



TRADE UNIONISM IN INDIA :  
A STATISTICAL ANALYSIS

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## TRADE UNIONISM IN INDIA : A STATISTICAL ANALYSIS

### Introduction

The trade union movement has now emerged as a formidable force in the industrial sector encompassing all the major industries in the country. It owes its present position to the pace of industrialisation in the country. Beginning with the early industrialisation in the 1850s, the pace picked up during the inter-war period and later during the plan periods in the post-Independence era. Trade union membership also shows a similar trend, particularly during the past four to five decades. No doubt, certain events in the trade union history and political developments in the country moulded the growth pattern of trade union membership. There is considerable documentation highlighting historical and political developments. There is, however, much less realisation of the extent to which economic forces influenced the growth of trade unionism in the country. The objective of this paper is to provide an economic explanation of the growth and spread of the trade union membership in the country.

It is hypothesised that the growth in trade union membership has been considerably influenced by the economic conditions of workers and the activities undertaken by the unions to protect or improve these conditions. While the former may be represented by such variables as

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the growth in employment, prices and wages, the latter could be indicated by industrial action such as strikes called by the unions.

Increasing employment provides an opportunity for unions to increase their membership. As industrialisation proceeds, unions find it easier to expand in both the existing centres of industrial development as well as in the emerging ones. At the same time, the early phase of industrialisation also ensures the propensity of workers to join the unions, providing in the process a grist for unions' defensive posture. In secular terms, therefore, union membership and employment may be considered as positively associated. Another secular influence could be the unions' offensive posture in obtaining increasing share of wages in industrial output. Secularly rising money wages could then be seen as another positive influence on union growth. Thus successive wage increases could help in extending the influence of unionism resulting in growth of membership. Consequently, an increase in wage rate may be positively associated with an increase in membership.

The short run variations in union growth may be considered in the context of changing economic situation. During the upswing of economic activity, rising prices tend to outpace the rising money wages. It is during this period that the unions are able to exert maximum pressure through strike action to protect real wages. Consequently, while the price increases may exert a positive influence on union membership, the real wages may be negatively associated with union membership. Under the circumstances of rising employment, rising prices and falling real wages, unions

in general resort to industrial action such as strike. It may therefore be expected that there will again be a positive relationship between mandays lost and growth in union membership.

The above hypothesis is represented by the following regression model:

$$T = \alpha + \beta_1 E + \beta_2 ML_{t-1} + \beta_3 CPI_{t-1} + \beta_4 W_{t-1} + \beta_5 W_{r,t-1} - \beta_6 W/V \dots (1)$$

Where T = Trade union membership; E = Employment; ML = Mandays lost; CPI = Consumer Price Index; W = Wages;  $W_r$  = Real wages;  $W/V$  = Ratio of wages to productivity;  $\alpha$  = Constant;  $\beta_1 \dots \beta_5$  = Regression coefficients.

(Subscript is used to denote time lag, if any)

The data to test this model will be subjected to both time-series as well as cross-section analyses. The time-series analysis will cover the period 1930-69. It will be further divided into four sub-periods, viz., 1930-39, 1940-49, 1950-59 and 1960-69. All variables, except the ratio of wages to productivity, will be included in the time series analyses. This is because of the non-availability of comparable data on productivity for the period as a whole. The cross-section analyses, both inter-industry and inter-state, will be attempted for 1961-63, 1964-66 and 1967-69. Such analyses will be restricted to employment, mandays lost, wages, and the ratio of wages to productivity, again due to paucity of relevant data.

Trade union data based on secondary sources are likely to suffer from imperfections. Therefore statistical analysis should be seen as indicative rather than definitive. Nevertheless, some conclusions based on the exercises reported here will be drawn in the concluding observations.

### Time Series Analysis

The data for time series analysis are presented in Table 1. They reveal the following trends :

- (a) During the 1930s there was an initial push in trade union membership. Employment had not increased to the same extent. While wages had fallen during 1934-35, they had recovered by the end of the period. Cost of living was almost stable. Yet, both real wages and strike activity had substantially increased during 1936-1938.
- (b) The union membership registered a tremendous growth during 1940-49. Employment increased in the early years but stabilised from 1944. Although money wages had more than trebled, cost of living sharply increased during this period. Thus the real wage did not show any improvement, particularly from 1942 to 1946. There was intense strike activity from 1945 to 1949.
- (c) While there was a doubling of union membership from 1950 to 1959, employment had also considerably increased during the period. Wages increased substantially, cost of living showed an increasing trend and, consequently, real wages registered some improvement. Strike activity slowed down from 1951 to 1954, but picked up again from 1955.
- (d) Union membership was further consolidated during 1960-69. The pace of employment generation also quickened. While money wages rose sharply, cost of living also increased. Thus the real wage rate did not increase to the same extent as the increase in money wage rate. The strike activity also continued at a fairly high level from 1966 to 1969.

These data are graphically presented in Figure 1 which helps us to understand the secular trends in union membership and associated variables.\* The statistical model discussed earlier was estimated using the ordinary least squares method of regression. While selected results

\*An analysis of the data revealed that increase in trade union membership was associated with economic conditions (Table 1A). During 39 years, trade union membership and employment increased together on 24 times. Similarly, preceding increases in wages, consumer price index and real wages were associated with increase in trade union membership for 25, 20 and 14 times respectively.

are reported below, others are reproduced in Table 2.

