MNEs, Product Differentiation, Skills and Employment: Lessons from Indian experience

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May 2006

Abstract

Several studies dealing with the overall impact of liberalization on employment, have been focusing on the issue of jobless growth. Given the short duration of liberalization experience, it is difficult to forecast its impact on overall employment. Nevertheless, it is possible to analyse the characteristics of sectors where employment went up in contrast to sectors where employment declined. Using panel data on 33 Indian manufacturing industries for nine years (1992-2001) our results based on generalised least squares estimates show that technology imports through joint ventures and MNE participation positively influence employment. Labour productivity, as expected, affects employment negatively. Nevertheless, the growth of value addition does compensate for this negative relationship and promotes employment. Positive growth in employment is observed in industries where skill intensity is high and where firms produce differentiated products. These results taken together have implications for the current debate on employment and liberalisation and suggest that employment, production of differentiated products, skill intensity of the work force and technological up-gradation measures go hand in hand.

Key Words: Liberalization, India, Employment, MNE.

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I INTRODUCTION

In the 1990s several less developed countries (LDCs) launched programmes aimed at liberalising their trade and investment regimes. These countries, in undertaking the liberalisation measures were partly influenced by the success of the liberalised East Asian economies and partly guided by the Uruguay trade negotiations that eventually resulted in the establishment of the World Trade Organization (WTO) in 1995. The liberalisation measures included drastic reduction in import tariffs, abolition of quantitative restrictions like quotas, encouragement to foreign direct investments (FDI), removal of restrictions placed on the operations of multinational enterprises (MNEs), enacting laws to protect intellectual property rights and liberal import of technologies against royalty and

technical fee payments. Several studies have been undertaken to analyse the impact of the liberalisation measures on employment. The results of these studies, however, have not been unambiguous. Some of the studies show that liberalisation measures have harmed employment prospects while others show mixed results. In this study we argue that in respect of generation of employment, liberalisation measures will result in gainers and losers. In this context, it is important to identify the industries/sectors that gained in employment and those that lost. In particular, we aim at identifying the characteristics of industries where employment increased/decreased after liberalisation. We further argue that liberalisation measures introduced in the current WTO regime would result in a global relocation of industries and changes in the location patterns. As a result in every country, some industries will wither away and some new industries will emerge and within industries some firms will die out and some firms will prosper. In the short run, however, it is difficult to forecast the impact of these structural and location changes on overall employment. Nevertheless, it is possible to analyse the characteristics of sectors where employment went up in contrast to sectors where employment declined. In this paper we use the Indian data to illustrate our case.

Several studies dealing with the overall impact of liberalization on employment have been focusing on the issue of jobless growth. Some of the country specific studies are: for China (the Chinese Blue Book 2001), India (Bhole and Dash 2002), Jamaica (King 2001), Russia (Tchernina 1994), South Africa (Nattrass 1998), and Mexico (Alarcon and Zepeda 1998; and Revenga 1997). The problem of high growth rates in income unaccompanied by employment growth has also engaged the attention of policy makers. For example, the Chinese Blue Book (2001, pp. 209-219) devotes an entire

chapter to this problem. As noted in the Blue Book, the impressive Chinese growth rates in GDP have been accompanied by very low and declining growth rates in employment. A decline in overall employment in developing countries, following liberalization, motivated a number of studies. One set of studies showed that the adoption of information and communication technologies creates only white-collar jobs and no blue-collar jobs. Salvanes and Forre (2003) have shown the existence of skill biased technological change resulting in job destruction of low skilled workers, while Feliciano (2001), has found increased wage inequality consequent to liberalization.

Espousing the point of view of labour, studies edited by Dabir-Alai and Odekon (1998) focus on the adverse impact of liberalization on employment. An important finding by Kim (1998) is that in Latin American countries, inflows of investment following liberalization have raised the demand for skilled labour relative to the less skilled or unskilled labour. The reason cited for such a shift is that following liberalization, demand for quality goods, which can only be produced by skilled workers, increases faster relative to the demand for standardized goods produced by the less skilled.

