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Industrial Wages and Prices of Foodgrains: A Study of Lead-Lag Structure in Indian Economy

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INTRODUCTION

In developed market economies wages, like other factor rewards, are determined by demand for and supply of labour. Marginal productivity of labour prevailing level of unemployment and degree of unionisation are some of the key factors that affect wages in these economies. But the situation is quite different in developing economies where real wages in manufacturing industries are supposed to remain stable irrespective of the extent of prevailing unemployment. In fact, some economists have propounded the wage constancy theory for attaining high growth rates in these ecomies. In so far as an accelerated rate of capital accumulation holds the key to rapid growth of national income in developing economies; and in so far as there is unemployment in these economies, it is argued that wages must remain stable or even decline in early phases of industrialisation. As opposed to this, a general hypothesis is that industrial wages tend to reach its maximum degree of inequality during early stages of industrialisation, while the degree of inequality gradually shrinks thereafter. In other words, wage structure tends to diverge in newly industrialising economies whereas it shows a tendency towards convergence in developed economies.

In so far as economic development hinges upon a rapid transformation of an economy from less efficient to more efficient methods of production, developmental process in its initial stages accentuates distances between techniques technologies of different vintages. But as an economy moves towards mature stage of growth, these differentials in vintage technologies tend to decline with the result that productivity and wage differentials among different industries, and different firms within industries, narrow down rapidly. Apart from theoretical controversies, it is neither feasible nor desirable to reduce wage levels where these are already at the traditional subsistence levels.

Economists hold a myriad of conflicting views about the impact of economic development upon conditions of industrial workers in India. One view is that three decades of planned economic development has brought about the immiserisation of workers, while official sources maintain that the process of development has led to a considerable improvement in levels and styles of living of industrial workers, especially those who are employed in the large organised sector of the economy, some economists support this view by maintaining that Government of India have succeeded in evolving a politically viable wage policy which has ensured equity as well as stability in movements of industrial wages. On the other hand,

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there is a strong belief that real wages have tended to remain constant, occasional fluctuations and rising productivity notwithstanding: 'production per worker has increased by about 63 percent between 1952 and 1964. A part of it must have been contributed by labour whose real earnings have remained almost static.' But some empirical studies show that wage constancy hypothesis is not true for entire era of planned development in India when real wages have shown improvements during first plan but deterioration thereafter. Changes in technology, cost of living index, employment, capital, output, degree of unionisation, profits and productivity, all have been tried to explain such movements as have occurred in wages in India with differing degrees of plausibility. Wage movements have also been examined in several macro-econometric models of Indian economy. However, treatment of wages differs from model to model. A brief review of treatment of wages in some of these models is reported in the appendix.

Inflationary processes affect different sections of society differently. Generally, wages and other contractual incomes are sticky with the result that increases in prices lead, wages lag behind. During the course of growth of an economy, as general prices begin to rise, wages also rise, but the growth of wages is generally less than the growth of prices. Symbolically, $\frac{dp}{dt}\ \frac{dw}{dt}$, where p, w, and t denote price, wages and time respectively. Besides, wage increases do not synchronise with rises in prices. There is always a time lag between rise in prices and rise in wages. This raises a number of questions of which (1) changes in price or prices of which good(s) cause a change in wages; (2) what magnitude of change in price(s) causes a change in wages; (3) what factor or factors retard or accelerate wage response to changes in price(s); (4) what the length of the period is that separates successive adjustments of wages to changes in price(s); and (5) what is the extent of adjustment of wages to a given change in price. This study attempts to answer question of this type. But the main objective of this study is to analyse the nature of relationship between money wages and prices of foodgrains and their lead-lag structure in the upward phase of the cycle so as to evaluate its impact upon fix-prices in Indian economy. Broad outlines of the ensuing analysis are as follows: Section I deals with the role of prices of foodgrains in Indian economy. Mathematical models developed to study the problem are reported in Section II. Section III evaluates empirical results. Conclusions are reported in the last section.