1930-39

$$\log T = -8.77 + 2.19^* \log E + .007 \log ML_{t-1} + .862 \log W_{t-1}$$

(4.37)                      (.12)                      (1.51)

$$R^2 = .84; DW = 2.65 \quad (2)$$

1940-49

$$\log T = -2.27 + .48 \log E + .70^{**} \log CP_{t-1} + .341^* \log ML_{t-1}$$

(.56)                      (3.50)                      (3.82)

$$R^2 = .93; DW = 1.84 \quad (3)$$

1950-59

$$\log T = -10.57 + 1.71^{***} \log E + 1.602 \log CP_{t-1} + .004 \log ML_{t-1}$$

(3.29)                      (1.87)                      (.05)

$$R^2 = .84; DW = 2.19 \quad (4)$$

1960-69

$$T = 526.10 + 2.72^{***} E + .072^{**} ML_{t-1} - 3.39^{***} W_{t-1}$$

(2.92)                      (2.69)                      (2.36)

$$R^2 = .91; DW = 2.88 \quad (5)$$

1930-69

$$\log T = -6.26 + 1.84^* \log E + .51^* \log CP_{t-1} + .075 \log ML_{t-1}$$

(7.95)                      (3.62)                      (1.37)

$$R^2 = .97; DW = .55 \quad (6)$$

(Significance : \*at 1%; \*\*at 5%; \*\*\*at 10%)

During 1930-1939 decade, employment seemed to be the most crucial variable affecting the growth of union membership (equation 2). While the regression coefficient of this variable had both the expected sign as well as statistical significance, the regression coefficient for consumer price index and real wages not only had the wrong signs but were statistically insignificant also. However, the regression coefficient for wages had the correct sign but was statistically insignificant.

Employment was found to be a much less influential variable from 1940 to 1949. The regression coefficient for employment was found to have the correct sign but insignificant in equation (3). On the other hand, mandays lost had considerable influence during the period. The regression coefficients for mandays lost as well as consumer price index not only had the correct sign but were also found to be statistically significant. In some equations, regression coefficient for wages had the correct sign and was found statistically significant. Similarly, the regression coefficient for real wages had also a correct sign but was found statistically insignificant. It may be concluded that during this period the socio-economic conditions and union action had considerably influenced the growth of union membership.

In the third decade (1950-59) there seems to be some uncertainty about the factors affecting the growth of union membership. The regression coefficient for employment was found significant at 5% only



(equation 4). While the coefficients for consumer price index and mandays lost had the correct sign, they were found insignificant. It may be seen from the results reported in Table 2 that the coefficients for wages and real wages also had the correct signs, but the coefficients for wages alone were found statistically significant.

As indicated earlier there was a relative stability in the growth of union membership during the period 1960-69. As a consequence, the growth in union membership was not influenced by any variable in particular. Nevertheless there was a combined influence of employment, mandays lost, and real wages. The coefficients for all these variables had the correct signs and were also statistically significant, between 5 to 10 per cent (equation 5). Moreover, the regression coefficient for consumer price index had the correct sign as well as statistical significance in one of the equations (Table 2). Regression coefficient for wages<sup>was</sup> found to be statistically significant and with wrong sign.

An attempt was also made to test the hypothesis for the entire period of four decades (1930 to 1969). It was found that employment and consumer price index had significant effects on union membership throughout this period (equation 6). In this equation, the regression coefficient for employment was both positive and statistically significant. Regression coefficient for consumer price index also had statistical significance and correct sign. Similarly, the regression coefficient for mandays lost also had the correct sign but with

statistical insignificance. While the regression coefficient for wages had the correct sign and statistical significance, the coefficient for real wages turned out to have wrong sign and was statistically insignificant. The multiple correlation coefficient was fairly high which would indicate that the variables considered in equation (5) were adequate for an explanation of union growth.

It may be concluded from ~~this~~ analysis that employment had by and large the most crucial impact on the growth of unionism in the country. Similarly, rising prices, wages, real wages and strike action **also** had some influence on unionism. On the whole the hypothesis that both the opportunity and the ability of the union to grow in response to socio-economic development appears to have been validated since the late twenties.

#### Cross-Section Analyses

This section attempts to analyse the relative variation in unionization among different states and industries for the period 1961-69. The relative propensity to unionise for each state and industry is separately obtained by computing their respective deviations from the average trade union membership. States and industries are then ranked in order of high or low deviations from the average. Thus, in terms of trade union membership states or industries showing high positive deviations from the average are described as highly unionised and vice-versa. The period under review is further divided into following

three sub-periods : period one -- 1961-63; period two -- 1964-66; and period three -- 1967-69.

(1) Inter-state Variation in Unionization

On the basis of data provided in Table 3, ten of the twenty states studied can be described as low unionised states in terms of the overall trend of unionisation in the country. Trade union penetration in these states is significantly less compared to the remaining ones. Their trade union membership shows wide deviations in the negative side from the total average. The low unionised states, as noted in Table 3, are: Assam, Gujarat, Himachal Pradesh, Madhya Pradesh, Mysore, Orissa, Punjab, Rajasthan, Tripura, and Andaman & Nicobar.

Among the highly unionised states West Bengal occupies the highest rank in period (1961-63) followed by Maharashtra, Bihar, Madras, Uttar Pradesh, Kerala and Delhi in that order. The lowest rank in terms of unionization is obtained by Andaman & Nicobar.

In period two (1964-66) interchanging of ranks among some highly unionised states is evident. In other words as against period one, some states show greater degree of unionisation in period two while others are marked by a relatively lesser propensity to unionise. In the former category are Maharashtra and Tamil Nadu. They move upward from second and fourth ranks in period one to first and third ranks in period two respectively. Contrarily, West Bengal and Bihar's position changed from first and third ranks in period one to second and fourth in period

two respectively. However, Kerala's downward movement is strikingly significant in that it moves from sixth rank in period one to eleventh rank in period two. Uttar Pradesh and Delhi retain their positions in period two also.

Even among low unionised states some improvement in terms of unionisation is noticed in period two. For instance, Andhra Pradesh, Assam, Madhya Pradesh and Mysore move upward from tenth, ninth, fifteenth and eleventh positions in period one to seventh, eighth, fourteenth and tenth positions in period two respectively. However, except Rajasthan and Gujarat whose positions deteriorate further in the subsequent years, the remaining low unionised states keep their positions unchanged.

As against period two, period three (1967-69) suggests no significant change in that the highly unionised states more or less remain in the same positions they held earlier. As for low unionised states, Madhya Pradesh and Rajasthan show improvement in terms of unionisation -- from fourteenth and fifteenth ranks in period two they move up to twelfth and fourteenth ranks in period three respectively. On the other hand, Orissa, Punjab and Tripura move further down in period three in terms of unionisation. No change of positions for other low unionised states is noticed in period three.

