EMPLOYMENT AND OUTPUT ELASTICITY PATTERN : A STUDTY OF TRANSPORT EQUIPMENT AND PARTS INDUSTRY

Dr. Manjit Sharma

Deptt. of Economics

DAV College, Sector 10, Chandigarh

Abstract

The present study is confined to manufacture of transport equipments and parts industry of organised manufacturing sectors of Punjab for the period of 1980-81 to 2002-03, at three digit level. Major source of data for the study is Annual Survey of Industries (ASI). Employment elasticity with respect to output in transport equipment and parts industry turned to be low and positive in pre-reform as well as post-reform period. Marginal productivity of capital is positive but marginal productivity of labour is negative for transport equipment and parts industry. In transport equipment and parts industry the negative and significant value (in pre-reform period) of employment elasticity with respect to capital puts a question mark on the absorption of labour with increase in capital. Output elasticity with respect to capital is negative for manufacture of railway, tramway locomotive and rolling stock industry (NIC-352) in pre-reform period, and negative significant for manufacture of transport n.e.c. industry (NIC-359) in post-reform period, puts a question mark on the extension of production capacity.

Transport equipment and parts is the largest manufacturing industry as measured by output. The transport equipment industry group accounts for almost one fourth of Indian's value added from manufacturing. The industry provides extensive forward and backward linkages with other key segments of the economy. The turnover of fast growing auto components industry, comprising around 500 firms in organised sector and more than 10,000 firms in small and unorganised sector, grew from US $ 3.1 billion to US $ 15 billion between 1997-1998 and 2006-07 (Economic Survey 2007-08). The industry exported passenger cars, commercial vehicles, two-wheeler and three-wheeler. No doubt, in 2007 there is decline in production of motorcycles and auto-rickshaw but at the same time production of passenger cars, scooters and moped grew.

In the current liberalized duty regime, the challenge faced by the industry is to innovate and upgrade continuously to remain competitive in international market. The initiative taken by government in 2006-07 to boost the industry included reduction in duty of raw material, setting up of the 'National Automotive Testing Research and Development Infrastructure Project' (NATRIP) for enabling the industry to usher in global standard of vehicular safety, emission and

performance. Efforts should be made for making India a preferred destination for design and manufacture of automobile and automotive components.

Structural Composition of Transport Equipment and Parts Industry

(i)   NIC- 341   -   Manufacture of motor vehicle

(ii)   NIC- 352   -   Manufacture of railways and tramway locomotive and rolling stock

(iii)   NIC –359   -   Manufacture of transport n.e.c.

Scope, Data sources and Prices and Period of study

The scope of study is confined to manufacture of food products industry of organised manufacturing sectors of Punjab at three digit level. Major source of data for the study is Annual Survey of Industries (ASI). Various issues of annual survey of industries, www.circonindia.com and statistical abstract of Punjab are used. For making price corrections in the reported data on value of output, gross value added, wholesale price index of manufacture of food industry has been used. Wholesale price index for transport and machinery has been used to adjust the data on fixed capital. Consumer price index has been used to deflate the emoluments. Every deflator has 1993-94 as a base year. This study covers the period of 1980-81 to 2002-03; it has also been divided into two phases, pre-reform period (1980-81 to 1990-91) and post-reform period (1991-92 to 2002-03) to capture the impact of change in policy regimes.

The industrial classification has been changed in 1998 and it is impossible to make the discrete series directly. For this purpose a vigorous exercise has been done by going to three-digit level to make the matching series by either clubbing or splitting the existing classification. Present study has been divided into three sections. In the first section methodology is discussed. In the second section employment and output elasticities are explored. In the last section concluding remarks and policy implications are given.

<div align="center">

SECTION I
</div>

Methodology

Employment and output elasticity has been calculated by using the regression equations.

Employment Elasticity will be calculated by using the following equation

$\text{Log } L_t = a_0 + a_1 \log Y_t - a_2 \log K_t$

Where :

L_t :   is level of employment in period 't'

K_t :   is level of capital in period 't'

Y_t :   is level of output in period 't'

a_1 and a_2 are elasticity of employment with respect to output and capital respectively, $a_2 > 0$ implies labour and capital are compliments and $a_2 < 0$ implies labour and capital are substitutes.

