CHAPTER - VII

LABOUR SHARE : ITS DETERMINANTS

1. Introduction :

While the observed constancy of labour's share over long period in the developed countries has been a subject of variety of studies, surprisingly, very little work has been done to analyse it in the context of a growing economy with industrialisation as a priority consideration. In connection with the variations in labour's share over time, it should be noted that the "changes in functional distribution of income produced, aside from cyclical factors and changes in the price level, may result from any of the following three groups of factors or their combination : (1) changes in the relative bargaining strength of factors of production; (2) changes in the proportion of inputs of various factors of production in particular sector of the economy; and (3) structural changes involving changes in the relative weight of various sectors within the economy".[1]

The present chapter attempts to analyse the first two groups of the above factors (along with other related

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1. George Garvy : "Functional and Size Distribution of Income and their Meaning". American Economic Review, May, 1954, p.239.

factors) to examine the labour share in the case of Indian manufacturing industries. The third group, namely, structural changes involving changes in relative importance of industries has already been examined in Chapter III. The analysis carried out here, relates to both cross-section and time-series studies. The cross-section studies refer to the years 1956 and 1964. It is the 28 Census of Manufacturing Industries (CMI) which are considered for the year 1956; while for the year 1964 the analysis is done for both 28 CMI industries which are comparable to ASI industries (see Sec.3,Ch.II), and all industries covered by the ASI sector (at two-digit level). Over-time study relates to the 28 CMI (comparable) industries for the period 1951-1964,[2] has been done with a view to analyse the changes over time so as to enable us to supplement the cross-section findings.

Capital/labour ratio, degree of unionism (including severity rate and worker-involvement ratio (see Sec.3 below), skill-composition of work force, productivity and wage-rate are the factors used to examine the inter-industry as well as over-time variations in factory labour's share It should, however, be noted that some of the above factors, although important from the view point of explanation of labour share,

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2. The years before 1951 could not be included because of the non-availability of data pertaining to degree of unionism etc.

might not be independent but related to one-another. Labour productivity, for example, will be highly correlated with capital/labour ratio. Thus, we have to eliminate the correlated explanatory variables and focus our attention on the strategic variables which play a crucial role in the explanation of the labour share. Before we do this, it would be quite worthwhile to examine the various hypotheses regarding labour share considered in cross-section as well as time-series analyses :

2. Theoretical Analysis :

(i) Capital-Intensity :

In a developing economy with an emphasis on industrialisation program, capital/labour ratio (K/L) is bound to change rapidly either through substitution of capital for labour (given the production functions), or due to application of labour-saving techniques under new production functions. This type of change will affect the labour share not only over time but also make the intensity of capital to vary from industry to industry. To examine the direction of changes in relative factor shares, therefore, we should also consider the type of technological progress or inventions taking place along with the change in capital/labour ratio.

Economists generally talk of three types of technological progress: neutral, labour-saving (capital-using) and capital-saving (labour-using). Neutral technological progress according to Hicks definition, takes place when the ratio of the marginal product of labour to the marginal product of capital is unchanged when capital/labour ratio is unchanged.[3] The technical progress is labour-saving, if the marginal product of capital is raised by more than that of labour, and it is capital saving if the marginal product of labour is raised by more than that of capital, given the capital/labour ratio.

For given capital/labour ratio and neutral technical progress, the ratio of marginal product of labour to marginal product of capital and hence the income distribution between labour and capital will remain unaffected. On the other hand, if the technical progress is, say, labour-saving, the ratio of the two marginal products will fall, since marginal product of capital is raised by more than that of labour (given the capital/labour ratio) and hence relative wage share will fall. At a given point of time, this amounts to saying that between two industries, the higher capital/labour ratio in one industry would mean a

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3. Hahn F.H. and Mathews R.C.O.: "The Theory of Economic Growth: A Survey" in Surveys of Economic Theory, Vol.II (Prepared for The American Economic Association and The Royal Economic Society)(London: Macmillan, 1966), p.47.

lower ratio of the marginal product of labour to that of capital as compared to the other industry where capital/ labour ratio is lower. Thus, we should expect the labour share to be negatively related with capital/labour ratio in different industries (at a point of time).

It should, however, be noted that it is quite possible that the industry which employs more capital relative to labour might be associated with higher marginal product of labour due to say, high skill-mix in the industry. This factor, therefore, will help narrow down the difference between the labour share in the two types of industries. However, it is not likely that the difference in labour productivity between the two will be so great as to make the labour share to be equal in both the industries.