In view of the overall performance of individual states for the period as a whole (1961-69) Maharashtra emerges as having the highest degree of unionisation followed in that order by West Bengal, Tamil Nadu, Bihar, Uttar Pradesh, Delhi and Andhra Pradesh. However, excluding Pondicherry, Andaman & Nicobar happen to be the least unionised state in view of its holding the lowest rank in terms of unionisation.

It was hypothesised earlier that while employment and mandays lost have a positive influence, wage-productivity ratio has a negative influence on the variation of trade union membership from state to state. An attempt was made to test the above hypothesis on the data reproduced in Tables 4, 5 & 6. Selected regression results are quoted in Table 7.

All the seven equations in Table 7 show the preponderant influence of variation in employment on variation in trade union membership. In equation (4) for example, the regression coefficient for employment is found to be both positive as well as statistically significant at 1% level. The results also indicate that variation in trade union membership has been associated with wage-productivity ratio. Although the sign of regression coefficient for this variable was found to be correct, it was not statistically significant. A similar result was also found for the variable mandays lost in equations (1) and (4) whereas the coefficient was found to have both a wrong sign as well as statistical insignificance in equations (2) and (6). It may be concluded from this analysis that the inter-state variation in trade union membership is dependent upon the

level of employment, while the influence of wage-productivity ratio as well as mandays lost has the right direction but their influence is rather weak.

## (2) Inter-industry Variation in Unionisation

The data on inter-industry variation in unionisation are provided in Table 8. The data suggest that thirteen out of twenty industries included in the present analysis consistently remain in a low state of unionisation in terms of their showing negative deviations from the average membership.

However, seven industries are identified as highly unionised and among them Textiles occupies the highest rank in each one of the three sub-periods as well as for all the three periods clustered as one. Except in period two Plantation and Mining & Quarrying occupy the second and third highest positions in terms of unionisation. These two industries, however, interchange their respective positions in period two — Plantation yields its earlier place to Mining & Quarrying. In period one, Food (except beverages), Commerce and Basic Metal occupy fourth, fifth and sixth positions respectively. In period two, further improvement is evident for Commerce in view of its moving upward from fifth to fourth rank whereas Basic Metal remains in the same position and Food (except beverages) descends from fourth rank in period one to fifth rank in period two. The latter two industries move one step down the ladder in period three — Food (except beverages) from fifth to sixth rank and

Basic Metal from sixth to seventh rank. Commerce, it is noted, keeps its earlier position unchanged in period three. A notable improvement, however, is evident for Electricity, Gas, Water & Sanitary Services which pulls itself up from seventh position in period two to fifth position in the subsequent period.

Among the low unionised industries periodic shifts from low to relatively high unionisation and vice-versa is also evident. For instance, such low unionised industries as Paper & Paper Products, Leather & Leather Products, Rubber & Rubber Products and Construction show relative improvement in their positions from period one to period two. In period three further improvement in unionization is noticed for Leather & Leather Products while Rubber & Rubber Products clings to its earlier position and Paper & Paper Products as well as Construction move further down. This trend is also evident for Electrical Machine, Apparatus & Appliances, Machinery (except electrical) and Beverages from sixteenth, tenth and seventh ranks in period one to seventeenth, eleventh and twentieth ranks in period two respectively. However, the descending trend of unionisation for these industries gets discontinued in period three. Not only that, except for Beverages whose position remains unaffected, Electrical Machine, Apparatus & Appliances and Machinery (except electrical) show relative improvement in unionization. An ascending trend for them is noticed from seventeenth and eleventh ranks in period two to fifteenth and eighth ranks in period three respectively.

It is stated earlier that for the period as a whole (1961-69), Textile, Plantation and Mining & Quarrying hold the top three positions in terms of unionisation. Correspondingly, Commerce, Food (except beverages), Basic Metal, Electricity, Gas, Water & Sanitary Services occupy fourth, fifth, sixth and seventh positions respectively. However, Beverages appears to be the least unionised industry in the period under review.

The data to test statistical model are reproduced in Table 9, 10 and 11 and the selected regression results in Table 12. It may be seen from the results that inter-industry variation in employment had considerable impact on the inter-industry variation in trade union membership. The loss of mandays was also found to have considerable influence. The variation in wage-productivity ratio between one industry and another had a weak relationship with trade union membership. The regression coefficient for this variable was found to have the correct sign but was statistically insignificant.

### Conclusion

The analysis suggests that Indian trade unions have attained substantial growth in total membership. It also confirms the hypothesis that the opportunity for unions to grow was provided by increasing employment. Consequently employment was found to be a significant factor in the growth of union membership. Other variables such as wages, consumer price index and mandays lost also contributed to growth of unionization.



In view of inter-state and inter-industry variation in unionisation three kinds of states and industries emerged from the present analysis. There are states and industries that are highly unionised from the beginning and remain so all through the period under review. Unionism seems to have established a firm foothold in these states or industries. Secondly, there are states and industries that are seemingly isolated from the mainstream of the movement and tend to remain weak in unionisation irrespective of considerable penetration and headway in neighbouring states or industries. Thirdly, there are industries and states that swing back and forth from high to low and low to high degree of unionisation.

The inter-state and inter-industry variation in union membership in the recent past is explainable by employment and mandays lost. There was also some influence of variation in wage-productivity ratio on the dispersion of trade union membership.

The persistence of low union industries or low union states has important implications for trade union response to wage behaviour in Indian industry. The analysis reported here implies that union membership has not particularly responded to those states and industries where the ratio of wages to productivity has been consistently low. It may therefore be necessary for unions to make more intensive efforts to organise the workers in these states and industries which may help in reestablishing wage productivity parity in these industries and states.

