 2007-08.

The findings reveal that during the first year data the wage rate of the domestic firms was estimated higher over the foreign firms whereas the wage rate for foreign firms in all other years stood higher over the domestic firms. The annual average growth of wage rate for the foreign firms was estimated higher at 11.4 percent compared to 10.7 percent for the domestic firms. The absolute growth wage rate of foreign firms during the study period stood at 108 percent compared to 82 percent for the domestic firms.

Table-2: Wage rate of Foreign and Domestic Firms: All Manufacturing

Year	No of Firms			Wage Rate (Rs '000)	
	Foreign	Domestic	Total	Foreign	Domestic
2001-02	70	262	332	140.8	158.7
2002-03	117	420	537	199.2	153.6
2003-04	117	423	540	209.2	164.8
2004-05	105	402	507	198.3	197.4
2005-06	113	430	543	247.2	224.0
2006-07	135	423	558	275.1	221.4
2007-08	127	415	542	293.2	289.6

Source: Author's Estimation from Prowess Database.

The wage rate of the foreign and domestic firm is given in fig-1. Fitting the trend line it shows that the foreign firms wage rate lies well ahead of the domestic firms during the entire time period.

Wage Rate: Major Manufacturing Groups

The analysis of wage rate for the major manufacturing groups' shows that the average wage rates of foreign firms in majority of the industry groups are higher over the domestic firms. This is shown for all major industry groups in figure-1 to 12. Analysis of food and beverages industry shows that the average wage rate for the domestic firms grew at 20.4 percent compared to a marginally higher growth of 20.9 percent for the foreign firms. Similarly the industry groups in which the trend growth of wage rate for the foreign firms is higher over the domestic firms include coke, refined petroleum products and nuclear fuel industry, chemicals and chemical products Industry, other non-metallic mineral products industry, basic metal Industry, machinery and equipment industry and electronics machinery industry. On the other hand the industry groups such as textile industry, rubber and plastic products industry, transport industry and other miscellaneous[5] industry groups have shown higher average wage rate for the domestic

[5] This industry groups composed of tobacco product industry, tanning and dressing of leather; manufacture of luggage, handbags saddlery, harness and footwear industry, wood and of products of wood and cork, except furniture; manufacture of articles of straw and plating materials, paper and paper products industry, publishing, printing and reproduction of recorded media, fabricated metal products, except machinery and equipments industry, office, accounting and computing machinery industry, medical, precision and optical instruments, watches and clocks industry and manufacture of furniture; manufacturing n.e.c. The

firms over the foreign firms. The average wage rate of all the major industry groups during the period 2001-02 and 2007-08 is given in the following sets of diagrams. The trend line for the sub groups such as foreign and domestic is fit to show the trend in the wage rate and the direction of change during the study period.

Fitting trend line for each foreign and domestic industry group reveals that in the industry groups such as food and beverages industry, other non-metallic mineral products, chemicals and chemical products industry, machinery and equipment industry and electronics machinery industry has shown an increase in the wage gap over the years. The wage rate of foreign firms in these industry groups increased faster than the increase in the wages in the domestic firms. However in textile industry, basic metal industry, transport industry and other miscellaneous industry group, the wage gap widened with higher growth for the domestic firms over the foreign firms.

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employment data of 35 industry (7 foreign and 28 domestic firms) in this industry group was released by prowess during 2001-02 which increased to 61 (13 foreign firms and 48 domestic firms) during 2007-08.