So far as time-series analysis is concerned, one should allow the capital/labour ratio to change over the period. In fact, it is the Harrod definition of technical progress which considers "the comparison of points on the production function at different times where the marginal product of capital, assumed equal to the rate of profit r, is constant. With K/L unchanged, technical progress will normally raise the marginal product of capital. For the marginal product of capital to remain constant in face of technical progress, K/L must normally rise".[4] Thus, if the

4. Hahn F.H. and Mathews R.C.O.: Op.cit.,p.49.

level of capital/labour ratio which causes the rate of profit to remain constant, also causes the capital/output ratio to remain constant, then the technical progress will be neutral in the Harrod sense. The technical progress will be labour-saving, if a constant rate of profit is associated with a higher capital/output ratio and it will be capital-saving in the opposite case. Thus, given the rate of profit (and perfectly competitive market), the distributive shares of labour and capital will remain unchanged when the technological progress is of a neutral type.

To put the argument slightly in a different way, the rise in capital/labour ratio, associated with constant capital/output (K/o) ratio will increase the average product of labour (o/L) at the same rate as the K/L is rising. This happens because, $\frac{o}{L} = \frac{K}{L} \times \frac{o}{K}$. But, the rising K/L with a given rate of return on capital (and constant K/o ratio) will at the same time make the wage rate (wages divided by labour, W/L) to rise at the same rate as the K/L ratio is rising. This happens because of the constancy of wages/capital (W/K) ratio in K/L x W/K = W/L.[5]

Thus, the rise in capital/labour ratio associated with constant capital/output ratio and constant rate of profit

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5. Since, W+P = 0, (P= profits)

   $\therefore$ W/K = O/K - P/K = constant.

will mean that the wage-rate and labour productivity are rising at the same rate, leaving the distribution of income between capital and labour unchanged.

However, if the rise in capital/labour ratio, leads to a higher capital/output ratio then, with a given rate of profit, (labour-saving technology) there will be rise in capital share. This means that the rise in K/L ratio accompanied by labour-saving technology, would be negatively related with labour's share.

In connection with the constancy of capital/output ratio, Joan Robinson points out that "In technically progressive economies we expect to find capital per unit of output more or less constant over the long run while capital per man employed is steadily rising".[6] It would be interesting to note that in the case of Indian manufacturing industries for the period 1953-1964, the capital/output ratio is found to be more less constant as against the rising capital/labour ratio during the period (see Table-IV-6).

(ii) Strength of Trade-Unionism :

Generally, the motive of trade union is to bargain with employers and try to improve the economic conditions of their members. The high degree of unionism would mean that the workers are in a better position to bargain, and

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6. Joan Robinson : "some problems of Definition and Measurement of Capital", in Collected Economic Papers, Vol.2.(Oxford: Basil Blackwell,1960)p,204.

hence increase their share in the total income generated. The stronger the trade-union, more will be the success in obtaining higher wages with minimum loss in terms of fall in the labour force. The rise in wages, in this way, will make the wage-share to rise at the cost of capital share. This will be true even when we compare two industries at a point of time. "Where the wage-earners are strongly organised in trade unions, one might expect labour to succeed in obtaining a larger share of the product than elsewhere".[7]

In connection with the impact of unions on labour's share, thus, one might expect that it will bring about an increase in wage-share at the expense of capital share. But most of the studies do not confirm this view[8] "the hypothesis that there exists a positive and significant correlation between the strength of trade unionism and labour's relative share of income is not confirmed by the available data for the manufacturing sector of the American economy in the first half of the twentieth century".[9] According

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7. Maurice Dobb: Wages, (London), 1946, 3rd rev.ed., p.21.

8. See, for example, N.J.Simler: "Unionism and Labour's share in Manufacturing Industries", Review of Economics and Statistics, Nov.1961; Harold M.Levinson, Unionism, Wage Trends and Income Distribution, 1914-1947, (Ann Arbor, 1951), pp.80-110; Paul E.Sultan: "Unionism and Wage-Income Ratios 1929-51", Review of Economics and Statistics, Feb.1954, pp.67-73, E.H.Phelps Brown: Pay and Profits; Ch.II.

9. N.J.Simler: Op.cit., pp.375-76.

to Albert Rees "It may seem very strange that statistical studies can find a considerable effect of unions on wages and none on labour's share".[10]

(iii) Skill-Composition of Workforce :

Skill-composition or skill-mix is another important factor influencing the labour's share in different industries.[11] Since the skill-mix of workers varies from industry to industry, one would normally expect the wage-share to be higher in those industries where the proportion of skilled workers in total workers is larger than where this proportion is lower. Assuming the same degree of capital intensity in two different industries, the average productivity of capital will be higher in that industry where skill-composition is higher, but marginal productivity of capital will be same in both the industries. This means that the industry, where skill-composition is higher, will experience a low ratio of marginal product of capital to average product of capital *to average product of capital* and hence lower will be the share of capital. Thus, higher the skill composition of work force, higher will be the share of labour.