Table 1  
 Index of Trade Union Membership and Associated Variables:  
 1929-1969 (base year = 1944)

Year	Index of trade union membership	Index of employ- ment	Index of cost of living	Index of mandays lost	Index of real wages	Index of wages
1	2	3	4	5	6	7
1929	23.19	57.69	57.8	352.90	74.65	43.15
1930	31.03	60.59	52.9	65.61	78.47	41.51
1931	28.06	55.51	43.9	69.86	99.68	43.76
1932	30.18	58.21	44.5	55.77	99.26	44.17
1933	30.39	56.34	42.3	62.69	102.98	43.56
1934	26.64	55.43	39.3	138.53	94.71	37.22
1935	36.48	63.84	40.5	28.24	94.04	38.04
1936	34.36	65.50	39.4	155.43	104.31	41.10
1937	33.43	67.01	40.2	260.56	107.34	43.15
1938	49.95	68.60	41.8	266.84	114.00	47.65
1939	51.11	69.43	41.2	144.83	119.61	49.28
1940	65.45	73.12	41.0	219.80	128.20	52.56
1941	65.79	85.49	44.8	96.61	123.71	55.42
1942	73.44	90.48	57.6	167.67	111.84	64.42
1943	87.75	96.59	114.5	67.42	78.23	89.57
1944	100	100	100	100	100	100
1945	113.88	104.76	100.2	117.61	101.44	101.64
1946	110.64	95.14	104.4	368.92	101.07	105.52
1947	170.55	97.22	116.8	480.45	114.15	133.33
1948	212.93	98.61	132.3	227.34	114.69	151.74
1949	250.98	104.86	136.4	191.47	123.28	168.10
1950	233.19	108.31	137.8	371.50	119.88	164.83
1951	224.97	115.52	143.30	110.78	123.15	176.48
1952	225.62	119.79	140.72	96.80	134.71	189.57
1953	268.77	117.76	144.73	98.12	130.84	189.37

1	2	3	4	5	6	7
1954	270.52	120.42	137.85	97.83	137.37	189.37
1955	277.92	123.47	130.93	165.28	152.70	200.00
1956	291.31	131.92	143.30	202.86	141.14	202.25
1957	304.37	137.99	151.47	186.50	139.79	210.22
1958	386.06	135.33	158.35	226.19	136.63	216.36
1959	466.99	144.13	165.08	163.41	131.92	217.78
1960	502.33	149.25	169.24	189.61	142.55	241.25
1961	513.85	155.35	171.96	142.68	149.12	256.43
1962	509.24	163.01	177.41	177.55	156.98	278.49
1963	471.47	173.12	182.85	94.81	160.41	293.31
1964	509.24	183.03	207.50	224.09	148.93	309.02
1965	571.86	187.55	226.56	179.10	151.27	342.72
1966	559.43	186.44	251.06	401.65	150.71	378.37
1967	576.59	188.74	285.17	497.40	146.54	417.90
1968	652.27	188.66	293.48	500.19	153.10	449.32
1969	623.07	190.29	290.61	552.35	158.01	459.20

**Source :** Column 2 : 1929 to 1950 : Karnik VB, Indian Trade Unions, A Survey, Appendix I, page 321.  
 1951 to 1969 : Indian Labour Statistics  
 Column 3 : 1929 to 1938 : Labour Year Book  
 1939 to 1950 : Palekar SA, Real Wages in India.  
 1950 to 1969 : Indian Labour Statistics  
 Column 4 : 1929 to 1950 : Singh VB, Economic History of India, 1857-1956, Table 5, p. 657.  
 1951 to 1969 : Indian Labour Statistics  
 Column 5 : Computed on the basis of columns 4 and 7.  
 Column 6 : Computed on the basis of columns 4 and 7.  
 Column 7 : 1929 to 1950 : Singh VB, Economic History of India, 1857-1956, Table 5, p. 657.  
 1951 to 1969 : Indian Labour Statistics.

Table 1(A)  
Trade Union Membership and Economic Conditions

Number of years in which --	Number of years in which --		
	Membership increased	Membership decreased	Total no. of years
<b>Employment</b>			
Increased	24	7	31
Decreased	4	4	8
Total	28	11	39
<b>Consumer Price Index (t-1)</b>			
Increased	20	8	28
Decreased	8	3	11
Total	28	11	39
<b>Wages* (t-1)</b>			
Increased	25	8	33
Decreased	2	3	5
Total	27	11	38
<b>Real Wages (t-1)</b>			
Increased	14	9	23
Decreased	14	2	16
Total	28	11	39

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\*Index for wages remained constant from 1954 to 1955.

Source : Calculated from Table 1.

Table 2  
Additional Regression Results

1930-39

$$(1) \log T = -3.044 + 1.708 \log E - .207 \log \text{CPI}_{t-1} + .067 \log \text{ML}_{t-1}$$

(2.18)                      (.44)                      (.92)

$$R^2 = .785; \text{DW} = 1.96$$

$$(2) T = -41.062 + .796^{***} E + .024 \text{ML}_{t-1} + .239 \text{Wr}_{t-1}$$

(1.97)                      (1.42)                      (1.55)

$$R^2 = .814; \text{DW} = 2.545$$

$$(3) \log T = -5.157 + 1.591^{**} \log E + .066 \log \text{ML}_{t-1} + .399 \log \text{Wr}_{t-1}$$

(2.69)                      (1.17)                      (1.17)

$$R^2 = .819; \text{DW} = 2.506$$

$$(4) T = -64.926 + 1.123 E - .197 \text{CPI}_{t-1} + .009 \text{ML}_{t-1} + .891 \text{W}_{t-1}$$

(1.84)                      (.42)                      (.33)                      (1.50)

$$R^2 = .837; \text{DW} = 2.791$$

$$(5) \log T = -7.354 + 1.997^{***} \log E - .163 \log \text{CPI}_{t-1} + .023 \log \text{ML}_{t-1}$$

(.61)                      (.37)                      (.30)

$$+ .845 \log \text{W}_{t-1}$$

(1.36)

$$R^2 = .843; \text{DW} = 2.793$$

1940-49

$$(6) \log T = -1.021 + .041 \log E + .201^{**} \log \text{ML}_{t-1} + 1.021^* \log \text{W}_{t-1}$$

(.07)                      (2.89)                      (5.83)

$$R^2 = .966; \text{DW} = 2.162$$

$$(7) T = -350.019 + 4.019^{***} E + .272^{**} \text{ML}_{t-1} + .372 \text{Wr}_{t-1}$$