Fig-1: All Manufacturing

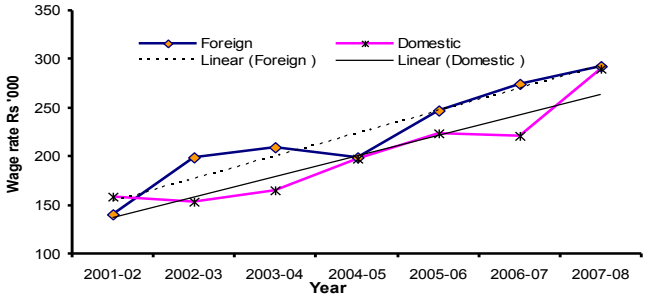

Fig-2: Chemicals and chemical products

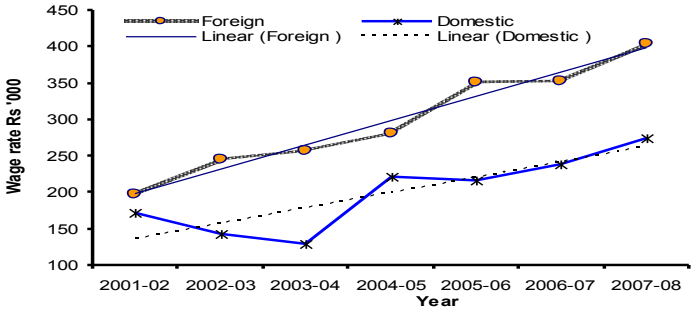

Fig-3: Food and Beverages

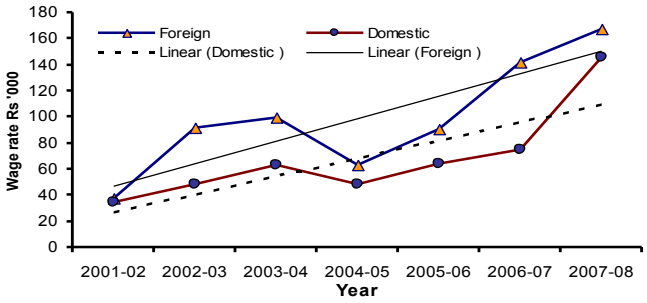

Fig-4: Textile Industry

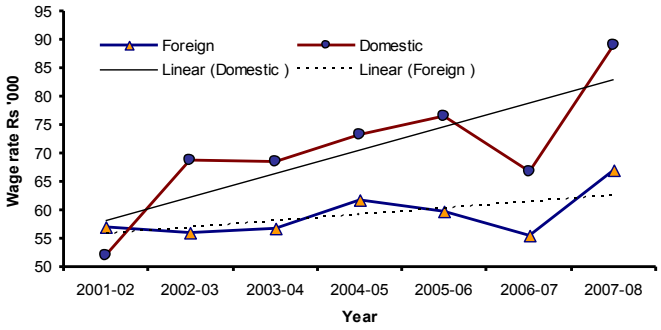

Fig-5: Rubber and plastic products

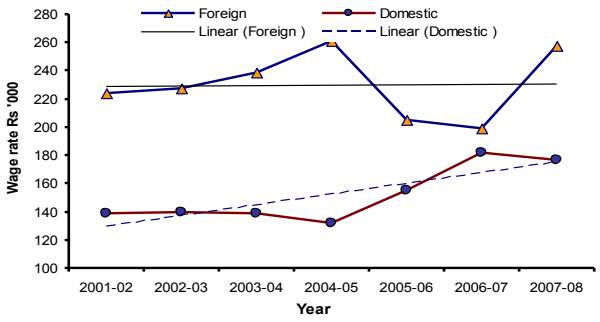

Fig-6: Coke, refined petroleum products and nuclear fuel

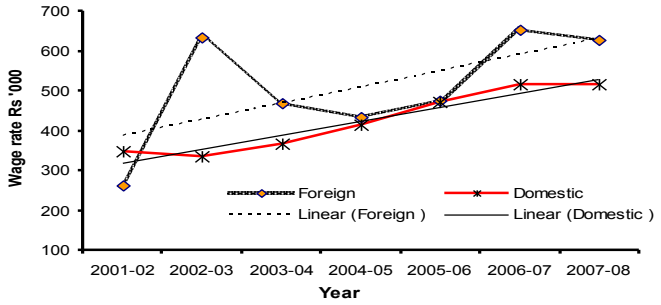