It should, however, be noted that the skill-intensive industry might be associated with the high capital-intensive industry. The high skill composition would mean high wage -

10. Albert Rees: The Economics of Trade Unions, (Chicago: James Nisbet, 1962), p.95.

11. Since year to year data on skill-mix are not available, the impact of this variable is examined only for cross-section studies.

rate, but at the same the high capital/labour ratio in the same industry would also mean higher labour productivity. Hence, the overall effect on wage share will depend upon the relative strength of skill-intensity and degree of capital-intensity in a given industry.

(iv) Wage Rate :

The relationship between wage-rate and the share of labour is not so simple as it is normally conceived to be. Assuming no technical change overtime, the increase in wage-rate relative to the cost of capital would mean an increase in marginal rate of substitution between labour and capital - the shifts in the factors of production would lead to an increase in marginal product of labour relative to the marginal product of capital.But the increase in marginal rate of substitution between labour and capital will mean a proportionately greater increase in capital/labour ratio if elasticity of substitution between the two factors is greater than one.This implies that the relative share of labour will decline with a relative increase in the wage rate. Similarly, the share of labour will increase with a relative increase in wage rate if the elasticity of substitution is less than one.

The above arguments can also be applied for the inter-industry analysis at a given point of time.Assuming the same production function in two industries, the share of labour in the higher wage industry will be lower if the elasticity of

substitution is greater than one, and it will be higher if the elasticity of substitution is less than one. It would be interesting to note that the relationship between wage-rate and wage share is generally believed to be negative. According to D.G.Brown, "Firms and industries in which labour costs are a relatively minor expense items have relatively larger abilities to afford the luxury of high wage levels".[12] A.M.Ross and W.Goldner[13] are also of the view that the employers will be more inclined to meet the union demands if the wages are only a small proportion of output.

3. Specification of the Regression Variables :

The present section is confined to the explanation of various terms and concepts used in the regression analysis of the following section :

Labour Share : Labour's share, the dependent variable, is calculated by dividing total wages paid to workers by value added or income originating. The term 'wages' in the Annual Survey of Industries includes all payments made in cash as compensation for work done during the year. Value added

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12. D.G.Brown: "Expected Ability to Pay and Inter-Industry Wage Structure in Manufacturing", Industrial and Labour Relations Review, October, 1962, p.48.

13. A.M.Ross and W.Goldner: "Forces Affecting the Inter-Industry Wage Structure", Quarterly Journal of Economics, May,1950, p.277.

is computed by deducting the gross value of inputs (including depreciation) from the gross ex-factory value of output. In the case of time-series analysis, the figures for wages, value added and other variables are adjusted so as to make them comparable overtime (See Chapts.II and IV). The necessity of adjustments arises because of the differences in coverage and classification of industries between the two sources of Census of Manufacturing Industries and Annual Survey of Industries.

Capital : The value of capital refers to the gross value of fixed capital plus inventories. The gross value of fixed capital is adjusted for variations in prices on the basis of the methodology discussed in Chapter IV. This has been done because the values of fixed capital as reported in the CMI and ASI represent the written down (book) values, and hence do not reflect the true values of capital. So far as the value of inventories is concerned, since it is available in current prices, it is simply added to the adjusted value of fixed capital to arrive at the figure of total capital. The regression analysis for cross-section data are carried out by considering the value of gross fixed capital both at current prices as well as purchase prices of the assets.

Labour : The concept of labour or worker refers to the factories Act 1948 as defined in earlier chapters.

Degree of Unionism : The degree of trade unionism is generally defined as the ratio of union members to unionizable workers. The traditional approach of measuring the degree of unionism in this way, however, does not reflect the actual actions or active measures taken by the workers to fight for their cause. To overcome this defect, the present analysis considers a modified concept of degree of unionism. This has been done in two ways: first the degree of unionism as defined above has been weighted by the severity rate, defined as the man-days lost due to industrial disputes per one lakh of man-days worked, and secondly the degree of unionism is weighted by severity-rate as well as worker involvement ratio, the latter being defined as the number of workers involved in industrial disputes per one thousand workers.

The crude measure of strength of unionism, thus, has been weighted by the actual actions taken by the trade-unions to fulfil their demands. Given the equal proportions of union members to total workers in two different industries, the industry with higher ratio of man-days lost to total man-days worked would certainly show a higher degree of unionism as compared to that with the lower ratio.

The data required to calculate the above index of unionism are available from the publications like Labour Year Book and Indian Labour Statistics. However, there is a difficulty regarding the coverage of such figures. The

available figures relate to all factories employing ten or more workers, while we require the figures at par with the ASI classification, namely, for those factories which employ 50 or more workers. However, because of the use of these data, the analysis, it is felt, will not be affected significantly as the union membership in small scale industries has been found to be a negligible proportion of the total membership. The total employment itself in the factories employing less than 50 workers has not been more than 16 per cent of the total factory employment in 1964. It is in fact, the large scale industries which are important from the view point of trade-union activities.