(2.24)                      (2.39)                      (.31)

$$R^2 = .721; \text{DW} = 1.545$$

$$(8) \log T = -6.775 + 2.577^{**} \log E + .478^{**} \log \text{ML}_{t-1} - .568 \log \text{Wr}_{t-1}$$

(2.56)                      (2.82)                      (.68)

$$R^2 = .788; \text{DW} = 1.826$$

$$(9) \quad T = -22.927 - .167E - .698 \text{CPI}_{t-1} + .080 \text{ML}_{t-1} + 2.295^* W_{t-1}$$

$$\quad \quad \quad (.16) \quad (1.25) \quad (1.38) \quad (3.92)$$

$$R^2 = .961; \text{DW} = 2.249$$

$$(10) \quad \log T = -1.177 + .064 \log E - .233 \log \text{CPI}_{t-1} + .167 \log \text{ML}_{t-1}$$

$$\quad \quad \quad (.10) \quad (.60) \quad (1.80)$$

$$\quad + 1.301^{***} \log W_{t-1}$$

$$\quad \quad \quad (2.60)$$

$$R^2 = .968; \text{DW} = 2.375$$

1950-59

$$(11) \quad \log T = -8.079 - 1.108 \log E + .187^{***} \log \text{ML}_{t-1} + 3.458^{***} \log W_{t-1}$$

$$\quad \quad \quad (1.03) \quad (2.20) \quad (3.31)$$

$$R^2 = .913;$$

$$(12) \quad T = -325.123 + 6.902^{***} E - .046 \text{ML}_{t-1} - 1.775 W_{t-1}$$

$$\quad \quad \quad (3.36) \quad (.23) \quad (.73)$$

$$R^2 = .755; \text{DW} = 1.764$$

$$(13) \quad \log T = -4.777 + 2.419^{**} \log E - .089 \log \text{ML}_{t-1} - .245 \log W_{t-1}$$

$$\quad \quad \quad (2.89) \quad (.08) \quad (.24)$$

$$R^2 = .754; \text{DW} = 1.626$$

$$(14) \quad T = -839.945 - 2.525E + 3.364^{***} \text{CPI}_{t-1} + .273^{***} \text{ML}_{t-1} + 4.849^{***} W_{t-1}$$

$$\quad \quad \quad (.99) \quad (2.51) \quad (2.05) \quad (2.75)$$

$$R^2 = .943; \text{DW} = 1.853$$

$$(15) \quad \log T = -11.687 - 1.111 \log E + 1.196^{***} \log \text{CPI}_{t-1} + .165^{**} \log \text{ML}_{t-1}$$

$$\quad \quad \quad (1.43) \quad (2.52) \quad (2.66)$$

$$\quad + 3.038^* \log W_{t-1}$$

$$\quad \quad \quad (3.91)$$

$$R^2 = .962; \text{DW} = 1.859$$

1960-69

$$(16) \quad \log T = 4.734 - .251 \log E + .549^{***} \log \text{CPI}_{t-1} - .012 \log \text{ML}_{t-1}$$

$$\quad \quad \quad (.69) \quad (2.08) \quad (.17)$$

$$R^2 = .882; \text{DW} = 2.387$$

$$(17) \quad \log T = 4.692 - .049 \log E + .074 \log \text{ML}_{t-1} + .256 \log W_{t-1}$$

$$\quad \quad \quad (.08) \quad (.97) \quad (.767)$$

$$R^2 = .814; \text{DW} = 2.325$$

$$(18) \log T = 5.907 + .964^{***} \log E + .072 \log ML_{t-1} - .995^{***} \log W_{r,t-1}$$

$$(4.11) (2.92) (1.85) (2.07)$$

$$R^2 = .881; DW = 2.732$$

$$(19) T = 117.983 + 1.316 E + 3.404^{***} CPI_{t-1} - .026 ML_{t-1} - 1.633^{***} W_{t-1}$$

$$(1.15) (3.14) (.17) (2.34)$$

$$R^2 = .945; DW = 2.395$$

$$(20) \log T = 2.740 + .329 \log E + 1.197^{**} \log CPI_{t-1} - .022 \log ML_{t-1}$$

$$(1.92) (.74) (2.81) (.36)$$

$$- .769 \log W_{t-1}$$

$$(1.79)$$

$$R^2 = .928; DW = 2.44$$

1930-69

$$(21) \log T = -4.262 + 1.146^{**} \log E + .063 \log ML_{t-1} + .756^{**} \log W_{t-1}$$

$$(3.96) (1.42) (5.27)$$

$$R^2 = .976; DW = .6206$$

$$(22) T = -296.786 + 4.327^{**} E + .103 ML_{t-1} + .259 W_{r,t-1}$$

$$(5.76) (11.80) (1.55) (.39)$$

$$R^2 = .951; DW = .599$$

$$(23) \log T = -8.230 + 2.515^{*} \log E + .091 \log ML_{t-1} + .227 \log W_{r,t-1}$$

$$(7.78) (14.08) (1.44) (.66)$$

$$R^2 = .957; DW = .537$$

$$(24) T = -173.134 + 2.695^{*} E - .219 CPI_{t-1} + .016 ML_{t-1} + .864^{***} W_{t-1}$$

$$(4.21) (.36) (.24) (1.90)$$

$$R^2 = .959; DW = .573$$

$$(25) \log T = -3.765 + 1.024^{*} \log E - .265 \log CPI_{t-1} + .069 \log ML_{t-1}$$