THE ROLE OF PRICES OF FOODGRAINS

Output and prices of agricultural goods in general and foodgrains in particular constitute the nerve centre of Indian economy. In fact, foodgrains happen to be the largest sub-sector of the Indian economy. In mid-fifties 'foodgrains accounted for 67 percent of Indian agricultural production and 31 percent of the entire wholesale trade.' In 1960-61, share of foodgrains in total agricultural output was 80.32 percent which increased to 81.77 percent in 1970-71. Besides, prices of foodgrains are the kingpin of Indian price structure in so far as their role in the determination of the movements in other prices is always decisive. For example, when the general price level during the period 1953 to 1955 seemed to be stabilishing, wholesale price index decreased fast 'due primarily to a decrease of about 33 percent in foodgrain prices' which 'acted as a drag on other prices.' Ever since 1960-61, foodgrain prices have increased persistently with the exception of 1968-69 and 1970-71 when a decrease of 11.84 and 0.48 percent occurred. In their trail, general prices have also been galloping. But rises in other prices have generally been led by rises in foodgrain prices. This is evident from the table given below:

Year	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Food-grain Prices	5.40	10.15	24.03	7.36	18.82	24.61	-11.84	3.47	-0.48	3.90	15.33	18.87
Whole-sale Prices	3.80	6.17	10.98	7.07	13.91	11.61	-1.14	3.75	5.54	4.03	9.93	22.74

The table shows year to year rates of change in price in indices. It is evident from the table that foodgrain prices have been leading all other prices through out the inflationary phases. In fact, foodgrain prices have increased from 1951 to 1976 at an annual compound rate of growth of 2.45 percent while the general wholesale prices have increased at a rate of 2.29 percent during the same period. The following regression equations show the nature of relationship underlying between two sets of prices:

$$\text{Log } P_w = 0.16 + 0.895 \log P_g, \quad r^2 = .988^{**}$$

and

$$\Delta P_w = 2.658 + 0.516 \; \Delta P_g, \quad r^2 = .824^{*}$$

where P_w and P_g denote wholesale and foodgrain prices respectively. Another feature of price movements in Indian economy is that even when bumper crops have been harvested, foodgrain prices have increased, for example, in such years as 1958-59, 1964-65, 1967-68 and 1973-74. In 1958-59, a record output of 78.35 million tonnes was produced, an increase of 18.73 percent over output of the preceding year; but foodgrain prices still increased by 9.02 percent. Similarly, an increase of 10.13 percent in output in 1964-65 was accompanied by an increase of 24.03 percent in prices. An increase of 87.83 percent in output synchronised with an increase of 18.87 percent in prices in 1973-74 primarily because of the creation of money income for a particular socio-economic group whose income elasticity of consumption of foodgrains is very high in India. In fact, farmers' incomes increase in the same proportion in which foodgrain prices change which tends to increase their consumption of foodgrains as their positive income elasticity is greater than negative price elasticity.

From theoretical viewpoint also, if the hypothesis of constant subsistence wage level in early stages of industrialisation is true, and there is some empirical evidence in its support, price of foodgrains in general, and prices of course grains in particular, which constitute the staple diet of workers in India, must be considered to be the prime movers of industrial wages. Therefore, we propound a hypothesis that there is an optimal relationship between prices of foodgrains and wage rates in India. If increases in foodgrain prices disturb this relationship between the two, wage adjustments take place to restore this relationship. But changes in wages in response to changes in foodgrain prices is asymmetrical so as to rule out a downward adjustment of wages in response to a decrease in foodgrain prices. On the other hand, upward adjustment of wages in response to an increase in foodgrain prices in not instantaneous.

Three alternative models of wage-price adjustment are developed in the next section.