Fig-7: Other Non-Metallic Mineral Products

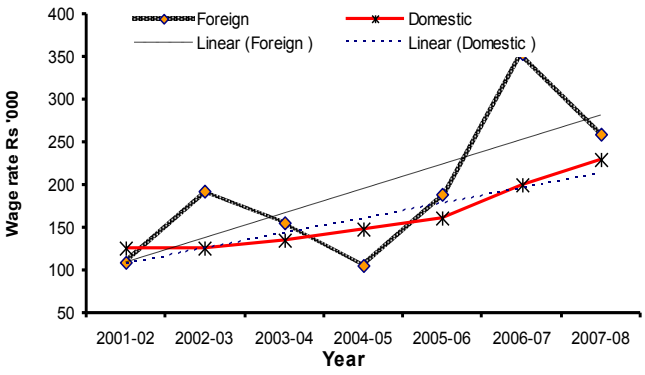

Fig-8: Machinery and equipment

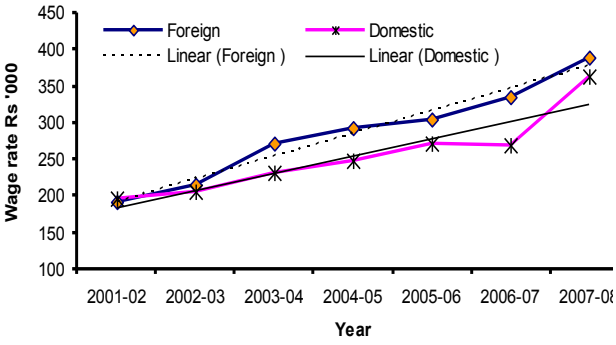

Fig-12: Other Miscellaneous

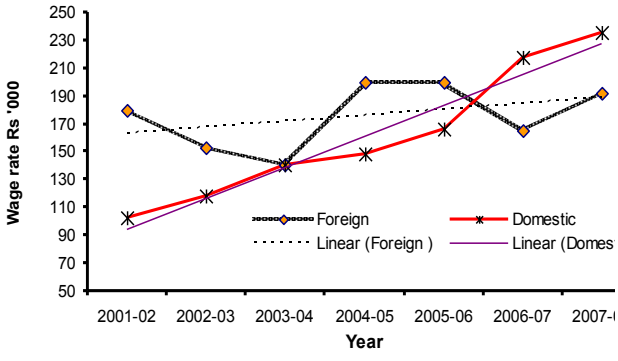

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Fig-9: Basic Metal

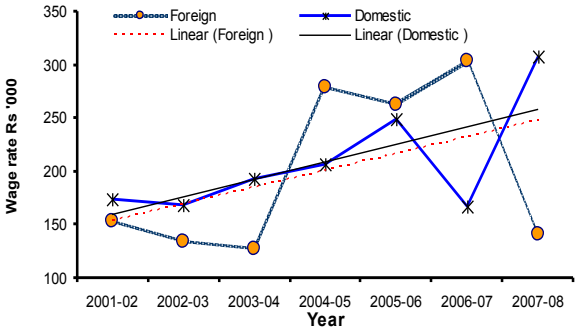


Fig-10: Electronics Machinery

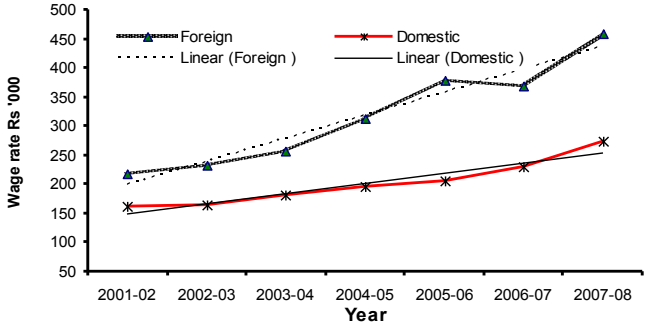
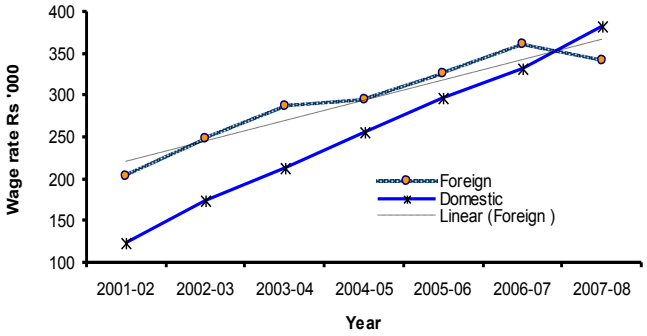