$$(3.28) (1.03) (1.43)$$

$$+ 1.026^{*} \log W_{t-1}$$

$$(3.44)$$

$$R^2 = .976; DW = .679$$

**Table 5**  
**Trends in Inter-state variation in Unionization (1961-69)**

States	Deviation from Average		
	1961-63	1964-66	1967-69
Andhra Pradesh	-146.89(X)	8.72(VII)	117.05(VII)
Assam	-53.89(IX)	-161.28(VIII)	-40.95(VIII)
Bihar	491.11(III)	508.72(IV)	735.05(IV)
Gujarat	-35.89(VIII)	-244.28(IX)	-90.95(IX)
Haryana	--	--	-568.95(XVI)
Himachal Pradesh	-636.89(XVII)	-648.28(XVII)	-689.95(XVII)
Kerala	92.11(VI)	-290.28(XI)	-271.95(XI)
Madhya Pradesh	-533.89(XV)	-487.28(XIV)	-433.95(XII)
Maharashtra	1165.11(II)	1821.72(I)	2266.05(I)
Manipur	--	--	5388.10(I)
Mysore	-309.89(XI)	-258.28(X)	-199.95(X)
Orissa	-435.89(XIII)	-482.28(XIII)	-522.95(XV)
Punjab	-411.89(XII)	-453.28(XII)	-463.95(XIII)
Rajasthan	-506.89(XIV)	-556.28(XV)	-468.95(XIV)
Tamil Nadu	427.11	537.72(III)	829.05(III)
Tripura	-624.89(XVI)	-682.28(XVI)	-696.95(XVIII)
Uttar Pradesh	297.11(V)	486.72(V)	696.05(V)
West Bengal	1793.11(I)	1461.72(II)	978.05(II)
Andaman & Nicobar	-638.89(XVIII)	-699.29(XVIII)	-711.95(XIX)
Delhi	70.11(VII)	155.72(VI)	255.05(VI)
Pondicherry	--	--	-714.95(XX)
			-1931.90(XX)

Source : Indian Labour Statistics

Note : Figures within bracket indicate respective ranks in terms of unionization.



Table 4

Statewise Index of Trade Union Membership and Associated Variables : 1961-63 (West Bengal & Andaman, Nicobar=100)

States	Index of trade union membership	Index of employment	Wage-productivity ratio	Index of mandays lost	Index of wages
Andhra Pradesh	20.40	30.77	42.27	15.53	14.17
Assam	24.20	10.80	24.56	1.14	5.19
Bihar	46.48	25.91	37.05	8.62	30.42
Gujarat	24.94	48.72	43.21	18.24	43.03
Kerala	30.14	23.21	37.60	18.47	9.18
Madhya Pradesh	4.58	22.81	41.65	11.09	14.04
Maharashtra	74.04	111.61	38.43	98.62	120.34
Mysore	13.74	24.02	25.49	8.02	13.58
Orissa	8.59	5.13	24.67	1.96	5.78
Punjab	9.57	17.81	154.86	3.21	10.69
Rajasthan	5.68	7.69	39.42	2.01	5.45
Tamil Nadu	43.87	44.53	38.14	46.69	35.14
Tripura	0.86	0.27	29.23	0.74	0.03
Uttar Pradesh	38.55	45.61	43.26	13.27	29.54
West Bengal & Andaman, Nicobar	100	100	36.86	100	100
Delhi	29.27	9.72	40.99	1.48	8.02

Table 6

Statewise Index of Trade Union Membership and Associated Variables : 1964-65 (Maharashtra = 100)

States	Index of trade union membership	Index of employment	Wage-productivity ratio	Index of mandays lost	Index of wages
Andhra Pradesh	28.28	27.21	34.54	15.22	12.80
Assam	21.56	8.64	20.79	1.94	4.23
Bihar	48.06	25.40	29.90	6.98	24.70
Gujarat	18.28	44.08	42.82	3.76	49.24
Kerala	16.46	21.34	27.96	62.18	8.87
Madhya Pradesh	8.66	22.63	42.15	4.64	16.12
Maharashtra	100	100	34.98	100	100
Mysore	17.72	25.61	25.59	14.17	14.48
Orissa	8.86	7.26	44.31	0.48	8.81
Punjab	10.01	11.10	26.78	8.54	6.59
Rajasthan	5.93	8.22	37.91	1.35	5.80
Tamil Nadu	49.21	43.22	38.30	18.36	36.54
Uttar Pradesh	47.19	44.29	40.26	26.94	26.83
West Bengal	86.47	93.17	42.36	103.24	90.79
Delhi	34.10	9.39	45.72	5.93	7.69

Table 6C  
 Statewise Index of Trade Union Membership and  
 Associated Variables: 1967-69 (Maharashtra=100)

States	Index of trade union membership	Index of employ- ment	Wage producti- vity ratio	Index of mandays lost	Index of wages
Andhra Pradesh	28.10	26.38	32.08	41.35	14.88
Assam	22.82	8.18	29.17	4.96	4.44
Bihar	48.78	26.79	35.70	156.53	24.02
Gujarat	21.14	42.43	37.49	10.44	39.25
Haryana	5.15	8.38	30.29	21.39	6.95
Kerala	15.09	20.96	25.44	127.94	12.19
Madhya Pradesh	9.67	21.78	41.86	53.90	16.02
Maharashtra	100	100	31.07	100	100
Mysore	17.50	26.58	26.24	60.10	17.07
Orissa	6.69	7.26	40.08	3.13	8.50
Punjab	8.67	10.84	32.19	7.86	9.39
Rajasthan	8.50	8.49	32.04	10.69	6.46
Tamil Nadu	51.92	43.05	34.28	57.89	39.02
Uttar Pradesh	47.47	40.80	30.97	33.55	25.89
West Bengal	56.91	84.15	46.81	776.52	83.43
Delhi	32.72	9.41	39.57	21.14	8.64

Table 7  
Inter-state Variation in Trade Union  
Membership : Regression Results

1961-63

$$(1) \quad T = 12.369 + .333 E - .063 W/P + .416 ML$$

(.95)      (.56)      (1.19)

$$R^2 = .815; \text{DW} = 1.361$$

$$(2) \quad \text{Log } T = 2.571 + .846^* \log E - .527 \log W/P - .093 \log ML$$

(.69)      (1.27)      (.48)

$$R^2 = .765; \text{DW} = 2.114$$

$$(3) \quad T = 12.4284 + .278 E + .104 W - .064 W/P + .361 ML$$

(.47)      (.19)      (.54)      (.96)

$$R^2 = .723; \text{DW} = 1.398$$

1964-66

$$(4) \quad T = 9.453 + .809^{**} E - .128 W/P + .080 ML$$

(3.02)      (.25)      (.37)

$$R^2 = .813; \text{DW} = 1.786$$

$$(5) \quad T = 16.209 + .217 E + .584 W - .218 W/P + .084 ML$$

(.29)      (.85)      (.41)      (.38)

$$R^2 = .826; \text{DW} = 1.707$$

1967-69

$$(6) \quad T = 7.416 + .922^* E - .084 W/P - .027 ML$$

(.577)      (.12)      (1.01)

$$R^2 = .778; \text{DW} = 1.923$$

$$(7) \quad T = 12.758 + .620 E + .302 W - .205 W/P - .025 ML$$

(.68)      (.34)      (.25)      (.93)

$$R^2 = .780; \text{DW} = 1.821$$

Table 6

Trends in Inter-industry Variation in Unionization (1961-69)