Another difficulty is about the nonavailability of the complete information on trade-union membership. The union-membership data are available only for those unions which submit the annual returns.The data in respect of unregistered trade unions are not available.So far as the coverage of the workers' unions submitting returns is concerned, during 1963-64, out of the total of 7101 workers' unions, the manufacturing sector alone accounted for 3409 unions. As regards membership, the manufacturing sector enjoyed the largest membership of about 42.6 per cent.

Since the data relating to union membership suffer from the defects mentioned above, it would be all the more

justifiable to use the composite index of degree of unionism duly weighted by the severity rate and worker involvement ratio (as defined above), the available information on which is not only relatively complete but also reliable.

Skill-Mix : The data on skill composition of work force (defined as the proportion of skilled workers in total workers) are not directly available for different industries examined in the present study. To meet the requirement for the year 1964, the skill-mix data are partly derived from the balance-sheets of about 120 firms (under the ASI classification) from the United Nations publications, Profiles of Manufacturing Establishments, (UNIDO, Vol.I and II, 1967, 1968). The firms covered by this study belong to the following two-digit industry groups: Food, Textiles, Wood and Cork, Paper and paper products, Rubber Products, Chemicals & Chemical Products, Non-metallic mineral products, Basic metal, Metal products, Machinery, Electrical machinery, and Transport equipment. For the remaining ASI industries, the figures for skill composition are derived from the Occupational Pattern in Manufacturing Industries (1959) which gives the data for 1956. The above study has been carried out by Pitamber Pant and M. Vasudevan through the field agency of the Sample Survey of Manufacturing Industries by Planning Commission working in collaboration with Indian Statistical Institute. The data on skilled and non-skilled workers from

the study are derived and adjusted for the required size-groups, so as to meet the requirements of the present study. In the absence of any other source available for the data on skill composition for the year 1964, the gaps in the case of industries not covered by the Profiles of Manufacturing Establishments, are filled up by the figures derived from the above Pant and Vasudevan study. Of course, this is based on the assumption that the skill-mix in these industries have not changed significantly between 1956 and 1964, and to that extent the 1964 analysis would be limited.

4. Inter-Relations of the Variables :

The analysis has been done by considering both cross-section (at two points of time) and time-series data. The cross-section analysis for 1964 relates to both ASI two-digit industries and 28 CMI (comparable), industries. In the case of ASI industries for 1964 the analysis is carried further by considering the fixed value of capital both at purchase prices and at current prices (See Ch.IV). The fourth cross-section study relates to 28 CMI industries for the year 1956. For the time-series study it is again 28 CMI-ASI comparable industries which are considered for the period 1951-1964.

Appendices VII-1-4 present all the regression variables considered in the analysis. It can be seen from Appendix VII-1

that there are wide variations in industry labour share ranging from as high as 55.2 per cent in textiles to as low as 15.6 per cent in petroleum and coal products. The high labour share is related with low capital-labour ratio and low product per labour. In other words there has been a negative correlation between labour share on the one hand and capital/labour ratio and labour productivity on the other hand.The value of the coefficient of correlation between labour share and capital/labour ratio (Fixed capital considered at current prices) has turned out to be -0.570, while that between labour share and labour productivity has been -0.738. Interestingly enough, none of the measures of strength of unionism, namely, degree of unionism (in percentages), degree of unionism weighted by the severity rate, and degree of unionism weighted by the severity rate and the worker-involvement ratio (all defined in the above section) has been found to be related with labour share. The value of the correlation of coefficients between labour share and the above three measures of the strength of trade-unionism for the year 1964, have worked out to be -0.317, -0.033 and -0.144 respectively.[14] The value of the correlation coefficient between

14. One might argue that the effectiveness of trade unionisation might take some time to make the distribution of income in their favour. To check this, the degree of unionism (weighted by severity rate) with one and a half years time lag was calculated to examine its impact on labour share. The relationship between the two was found to be insignificant, with the value of the correlation coefficient at -0.21. The degree of unionism taken as an average of 1962-63 and 1963-64 weighted by the severity rate as an average of 1963 and 1964 also did not explain the labour share in 1964 - the value of the correlation coefficient between the two being only -0.17.

labour share and wage rate has been -0.353, while that between labour share and skill-composition of work force has been 0.070.

Before running a regression to explain the labour share in different industries and over time, it was found necessary to check the inter-relation between different explanatory variables so as to avoid the multicollinearity of the variables as far as possible. This has been done with reference to the year 1964. The coefficient of correlation matrix of all the variables under examination is presented in Table VII-1. It can be easily seen from the table that the capital/labour ratio is highly correlated with (i) labour productivity and (ii) wages per labour (i.e. variable x_2 with x_6 and x_7). Similarly, all the three measures of strength of unionism (x_3, x_4 and x_5) are correlated with one another. Labour productivity and wages per labour (i.e. x_6 and x_7) are also highly correlated with each other.