Some studies, however, report positive growth in employment consequent to liberalization. For example, Athukorala and Rajapatirana (2000) report an increase in employment in organized manufacturing sector in the post liberalization period in Sri Lanka. In yet another set of studies it is argued that due to industrial restructuring and relocation following liberalisation, aggregate employment need not increase in the short-run (Lang 1998, Abizadeh and Grant 1999). Under a liberalised regime, some firms might be out-competed by their new rivals, resulting in loss of jobs. Nevertheless, new

units using new technologies would come up and employment can increase in the concerned sectors. The response of different industries is thus bound to be different. To examine this problem it is important to introduce specific variables to capture the determinants of inter-industry differences in growth of employment, following liberalisation.

We select India for illustration as India launched a major programme of liberalisation and economic restructuring during 1991. We attempt to analyse the influence of liberalisation on growth of employment across manufacturing industries. The study aims at identifying the characteristics of industries where employment increased in comparison to those where employment declined. An important aspect of the current economic reforms in India is increased inflow of FDI and the presence of MNEs. Industries differ in respect of presence of MNEs and the extent of product differentiation. Industries also differ, among other things, in respect of labour productivity, growth of value added and skill intensity of the work force. All this results in inter-industry differences in the growth of employment. Using data on 33 manufacturing industries in India for 1992-2001 the present study examines how these inter-industry differences influence growth of employment at the industry level. In particular our objective is to find out whether the presence of MNEs hinders or promotes employment? Furthermore, is employment growth higher in sectors that produce differentiated products or in sectors producing standardised goods? Likewise, does skill content of the workforce influence employment? The answers to these questions are important for evaluating the current economic strategy.

In section II we discuss the impact of liberalization and the presence of MNEs on employment. This is followed by specification of the model. The statistical results are presented in section III followed by concluding remarks in section IV.

II LIBERALIZATION, MNEs AND EMPLOYMENT

An important dimension of economic reforms in India is opening up of the economy to foreign firms involving both equity and non-equity strategic relationships. This has pushed a large number of industrial units on to a different trajectory of expansion and growth. Emphasizing the demand-augmenting and cost-reducing aspects of the use of new technology, earlier works (Pandit and Siddharthan 1998; Siddharthan and Pandit 1998) have shown how technological acquisition, through strategic partnerships positively influenced firm level investment during the initial phase of economic reforms in India.

Under the impact of economic reforms, important changes have been underway in the Indian industrial sector. These include introduction of new technology, changes in the ownership structure due to the increase in the foreign stake in ownership of firms and above all “shut down” of a number of non-competitive units. In these conditions, the heterogeneity of the labour input comes to surface and plays a decisive role.

Our literature survey in Section I shows that current technology favours the use of skilled labour force (Salvanes and Forre 2003; Kim 1998), and production of differentiated products (Kim 1998). The world market is growing mainly in high tech and skill intensive goods. The global market for standardised goods is either stagnating or declining (Lall 1999). Under these conditions industrial units using skill intensive

workforce and producing differentiated and quality products are likely to grow faster and thereby contribute to growth of employment.

Specification of the Model

As discussed earlier, after liberalization of the economy, the growth of overall employment in the manufacturing sector declined. However, not all sectors experienced a decline in employment during the period of the policy change. The objective of this study is to analyse the determinants of growth of employment across industries.

Broadly speaking at the industry level we specify the model as follows:

Employment Growth =f (Labour Productivity, Growth of Value Added, Skill Intensity, MNEs, Product Differentiation, Wage Rate, Technology Imports) ……. (1)

Where:

MNE, Share of the sales of firms with foreign equity of more than 25 per cent to the total industry sales;

Product differentiation is measured by the advertisement expenditure as a ratio of sales;

Technology imports is measured by the ratio of expenditure on import of technology to sales; it refers to arms' length import of technology through the market in contrast to intra-firm imports through FDI. The variable MNE represents intra-firm technology imports through FDI.

Labour Productivity is value added divided by the number of employees.

Skill Intensity is measured by the ratio of total emoluments to all employees to wages. In the Indian classification, wages cover only payments to workers, while emoluments cover all employees, namely, both workers and high paid employees.

Wage Rate refers to total emoluments divided by the number of total employees.