MODELS USED IN THE STUDY

Model I:

It is assumed that there is an optimum wage rate W_t^* in period t which is uniquely related to prices of foodgrains P_{gt} in that period:

$$W_t^* = a + bP_{gt} \qquad (1)$$

Due to frictions and delays in adjustment of wages to changes in prices, actual change in wages $(W_t - W_{t-1})$ is only a fraction of change which is required to remove the discrepancy between actual and desired change in wages:

$$W_t - W_{t-1} = (1-c)\ (W_t^* - W_{t-1})$$

Or

$$W_t = c\ W_{t-1} + (1-c)\ W_t^* \qquad (2)$$

where $0 < c < 1$. If $c = 0$, adjustment is instantaneous, if $c = 1$, there is no adjustment. Between these two extreme values, smaller the value of c, quicker will be the process of adjustment, and greater the value of c, slower will be the adjustment process.

Combining equations (1) and (2) together, we get

$$\begin{aligned} W_t &= c\ W_{t-1} + (1-c)b\ P_{gt} + (1-c)a \\ &= II_1 W_{t-1} + II_2 P_{gt} + II_o \end{aligned} \qquad (3)$$

where

$II_o = a(1-c)$, $II_1 = c$, and $II_2 = b(1-c)$.

Model II:

Rise in foodgrain prices may in itself not be sufficient to ensure an increase in industrial wages. In spite of pressures exerted by trade unions to raise wage rates when foodgrain prices rise, employers would not concede their demands always. Adjustment of wages and its extent depends upon a number of factors. One of the most important of these factors is the ability and willingness of employers to effect such changes in wages as are made necessary by price rises. Employers generally do not agree to grant such rises unless they can afford them. Their capacity to bear wage increases is governed, off course, by profitability of the industry, which, in its turn, is determined by their ability to adjust their product prices for increases in cost. Their capacity to pay wages at enhanced rates and their ability to effect cost-price adjustments is reflected in profits they earn. Therefore, it is assumed that the wage increases in current year are financed out of profits of the preceding year. If profits in the preceding year have been above average, employers would generally tend to raise wages in the current year and the extent of wage increase would only be a fraction of the preceding year's profits. Hence

$$W_t - W_{t-1} = rF_{t-1}$$

Or

$$W_{t-1} = W_t - rF_{t-1} \qquad (4)$$

Substituting into equation (3), we get

$$W_t = bP_{gt} - \frac{cr}{1-c} F_{t-1} \neq a \qquad (5)$$

$$= II_1 P_{gt} \neq II_2 F_{t-1} \neq II_o$$

where $II_o = a$, $II_1 = b$, and $II_2 = \frac{-cr}{1-c}$. $c/(1-c)$ is the average of lag of wage price adjustment while $(1-c^t)$ gives the result of the desired adjustment achieved after t periods.

Model III:

Hypothesis underlying Models I and II are modified for obtaining Model III. We assume that changes in wage rate in the current year are effected to remove the discrepancy between actual and the desired wage rates in the preceding year. Let the desired change be given by

$$dW_t^* = W_t^* - W_{t-1} \qquad (6)$$

Again, the actual change in the current year assumed to be a fraction of the desired change:

$$W_t - W_{t-1} = (1-c)\ (W_t^* - W_{t-1}) \qquad (7)$$

Extent of change in wages is again a fraction of profits of the preceding year:

$W_t - W_{t-1} = rF_{t-1}$, and we also have optimum relationship between wages and foodgrains price of the preceding year:

$$W^*_{t-1} = a + bP_{gt}^{-1} \qquad (8)$$

Substituting values of W^*_{t-1} and W_{t-1} into (7), we get

$$W_t = a + bP \qquad \frac{-\ cr\ F_{t-1}}{1 - + II_2 P_{gt-1}} \qquad (9)$$
$$= II_o + gt_1^{-1}\ F_{t-1}$$

EMPIRICAL RESULTS

Models developed in the preceding section have been applied to Indian data covering a period of 26 years from 1950-51 (1951-52) to 1975-76 (1976-77). Wages refer to money wage rates in organised manufacturing industries alone. In all 30 regression equations have been estimated by ordinary least squares. Both linear and log-linear functions have been tried. Multi-collinearity has been tested by X^2, while Durbin-Watson d statistic has been used to test auto-correlation except in cases which include lagged wages as an explanatory variable. In these latter regressions, we have employed modified Durbin d statistic denoted by h for testing auto-correlation.