Industries	Deviation from Average		
	1961-63	1964-66	1967-69
Plantation	628.10(II)	555.70(III)	570.80
Mining & Quarrying	593.10(III)	560.70(II)	476.80(III)
Food (except Beverages)	231.10(IV)	134.70(V)	117.80(VI)
Beverages	-310.90(XVII)	-373.30(XX)	-415.20(XX)
Tobacco	-118.90	-109.30(VIII)	-216.20(XIII)
Textiles	1316.10(I)	1607.70(I)	1663.80(I)
Paper & paper products	-312.90(XVIII)	-346.30(XVI)	-376.20(XVIII)
Printing, Publishing & Allied Industries	-230.90(XV)	-284.30(XV)	-305.20(XVI)
Leather & Leather Products	-328.90(XIX)	-356.30(XVIII)	-371.20(XVII)
Rubber & rubber products	-332.90(XX)	-360.30(XIX)	-404.20(XIX)
Chemical & chemical products	-175.90(XII)	-185.30(XII)	-178.20(X)
Non-metallic Mineral products	-130.90(IX)	-136.30(IX)	-166.20(IX)
Basic Metal Industries	44.10(VI)	89.70(VI)	106.80(VII)
Metal Products	-196.90(XIII)	-236.30(XIII)	-277.20(XIV)
Machinery (except electrical)	-166.90(X)	-170.30(XI)	-129.20(VIII)
Electrical Machine, Apparatus & Appliances	-291.90(XVI)	-353.30(XVII)	-278.20(XV)
Transport Equipments	-197.90(XIV)	-265.30(XIV)	-196.20(XII)
Construction	-168.90(XI)	-149.30(X)	-179.20(XI)
Electricity, Gas, Water & Sanitary Ser.	-40.90(VII)	-26.30(VII)	161.80(V)
Commerce	193.10(V)	344.70(IV)	394.80(IV)
			1754.60(II)
			1630.60(III)
			483.60(V)
			-1099.40(XX)
			-444.40(IX)
			4587.60(I)
			-1035.40(XVII)
			-820.40(XV)
			-1056.40(XII)
			-1097.40(XIX)
			-539.40(XII)
			-433.40(VIII)
			240.60(VI)
			-710.40(XIV)
			-466.40(X)
			-864.40(XVI)
			-659.40(XI)
			-497.40(XI)
			94.60(VII)
			932.60(IV)

Source : Indian Labour Statistics

Note : Figures within bracket indicate respective ranks in terms of unionization.

Table 9  
Industrywise Index of Trade Union Membership and  
Associated Variables : 1961-63 (Textile = 100)

Industries	Index of tr. union membership	Index of employ- ment	Wage- produc- tivity ratio	Index of mandays lost	Index of wages
Food (except Beverages)	35.91	45.68	28.31	6.25	16.21
Beverages	3.90	0.71	17.81	0.46	0.34
Tobacco	15.24	13.84	26.28	395.91	3.49
Textiles	100	100	53.91	100	100
Paper & paper products	3.78	3.85	28.70	0.54	3.89
Printing, publishing & allied industries	8.62	9.04	42.34	1.23	6.29
Leather & leather products	2.84	2.04	41.84	0.31	0.52
Rubber & rubber products	2.60	3.85	25.19	8.18	4.25
Chemical & chemical products	11.87	13.84	21.61	4.01	11.73
Non-metallic mineral products	14.53	17.30	34.34	12.35	9.27
Basic metal industries	24.87	18.08	33.15	5.09	25.14
Metal products	10.63	13.84	32.84	18.52	5.52
Machinery (except electrical)	12.40	20.28	36.54	2.62	11.24
Electrical machinery, apparatus & appliances	5.02	9.59	32.04	10.49	8.94
Transport equipments	10.57	31.76	45.47	10.49	28.3'

Table 10

Industrywise Index of Trade Union Membership and  
Associated Variables : 1954-66 (Textile = 100)

Industries	Index of tr. union membership	Index of employ- ment	Wage- produc- tivity ratio	Index of mandays lost	Index of wages
Food (except Beverages)	27.58	47.66	24.83	5.54	18.07
Beverages	2.61	0.95	15.54	0.50	0.60
Tobacco	15.59	12.69	18.59	3.90	3.04
Textiles	100	100	57.33	100	100
Paper & paper products	3.39	4.68	31.17	1.48	4.40
Printing, publishing & allied industries	6.98	9.83	44.59	2.40	7.36
Leather & leather products	3.44	2.06	33.83	0.36	0.60
Rubber & rubber products	3.24	4.60	28.98	1.63	4.76
Chemical & chemical products	11.85	16.34	19.24	6.44	13.36
Non-metallic mineral products	14.26	18.64	31.99	12.37	10.61
Basic metal industries	25.35	20.94	37.00	3.74	30.23
Metal products	9.34	15.94	33.83	9.12	6.47
Machinery (except electrical)	12.59	27.36	37.36	5.17	15.11
Electrical machinery, apparatus & appliances	6.49	12.61	30.08	5.09	11.69
Transport equipments	7.92	35.84	47.18	2.86	37.41

Table 11  
Industrywise Index of Trade Union Membership and  
Associated Variables : 1969 (Textile = 100)