The present study argues that growth in employment could be consistent with an increase in the economy-wide level of unemployment in the wake of reforms. The reasons for this could be various. In those industrial units/sectors where it is not possible to cope with competitive pressures generated by opening up of the economy, investment may just fall resulting in a fall in employment. In some other cases the new technology may be labour saving with the result that in the very short run, while the multiplier effects of the use of new technology for the entire economy are yet to fructify, there is more attrition of labour force than fresh employment.

Nevertheless, in industrial units in which new technology brought in by MNEs is coupled with skill- compatible workers, there would be a positive change in employment. This is the direct fallout of the process of profit maximization by employers given the opportunity of combining new technology with skill-compatible workers.

In the model two variables are used to represent technology imports, namely, arms' length technology imports and intra-firm technology imports through FDI (MNE). These variables mainly represent different modes of technology transfer (Siddharthan and Safarian 1997). Arms' length imports represent disembodied technology transfer, that is transfer of codified technology - blue prints, and licensing of technology and patents against licensing fee, royalty and lump sum payments. MNE represents intra-firm transfer of technology. These technologies are likely to be tacit, may not be codified, and could still be evolving. They may also involve transfer of brand names, goodwill and managerial practices. Hence, MNEs transfer a bundle of intangible assets that include technology, management and marketing. On the other hand, arms' length transfer mainly transfers codified and standardised technology. It could be argued that intra-firm transfer

through joint ventures could have an advantage. Some argue that the entry of MNEs could have a crowding out effect on the local firms and overall employment need not increase. However, the presence of MNEs can result in technological and productivity spillovers and that could result in a rapid growth of output and employment (Haddad and Harrison 1993, Kokko, Tansini, & Zejan 1996, Kokko, Zejan & Tansini 2001 Kathuria 2002). Literature is divided on this issue and we cannot predict the sign of the coefficients of these variables in advance. If the coefficients of these variables emerge positive, then it would mean that technological up-gradation and modernization results in an increase in the demand for the products resulting in an increase in employment.

In the model (equation 1) we expect the coefficient of labour productivity to be negative as labour productivity is the inverse of employment per unit of output. Employment can grow with growth in labour productivity if the industry's output grows faster. Since industry's growth is introduced as a separate variable we expect a negative sign for labour productivity and a positive one for growth of output.

Product differentiation is denoted by advertisement to sales ratio. Expenditures on product differentiation and sales promotion are expected to expand the demand for the product and increase output and employment. In the current era of knowledge based industrial growth, industries and firms producing non-differentiated products have not been experiencing high growth rates. On the other hand, industries and firms using flexible manufacturing systems, frequently changing their product mix and producing differentiated and in particular, customised products, have been experiencing rapid growth. We therefore expect advertisement intensity to be positively associated with growth of employment.

In addition to these variables, we have also introduced wage rate and expect it to be negatively related with growth of employment.

III STATISTICAL RESULTS

Data

The sample period is from 1992 to 2001. We have taken data on Indian industries at three-digit level of industrial classification for the variables ***Employment Growth***, ***Labour Productivity, Growth of Value Added, Skill Intensity, and Wage Rate*** from the Annual Survey of Industries (ASI), Central Statistical Organization (CSO). We have considered all units that employ more than 100 workers. The ASI has changed their classification in 1998. This has created problems in comparing the pre 1998 series with the post 1998 series. Fortunately, CSO on request has provided us continuous series till the year 2001 based on the pre 1998 classification and we have used the data set provided by CSO[1]. Despite the CSO providing us a continuous series for ten years, we found that for the year 1999, for some industries, the data on the growth of employment were not strictly comparable across the two classifications. Hence, we deleted observations related to the year 1999 from the sample.

For other variables, namely, ***MNEs, Product Differentiation ,Technology Imports*** we used data from Capital Line data set. This data set gives data for more than 8000 firms and provides firm level and three-digit industry level information for more than 400 variables. However, it provides data for only listed companies in stock exchanges. In other words the data set excludes non-corporate sector, namely, entrepreneurial and partnership firms. Since our CSO data set covers only plants with

more than 100 workers, ignoring smaller non-corporate firms might not affect the results adversely. Furthermore, we have taken all the variables as ratios of sales turnover of the industry, and the industries considered in the study are the ones dominated by large enterprises. It is therefore hoped that the two sets of data are roughly comparable. Nevertheless, we encountered another problem, namely, the industrial classification used by Capital Line data set did not match the ASI classification. We had to make several adjustments and as a result, we lost some observations. After all these adjustments, we are left with 33 industries over 9 years, that is, 1992 to 2001.