First ten of the 30 regression equations are exploratory in nature; these equations examine the nature and extent of influence exercised by each of the five explanatory variables: lagged wages, current and lagged foodgrain price, lagged and current profits. These equations reveal that the regression co-efficients attached to explanatory variables W_{t-1}, P_{gt}, P_{gt-1}, and F_{t-1} are highly significant even at .001 percent probability level.

But the co-efficient attached to current profits in linear function is not significant. However, this co-efficient is also significant in log-linear function. The variable which exerts greatest degree of influence upon wages is lagged wages itself. In fact, lagged wages explains as much as 98 percent of total variation in current wages. But lagged profits and prices, both current and lagged also exercise a very high degree of influence upon wages. One common feature of these results is that linear and log-linear functions both fit the data almost equally well. Another feature of the results is that there is significant auto-correlation in equations which have either price or profit as an explanatory variable. Two situations which are an exception to this are equation (8) and (10) in which auto-correlation is inconclusive. Auto-correlation can arise either due to wrong specification of relationship or functional form, or due to exclusion of important explanatory variable(s) from the relationship or due to errors of measurement in explained variable. In our case, exclusion of variables seems to be the cause of significant auto-correlation. This premise will be supported by the theory underlying the models and the empirical results embodied in other equations.

Each of the 14 equations from (11) to (24) contains two explanatory variables while multiple regression equations (25) and (26) contain 3 explanatory variables. Equations (11) and (12) relate to Model I. Coefficient of partial regression attached to lagged wages is highly significant at .001 percent probability level, while the partial regression coefficient attached to price of foodgrains is significant only at 5 percent probability level. The two multiple regression equations explain as high as 98.6 and 98 percent of total variation in wages. Thus, both linear and log-linear functions fit the data equally well. Though there is no auto-correlation involved in these relations, there is serious multicollinearity. Foodgrain prices exhibit lot of seasonal fluctuations, and one never knows whether a given change at a given time during the year is permanent or seasonal unless the period as a whole is over. There is no question of wage adjustments being effected in response to seasonal changes in these prices. But we are dealing with annual data in which such seasonal fluctuations have already been averaged cut.

If we modify our hypothesis underlying Model I and postulated that there is a unique relationship between optimum wage rate W_t^* and price of foodgrains in the preceding period, the reduce form regression equation will contain lagged wages and lagged price of foodgrains as explanatory variable. Equations (13) and (14) are the empirical counterparts of such a model. Partial regression coefficient attached to lagged wages is again significant at .001 percent probability level while the other coefficient is significant at 5 percent probability level in both the equations. Proportion of total variation explained by these equations is also 98.6 and 98.4 percent. Multi-collinearity is again serious while auto-correlation is not significant. Thus, these two equations do not differ much from the equations of Model I either quantitatively or qualitatively.

Equations (21) and (22) relate to Model II. Both the partial regression coefficients are highly significant at .001 percent probability level in both these equations, while the proportion of total variation explained is as high as 94 and 91 percent respectively. Whereas auto-correlation is not significant, there is serious degree of multi-collinearity involved. If we replace the hypothesis of wage increases being financed out of profits of the preceding year by the hypothesis of wage increases being financed out of profits of the current year, we will have current wages as a function of current profits and current price of foodgrains if reduced form regression is derived. Estimated values of these parameters are contained in equations (19) and (20). Both the regression coefficients are statistically significant in linear as well as log-linear function and the fitted equations explain as much as 87.3 and 89.5 percent of total variation in wages, this is less than the variation explained by Model II or Model I or its variant discussed earlier.