Output elasticity with respect to labour and capital measure the change in output due to one unit change in labour and one unit change in capital. For estimating output elasticity the following equation is used:

$$\text{Log } Y_t = a_0 + a_1 \text{ Log } L_t - a_2 \log K_t$$

Here a_1 a measure elasticity of output with respect to labour and a_2 measure elasticity of output with respect to capital.

Expansion of industrial manufacturing alone cannot be expected to solve the unemployment and underemployment problems in many less developed countries (Morawetz 1974). The employment elasticity with respect to output and capacity expansion should also be highly significant. Elasticity measures the rate of growth of employment in a specific sector resulting from one per cent rate of growth in output and capital stocks. Employment elasticity, therefore also gives an idea of the trend in labour productivity vis-à-vis the growth in employment for the sector. Specifically, an elasticity, that is greater than one indicates declining level of productivity over a period, and elasticity equal to one indicates labour productivity is maintained at the same level, and an elasticity that is less than one reflects rising level of productivity (Suryanarayan 1995). Keeping in view the dismal scenario of educated employment and significant share of industrial sector in state domestic product, employment elasticity with respect to output and capital has been calculated to discern the potential of industrial sector in generating employment.

SECTION II

Employment and Output Elasticity Pattern: Transport Equipment and   Parts Industry

Employment elasticity with respect to output describes how far output of an industry has been able to generate employment in that industry. It is clear from the table 1 that employment elasticity with respect to output in transport equipment and parts industry turned to be low and positive (>1) but significant in pre-reform as well as post-reform period. Demand for labour is

derived demand, with increase in output, demand of labour is expected to increase, and same phenomenon has been noticed here. However, situation was not so good as far as increase in employment with respect to increase in capital is concerned.

The employment elasticity with respect to capital indicates whether an extra unit of capital leads to decrease in employment of labour or increase it. In the former case capital acts as substitute for labour and the latter implies complementarity between two. Employment elasticity with respect to capital in transport equipment and parts industry recorded negative coefficients that don't support the labour absorbing character in the pre-reform period. In transport equipment and parts industry the negative and significant value (in pre-reform period) of employment elasticity with respect to capital puts a question mark on the absorption of labour with increase in capital.

Output elasticity with respect to capital and labour provides a measure for relative importance of the factor of production. Positive output elasticity with respect to capital for transport equipments and parts (during pre-reform period) implies marginal productivity of capital is positive for this industry. This clearly suggests that use of capital will raise the production level. Negative output elasticities with respect to labour implying that extra unit of labour will   reduce the output level. Marginal productivity of labour is negative for the industry.

In case of transport equipment and parts industry, the values of labour variables are 1.86 and 1.16 in pre and post-reform period respectively, which are statistically significant. It indicates the sufficient contribution of labour in manufacturing. However, the capital variable has failed to contribute more output in pre-reform as well as in post-reform period.

TABLE - I

Employment and Output Elasticities of Sub-groups of Transport Equipment and Parts Industry

Manufactu-ring group	Employment Elasticity				Output Elasticity			
	Output		Capital		Capital		Labour	
	T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2

Transport equipment and parts	0.27* (2.85)	0.37* (2.60)	-0.26* (3.11)	-0.10 (1.12)	0.07 (1.64)	-0.24 (1.52)	1.85* (2.85)	1.14* (2.60)
Manufacture of motor Vehicles	0.71* (3.29)	0.46* (5.60)	0.28 (1.20)	0.01 (-0.1)	0.67 (4.97)	-0.41 (1.75)	0.81* (3.29)	1.63* (5.31)
Manufacture of railway and tramway locomotive and rolling stock	0.35 (1.01)	0.07 (.08)	-0.15 (-.71)	-0.51* (4.32)	-0.59* (-12.22)	-0.52 (.72)	0.32 (1.01)	1.00 (.87)
Manufacture of transport equipment n.e.c.	0.36* (3.51)	0.44 (1.41)	-0.60* (3.20)	-0.02 (-.01)	0.37 (-.60)	-0.38* (6.12)	1.69* (3.51)	0.41 (1.41)

Note : T_1 - 1980-81 to 1990-91, T_2 - 1991-92 to 2002-03

         * 1% level of significance, **   5% level of significance

         Figure with in bracket are 't' ratios

   Output elasticity with respect to capital and labour has been calculated to get an idea about importance of the factor of production.It is clear from the table I that the value of employment elasticity with respect to output is positive and significant (0.27 and 0.37 in the pre-reform and post-reform periods respectively) for transport equipment and parts industry. However, these values are 0.71 and 0.46 in pre and post-reform periods respectively for manufacture of motor vehicle industry (NIC-341) and 0.36 for manufacture of transport equipments n.e.c. industry (NIC-359) during pre- reform period. The values of coefficients indicate that expansion in output, has contributed in generating the employment opportunities. However, manufacture of railways and tramway locomotive and rolling stock industry (NIC-352) in both the periods and   manufacture of transport n.e.c. industry (NIC-359) in post-reform period exhibited   positive but insignificant values.