Industries	Index of tr. union membership	Index of employ- ment	Wage- produc- tivity ratio	Index of mandays lost	Index of wages
Food (except electrical)	27.32	52.44	22.09	19.37	22.72
Beverages	2.26	1.32	10.14	0.85	0.88
Tobacco	11.61	11.48	15.65	2.72	3.97
Textiles	100	100	54.05	100	100
Paper & paper products	4.09	5.37	27.89	4.74	5.56
Printing, publishing & allied industries	7.43	10.82	46.08	0.97	11.02
Leather & leather products	4.33	2.15	41.64	0.05	1.19
Rubber & rubber products	2.77	5.45	27.65	2.47	6.23
Chemical & chemical products	13.40	19.65	18.87	7.07	19.88
Non-metallic mineral products	13.96	20.48	35.34	13.04	12.63
Basic metal industries	26.80	22.30	40.58	11.05	35.08
Metal products	8.74	17.01	35.34	19.44	9.59
Machinery (except electrical)	15.70	28.41	33.67	14.35	20.62
Electrical machinery, apparatus & appliances	8.70	15.19	32.95	13.38	15.42
Transport equipments	12.55	39.55	49.85	13.71	40.50



Table 12  
 Inter-industry Variation in Trade Union  
Membership : Regression Results

1961-63

$$(1) \quad T = 2.231 + .97^* E - .15 W/P + .01 ML$$

(10.13) (.59) (.64)

$$R^2 = .94; DW = 1.27$$

$$(2) \quad T = 7.656 + .59^{***} E + .44^{***} W - .29 W/P + .02 ML$$

(2.94) (2.07) (1.26) (.90)

$$R^2 = .96; DW = .86$$

1964-66

$$(3) \quad \log T = 7.066 + .42^* \log E - .19 \log W/P + .61^* \log ML$$

(3.33) (1.11) (4.94)

$$R^2 = .96; DW = 2.12$$

$$(4) \quad T = 9.34 + .32 E + .19 W - .27 W/P + .55^* ML$$

(1.79) (.82) (1.35) (3.73)

$$R^2 = .96; DW = 1.77$$

1967-69

$$(5) \quad T = 2.04 + .26 E - .05 W/P + .72^* ML$$

(1.54) (.30) (4.04)

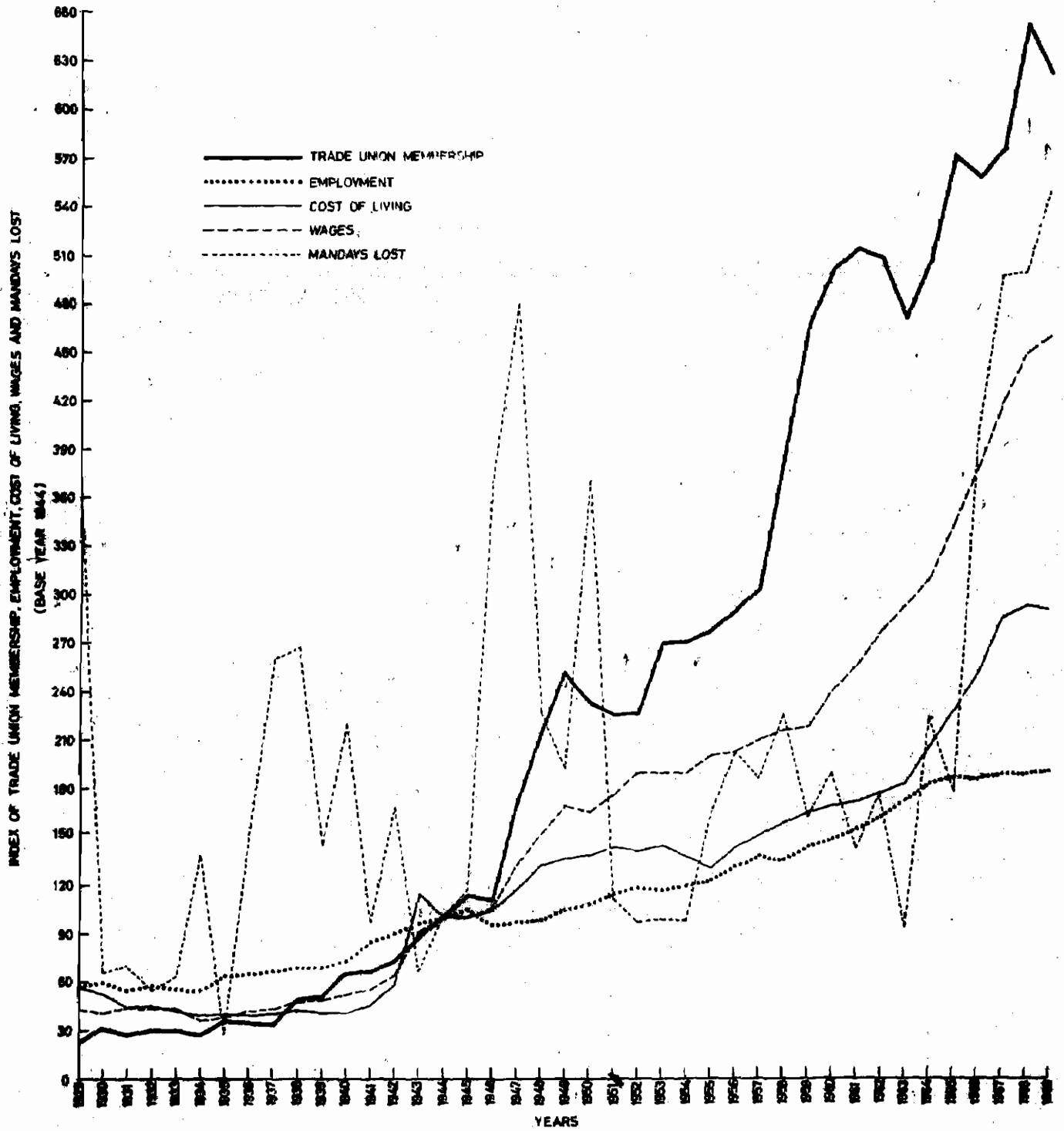
$$R^2 = .95; DW = 2.14$$

$$(6) \quad T = 5.36 + .06 E + .39 W - .18 W/P + .58^{***} ML$$

(.30) (1.72) (1.12) (3.16)

$$R^2 = .96; DW = 1.47$$

FIGURE I  
INDEX OF TRADE UNION MEMBERSHIP AND ASSOCIATED VARIABLE



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