Equations (15) and (16) relate to our Model III. Both partial regression coefficients are significant at .001 percent probability level, and the fitted equations explain 94.5 and 93 percent of total variation in wages. Test of auto-correlation in linear function is inconclusive in linear function at 1 percent probability level, while it is found to be not significant at 5 percent probability level in log-linear function. In this case, presence of auto-correlation in linear function, if any at all, may be accounted by mis-specification of the functional form. In view of this, log-linear function will be preferred to linear one. Multicollinearity is again significant in both the functions. Log-linear function is preferrable on a priori ground also. It relates changes rather than absolute values of the variables with the result the estimated coefficients provide direct estimates of elasticities.

If we postulate that optimal wages are related uniquely either to current or preceding years profits, reduced form multiple regression equation will included lagged wages and current/lagged profits as the two explanatory variables. Equations (17), (18), (23) and (24) correspond to these models. However, the partial regression coefficient attached to current/lagged profits is not significant statistically in any of four equations. Thus, these are the only two models which are not supported by empirical results. Another point of interest is that current profits are the only factor that emerge as not significant factor affecting wages. Changes in current profits fail to explain wage movements not only by themselves but they happen to be not significant in combination with lagged wages also. In view of these results and also in view of the fact that profits earned during the year are known only after the end of the year, current profits cannot be the basis of wage settlement and wage adjustments, current profits are ruled out as a significant factor affecting wages. But profits of the preceding year are on a different footing. Then, we try all the three explanatory variables: P_{gt-1}, W_{t-1} and F_{t-1}. Equations (25) and (26) correspond to this case. Partial regression coefficient of profits in linear function are not significant, but this coefficient is significant at 5 percent probability level in the log-linear function. The other two coefficients are significant even at 1 percent probability level in both the equations. If we compare the values of R^2 of these equations with those of equations (13) and (14), we find that the addition of the third explanatory variable does not add much to the explained proportion of changes in current wages. Hence, we are left to choose only from amongst the original three models.

Above results have established the fact that industrial wages in India are inseparably linked with the foodgrain prices. These results have also provided evidence in support of the view that the effects of changes in foodgrain prices upon manufacturing wages are spread over more than one period. Therefore, a model which takes these features explicitly into account will be the appropriate model for Indian economy. From this view point, Model III seems to be the most appropriate one. Lead-lag structure of prices and wages is most pronounced in this model.

WAGE-PRICE ADJUSTMENT: INFLATIONARY Vs STABLE PERIOD HYPOTHESIS

We postulate that wage adjustments take place only when inflationary pressure is persistent and high. Occasional or negligible increases in foodgrain prices do not cause upward revision of wages. An associated hypothesis is that such wage adjustments are effected only if profits have also increased with prices in the preceding period. For testing these hypotheses, we introduce dummy variable X_2 which takes a value 1 if the index of foodgrain prices have increased at least bv 5 percent, otherwise it has a value zero. In the second case, dummy variable has a value 1 in those years in which index of profits shows an increase, otherwise it is zero. Estimated equations are from 27 to 30. Difference between the intercepts of inflationary and non-inflationary periods does not differ from zero significantly in both the estimated equations. This must be due to the fact that throughout the period covered by the study one or two normal years are preceded or succeeded by recurring inflationary years with regularity which means that by the time wage adjustment in response to an increase in foodgrain prices is over or is about to be over, the new process of fresh adjustment get started with the result that the adjustment process becomes continuous and indistinguishable between inflationary and non-inflationary periods.

CONCLUSIONS

Results of this study show that movements in rates of money wages of industrial workers in India are primarily determined by rises in foodgrain prices and such wage increases as are effected in response to rises in prices are financed out of enhanced profits. But the effects of price increases are spread over several periods during which wage adjustments take place. Due to persistently recurring nature of inflationary pressures in Indian economy, and the lags involved in wage adjustments, wages adjustments take place almost continuously with the result that inflationary and non-inflationary periods cannot be distinguished from the viewpoint of wage adjustments. It also blurrs the distinction between short term and long-term adjustments. Empirical results have lent overwhelming support to the hypotheses underlying the models developed in this paper. But we prefer Model III.