Fig-11: Transport



Empirical Estimation of Wage Determination:

Here we consider the factors associated in determining the wage rate of the entire manufacturing vis-à-vis the foreign and the domestic firms. In the previous section we didn't take into account the controlling factors such as the productivity of workers, firm size, number of employees, profit and other factors that might affect in determining the wage rate of the firm. Studies in this regard reveal that the incorporation of these factors might affect the extent of wage differential in the foreign and domestic firms. Globerman et al (1994) in their study on Canadian manufacturing found the wage gap between the foreign and domestic firms vanished once the control for the size and capital intensity are introduced. In this regard we follow a simple wage determination model as discussed in the methodology section.

Wage Determinants of Entire Manufacturing:

The equation-1 has been estimated for the entire manufacturing based on 11 broad industry groups which contains a maximum of 550 firms and 3257 observations during the period 2001-02 to 2007-08. The result is estimated in panel data estimation method. The second column of the table shows the un-standardized coefficient, is based on the findings from the panel data regression. The third column shows a vector of fully standardized coefficient estimated based on equation-3. These coefficients are scale free and its estimation is useful in comparing the strengths of different explanatory variables of the regression.

The estimated model for entire manufacturing sector (table-7.3) shows highly significant z-statistics indicating that all the determinants taken together have contributed significantly in determining the wage rate of the manufacturing. The major points that can be derived from our analysis that the foreign share (Fown) has got a strong positive impact in determining the wage rate of the manufacturing. The vector of standardized coefficient shows that it is the third dominant factor of the firm level wage rate variation placed next to capital intensity and the output per worker.

Table-7.3: Determinants of Wage Rate: Entire Manufacturing

Dependent Variable: wage rate		
Explanatory Variables	**Unstandardised Coefficients**	**Standardised Coefficients**
OP_{it}	0.0345226 ***	0.060074458
	(0.0039612)	
Cap_{it}	0.0666811 ***	0.928504660
	(0.0004944)	
$Fown_{it}$	0.1020812 ***	0.010439832
	(0.0315712)	
$Size_{it}$	-0.000000319 **	-0.010272597
	(0.000000151)	
$Profit_{it}$	-0.00000443 **	-0.010800024
	(0.000002)	
Constant	0.0216008 *	
	(0.0121666)	
Maximum No of Firms	550	
No of Obs.	3257	
Prob > chi^2	0.000	
R-Square	0.8635	

Note: Value in the parentheses shows the standard error.
***, ** and * represents the significance level at 1 percent 5 percent and 10 percent respectively.
Source: The un-standardized coefficient is calculated on using the equation-1 and the standardized coefficient is calculated on using the equation-3.

Similar explanation can be extended to the output per worker and the capital intensity which shows that both the coefficients are positive and statistically significant with the difference in their magnitude of impact on the wage determination. In other words higher the output per workers (labour productivity) higher is the wage rate of the firms. This finding is in line with the neoclassical model of the demand for labour which says that the high wage rate is directly related to the marginal productivity of labour. Similarly high capital intensive firms pay more wages to the employees over the low capital intensity firms. Looking at the standardized coefficient, this variable explains the maximum impact on determining the wage behaviour of the firm. This may be that the employees worked under the high capital intensity are in an advantageous position and better off

than their counterparts. Loosing these employees would increase the time and cost of the firm in bringing up the new workers up to their requirements. This could be the reason for the firms to pay high wages to the workers working under more capital intensity.

Contrary to the above findings, the variables such as size and profit show negative and statistically significant. This is contradictory to the general expectations. It appears that the large establishments in Indian manufacturing may not be sharing much of its profit with the employees, whereas the smaller sized firm pays higher wage to their employees. This may that the unfavorable characteristics such as the higher job risk and less job satisfaction they face while working with the smaller sized firm.

