Inter-industry Differentials in Wages and Earnings in Pakistan's Manufacturing Sector

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Introduction

Research on wage policy issues is a relatively uncommon commodity in Pakistan. The absence of studies of the structure of wages and their trend over time is disturbing in view of the far-reaching effects which the structure of wages has on some of Pakistan's most pressing development problems—the underutilization of its human resources, the distribution of income and the flow of migrants from rural to urban areas. Policies designed to cope with these problems will in most cases operate through changes in the levels of wages in various branches of the economy. The lack of information on the structure of wages is a rather obvious and substantial barrier to the formulation of appropriate development policies. Reasons for this neglect are not hard to find: reliable and pertinent data are rare, a condition not unrelated to the fact that the structure of wages lends itself to few simple generalizations. In spite of economic theory's tendency to gloss over the fact, labour is not a homogeneous commodity and wage levels vary among regions, skill groups, and economic sectors as well as within sectors among sub-sectors. Our objective in this study is to explore just one facet of the wage structure in Pakistan : the pattern of inter-industry wage differentials in the large-scale manufacturing sector.

Wage levels and trends in Pakistan's industrial sector have been examined in several previous studies (*see* Guisinger and Irfan [2], Hamid [3], A.R. Khan [4], S. R. Khan [5] and Rizvi [13]), but so far relatively little is known about the structure of wages and especially about the pattern of inter-industry wage differentials. Studies of wage differentials are useful because they reveal certain important characteristics about the market for labour. If workers are paid varying amounts for similar work in different industries, the reasons should be understood and the implications of these wage differentials for the economy need to be drawn out. Previous studies of inter-industry differentials in both developed and developing countries have concluded that (1) differentials emerge from a combination of market and non-market forces ; (2) the magnitude of wage dispersion changes over time and is related to the stage of industrial development; and (3) if non-market forces cause differentials to spread too far, serious consequences for employment and income distribution can ensue.

The market forces involved in wage determination are simply the unfettered, competitive pressures of supply and demand. Workers, acting individually, offer their labour services and employers, acting independently, bid for labour

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services in accordance with labour's marginal contribution to output. Non-market forces can interfere with the perfectly competitive determination of wages in various ways. Both workers and employers may collude to alter wage levels through concerted action often sanctioned by law. Governments may establish minimum wage laws which place a floor below which wages are not permitted to fall. Occasionally, exogenous factors cause wages to be pegged to some outside standard unrelated to local supply and demand conditions. Foreign employers in developing countries, for example, often fail to adapt their pay scales based on developed country conditions to local situations.

The objective of this paper is to examine the available data on wages, depict the structure and trend in inter-industry wage differentials and venture some tentative conclusions about the role of market and non-market forces in setting wages in Pakistan's manufacturing sector. Conclusions drawn from empirical research are invariably tentative because the quality of the data cannot be assured. In this study, however, more than the standard disclaimer is warranted because the paucity of alternative sources of information has precluded consistency checks of our data. Our primary aim, however, is to raise relevant questions rather than supply final answers. If the conclusions of this study are challenged by others who either provide new sources of data or re-analyze existing data, then our purpose will have been well served. With this "*caveat lector*", we turn to the analysis of the structure of inter-industry differentials in Pakistan during the 1955-1970 period.

Structure of Industrial Wages and Earnings Data

Wage data have been compiled from the *Censuses of Manufacturing Industries*, which have appeared more or less annually since 1954. The *Census of Manufacturing Industries* (CMI) reports total employees and total employee costs from which it is possible to derive the average annual earnings of employees. For most years, the CMI reports employment and employment cost separately for production and non-production workers, the latter category comprising managers and technicians as well as unskilled workers such as nightwatchmen and sweepers. For the few years in which separate data for the two categories of workers are not provided, we have made estimates using an approach described in our earlier study [2, p. 381]. Although the central focus of the study is on the variation in wages among production workers, we examine the structure of earnings per employee as well. Because of the absence of a common definition of production workers among countries, international comparisons of wage structures frequently employ earnings per employee, and it is instructive to view Pakistan's wage structure in the perspective of other countries' experiences. Also, we adopt the two-digit classification of industries both to facilitate comparisons with wage structure in other countries and to assure complete and consistent coverage of Pakistan's industries over the 1955-70 period. Wage data at the three-digit level can be obtained from the CMI's, but for only a relatively small number of industries are data available at this level for each year during the period. Finally, all wage data pertain to the former West Pakistan, now Pakistan.

The CMI data suffer from a number of shortcomings, among which the most important are the uneven coverage from year to year and the questionable reliability of the data supplied by the responding firms. Non-response surveys conducted in two separate years during the period covered by our study

suggest that total industrial output is understated by more than 20 percent. It should be noted, however, that non-response is a less serious problem for statistics on wages which involve ratios—employee cost divided by the number of employees—than for absolute values. Non-response thus means that the wage data are drawn from a non-random but relatively large sample of industrial firms. As is the case with most industrial censuses, some disaggregation of earnings per employee—but not wages of production workers—is available by size of firm and region, though no further distinction among skill groups within production workers is attempted.

The wage and earnings data derived from the CMI's are presented in Tables A-1 and A-2 in the Appendix where a number of anomalies in the data can be observed. It is highly improbable, for example, that the wages of workers in Printing and Publishing and in Electrical Machinery industry fell by more than 30 percent between 1959-60 and 1962-63. Also, it is conceivable, but highly unlikely, that Beverage workers experienced a pay rise of more than 60 percent during the same period. Our reservations about the quality of the 1962-63 CMI have been stated elsewhere [2, p. 369-70]. In spite of the seeming inconsistencies that often lead to extremely low or high wage levels, we have included the unadjusted CMI data to avoid any possible understatement of the degree of dispersion.