Statistical Appendix

1. $W_t = 8.8281 + 1.1459^{**} W_{t-1}$, $R^2 = .9798^{**}$, $d = 1.864$, $H = .2773$
   (-2.17) (26.04)

2. $\log W_t = -0.2612 + 1.0681^{**} \log W_{t-1}$, $R^2 = .9788^{**}$, $d = 1.800$, $H = .4069$
   (-1.38) (25.44)

3. $W_t = 29.2676 + 0.6049^{**} P_{gt}$, $R^2 = .7935^{**}$, $d = 0.608^{**}$, $H =$
   (3.14) (7.34)

4. $\log W_t = 1.3279 + 0.6884^{**} \log P_{gt}$, $R^2 = 7166^{**}$, $d = 0.5864^{**}$
   (2.46) (5.95)

5. $W_t = 15.0784 + 0.7699^{**} P_{gt-1}$, $R^2 = .6660^{**}$, $d = 0.4397^{**}$, $H = 3.3351$
   (0.97) (5.28)

6. $\log W_t = 0.9939 + 0.7659^{**} \log P_{gt-1}$, $R^2 = .5521$, $d = 0.4157^{**}$, $H = 4.0232$
   (1.16) (4.15)

7. $W_t = 85.7405 + 0.1403\ F_t$, $R^2 = .0546$, $d = .1988^{**}$,
   (11.98) (0.90)

8. $\log W_t = 2.9516 + 0.3684^{**} \log F_t$, $R^2 = .757^{**}$, $d = 1.1923^{(x)}$
   (18.96) (6.36)

9. $W_t = 50.1751 + 0.6263^{**} F_{t-1}$, $R^2 = .8101^{**}$, $d = 0.8057^{**}$,
   (68.01) (7.83)

10. $\log W_t = 2.7735 + 0.4203^{**} \log F_{t-1}$, $R^2 = .8065^{**}$, $d = 1.0171^{(xx)}$
    (11.98) (7.64)

11. $W_t = -6.3939 + 0.1008^{*} P_{gt} + 0.9979\ W_{t-1}$, $R^2 = .9855^{**}$, $d = 2.68$, $H = 1.43$
    (-1.71) (2.26) (13.10) $X^2 = 18.28$

12. $\log W_t = -0.2624^{*} \log P_{gt} + 0.1072\ \log P_{gt} + 0.9571^{**} \log W_{t-1}$, $R^2 = .9788^{**}$, $d = 2.35$, $H = .72$
    (-1.26) (1.99) (14.34) $X^2 = 14.44$

13. $W_t = -11.0197 + 0.1204^{*} P_{gt-1} + 1.0317\ W_{t-1}$, $R^2 = .9863^{**}$, $d = 2.3328$, $H = .69$
    (-3.58) (2.50) (17.47) $X^2 = 12.26^{*}$

14. $\log W_t = -0.3953 + 0.1007^{*} \log P_{gt-1} + 0.9942^{**} \log W_{t-1}$, $R^2 = .9837^{**}$, $d = 2.20$, $H = .404$
    (-2.13) (1.966) (18.54) $X^2 = 9.13^{*}$

15. $W_t = 18.9376 + 0.4224^{**} P_{gt-1} + 0.4481^{**} F_{t-1}$, $R^2 = .9448^{**}$, $d = 1.113^{(xx)}$
    (2.89) (5.64) (8.11) $X^2 = 5.35^{*}$

16. $\log W_t = 1.25 + 0.5118^{**} \log P_{gt-1} + .3289^{**} \log F_{t-1}$, $R^2 = .928^{**}$, $d = 1.43$, $X^2 = 5.69^{*}$
    (3.50) (4.68) (8.24)