5. Results and Conclusion :

After elimination of the inter-related variables, we are left with the following three variables namely, skill-mix, capital/labour ratio, and degree of unionism (weighted by severity rate). The different hypotheses developed in Sec.2, predict that the labour share will be positively related with skill composition of work force and the degree of unionism,

Table VII-1

Coefficient of Correlation Matrix

			x_1	x_2	x_3	x_4	x_5	x_6	x_7
1.	Skill-composition of workforce	x_1							
2.	Capital/labour ratio	x_2	0.1762						
3.	Degree of unionism weighted by severity rate.	x_3	0.0193	-0.2076					
4.	Degree of unionism weighted by severity by severity rate and worker involvement ratio	x_4	0.1389	-0.2182	0.9684				
5.	Degree of unionism	x_5	0.3095	0.3376	0.4930	0.5069			
6.	Labour productivity	x_6	0.0124	0.8347	-0.1543	-0.2293	0.1808		
7.	Wage rate	x_7	0.1432	0.7448	-0.3568	-0.4057	0.0479	0.8584	
8.	Labour share	y	0.0696	-0.5699	-0.0331	-0.1442	-0.3173	-0.7379	-0.3530

Note: The critical values of coefficients of correlation (with 16 degrees of freedom) at 1 % and 5% levels of significance are 0.590 and 0.468 respectively.

The coefficients are calculated from the figures provided in Appendix VII-1.

whereas the labour share will be negatively related with the capital/labour ratio.

The functional relationship between the above variables may be expressed as

$$Y = f(x_1, x_2, x_3, u)$$

where Y = labour share (in percentage)

x_1 = skill composition of work force, $(\frac{\text{skilled workers}}{\text{total workers}})$

x_2 = capital/labour ratio (Rs. in '000)

x_3 = Degree of unionism (in percentage) weighted by the severity rate (i.e. man-days lost due to industrial disputes per one lakh of man-days worked)

u = Error term which represents the combined effect of all others factors.

The multiple least squares linear regression models are fitted to the cross-section as well as time-series data. The theoretical regression model, then, takes the following form :

$$Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + u$$

The statistical specification of these variables has been discussed in section-3. The results of the fitted regression models are presented in Table VII-2. The value of individual correlation coefficients of dependent variables with independent variables for different models are also presented in Table VII-3.

Table VII-2

The Results of Multiple Regressions

Model	No. of observations	Dependent variable	Constant	Regression Coefficients and their standard errors			Multiple R^2 and (F-ratio)
			α	β_1	β_2	β_3	
1	2	3	4	5	6	7	8
A_{1964}	18	y	38.8365	+ 10.9204 (9.0472)	-0.1934 (0.0436)	-0.0112 (0.0055)	0.602 (7.070)
B_{1964}	18	y	38.9508	+ 11.8031 (9.0286)	-0.2273 (0.0506)	-0.0113 (0.0056)	0.606 (7.184)
C_{1964}	28	y	37.7920	+ 10.0948 (17.7024)	-0.3134 (0.1108)	-	0.284 (4.962)
D_{1956}	28	y	20.3994	+ 42.4145 (12.2158)	-0.5047 (0.1567)	-	0.481 (11.553)
$E_{1951-64}$	14	y	52.8805	-	-0.3545 (0.2567)	-0.0236 (0.0140)	0.348 (2.949)

Note:

A : is a cross-section model for 1964 which refers to all ASI industries (gross value of fixed capital considered at current prices)

B : is a cross-section model for 1964 again refering to all ASI industries (with gross value of fixed capital at purchase prices).

C : is a cross-section model for 1964 which relates to 28 ASI industries which are comparable to CMI industries (gross value of fixed capital being at purchase prices)

D : is a cross-section model for 1956 which relates to 28 CMI industries (gross value of fixed capital being at purchase prices)

E : is a time-series model for the period 1951-1964 for the total of CMI-ASI 28 comparable industries (value of capital is taken at 1950 prices)

Because of the pausity of data it was not possible to include the skill-mix factor in model E, and the degree of unionism in models C and D.

The regressions are fitted on the basis of the data shown in Appendix VII- 1-4.

Table VII-3

Results of Simple Correlations

Coefficient of correlation between labour share and,	Model and No. of observations				
	A N=18	B N=18	C N=28	D N=28	E N=14
i) Skill composition of the workforce.	+0.005	+0.070	+0.242	+0.515	-
ii) Capital/labour ratio	-0.570	-0.669	-0.527	-0.479	-0.297
iii) Degree of unionism weighted by severity rate	-0.033	-0.182	+0.086	-	-0.485

Note: The critical values of the coefficient of correlation at 1% and 5% significance level at different degrees of freedom respectively are as follows:

12 d.f. 0.671 and 0.532

16 d.f. 0.590 and 0.468

26 d.f. 0.479 and 0.374

The coefficients are calculated from the data provided in Appendix VII 1-4.