Dispersion of Wages and Earnings

Two important characteristics of wage structures are the general level and trend in the dispersion of wages and earnings. The principal measure of dispersion employed in studies of inter-industry wage differentials is the coefficient of variation—the ratio of the standard deviation of wages (or earnings) divided by the mean level of wages (or earnings). The coefficients of variation shown in Table 1 below, derived from the data in Appendix Tables A-1 and A-2, indicate the magnitude and trend in dispersion levels over the 1955-70 period. If one discounts the sharp annual changes implied in a few CMI's, particularly those of 1955 and 1962-63, the dispersion in both wages and earnings shows a fairly high degree of stability with no discernible tendency to decrease or increase over time. This relative stability in dispersion levels is brought into much sharper relief when Pakistan's wage structure is compared with that of other developing countries. Papola and Bharadwaj [10] calculated the coefficients of variation for industrial earnings for 17 countries at four different points of time. We have reproduced their data in Table 2 below where we have also added the data for Pakistan for 1955, 1960 and 1965. The largest change for Pakistan shown in Table 2 is 5 percentage points and the largest difference between any two years during the 1955-70 period is only 7 percentage points. For a number of countries in the Papola-Bharadwaj sample, the change in the coefficient of variation exceeds these levels, in some cases quite substantially.

The general level of Pakistan's dispersion of earnings can also be appreciated through comparison with the dispersion levels in other countries. In Table 2, Pakistan appears to be in the " upper middle " range, but this comparison fails to take into account the stage of development. Through a cross-section analysis of their sample, Papola and Bharadwaj confirmed the Reynolds-Taft hypothesis [12] that the degree of industrial earnings dispersion is related to the stage of industrial development. Papola and Bharadwaj obtain a fairly good fit ($R^2 = .64$) for a regression of coefficients of variation on the share of manufacturing

Table 1

Pakistan : Measures of the Dispersion in Wages and Earnings

Year	Mean Wage (Rs. per year)	Coefficient of Variation (%)	Mean Earnings (Rs. per year)	Coefficient of Variation (%)
1955	903	27	1,020	19
1957	996	16	1,262	23
1958	1,088	18	1,289	21
1959-60	1,151	22	1,480	24
1962-63	1,115	25	1,372	24
1963-64	1,332	15	1,657	17
1964-65	1,434	15	1,850	21
1965-66	1,621	16	2,035	19
1966-67	1,651	14	2,000	21
1967-68	1,758	20	2,080	22
1969-70	1,975	18	2,393	20

Source : Appendix Tables A-1 and A-2.

Table 2

Coefficients of Variation for Earnings of Industrial Workers : Pakistan and Selected Countries

Country,	1948	1955	1960	1965
United States	14.29	17.17	18.20	17.82
Sweden	8.40	9.07	8.04	8.67
France	11.41	12.91	18.28	16.69
U. K.	6.05	6.39	8.47	9.01
West Germany	4.30	11.19	10.21	7.98
Poland	—	17.24	14.97	14.11
Hungary	—	10.67	7.75	7.41
East Germany	—	15.67	6.67	10.86
Costa Rica	—	17.62	17.73	19.83
Japan	26.52	25.85	28.51	23.05
Mexico	22.16	29.25	29.07	28.61
Ghana	—	41.27	33.82	34.72
U. A. R.	37.62	40.40	24.55	18.52
Taiwan	28.60	24.62	18.13	17.71
Kenya	—	19.30	26.91	44.99
India	17.19	24.54	19.98	13.25
Burma	—	43.38	22.22	23.56
Pakistan	—	19.00	24.00	21.00

Source : Table 1 and Papola and Bharadwaj [10].

in GNP. Using the Papola-Bharadwaj equation, we predicted Pakistan's coefficient of variation for 1960, and the estimated value (.25) did not differ significantly from the actual (.24), suggesting that Pakistan was "on track" in the light of the experiences of other countries.

Stability of the Wage Structure

Another interesting feature of the wage structure is the extent to which industries maintain their relative position in the wage hierarchy over time. Turner and Jackson, in their study of 58 developed and developing countries [15], found that a high degree of wage dispersion was generally accompanied by a high degree of instability in the rank order of industries. Pakistan's experience is consistent with the Turner-Jackson results since there appears to be little re-shuffling in the rank order of industries from year to year. In Table 3, we have grouped industries in four sub-categories, ranging from the highest paid (category I) to the lowest paid (category IV). The data in Table 3 indicate that while industries occasionally move to an adjacent group, the overall impression is one of stability. This stability is further confirmed by rank order correlations which show significant positive association, even between wage structures separated by more than 10 years.

Determinants of Inter-industry Differentials

The " vital signs " of Pakistan's industrial wage structure thus seem reassuring : the differentials are moderate and have remained stable over time. Whether this pattern will continue depends, of course, on the factors which determine the structure of wages. There are many possible sources of inter-industry differentials and we examine only those which appear to be the principal causes.

Inter-firm Differentials

Studies in both developed and developing countries by Taira [14], Lester [6] and others have found a fairly strong positive relationship between firm size and wages. In Table 4 below we report the results of four of these studies along with similar data for Pakistan. In the USA, Nigeria, Japan and India, earnings rise steadily with the size of firm, reaching their peak in the highest size category.[1] The most striking feature in the Pakistani data is that employee earnings reach a peak in the middle size firms and decline thereafter. The rising portion of the earnings-firm size profile for Pakistan can be explained by the various non-market forces which Ranis [11] identified in his study of Karachi.[2] What cannot easily be explained is the decline in earnings between the medium and large size firms. Reasons can be adduced to explain the decline but these should be generally applicable and not unique to Pakistan. For example, it is possible that medium size firms may employ a higher percentage of skilled workers than do large firms. Or, the average earnings of employees in middle-size firms may give a greater proportional weight to higher-paid managers and technicians than the average earnings in larger firms where overhead management costs are spread over more workers and therefore receive less weight in the average level of earnings. Another, more speculative explanation is that the largest firms can exercise monopsony power and hold their wage costs

[1] From the reference given by the authors of these studies, it would appear that the indices relate to earnings per employee rather than to wages per production worker.