Wage Determination: Foreign Vs Domestic Firms

The estimation of wage determinants of the foreign firms is based on a maximum number of 135 firms with 829 observations. The estimated result shows highly significant z-statistics indicating that all the variables have significant impact in determining the wage rate of the foreign firms.

The explanatory variables such as output per worker, foreign ownership and firm size have strong positive and significant relation with the wage rate. The value of standardized coefficient for the output per worker shows the most dominated factor in determining the wage rate of the foreign firms followed by the foreign ownership share. More simple, higher the foreign ownership higher the wage paid to the workers. In other words the foreign firms' pays better compensation to their employees compared to their counterparts. Similarly the big foreign establishments pay higher wages to their employees over the small foreign firms.

Table-4: Determinants of Wage Rate: Foreign Firms

Dependent Variable: wage rate	Foreign Firms		Domestic Firms	
Explanatory Variables	Unstandardised Coefficients	Standardised Coefficients	Unstandardised Coefficients	Standardised Coefficients
OP_{it}	0.0864427 ***	0.463627636	0.0314503***	0.054588004
	(0.0069245)		(0.0044831)	
Cap_{it}	-0.0008623	-0.018586292	0.0671081***	0.933977686
	(0.0015856)		(0.0005585)	
$Fown_{it}$	0.1270774 ***	0.27217598		
	(0.013455)			
$Size_{it}$	0.000000696**	0.100581586	-0.000000238	-0.007615857
	(0.000000322)		(0.00000017)	
$Profit_{it}$	-0.00000152	-0.018394963	-0.00000516**	-0.012486469
	(0.00000384)		(0.00000225)	
Constant	0.1087046 ***		0.02005*	
	(0.0109445)		(0.0138279)	
Max. No of Firms	135		415	
No of Obs.	829		2698	
Prob > chi^2	0.000		0.000	
R- Square	0.3734		0.8658	

Note: Value in the parentheses shows the standard error.

***, ** and * represents the significance level at 1 percent 5 percent and 10 percent respectively.

Source: The un-standardized coefficient for foreign firms and domestic firms is calculated on using equation-1and.2 respectively. The standardized coefficient is calculated on using the equation-3.

In contrary the capital intensity and the rate of profit shows negative relationship with the wage rate of the foreign firms. However the insignificant coefficient of these variables does not strongly support to these arguments, meaning these variables have insignificant association with the wage determining factor of the foreign firms.

Wage Determinants of Domestic firms

The determinants of wages at the firm level for the domestic manufacturing are estimated on using equation-2. The estimation process involves a maximum number of 415 manufacturing firms with 2698 observations. The highly significant z-statistics reveals that all the explanatory variables have high significant impact in determining the wage rate of the domestic manufacturing.

The estimated coefficients such as output per workers and capital intensity have strong positive and significant association with the wage rate whereas the profit has negative and significant association. The findings almost resembles with the findings of entire manufacturing except the exception of negative and insignificant association of firm size in case of domestic manufacturing. Here the vector of standardized coefficient of capital intensity is the most dominant factor in determining the wage rate of the domestic firms followed by output per worker. On the other hand the arguments of negative association of firm size with the wage rate can not be valid statistically due to the insignificant coefficient. The explanations of association of variables with the wage rate in case of domestic manufacturing can be the same as given in case of the wage determinants in entire manufacturing.

Fig-13: Growth rate of Employment and

Firms: All Manufacturing

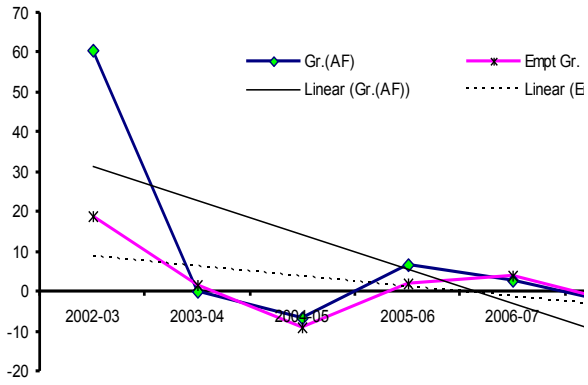


Fig-15: Growth rate of Employment and Firms:

Foreign Firms

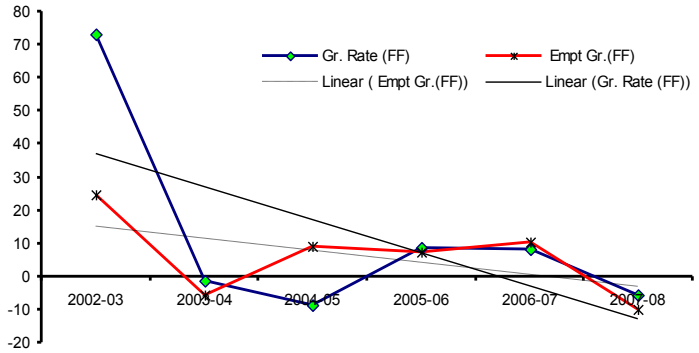
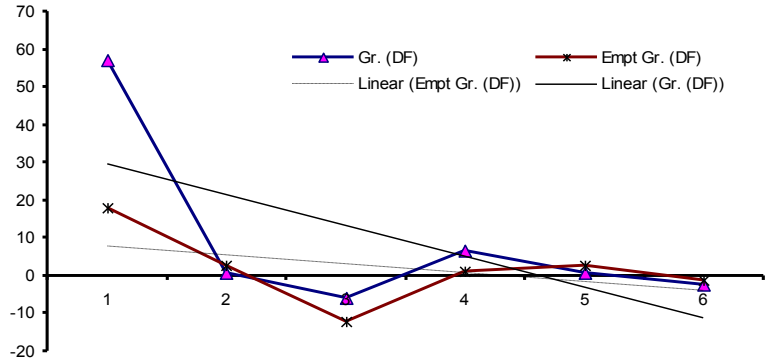


Fig-14: Growth rate of Employment Firms: Domestic Firms



In regard to employment a more disaggregated analysis at the firm level reveals that the annual average growth of all firms during the period 2000-01 to 2007-08 reporting the number of employees is estimated at 5.3 percent compared to 5 percent and 6.3 percent growth of the domestic and foreign firms respectively. However the growth rate of the number of employees during the same period for all firms is estimated at 0.9 percent compared to an estimated 0.04 percent for the domestic and 5.4 percent for the foreign firms. The share of salaries and wages[6] of the foreign firms in the entire manufacturing was about 13.1 percent during the year 1999-00 which increased to 20.2 percent during

[6] The calculation is based on the initial sample of 2083 observations reporting the figure of salaries and wages till the financial year 2007-08 in the PROWESS database. The entire manufacturing is composed to 299 foreign and 1784 domestic firms on the basis of the share holding pattern.

2007-08 registering an annual average growth of 3.74 during the period. On the other hand the salaries and wages share of the domestic firms declined at an annual average of -0.8 from nearly 87 percent to 79.8 percent during the same period. This gives a clear picture of increase in the role of foreign holding firms over the domestic holding firms over the years.

Determinants of Employment: Entire Manufacturing

We attempt to analyse the employment behaviour of the manufacturing through the panel data regression model after controlling the extraneous factors. The analysis involves maximum of 483 firms with 2859 observations[7]. The analysis shows nearly 66 percent, and the z statistics shows overall the model is highly significant. The selection of variables is undertaken on the basis of autocorrelation problem within the independent variables.

Table-5: Determinants of Employment: Entire Manufacturing

Dependent Variable: Employment		
Explanatory Variables	**Unstandardised Coefficients**	**Standardised Cefficient**
$Wage_{i\,t}$	0.048669	0.1222930623
	(0.0287858)	
Cap_{it}	-0.007059***	-0.2460165696
	(0.0020769)	
$FOWN_{it}$	-0.228595***	-0.0549869445
	(0.0460283)	
$Expin_{it}$	0.283017***	0.0449455381
	(0.0686958)	
$Size_{it}$	0.646152***	0.76717074465
	(0.0174669)	
$Profit_{it}$	0.045812***	0.06810289704
	(0.0140261)	

[7] The number of samples and observations in this analysis differs from that of the estimation of wage rate determination. This is because the reporting of negative profit by some firms could not be converted into the logarithm value, hence those year data are excluded from the analysis.