Regression results

Since we have used a panel data set (pooled cross-section and time series), and have estimated fixed effect models with cross-section weights corrected for heteroskedasticity using generalised least squares. Table 1, presents the generalised least squares estimates of the determinants of growth of employment.

Table 1

Dependent Variable: ***Employment Growth***
(Generalised Least Square Estimates)

Variable	Coefficient	t-Statistic	Prob.
MNE	0.082070	4.12	0.0001
Wage Rate	-0.040779	-4.29	0.0000
Labour Productivity	-0.024600	-7.59	0.0000
Product Differentiation	2.796563	10.49	0.0000
Skill Intensity	0.000197	2.02	0.0443
Growth of Value Added	0.098231	25.95	0.0000
Technology Imports	-0.317761	-0.63	0.5272
Fixed Effects			
_1--C	1.686356		
_2--C	0.025913		
_3--C	-0.029537		
_4--C	0.008252		
_5--C	0.068152		
_6--C	-0.108635		
_7--C	0.077209		

_8--C	0.056819		
_9--C	0.047159		
_10--C	-0.008384		
_11--C	0.131653		
_12--C	0.073899		
_13--C	0.022220		
_14--C	-0.180083		
_15--C	0.072819		
_16--C	0.054867		
_17--C	0.032014		
_18--C	-0.010504		
_19--C	0.059121		
_20--C	0.056594		
_21--C	0.143339		
_22--C	0.065688		
_23--C	-0.019527		
_24--C	-0.008826		
_25--C	0.067593		
_26--C	0.064457		
_27--C	-0.053851		
_28--C	0.038989		
_29--C	0.004371		
_30--C	0.113325		
_31--C	0.056033		
_32--C	0.072217		
_33--C	-0.102447		
NOBS	297(33x9)		
Weighted Statistics			
R^2	0.2985		
F	18.22		0.000

In Table 1, all variables except arms' length technology imports emerge significant. Growth of value added as expected, has turned out to be highly significant. Harrison and Hanson (1999) interpret high correlation between growth in employment and output as an indication of employment responding significantly to output changes. Thus during a period of restructuring, consequent to liberalization policies, both output and employment will decline in some sectors and increase in others. However, so long as

employment responds significantly to output changes, in the long run overall employment would grow.

The presence of MNEs makes a significant difference to employment growth. This result is important from the point of view of the current debate on MNEs, technology imports and employment. There is a perception in some quarters that MNEs bring inappropriate labour saving technology and harm employment prospects. On the other hand, there is evidence that presence of MNEs has spillover effects resulting in an increase in the productivity of the concerned sector (Haddad and Harrison 1993, Kokko, Tansini, & Zejan 1996, Kokko, Zejan & Tansini 2001 Kathuria 2002). Increase in productivity, namely, increase in value added by labour, would mean a decline in the ratio of employment to value added. Therefore, with an increase in labour productivity, employment per unit of output would decline. However, total employment in the sector need not decline as sectors that produce more recent vintage of goods could grow faster and could lead to an increase in employment. The results confirm the latter hypothesis. It is noteworthy that a positive and significant relationship between MNE presence and employment has been observed even after controlling for the growth of output.

Product differentiation as indicated by the advertisement to sales ratio is also significant with a positive sign indicating that employment has been growing in sectors that have been producing differentiated rather than standardised products. This result further reinforces the arguments advanced while discussing the MNE variable. The thesis is further strengthened by the emergence of the skill variable with a positive sign. The significance of the skill variable supports the modern theory of employment. Modern theory of employment (Solow 1979; Yellen 1984; Katz 1986), unlike the neoclassical

competitive wage theory, acknowledges the heterogeneity of labour in terms of both observable and non-observable characteristics like skills, dexterity, adaptability and motivation. Under the impact of economic reforms, as seen in the earlier sections, important changes have been underway in the Indian industrial sector. In these conditions, the heterogeneity of the labour input comes to surface and plays a decisive role. Under these conditions we expect the skill variable to emerge important and the results confirms the hypothesis.