[2] The data from the 1969-70 CMI seem to indicate that the highest earnings occur in the smallest firms. This is most probably the result of misreporting the profits of working proprietors as labour income.

Table 3

Pakistan : Industries Grouped by Wage Levels

Standard Industrial Classification Number	Industry	Wage Categories		
		1959-60	1964-65	1969-70
20.	Food Manufacturing except Beverages	III	II	II
21.	Beverages	III	III	III
22.	Tobacco	I	I	I
23.	Textiles	IV	IV	III
24.	Footwear and Wearing Apparel ..	I	I	II
25.	Wood, Cork and Allied Industries	II	IV	IV
26.	Furniture and Fixtures	III	III	II
27.	Paper and Paper Products	I	I	I
28.	Printing, Publishing and Allied Industries	I	I	I
29.	Leather and Leather Products ..	IV	III	IV
30.	Rubber and Rubber Products except Rubber Footwear	II	—	II
31.	Chemicals and Chemical Products ..	I	I	I
32.	Petroleum and Coal Products ..	—	—	—
33.	Non-Metallic Mineral Products except Products of Petroleum and Coal ..	III	III	III
34.	Basic Metals	III	II	III
35.	Metal Products except Machinery and Transport Equipment	III	III	III
36.	Machinery except Electrical Machinery	IV	IV	IV
37.	Electrical Machinery and Appliances	II	II	I
38.	Transport Equipment	II	II	I
39.	Miscellaneous Manufacturing Industries	IV	IV	IV

Source : Table A-2.

Table 4

Index of Wages by Employment Size Categories of Establishments— All Industries : Pakistan and Selected Other Countries

Size Category : Number of Employees	Pakistan		U.S.A.	Nigeria	Japan	India	U.A.R.
	1959-60	1969-70					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1-4							
	—	116	—	—	43	—	—
5-9	—		—	—	48	—	—
10-19	82	95	73	—	49	47	—
20-49	88	104	73	75	52	51	—
50-99	96	128	74	83	57	55	65
100-249	104	135	77	67	64	72	74
250-499	123	124	81	73	74	85	
500-999	107	122	97		87	88	100
1000+	100	100	100	100	100	100	

Source : Columns 2 & 3 : Appendix Tables A-3a and A-3b.
Column 4 : Lester [6].
Columns 5, 6, 7, and 8 : Taira [14].

down. This seem at odds, however, with the presence of most of the large enterprises in urban areas where monopsony power would be negligible.

Against these factors that might possibly explain a decline in wages between medium and large firms are arrayed a number of equally plausible reasons why wages should increase with firm size. First, the larger firms are located in bigger cities where the general cost of living is higher. Second, as pointed out by Lester [6], trade union strength grows with the size of the firm. Third, in Pakistan, turnover rates are lower for large firms than for medium size firms. Finally, if, as is normally presumed, large firms are more profitable because of scale economies or market dominance, their capacity to pay higher wages may be greater and employers may find it easier to overcome labour demands by simply yielding to them.

The unusual shape of Pakistan's earnings-firm size profile is a puzzle without a simple answer. From Tables A-3a and A-3b, it is clear that the inverted U-shaped pattern characterises a number of industry groups as well as the manufacturing sector as a whole. Whatever its shape, it is clear that the relationship between firm size and wages can have an influence on the pattern of inter-industry differentials. To illustrate the point, those industries in Pakistan in which

medium size firms predominate should have, *ceteris paribus*, higher earnings than those industries in which the bulk of the output originates in either small or large units. Of course, the relationship between typical firm size and industrial wage levels is not quite that simple. From Tables A-3a and A-3b, it is evident that the firm size paying the peak wages varies from industry to industry. Most importantly, firm size is only an intermediate determinant of industrial wage differentials, and both market and non-market forces need to be examined to assess their relative roles in creating inter-firm differences in wages.

Regional Wage Variations

Another factor possibly contributing to inter-industry differentials is the variation in wages among regions. If industries are regionally concentrated and wage levels differ among regions, then some part of inter-industry differentials can be explained by the regional wage differentials. But, as in the case of inter-firm differentials, one must regard the regional differentials as an intervening variable, which is in turn determined by more basic market and non-market forces. The extent of regional wage differentials is shown in Table 5. In two industries, earnings in Sind fall below earnings in the Punjab but in most cases employees in Sind, in which Karachi is heavily weighted, earn substantially more than employees in the Punjab. Part of the explanation is that prices for basic consumer goods are higher in Karachi than in Lahore and money earnings reflect, at least partly, cost-of-living differentials. Another part of the differences may be solely statistical: the two-digit categories may mask substantial differences in the composition of industrial output at the three-digit level. For example, under Food Manufacturing, tea blending has a substantial share of employment in Sind but none at all in the Punjab. Thus, an unknown part of regional wage differentials may stem from insufficient disaggregation of the industrial categories. Nevertheless, in the case of textiles where the aggregation bias is probably not significant, earnings in Sind exceed those in the Punjab by 14 percent. The exact contribution of regional differences to inter-industry differences cannot be measured until more disaggregated data become available.