Constant	1.371207***	
	(0.0884054)	
Maximum No of Firms	483	
No of Obs.	2859	
Prob > chi^2	0.000	
R-Square	0.6654	

Note: Value in the parentheses shows the standard error.

***, ** and * represents the significance level at 1 percent 5 percent and 10 percent respectively.

Source: Estimated on using the equation-7.4.

Amongst the determinants of employment in the entire manufacturing the wage rate has shown positive but statistical insignificant result does not explain strongly the direct association in determining the employment behaviour of the manufacturing. Amongst other variables the export intensity, size of the firm and the profit has shown positive and statistically significant. This shows that as the size of the firm and the rate of profit increases the employment also increases. Similarly the highly export oriented industry also employs more compared to their counterparts. However the capital intensity has got significantly negative impact saying that the employment performance of the firms is less in capital intensive firms. The role of foreign ownership is not much to our expectations. It shows negative and significant association, meaning, higher the inflow of foreign capital lower will be the direct employment generation in the manufacturing.

Determinants of Employment: Foreign Vs. Domestic Firms

The determinants of employment in the foreign manufacturing sector are estimated employing the equation-4. The analysis is based on a maximum sample of 126 firms with 724 observations.

Table-6: Determinants of Employment: Foreign and Domestic Firms

Dependent Variable: Employment				
Explanatory Variables	**Coefficients of Foreign Firms**	**Standardised Coefficient (FF)**	**Coefficients of Domestic Firms**	**Standardised Coefficient (DF)**
$Wage_{it}$	-3.08549 ***	-0.433815362	0.0456677	0.124728479
	(0.1644197)		(0.0304183)	
Cap_{it}	-0.0816525 ***	-0.255919112	-0.0067601 ***	-0.255933709
	(0.0066626)		(0.0021957)	
$EXPIN_{it}$	0.0798841	0.012600655	0.2417302 ***	0.038323808
	(0.1198739)		(0.0763169)	
$FOWN_{it}$	0.1895498 ***	0.056999971	----	----
	(0.0694793)		----	----
$Size_{it}$	0.7627189 ***	0.944798185	0.6520949 ***	0.764543705
	(0.0267565)		(0.0203334)	
$Profit_{it}$	0.0536219 ***	0.083334816	0.0551058 ***	0.080127910
	(0.0203221)		(0.0163422)	
Constant	1.065867 ***		1.299788 ***	
	(0.1411096)		(0.1011955)	
No of Firms	126		357	
No of Obs.	724		2135	
Prob > chi^2	0.000		0.000	
R-Square	0.7402		0.6927	

Note: Value in the parentheses shows the standard error.

***, ** and * represents the significance level at 1 percent 5 percent and 10 percent respectively.

Source: Estimated on using the equation-4.

The finding of foreign firms is much to the expectations. The variables wage paid and the capital intensity has shown negative and significant association with the employment generation. This implies that higher the wage rate lower will be the employment of the manufacturing and the employment performance of the firms is less in the high capital intensive firms. In contrary the variables such as foreign ownership, size of the firm and the profit rate has shown positive and significant impact on the employment creation. In other words any increase in either of these variables positively influence the employment

generation of the firm. The standardized coefficient value shows that the size of the firm is the most dominant factor in determining the employment of the foreign firms. At the same time the positive sign of export intensity can not be explained empirically on the employment behavior of the foreign firms due to the unaccepted level of significance.

The estimated result for the domestic firms shows nearly 70 percent and overall the model is highly significant as observed from the z-statistics. The capital intensity coefficient is the only one showing the negative and significant association with the employment generation in contrary to positive association of all other variables. However the positive wage coefficient does not prove statistically the high employment with the high wage rate due to the insignificant coefficient. On the other hand the variables such as profit rate, export intensity and the size of the firm have strong positive relation in determining the employment of the domestic firm. The association of profit rate with the employment generation can be explained under the ground that, with the increase in profit of the firm it raises the expectation of growing up by expanding its size and base in the way of increasing the output; sales etc. and hence increases the employment.