17. $W_t = -8.0608 + 0.0118 F_{t-1} + 1.128^{**} W_{t-1}$, $R^2 = .9798^{**}$, $d = 1.82$, $H = .41$,
    (-1.35) (0.18) (10.46)

18. $\log W_t = -0.059 + 0.9855^{**} \log W_{t-1} + 0.0403 \log F_{t-1}$, $R^2 = .9804^{**}$, $d = 1.58$, $H = .901$,
(-0.22) (10.73) (1.01)

19. $W_t = 16.2725 + 0.6152^{**} P_{gt} + 0.1693^{*} F_t$, $R^2 = .8728^{**}$, $d = 1.04^{(xx)}$,
(1.84) (5.14) (2.85)

20. $\log W_t = 1.6182 + 0.2711^{**} \log F_t + 0.377^{**} \log P_{gt}$, $R^2 = .8945^{**}$, $d = 1.68$

21. $W_t = 30.57 + 0.3754^{**} F_{t-1} + 0.3448^{**} P_{gt}$, $R^2 = .9378^{**}$, $d = 1.24^{(x)}$, $X^2 = 9.47^{*}$
(5.75) (5.49) (5.17)

22. $\log W_t = 1.7026 + 0.2806^{**} \log F_{t-1} + 0.3553^{**} \log P_{gt}$, $R^2 = .9082^{**}$, $d = 1.25^{(xx)}$, $X^2 = 8.52^{*}$
(5.20) (5.21) (3.80)

23. $W_t = -6.7338 + 0.0085 F_t + 1.1142^{**} W_{t-1}$, $R^2 = .9691^{**}$, $d = 1.65$, $H = .832$, X
(-.87) (0.12) (8.13)

24. $\log W_t = .0984 + 0.174 \log F_t + 1.015 \log W_{t-1}$, $R^2 = .9710^{**}$, $d = 1.66$, $H = .72$
(-.29) (.41) (9.40)

25. $W_t = -5.4633 + 0.1623^{**} P_{gt-1} + 0.8452^{**} W_{t-1} + 0.974 F_{t-1}$, $R^2 = .9891^{**}$, $d = 1.85$, $H = .35$
(-1.18) (3.18) (6.96) (1.72)

26. $\log W_t = .0383 + .1497^{**} \log P_{gt-1} + .7856^{**} \log W_{t-1} + .0841^{*} \log F_{t-1}$, $R^2 = .9893^{**}$, $d = 1.78$, $H = .48$
(.18) (3.16) (8.28) (2.50)

27. $W_t = 1.5759 + 0.8596^{**} P_{gt-1} + 7.3345 X_2$, $R^2 = .6948$, $d = .6024^{**}$
(.08) (5.19) (1.08)

28. $\log W_t = 0.4976 + 0.8640^{**} \log P_{gt-1} + 0.0737 X_2$, $R^2 = .5818^{**}$, $d = 0.53^{**}$
(0.50) (4.09) (0.97)

29. $W_t = -8.8458 + 1.1462^{**} W_{t-1} - 0.0182 X_3$, $R^2 = .9798^{**}$, $d = 1.86$
(-1.94) (20.40) (-0.01)

30. $\log W_t = 0.2448 + 1.0642^{**} \log W_{t-1} + 0.0026 X_3$, $R^2 = .9789^{**}$, $d = 1.80$

where

figures in parentheses are the t values,

W_t = Money wage rate in year t in manufacturing industry,

P_{gt} = Foodgrain price in year t,

F_t = Profits before tax in year t,

d = Durbin-Watson d statistic,

H = Durbin modified d test when lagged values of dependent variable occur as an explanatory variable,

* = Significant at 5 percent probability level,

** = Significant at 1 percent probability level,

(x) = Auto-correlation test is inconclusive at 5 percent probability level,

(xx) = Auto-correlation test is inconclusive at 1 percent probability level,

X^2 = Glauber-Ferrar Index of multi-collinearity.

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