Cross-section Analysis of the Determinants of Wage Levels

A direct test of the importance of the basic market and non-market forces in determining wage levels can be made using regression techniques. This procedure has the advantage of bypassing the intervening variables such as firm size and regional concentration—and of examining primary causes. However, the limits to the use of regression analysis are rather severe in the present case. First, time series data on wages are both too fragile and too short to support multivariate regression analysis, leaving open only cross-section analysis. Second, the effects of various hypothesized market and non-market forces cannot easily be distilled into simple cardinal indices for insertion into regression equations. No single variable captures, for example, the exact effects of trade union strength on the wage level. It is common in studies of wage determination to find, as a proxy for union strength, union membership as a percentage of eligible employees, but its limitations are apparent. Finally, no simple model of wage determination exists which encompasses all of the hypothesized market and non-market factors. Regression analysis conducted outside the frame of a carefully specified model often runs the danger of becoming, in the parlance of econometricians, a "fishing expedition", or an unscientific search for high R^2's.

Table 5

Pakistan : Employee Earnings by Province, 1969-70

Industry	Average Earnings (Rs. per Employee)				Sind as % of the Punjab
	Punjab	N.W.F.P.	Sind	Baluchistan	
All Industries	2,133	2,196	2,693	1,119	126
Food Manufacturing except Beverage	2,605	2,018	3,123	1,510	120
Beverage	2,195	—	2,136	—	97
Tobacco	1,601	3,179	2,425	—	151
Textiles	1,913	1,610	2,172	751	114
Footwear and Wearing Apparel	2,975	—	2,064	—	69
Wood, Cork and Allied Industries	1,670	—	—	—	—
Furniture and Fixtures.. ..	2,573	1,403	3,468	—	135
Paper and Paper Products ..	—	—	2,363	—	—
Printing, Publishing and Allied Industries	2,800	1,234	2,920	1,806	104
Leather and Leather Products ..	1,743	1,572	2,591	—	149
Rubber and Rubber Products ..	1,796	—	3,303	—	184
Chemicals and Chemical Products	2,988	2,665	4,512	2,625	151
Non-Metallic Mineral Products except Products of Petroleum and Coal	2,185	—	2,519	—	115
Basic Metals	2,223	—	3,401	—	153
Metal Products except Machinery and Transport Equipment ..	1,488	1,505	2,959	—	194
Machinery except Electrical Machinery	1,823	—	2,441	—	134
Electrical Machinery and Appliances	2,393	—	3,560	—	149
Transport Equipment	2,085	1,544	3,161	—	152
Miscellaneous Manufacturing Industries	2,061	—	3,545	—	172

Source : Census of Manufacturing Industries : 1969-70.

To simplify our task, we have limited ourselves to two time periods: 1964-65 and 1969-70. Not only are these good years to select from the point of view of the quality of the wage series but, even more importantly, the only data available on some of the key market and non-market variables relate to these years. In all regressions, the wages of production workers were used as the dependent variable.

Independent Variables

1. ***Skill differentials.*** The principal market force affecting wage differentials is labour force quality, which depends on the mix and type of skills required by each industry. As a measure of labour force quality, we have used the proportion of skilled workers in total production workers. Since skill data are not available for Pakistan, we have used a skill index constructed by Dadi [1, p. 105a] for a study of Indian industry. In using this index for Pakistan we are implying that the skill intensities in the industrial sectors of India and Pakistan are similar—a defensible assumption in our view, but one which warrants further checking as data become available.

2. ***Capital intensity.*** Another variable commonly thought to be associated with wage levels is capital intensity, which may stand as a proxy for either market or non-market factors. The skill composition of the labour force, a market factor, may increase with capital intensity. Machines may displace proportionately more unskilled workers than skilled workers; sophisticated equipment often needs sophisticated labour skills to keep it running smoothly. On the other hand, non-market forces may be at work as well. Capital-intensive plants may generate higher profits per worker than labour-intensive plants. If monopoly profits are earned because barriers to entry establish oligopolistic markets, the existence of this surplus makes it easier for management to yield to labour demands. Moreover, capital-intensive industries may attract a larger share of foreign firms than can labour-intensive industries. As described below, the presence in an industry of firms managed by foreigners may be a non-market force pulling wages upward. To measure capital intensity, we have used non-labour value added per worker derived from the CMI data.

3. ***The share of wages in total costs.*** The pressure to hold wage costs down mounts as the share of wages in total costs increases. Since competitive forces should assure equal wages in all industries, an association between the share of wages in total costs and the wage level would suggest the presence of non-market forces. The wage share was calculated from the CMI data.

4. ***Foreign ownership.*** Foreign firms frequently adopt a high wage policy in developing countries. In some cases, wage scales reflecting labour supply conditions in developed countries are applied to branch operations in developing countries. In other cases, a high wage policy is simply considered a wise posture to adopt. It minimizes confrontations with government and labour unions and is a fairly inexpensive policy if the manufacturing process is capital-intensive. High wages paid by foreign firms may spill over, pulling up the wage levels paid by domestic firms in the same industry. Thus, where foreign firms constitute an important segment of industrial output, wage levels may be above average. In this study, the influence of foreign firms in an industry is approximated by the percentage of all firms with more than 50 employees in which non-residents control more than 30 percent of the equity. Data on foreign ownership were obtained from unpublished work-sheets made available by the State Bank of Pakistan.

5. ***Trade union strength.*** Trade unions grew apace during the 1960's but their impact was not spread uniformly across all industries—both the numerical strength and bargaining effectiveness of unions varied from industry to industry. As a simple measure of trade union strength, we have computed each industry's union membership, as reported by the Directorate of Labour [9], as a percentage of total industry employment.