It can be seen from Table VII-2, that the skill composition of work force seems to have no impact on labour share in the models under consideration, except D (i.e. for the year 1956). The regression coefficients, although having positive signs before them, are not found statistically significant, (except in the case of model D). The values of the regression coefficients except for 1956, appear to have been suffering from the non-availability of complete information on skill-mix in different industries in the year 1964. The data on skill composition for 1956, it should be remembered, are derived from the Pant and Vasudevan study (see Section-3) which are quite exhaustive. While the data on skill composition for the year 1964 are limited in coverage. Hence, the regression coefficients in the case of 1964 models seem to have suffered from the lack of complete information. The values of individual correlation coefficients (Table VII-3) are also not found to be significant except the year 1956.

The capital/labour ratio appears to be the most significant variable influencing the labour share. The regression coefficients of capital/labour ratio in all of the cross-section studies have turned out to be highly significant (Col.6, Table VII-2). However, in the case of time-series analysis (model E), the coefficient, although with expected sign before it, is not found to be significant statistically. The same is true when we examine the relationship between labour share and labour/capital ratio individually. The simple

correlation coefficients between the two variables are found significant in all the models except the time-series model. The cross-section results, thus, do not seem to have been supported by the time-series results.[15]

The degree of unionism does not explain the labour share both in cross-section as well as time-series studies. The regression coefficients of all the models examined, bear negative signs before them. This is quite opposite of what one would expect from the hypotheses formulated in Section-2. However, the values of the regression coefficients are not significant and hence confirm the general findings that the degree of unionism does not explain the labour share either in different industries or over a period of time. In the case of simple correlation coefficients also, the labour share does not seem to be related with degree of unionism, (See Col.3, Table VII-3). In connection with the relationship between labour share and degree of unionism, Albert Rees points out that the substitution of capital for labour will generally not induce the rate of return to capital to decline in a particular industry. The total payments to capital, therefore, will rise more than the rise in wage bill. "It is thus entirely possible for a union simultaneously to raise the relative wages of its members and to reduce their aggregate share of income arising in their industry."[16]

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15. While examining the factor shares in industrial sector of the Western countries, Phelps Brown also observes the similar findings (c.f. op.cit.,p.41).

16. A.Rees: Op.cit.,p.16.

We may conclude that the explanation which is consistent with our inter-industry (cross-section) regression results is that the labour share is negatively related with capital intensity of the industry. However, the time-series results do not support the hypothesis so forcefully as cross-section studies do.

The series of the capital/labour ratio (Table IV-6) indicates that there has been a tendency for capital to grow relative to labour. And the rise in capital/labour ratio, depending upon the elasticity of substitution between labour and capital, will affect the trend in relative factor shares. The question then arises is, "how different from unity need the elasticity of substitution be in order that it convert a strong trend in the capital/labour ratio into a strong trend in relative shares".[17]

The average value (simple) of the elasticity of substitution between labour and capital in Indian Industries for the year 1962 has worked out to be 1.013, slightly more than unity (see Section-5, Chapter VI). However, it should be noted that the value of the elasticity of substitution, even if it were fairly away from the value of unity, would not make the relative factor shares to change by any significant amount.[18] If the division of income between labour and capital

17. R.M.Solow: "A Skeptical Note on the constancy of Relative Shares", American Economic Review, Sept.1958,p.629.

18. I.B.Kravis: "Relative shares in Fact and Theory": American Economic Review, Dec.1959, p.940.

is given by say, 75-25 and if there is a 20% increase in the ratio of the price of labour to capital (or say 40% increase in the ratio of capital to labour), the labour share will not fall by more than 3 or 4 per cent points from 75, were the elasticity of substitution as high as 2. This happens because "if the price and quantity ratios would move in opposite directions, the opportunity for factor substitution would clearly serve as a built-in stabilizing mechanism limiting changes in relative shares".[19]

In connection with the cross-section studies not being strongly supported by the time series study, it should be noted that the change in labour's share depends not only on the change in capital/labour ratio but also on the ratio of marginal products of the two factors. Thus, when we relate the share of labour with productivity, which is in fact a composite index of capital/labour ratio and the ratio of marginal products (which again partly depends on technological progress), we find that there is a high negative correlation between the two.

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19. Ibid, p.940.