       Employment elasticity with respect to capital is negative (-0.26) and significant for transport equipment and parts industry during pre-reform period. The value of employment elasticity (-0.51) in manufacture of railways and tramway locomotive and rolling stock industry (NIC-352) during post-reform period and in   manufacture   of transport n.e.c. industry (NIC-359)   is also negative (-0.60) in pre-reform period. It clearly indicates that increase in capital has

not generated employment level. For transport equipment and parts industry the capital and labour are competitive in nature pre-reform period only. In manufacture of motor vehicle industry (NIC-341) during both the periods, manufacture of railways and tramway locomotive and rolling stock industry (NIC-352) during pre-reform period and   manufacture   of transport n.e.c. industry (NIC-359) in post-reform period, capital and labour are complementary in nature, but its coefficient is found to be statistically insignificant.

Output elasticity with respect to labour is 1.85 in pre-reform and 1.14 in post-reform period for transport equipment and parts industry, 0.81 in pre-reform and 1.63 in post-reform period for manufacture of motor vehicle industry (NIC-341) and 1.69 in pre-reform period for manufacture of transport n.e.c. industry (NIC-359) is positive and significant, which highlights the important role of labour in the production process.

Output elasticity with respect to capital is negative (-0.59) for manufacture of railway, tramway locomotive and rolling stock industry (NIC-352) in pre-reform period, and negative significant (-0.38) for manufacture of transport n.e.c. industry (NIC-359) in post-reform period, puts a question mark on the extension of production capacity. One more disturbing point is that transport equipment and parts industry, which is supposed to be capital-intensive, has recorded insignificant value of capital coefficient; put a doubt on output generating potential of this sector as it has recorded a positive and significant value for labour. These findings indicate that transport equipment and parts industry is shedding its capital oriented character and has started to use more labour.

SECTION III

Concludind Remarks

Employment elasticity with respect to output is positive and significant for transport equipment and parts industry during study period. Demand for labour is derived demand, with increase in output, demand of labour is expected to increase, and same phenomenon has been noticed here. However, situation was not so good as far as increase in employment with respect to increase in capital is concerned. Positive output elasticity with respect to capital for transport equipments and parts (during pre-reform period) implies marginal productivity of capital is positive for this industry. This clearly suggests that use of capital will raise the production level.

Negative output elasticities with respect to labour implying that extra unit of labour will reduce the output level. Marginal productivity of labour is negative for the industry.

Employment elasticity with respect to capital is negative (-0.26) and significant for transport equipment and parts industry during pre-reform period. The value of employment elasticity (-0.51) in manufacture of railways and tramway locomotive and rolling stock industry (NIC-352) during post-reform period and in manufacture of transport n.e.c. industry (NIC-359) is also negative (-0.60) in pre-reform period. It clearly indicates that increase in capital has not generated employment level. For transport equipment and parts industry the capital and labour are competitive in nature pre-reform period only. In manufacture of motor vehicle industry (NIC-341) during both the periods, manufacture of railways and tramway locomotive and rolling stock industry (NIC-352) during pre-reform period and manufacture of transport n.e.c. industry (NIC-359) in post-reform period, capital and labour are complementary in nature, but its coefficient is found to be statistically insignificant. The situation demands for the restructuring of industrial pattern and process, which can help to resolve the structural problems of the existing model of growth. Large sized units, which must based on local raw mateial and must have local market, must be set up with latest technological know-how's. There should be special economic zone for the industry to meet the export quality level.

References:

Marowetz, D. (1974), " Emploment Implication of Industrialisation in Developing Countries,"*Economic Journal*, Vol. 84, No. 335, pp.175.

Suryanarayan S.S. (1995): The Service Sector and its Role in Economic Development, *Indian Journel of Labour Economics.* Vol.41.