Results

Different combinations of these and other variables were tried in both linear and log-linear forms, and the main results are shown in Table 6. The most notable aspect of these findings is that a small number of variables appear to explain a substantial portion of the variation in wage levels in both 1964-65 and 1969-70. The relative contribution of these variables does, however, shift between the two time periods in important and interesting ways. The only variable which is significant at the 5 percent level in both periods is capital intensity. The skill mix of the industrial labour force is an important determinant of wage levels in 1964-65 but less important in 1969-70. The share of wages in total costs of production exerts a significant influence on wage levels in 1969-70 but not in the earlier period. In both periods, the sign of the coefficient of wage share is contrary to the normal expectation. Trade unions are significant only in 1964-65 and then at the 10 percent level. Foreign firms' share is significant only in the second period.

We attempted to gauge the influence of factors other than these five using the regression analysis approach but found no other significant correlates of wage levels. The problems of incorporating size-of-establishment effects in a single variable have already been noted. We tried the average size of firm and its square to take account of non-linearities, but without success. The potential influence of regional concentration of industries was checked by including the share of each industry's output originating in Karachi, but this variable proved insignificant. The degree of tariff protection, the export orientation of industries and the rate of growth of output were tried but none showed any connection with wage levels. Attempts to include real productivity growth were foiled by the absence of industrial price data with which to deflate value added at current prices. None of these variables was tested with the quality of data one would like to have, and as more and better data become available their influence on wage levels should be rechecked.

Overall, the regression analysis leaves the impression that between 1964-65 and 1969-70 the contribution of market forces to the determination of wage levels declined markedly. Capital intensity's influence, which may derive from either market or non-market forces, remained steady over the five-year interval. But the skills variable, the principal indicator of market forces, declined in importance while a number of non-market variables that were not significant in the earlier period became significant in 1969-70. What this analysis suggests is that even though the overall level of dispersion rose imperceptibly--from 15 to 18--the proportion of the dispersion attributable to non-market forces increased sharply.

Conclusions and Policy Significance

Our purpose in this study has been a fairly narrow one : namely, to pull together a few strands of the complex and multi-faceted problem of Pakistan's industrial wage structure. We have concentrated on identifying the magnitude and trend of inter-industry wage differentials, recognizing that many loose

Table 6

Regression Results

	Number of Observations	Intercept	Skill	Capital Intensity	Wages Shares	Foreign Participation	Trade Union Membership	R^2
1964-65								
1	19	620	968 (4.21)**	.089 (4.13)**	1,052 (1.15)	116 (.385)	—	.86
2	19	839	838 (3.54)**	.062 (3.55)**	—	—	421 (1.40)*	.87
1969-70								
1	19	1,407	769 (1.70)*	.088 (2.47)	—	—	-202 (-.35)	.63
2	19	1,051	14.73 (.03)	.026 (1.93)**	5,262 (2.63)**	1,041 (1.98)**	—	.74

*Significant at 10% level.
**Significant at 5% level.

strands remain to be woven together before a complete picture of the structure of manufacturing wages and its evolution over time can be formed. Little is known, for example, about the magnitude and trends in skill and occupational differentials. Nor is the process of wage determination well understood—how wages are set in each industry and to what extent wage increases in one industry are transmitted to other industries. These are not simple issues conceptually, but the crucial role of wage incentives in determining modern sector employment makes it essential that some attempt be made to tie these strands together. Our objective has been to lay part of the groundwork for such an attempt.

On the basis of data which we freely admit as being rough and aggregated, we have nevertheless been able to outline some of the dimensions of the wage structure, indicating orders of magnitude for the degree of wage dispersion, and to generate some preliminary findings which may prove valuable as working hypotheses in subsequent and more refined analysis.

1. Both the wages of production workers and the earnings of all industrial employees (production plus non-production workers) exhibit, by international standards, a fairly moderate degree of dispersion. It has been found that the dispersion of industrial earnings among broad industrial categories is linked to the stage of development——the greater is the importance of industry in overall national income, the smaller is the degree of dispersion. If the appropriate adjustment for Pakistan's stage of development is made, the degree of wage spread turns out to be exactly in line with the experience of other countries.

2. No tendency for the differentials among either wages or earnings to contract or expand can be observed during the 1955-1970 period. It has been hypothesized that in developing countries industrial wage differentials should widen initially, reach a peak and then decline. No such pattern can be observed for Pakistan, perhaps because the period covered by this study is too short and the data are too rough, or simply because Pakistan is an exception. The stability of the trend in wage and earnings differentials is remarkable in view of the fast pace of industrialization during the period.

3. Not only has Pakistan's manufacturing sector shown a moderate degree of wage spread but the relative positions of different industries in the wage hierarchy have remained essentially stable. The rank order of Pakistan's industries according to wage levels was very nearly the same in 1970 as it was in 1960. Such stability is somewhat surprising in view of the low degree of wage spread since, under these conditions, only small differential growth rates among industries are capable of producing considerable reshuffling in rank order.

4. Within industrial groups, earnings per employee vary significantly among small, medium and large firms, but the pattern of inter-industry variation in Pakistan is unique. In all countries for which data are available, the highest earnings originate in the largest firms. In Pakistan, however, medium size firms appear to have the highest earnings per employee. No plausible explanation for this particular pattern can be offered at this stage and more research on inter-industry differentials is definitely warranted.

5. Earnings of employees within the same industrial category differ among geographic regions. In part, the higher earnings may be due to the higher cost of living in certain regions, but there are other factors contributing to regional differences in wage levels which could not be explored in this study.

6. Cross-section statistical analysis of wage data for two time periods—1964-65 and 1969-70—suggests that a small number of variables, representing both market and non-market forces, can explain a significant portion of the inter-industry variation in wage levels. The capital intensity of industries is positively and significantly related to wage levels in both periods. A variable representing the proportion of skilled labour among production workers is strongly related to wages in the first period but appears to lose its importance in the second period. The other non-market factors which have a measurable influence on wage levels include the degree of foreign participation in the industry, the share of wages in total production costs, and trade union strength. The results of the statistical analysis should not be regarded as either confirming or refuting particular hypotheses but rather as a means for sorting out useful avenues for further research. One interesting and potentially important conjecture arising out of this cross-section analysis of wages is that non-market forces may have become substantially more important in determining wage levels in recent years even though this is not reflected in a material increase in the degree of wage spread. In other words, had non-market constraints on wage movements not existed, wage differentials would have contracted sharply towards the end of the decade.