Concluding Remarks

This paper is primarily based on the factors associated with the Indian manufacturing and their subgroups in determining the wage behaviour and the employment behaviour. The empirical variation of the impact of FDI on wages has been progressed in two stages; first, it involved simple calculation of wage rate to the employees and second, the estimation followed an econometric approach in determining the wage behaviour for the types of firms. The findings shows that in majority of industry groups the wage rate of the foreign firms is observed high over the domestic firms except the exception of textile industry, rubber and plastic products industry, transport industry and other miscellaneous industry groups where the average wage of the domestic firm is estimated higher. The findings of wage determinants for the entire manufacturing and the domestic firms revealed that the capital intensity plays the most dominant factor in determining the wage rate. On the other hand the high output per worker is found to be the most dominant

factor followed by foreign ownership are the prime determinants of wage rate in foreign firms.

In determining the employment behaviour of the manufacturing it is observed that the capital intensity is significantly negative for the entire manufacturing vis-à-vis the foreign and the domestic firms, indicating that the employment performance of the firms is less in high capital intensive firms. Similarly the size and the rate of profit of the entire manufacturing and its subgroups are observed positive and significant. The wage rate, considered to be amongst the prime determinants of employment is found insignificant for the domestic and the entire manufacturing while for the foreign manufacturing it is estimated to have negative impact on the employment generation. Above all the role of foreign ownership on the employment in the entire manufacturing is found negative whereas for the foreign firms it is positive. Be it domestic firms, foreign firms or all manufacturing, the estimation of standardized coefficient shows that the firm size takes the first place amongst all the explanatory variables in explaining the determining the employment.

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Appendix-A

The use of Perpetual Inventory Method (PIM) involves certain assumptions; first in order to convert to net physical capital stock in constant 1999-00 prices the methodology assumes 6 % depreciation of capital so that the full depreciation of machinery and equipments would take about 16 years for accounting purpose.

In order to construct a net physical capital stock at constant 1999-00 prices, it first calculates the average age of the firm through the following formulae.

$$AA = \frac{AD_{99}}{GCS_{99}/16} \qquad \text{---------- (1.a)}$$

Where AA= Average age of the firm

AD = Accumulated depreciation of the firm.

GCS = Gross capital stock of each firm.

After computing the value of AA for each firm from the equation-1.a during the year 1999, the real capital stock is calculated using a deflationary measure. This is calculated in taking the ratio of Gross capital stock to the price index of machinery and the tools for the year 1999-00 as the base year on the basis of the Average age of the firm. More clearly the method follows as under.

Suppose we find AA for a particular firm is 8. Considering the base year as 1999, suppose the price index of machinery and the tools 8 years back is 0.83. Now-

The real capital stock in 1999 = GCS/ 0.83 (where GCS= Gross Capital Stock) and

The Net Capital stock (NCS) in 1999 is

$NCS_{99} = (GFA/0.83)\ (1- 0.06)^8$ ……. (1.b)

Equation (1.b) is used to compute the net capital stock for the year 2000 as under

$$\text{The NCS in 2000 } (NCS_{2000}) = NCS_{99}\ (1\text{-}0.06) + \frac{(GCS_{2000} - GCS_{99})}{WPI_{2000}} \qquad \text{……. (1.c)}$$

Here WPI_{2000} stands for the price index of machinery and the tools during the year 2000. The above equation (1.c) is used for computing the net capital stock during the year subsequent year 2001.

Hence the NCS in 2001 (NCS_{2001}) = NCS_{2000} (1-0.06) + $\frac{(GCS_{01} - GCS_{2000})}{WPI_{01}}$ ……. (1.d)

Equation (1.d) will be used for estimating the net capital stocks for the subsequent years, giving a capital stock series net of depreciation and expressed in constant 1999-00 prices.