As anticipated, wage rate and labour productivity have negative signs and are significant. These two variables were used as control variables. Arms' length import of technology has not emerged significant as such technologies are usually standardised technologies and are also codified and, by and large, transferred through designs and drawings. In contrast to this, MNE joint ventures receive technologies that are new and in some cases still evolving, tacit and not yet codified (Siddharthan and Safarian 1997). In addition, MNEs also transfer knowledge relating to management and marketing. Perhaps the differences in the nature and type of technologies transferred between these two modes, namely, arms' length inter-firm transfer and intra-firm transfer through FDI account for the statistical significance of the MNE variable and insignificance of the arms' length variable.

The results indicate that as a result of liberalisation policies initiated in India since the early 1990s, India has been experiencing changes in its industrial composition compared to the license and permit regime. Employment in certain industries has been declining while it has been increasing in others. Since the process of adjustment is not yet complete, it is premature to estimate the overall impact of this restructuring on industrial

employment. Studies for the Malaysian economy (Wah 1997) show that in the early phase of reforms the growth of industrial employment was not rapid enough to absorb the growing labour force. However, the export oriented strategy yielded fruit and employment increased at a more rapid pace. Our results show that employment grew positively in industries, which went in for modernisation programme through intra-firm technology imports, used more skilled workforce and produced differentiated products. These are precisely the industries where value additions are large.

IV CONCLUDING REMARKS

Using data on a cross section of 33 Indian manufacturing industries through 1992-2001, the present study examines the impact of liberalization on growth of employment at the industry level. The study does not focus on aggregate employment. The emphasis is on why industries experiencing positive growth in employment discriminate themselves from industries experiencing negative growth. The study takes into account the important fact that economic reforms in India are associated with the use of skilled workforce producing differentiated products. The main finding of the study is that in industrial units that have been importing technology intra-firm through MNE equity participation and have been producing differentiated products using more skilled workforce, have been experiencing a higher growth of employment.

The results of our study have some implications for the ongoing debate on liberalization and employment. Growth in employment is strongly related to growth in value addition, product differentiation and modernization through intra-firm technology imports. In the current global regime, growth in value addition is not possible without incurring modernization expenditures and importing technology. Our results show that

technology imports help employment growth. Furthermore, the presence of MNEs seems to affect employment prospects favourably. Labour productivity, as expected, affects employment negatively. Nevertheless, the growth of value addition does compensate for this negative impact and promotes employment. These results taken together suggest that employment, skill intensity, product differentiation and technological up-gradation measures go hand in hand.

These results also imply that low skill and technology industries producing standardised products are not likely to grow. Thus the demand for unskilled and semi literate workers is likely to decline. To tackle this problem it is important to launch a massive literacy drive and make schooling up to 10 years compulsory. Workers who cannot read and follow instruction manuals will not get jobs in the current knowledge era. India has not done enough to spread literacy and education and has not committed adequate funds for primary and secondary education. Most East-Asian countries have been able to achieve 10 years of schooling in relatively short time. In this context, the Japanese example during the early 20th century is worth emulating. As reported by Sen (2006, page 111), “between 1906 and 1911, education consumed as much as 43 percent of the budget of the towns and villages for Japan as a whole. [B]y 1910, Japan had universal attendance in primary schools. By 1913 even though Japan was still economically very poor and underdeveloped, it had become one of the largest producers of books in the world, publishing more books than Britain and indeed more than twice as many as the United States. Indeed, Japan’s entire experience of economic development was, to a great extent, driven by human-capability formation, which included the role of

education and training, and this was promoted both by public policy and by supportive cultural climate".