The policy significance of these findings about the magnitude and correlates of inter-industry wage differentials is no greater than the quality of the data which support them. As we have stressed, the absence of reliable and relevant data on wages is a serious limitation to research in Pakistan on issues relating to manpower and employment. If, as we believe is the case, the formulation of an explicit wage policy will become a major priority of Pakistan's planners in the near future, then it becomes imperative now to upgrade the quality and coverage of data on wages and income for different branches of the economy. At a minimum, for the manufacturing sector, data should be available indicating worker compensation (and its basic components) disaggregated by industry, region and skill group.

If the data employed in our analysis are, however, broadly correct, then one important implication needs to be underlined : the emergence of non-market factors in the determination of industrial wage levels ought to be a matter of serious concern to government planners. While at present moderate in their impact on Pakistan's industrial wage structure, non-market forces can easily break loose and wage spread could develop into wage sprawl. The economic significance of increases in wage differentials is considerable.

One consequence is the creation of an inappropriate set of incentives that induces labour to acquire skills of a kind and in an amount unrelated to either a country's need or absorptive capacity. The distorted set of incentives also attracts labour to urban areas by creating income expectations that are generally not realized because of the lack of jobs. Artificially high wages are a great boon to the privileged workers employed in the " favoured " industries, but the net impact on urban income distribution may well be negative because inflated wage costs encourage employers to find ways to replace men with machines, dampening the demand for labour while at the same time spurring the rush of urban in-migrants trying to land one of the high-paying jobs. Less obvious but no less important, a distorted wage structure upsets a country's normal pattern of comparative advantage. Industries that would be internationally competitive under normal circumstances are made to appear uncompetitive when their wage costs

are artificially raised. Apart from the inducements this gives for the over-capitalization of industry, which also adds to the country's import burden, the principal effect of wage distortions may be to reduce exports and increase imports, pushing the country deeper into dependence on aid and foreign capital inflows.

Most importantly, the economic costs arising from the inefficiencies associated with wage distortions are not offset by social benefits in the form of a better distribution of income. No persuasive case can be made that men with similar skills should earn vastly different wages simply by virtue of their being in one industry rather than in another. It is argued that workers should participate in the financial success of the firms in which they work. Profit-sharing by workers is an understandable and even justifiable response to the windfall profits that firms in developing countries frequently enjoy by the possession of investment licences, tariff protection and, not infrequently, monopoly power. Still, profit-sharing at the enterprise level creates inequities among firms in the same industry and between industries that may not be tolerated by the majority of workers who do not benefit from such schemes.

That Pakistan should avoid these adverse consequences is obvious. How they can be avoided by controlling non-market forces is less clear. As noted earlier, if our analysis brings to light the dimension, nature and possible causes of inter-industry differentials, then it will have achieved its limited objectives.

Appendix Table A-1

Pakistan : Annual Wages of Production Workers in Manufacturing

(Rupees per Worker per Year)

Name of Industry	1954	1955	1957	1958	1959-60	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1969-70
Food Manufacturing except Beverages	870	850	1,010	1,060	1,050	976	1,174	1,432	1,417	1,592	1,494	2,103
Beverages	—	940	9,970	1,320*	794	1,435	1,302	1,493	1,790	1,706	1,982	1,488
Tobacco	—	1,660	820	1,390	1,730	1,736	1,716	2,290	1,596	1,728	2,360	2,261
Textiles	990	940	790	990	1,032	1,017	1,116	1,242	1,337	1,374	1,335	1,795
Footwear and Wearing Apparel	1,160	910	1,010	1,470	1,469	1,263	1,625	1,695	1,481	1,732	1,451	2,314
Wood, Cork and Allied Industries	1,350	820	760	840	760	761	1,134	1,005	1,305	1,331	1,177	1,535
Furniture and Fixtures	—	700	1,300	910	1,144	1,567	1,274	1,514	1,789	1,690	1,957	2,301
Paper and Paper Products	—	—	—	1,050	1,407	1,113	1,310	1,667	1,902	2,053	2,223	2,319
Printing, Publishing and Allied Industries	1,120	1,160	1,160	1,300	1,463	970	1,736	1,913	1,832	1,944	2,233	2,272
Leather and Leather Products	620	700	900	810	869	975	1,242	1,434	1,634	1,539	1,503	1,635
Rubber and Rubber Products, except Rubber Footwear	770	680	1,030	840	1,087	889	1,340	1,560	2,099	1,966	2,022	1,838
Chemicals and Chemical Products	1,110	880	1,030	1,210	1,296	1,306	1,420	1,515	1,688	1,965	2,036	2,684
Non-metallic Mineral Products except Products of Coal and Petroleum	1,030	1,050	1,110	1,260	1,138	1,238	1,205	1 318	1,485	1,408	1,522	1,979
Basic Metals	960	1,010	1,080	1,100	1,201	1,308	1,408	1,600	2,187	1,772	2,016	2,090
Metal Products except Machinery and Transport Equipment	950	820	860	840	977	1,071	1,241	1,245	1,489	1,501	1,638	1,752
Machinery except Electrical Machinery	930	810	840	990	1,032	1,087	1,164	1,296	1,402	1,408	1,488	1,588
Electrical Machinery & Appliances	870	1,040	1,000	1,060	1,147	626	1,361	1,444	1,464	1,712	1,928	2,381
Transport Equipment	1,090	780	1,300	1,210	1,311	1,092	1,496	1,578	1,706	1,719	1,830	2,061
Miscellaneous Manufacturing Industries	840	5,200	950	1,030	955	779	1,060	1,161	1,671	1,359	1,204	1,507

Source : *Census of Manufacturing Industries* (Various issues).
*Data available for Karachi only.