APPENDIX VII-1

Labour Share in Value Added and Other Regression Variables - 1964 (Reference: Model A & B)

I. No.	Industry	Wages share %	Skilled workers as a proportion of total workers	Capital labour ratio(fixed capital at current prices)(Rs.)	Capital labour ratio(fixed capital at purchase prices)(Rs.)	Degree of unionism (%)	Degree of unionism weighted by severity rate	Degree of unionism weighted by severity rate and worker involvement ratio	Value added per worker (Rs.)	Wages per worker (Rs.)
1	2	3	4	5	6	7	8	9	10	11
20-21	Food including Beverage	26.95	0.4317	19793	16096	32.54	46.3	2259	3599	971
22	Tobacco	27.45	0.5354	5734	5330	72.97	1163.8	513172	2964	814
23	Textiles	55.22	0.4143	12243	9982	47.52	279.7	71805	3259	1800
24	Footwear & other wearing apparrels	47.78	0.6158	6449	5993	31.42	6.2	8	2827	1349
25	Wood and Cork	40.69	0.0723	9736	8702	15.48	72.6	4024	2375	966
26	Furniture and fixtures	43.83	0.6109	9599	8884	2.47	43.9	4097	3690	1617
27	Paper and Paper products	28.39	0.2113	45565	36833	38.34	264.9	20361	5908	1677
28	Printing & publishing	43.71	0.7002	11573	10000	37.45	75.4	2054	4178	1827
29	Leather & fur products	39.72	0.6158	13557	12253	93.60	453.2	16273	3157	1251
30	Rubber products	32.03	0.2204	21215	19561	41.50	149.7	9500	7623	2441
31	Chemicals & chemical products	20.29	0.2664	58328	48314	40.09	367.2	64737	10519	2135
32	Products of petroleum & coal	15.60	0.7277	170959	149201	68.83	14.6	43	11909	3184
33.	Non-metallic mineral products	37.32	0.2184	20531	16271	40.92	162.6	20117	3423	1277
34	Basic metal	29.25	0.2989	83677	68448	53.28	127.6	8778	7451	2180
35	Metal products	33.77	0.3456	15981	14432	35.62	806.4	243248	4983	1684
36	Machinery(except elect.machinery)	34.47	0.3394	19962	18711	24.71	46.0	2668	5419	1868
37	Elect.Machinery	30.49	0.5026	25773	24014	27.62	113.7	25241	6437	1962
38	Transport equipment	43.72	0.3601	16587	15010	12.36	39.1	2349	4749	2077

Note: Degree of unionism is defined as union members as a percentage of total workers (union members relate to the year 1963-64). Severity rate is defined as man-days lost due to industrial disputes per one lakh ('00000) of man-days worked. Worker-involvement ratio is defined as the number of workers involved in disputes per one thousand workers. Fixed capital figures are adjusted. All the figures are calculated on the basis of the data derived from the following sources:
(i) Annual Survey of Industries, 1964; (ii) United Nations, Profiles of Manufacturing Establishments, Vol.I&II, 1967, 1968; (iii) Pant Pitamber and M.Vasudevan, Occupational Pattern in Manufacturing Industries, (Planning Commission), 1959; (iv) The Indian Labour Yearbook (Labour Bureau), 1965; (v) Statistics of Factories (Labour Bureau), Govt. of India, 1964; (vi) Statistical Abstract, (C.S.O.) Govt.of India, 1967.

APPENDIX VII-2

Labour's Share in Value Added and Other Regression Variables - 1964 (Reference: Model 6)

S. No.	Industry	Wage share %	Degree of unionism % (1963)	Capital per worker (Fixed capital at purchase prices (Rs.)	Skilled workers as a prop. of total workers
1		2	3	4	5
1.	Wheat floor	18.79	10.53	14700	.3532
2.	Rice milling	28.94	13.13	4215	.3532
3.	Biscuit making	23.83	20.00	9551	.4347
4.	Fruits and vegetables processing	24.69	25.00	9784	.0982
5.	Sugar	30.08	92.85	32051	.2562
6.	Distilleries and Breweries	16.60	13.13	24774	.4120
7.	Starch	23.56	21.00	42054	.2676
8.	Oilseeds crushing	31.20	11.87	16309	.3796
9.	Edible hydrogenated oils	23.30	30.30	34650	.3796
10.	Paints and varnishes	17.33	25.00	22594	.4131
11.	Soap	19.46	25.00	35916	.1006
12.	Tanning	39.63	11.76	12241	. 6158
13.	Cement	27.92	82.35	53595	. 2790
14.	Glass & glassware	59.22	28.30	7506	.5033
15.	Ceramics	44.79	38.10	11495	.2822
16.	Plywood & teachests	38.55	30.00	11666	.0724
17.	Paper & Paperboard	28.40	42.86	36832	.2114
18.	Matches	45.77	25.29	6578	.1006

APPENDIX VII-2 (concluded)