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Dependent Variable: GEMP?
Method: GLS (Cross Section Weights)
Date: 04/13/06 Time: 13:03
Sample: 1992 2000
Included observations: 9
Number of cross-sections used: 33
Total panel (balanced) observations: 297
White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MNE?	0.082070	0.019902	4.123654	0.0001
WR?	-0.040779	0.009511	-4.287351	0.0000
LPASI?	-0.024600	0.003240	-7.592094	0.0000
ADS?	2.796563	0.266691	10.48616	0.0000
SKIL?	0.000197	9.74E-05	2.020947	0.0443
GVAD?	0.098231	0.003786	25.94783	0.0000
MTS?	-0.317761	0.501872	-0.633152	0.5272
Fixed Effects				
_1--C	1.686356			
_2--C	0.025913			
_3--C	-0.029537			
_4--C	0.008252			
_5--C	0.068152			
_6--C	-0.108635			
_7--C	0.077209			
_8--C	0.056819			
_9--C	0.047159			
_10--C	-0.008384			
_11--C	0.131653			
_12--C	0.073899			
_13--C	0.022220			
_14--C	-0.180083			
_15--C	0.072819			
_16--C	0.054867			
_17--C	0.032014			
_18--C	-0.010504			
_19--C	0.059121			
_20--C	0.056594			
_21--C	0.143339			
_22--C	0.065688			
_23--C	-0.019527			
_24--C	-0.008826			
_25--C	0.067593			
_26--C	0.064457			
_27--C	-0.053851			
_28--C	0.038989			
_29--C	0.004371			
_30--C	0.113325			
_31--C	0.056033			
_32--C	0.072217			
_33--C	-0.102447			

Weighted Statistics

R-squared	0.298481	Mean dependent var	0.159920
Adjusted R-squared	0.192025	S.D. dependent var	0.980999

S.E. of regression	0.881795	Sum squared resid	199.8335
F-statistic	18.22467	Durbin-Watson stat	2.396326
Prob(F-statistic)	0.000000		
Unweighted Statistics			
R-squared	0.107350	Mean dependent var	0.075482
Adjusted R-squared	-0.028111	S.D. dependent var	0.968971
S.E. of regression	0.982496	Sum squared resid	248.0816
Durbin-Watson stat	2.595690		

Appendix 1

LIST OF INDUSTRIES

Name and ASI three digit code	Corresponding Capital Line code
1. Food: 201 to 205	148 to 162
2. Food: Sugar: 206	279, 280
3. Food: Tea: 213	281 to 283
4. Textiles: Cotton/composite: 235,6,9	290 to 94
5. Textiles: Manmade: 247,8	297 to 306
6. Textiles: Silk: 245,6	307
7. Textiles: Hosiery/knitwear: 260	310 and 311
8. Paper: 280	213 and 214
9. Printing and Stationery: 284 and 289	244
10. Leather: Foot-ware: 291	177 and 178
11. Chem: Fertilisers and Pesticides: 301	134,135, 218,219,220
12. Chem: Paints and varnishes: 303	212, 93 to 96
13. Chem: Pharmaceutical: 304	224 to 230
14. Chem: Personal Care: 305	215 to 217
15. Tyre and Tubes: 310	322 to 324
16. Ceramics: 323	49,50
17. Cement: 324, 327	44 to 48
18. Iron & Steel: 330,31,32	259 to 278, 192, 42,43
19. Aluminium: 335	3,4,5
20. Domestic appliances, Cooker: 346	89
21. Machinery: Textile: 354	289
22. Machinery: 354 and 356	119, to126
23. Machinery: Refrigerators, Air Con: 355	1,2,91,
24. Machinery: Machine tools: 357	127,128,187,188
25. Electrical Equipment: 360	97 to 102
26. Cables: 361	38 to 40
27. Batteries: 362	92
28. Consumer Electronics: 366	105 to 113
29. Computers: 367	69 to 71
30. Automobiles: Com.Veh: 373	11,13
31. Auto: Car: 374	12
32. Motorcycles Etc. 375	14,15
33. Others: 379	16 to 31, 132

[1] It is not possible for individual researchers to develop a continuous and uniform series from 1991-2001 for all the variables at three digit level of aggregation with out having access to five digit level of aggregation. This is because, in some of the industrial sectors part of the sampled sector at the three digit level was taken out and merged with another sector. Since CSO does not publish the five digit level data, CSO's cooperation was crucial in developing and providing us with a continuous and uniform series.