Appendix Table A-2

Pakistan : Annual Average Earnings of Employees in Manufacturing

(Rupees)

Name of Industry	1954	1955	1957	1958	1959-60	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1969-70)
Food Manufacturing except Beverages	1,016	1,008	1,310	1,303	1,342	1,356	1,630	1,997	1,964	1,926	1,815	2,456
Beverages	—	—	1,563	—	1,282	1,670	1,514	1,736	2,272	2,107	2,477	2,254
Tobacco	—	—	—	—	2,442	1,973	1,950	2,242*	1,757	1,842	2,537	2,871*
Textiles	1,032	1,017	1,066	1,066	1,135	1,132	1,240	1,317 1,374	1,444	1,484	1,437	2.394 1,927
Footwear and Wearing Apparel	1,546	1,267	1,929	1,878	1,867	1,641	2,115	2,204	2,138	2,118	1,84(	2,497
Wood, Cork and Allied Industries	1,595	—	838	950	1,441	952	—	1,259	1,412	1,503	1,416	1,633
Furniture and Fixtures		—	—	—	1,150	1,685	1,372	1,640	2,077	1,788	2,042	2,430
Paper and Paper Products	—	—	889	1,383	1,983	1,767	2,065	2,641	2,710	2,940	2.96(	2,949
Printing, Publishing and Allied Industries	1,289	1,292	1,364	1,459	1,664	1,091	1,955	2,139	2,111	2,243	2,417	2,659
Leather and Leather Products except Footwear	753	827	1,037	987	1,087	1,096	1,400	1,517	1,793	1.712	1,783	1,880
Rubber and Rubber Products except Rubber Footwear	1,000	870	1,374	1,282	1,456	1,141	1,719	—	2,904	2,679	2,709	2,466
Chemicals and Chemical Products	1,479	1,189	1,461	1,810	1,870	1,838	2,000	2,165	2,558	2,771	2,754	3,623
Non-Metallic Mineral Products except Products of Coal and Petroleum	1,202	1,260	1,279	1,417	1,319	1,511	1,466	1,660	1,811	1,691	1,756	2,283
Basic Metals	1,042	1,158	1,232	1,138	1,385	1,486	1,578	1,815	2,383	1.997	2,214	2,344
Metal Products except Machinery and Transport Equipment	1,669	950	1,012	954	1,242	1,276	1,477	1,485	1,621	1,826	2,783	2,020
Machinery except Electrical Machinery	1,035	871	932	1,010	1,098	0,221	1,308	1,455	1,653	1,611	1,652	1,830
Electrical Machinery and Appliances	993	—	1,439	1,416	1,615	836	1,815	1,930	1,909	2,229	2,309	2,942
Transport Equipment	1,241	902	1,633	1,337	1,634	1,476	1,968	2,137	2,216	2,037	2,232	2,641
Miscellaneous Manufacturing Industries	958	653	1,103	1,198	1,109	928	1,263	1,379	1,925	1,505	1,389	1,766

**Source* : *Census of Manufacturing Industries* (various issues).

Appendix Table A-3a

Pakistan : Earnings per Employee by Size Category : 1959-60

(Rupees)

Name of Industry	Employment Size Category (Number of Employees)						
	Up to 19	20—49	50—99	100—249	250—499	500—999	1000+
All Industries	1026	1101	1204	1310	1550	1349	1256
Food Manufacturing Except Beverages	1077	1026	988	1501	1411	1386	
Beverages	1265	1228				—	—
Tobacco	1392	1150			2387		
Textiles	963	997	1165	1108	1120	1064	1311
Footwear and Wearing Apparel	1147	1166	1147		2312		
Wood, Cork and Allied Industries	—	—	—	—	—	—	—
Furniture and Fixtures	984	1151	1106	—	—	—	—
Paper and Paper Products	1591	1406	1020	—	1905		
Printing, Publishing and Allied Industries	1002	1336	1720	1186	2087	2104	
Leather and Leather Products	1015	1048	1091	1145			—
Rubber and Rubber Products Except Rubber Footwear	988	782	—	1644		—	—
Petroleum and Coal	—	—	—	—	—	—	—
Non-Metallic Mineral Products Except Products of Coal and Petroleum	1019	1000	798	1242	1482	—	1267
Basic Metal Products	1041	1251	1343	1319	1406		
Chemicals and Chemical Products	1440	1710	2142	1674	2844	—	1548
Metal Products Except Machinery and Transport Equipment	994	958	1187	1256	1700		—
Machinery Except Electrical Machinery	936	1031	1205	1134	1145		—
Electrical Machinery and Appliances	956	1235	1561	2002	1417		—
Transport Equipment	1385	1549	1699	1422	1712	1665	
Miscellaneous Manufacturing Industries	972	1154	972	1099	1260		

Source : Census of Manufacturing Industries, 1959-60.