Labour's Share in Value Added and Other Regression Variables - 1964 (Reference: Model ℂ)

S. No.	Industry	Wage Share %	Degree of unionism %(1963)	Capital per worker (fiexed capital at purchase prices (Rs.)	Skilled workers as a prop. of total workers
	1	2	3	4	5
19.	Cotton textiles	58.86	55.74	10975	.4176
20.	Woollen textiles	34.38	34.28	15267	.4176
21.	Jute textiles	61.11	24.42	7495	.4176
22.	Chemicals	19.26	51.16	57438	.2551
23.	Aluminium, copper & Brass	14.11	62.18	61313	. 2190
24.	Iron and Steel	30.49	62.18	106204	.3589
25.	Bicycles	37.17	78.57	21558	.4725
26.	Sewing machines	58.53	52.00	12671	.3395
27.	Electric lamps	35.49	52.00	16808	.5026
28.	Electric fans	33.93	25.97	13462	.5026

Source: Same as Appendix VII-1, except column 3, the figures for which are taken from P.K.Sawhney, "Inter-industry wage Differentials in India", Indian Economic Journal, July-Sept. 1969, Table 6, p.53.

APPENDIX VII-3

Labour's Share in Value Added and Other Regression Variables-1956. (Reference: Model-D)

S. No.	Industry	Wage share %	Skilled workers as a prop.of total workers	Capital per worker (fixed capital at purchase prices(Rs.)
1		2	3	4
1.	Wheat floor	20.28	.3299	10539
2.	Rice milling	30.10	.1494	3077
3.	Biscuit making	21.33	.4347	8872
4.	Fruits and vegetables processing	25.03	.3581	9588
5.	Sugar	27.98	.3390	14575
6.	Distilleries & Breweries	20.39	.4120	13639
7.	Starch	25.49	.2676	24626
8.	Oilseeds crushing	32.15	.2884	6834
9.	Edible hydrogenated oils	18.81	.2884	21076
10.	Paints and varnishes	15.49	.3992	14582
11.	Soap	12.95	.3599	21719
12.	Tanning	43.24	.7579	6416
13.	Cement	21.56	.4536	27478
14.	Glass & glassware	58.94	.5033	2774
15.	Ceramics	48.95	.2822	5475
16.	Plywood & teachests	23.34	.3423	7477
17.	Paper & Paperboard	24.30	.3606	17579
18.	Matches	37.83	.1667	2925

APPENDIX VII-3 (concluded)

Labour's Share in Value Added and Other Regression Variables - 1956. (Reference: Model-D)

S. No.	Industry	Wage Share %	Skilled workers as a prop.of total workers	Capital per worker (fixed capital at purchase price(Rs.)
1		2	3	4
19.	Cotton textiles.	54.93	.6729	5590
20.	Woollen textiles	39.55	.7617	8549
21.	Jute textile	64.07	.6296	4158
22.	Chemicals	17.05	.3430	36174
23.	Aluminium, copper & Brass	26.53	.5305	17994
24.	Iron and Steel	24.76	.5403	65757
25.	Bicycles	26.33	.5159	11306
26.	Sewing machines	55.41	.6773	5951
27.	Electric lamps	27.52	.3793	12340
28.	Electric fans	43.35	.6457	9819

Source: (i) Census of Manufacturing Industries, 1956.

(ii) P.Pitamber and M.Vasudevan study. See Appendix VII-1.

Appendix VII-4

Labour's share in Value added and other Regression Variables 1951-1964. (Reference: Model-E)

Year	Wage share (%)	Capital per worker (Rs.) (capital at 1950 prices)	Degree of unionism weighted by severity rate	Degree of unionism (unweighted) %
1	2	3	4	5
1951	40.70	14146	126.73	29.89
1952	48.00	14229	116.72	37.65
1953	49.39	14339	140.22	36.61
1954	45.96	14000	124.52	31.13
1955	42.05	13957	211.74	37.61
1956	41.73	13831	215.22	36.05
1957	44.00	14626	172.04	43.01
1958	41.02	15837	192.22	46.43
1959	40.30	16229	210.50	50.00
1960	42.20	16580	246.51	46.25
1961	41.33	16936	160.40	38.10
1962	43.04	20089	183.60	42.50
1963	41.44	21041	94.61	40.26
1964	40.38	21651	262.07	49.54

Note: The figures of wages and value-added for the years 1951 and 1952 for the employment size-group of 50 and above are adjusted by applying the respective ratios of 1953 to the figures of the above years. (See Ch.II and IV.)

Sources of the data are : (i) Census of Manufacturing Industries; (ii) Annual Survey of Industries; (iii) C.K.Johri, Unionism in a Developing Economy, (Bombay: Asia Publishing House,1967); (iv) The Indian Labour Year Book - Different Issues; (v) For Capital Figures, See Ch.IV.