Appendix Table A-3b

Pakistan : Earnings per Employee by Size Category : 1969-70

(Rupees)

Name of Industry	Employment Size Category (Number of Employees)									
	Up to 9	10—19	20—49	50—99	100—249	250—499	500—999	1000—1999	2000—4999	5000+
All Industries	2455	2015	2206	2712	2852	2633	2589	2246	2143	1824
Food Manufacturing except Beverages	2335	2333	2340	2629	2557	2934	3029	2379	—	—
Beverages	—	—	2289	2898	1847	—	—	—	—	—
Tobacco	1541	—	—	2355	—	1347	2207	3584	—	—
Textiles	3941	2298	2301	2804	2586	2258	1753	2035	2042	1605
Footwear and Wearing Apparel	2721	2220	2543	2507	3253	2707	—	—	—	—
Wood, Cork and Allied Industries	—	1909	—	1947	—	—	—	—	—	—
Furniture and Fixtures	2564	1923	3444	2807	1759	—	—	—	—	—
Paper and Paper Products	2271	—	—	—	—	—	—	—	—	—
Printing, Publishing and Allied Industries	2187	2098	2323	2307	2298	3361	3325	—	—	—
Leather and Leather Products	1843	1789	2097	2048	3125	1737	—	—	—	—
Rubber and Rubber Products except Rubber Footwear	1800	1201	1373	2033	3212	—	—	—	—	—
Chemicals and Chemical Products	1996	1818	2253	3054	4265	3780	4492	—	—	—
Petroleum and Coal	—	—	3070	—	—	7142	—	—	—	—
Non-Metallic Mineral Products except Products of Coal and Petroleum	1334	1670	1667	2210	1420	2396	2565	—	—	—
Basic Metals	1962	1946	2082	3079	2212	2539	—	—	—	—
Metal Products except Machinery	1836	1622	1770	2179	2716	2162	—	—	—	—
Machinery except Electrical Machinery	1830	1882	1805	1889	2667	1593	—	—	—	—
Electrical Machinery and Appliances	1670	1473	1910	2139	3440	3584	2954	—	—	—
Transport Equipment	1954	1732	1849	2346	3102	—	2737	—	—	—
Miscellaneous Manufacturing Industries	2324	2555	2850	3723	1971	1698	—	—	—	—

Source : Census of Manufacturing Industries, 1969-70

Appendix Table A-4

Data for Regression Analysis

Serial No.	Name of Industry	Wages of Production Workers : 1964-65	Wages of Production Workers : 1969-70	Skill Index	1964-65			1969-70			Trade Union Membership 1964-65
					Capital Intensity	Share of Wages in Total Costs	Foreign Investment	Capital Intensity	Share of Wages in Total Costs	Foreign Investment	
		(Rs. per year	(Rs. per year)	(%)	(Rs. per year)	(%)	(%)	(Rs. per year)	(%)	(%)	(%)
1.	Food Manufacturing except Beverages	1432	2103	.4317	4420	.047	.110	18390	.035	.143	.121
2.	Beverages	1493	1488	.2120	1370	.138	.440	13910	.073	.230	.313
3.	Tobacco	2290	2261	.5354	9860	.058	.080	33580	.040	.091	.610
4.	Textiles	1242	1795	.4143	1930	.148	.031	5870	.129	.045	.370
5.	Footwear and Wearing Apparel	1695	2314	.6158	3980	.142	.059	7590	.151	.077	.280
6.	Wood, Cork and Allied Industries	1005	1535	.0723	1610	.200	.001	2590	.060	.001	.001
7.	Furniture and Fixtures	1514	2301	.6109	1810	.226	.001	2180	.226	.001	.001
8.	Paper and Paper Products	1667	2319	.2113	6950	.105	.125	6980	.108	.111	.112
9.	Printing, Publishing and Allied Industries	1913	2272	.7002	3060	.206	.031	5390	.192	.029	.407
10.	Leather and Leather Products	1434	1637	.6158	4280	.076	.001	15960	.033	.001	.099
11.	Rubber and Rubber Products except Rubber Footwear	1340	1838	.2204	5400*	.160*	.210*	15560	.085	.148	.200

—Continued

Table A—4 *Continued*

Serial No.	Name of Industry	Wages of Production Workers : 1964-65	Wages of Production Workers : 1969-70	Skill Index	1964-65			1969-70			Trade Union Membership 1964-65
					Capital Intensity	Share of Wages in Total Costs	Foreign Investment	Capital Intensity	Share of Wages in Total Costs	Foreign Investment	
		(Rs. per year	(Rs. per year)	(%)	(Rs. per year)	(%)	(%)	(Rs. per year)	(%)	(%)	(%)
12.	Chemicals and Chemical Products	1515	2684	.2664	8170	.071	.476	15570	.086	.585	.332
13.	Non-metallic Mineral Products except Products of Coal and Petroleum	1318	1979	.2184	3140	.139	.048	14590	.096	.067	.238
14.	Basic Metals	1600	2090	.2989	3240	.100	.211	6090	.084	.167	.088
15.	Metal Products except Machinery and Transport Equipment	1245	1752	.3456	1510	.167	.026	7800	.144	.028	.094
16.	Machinery except Electrical Machinery	1296	1588	.3394	1650	.187	.085	2680	.136	.184	.133
17.	Electrical Machinery and Appliances	1444	2381	.5026	2580	.143	.109	6960	.140	.133	.224
18.	Transport Equipment	1578	2061	.3601	3300	.121	.001	1260	.172	.020	.109
19.	Miscellaneous Manufacturing Industries	1161	1507	.2000	4090	.037	.064	11200	.025	.090	.071

Source : See text.
*Estimates based on 1963-64 data.

Table A—4 *Continued*

Serial No.	Name of Industry	Wages of Production Workers : 1964-65	Wages of Production Workers : 1969-70	Skill Index	1964-65			1969-70			Trade Union Membership 1964-65
					Capital Intensity	Share of Wages in Total Costs	Foreign Investment	Capital Intensity	Share of Wages in Total Costs	Foreign Investment	
		(Rs. per year	(Rs. per year)	(%)	(Rs. per year)	(%)	(%)	(Rs. per year)	(%)	(%)	(%)
12.	Chemicals and Chemical Products	1515	2684	.2664	8170	.071	.476	15570	.086	.585	.332
13.	Non-metallic Mineral Products except Products of Coal and Petroleum	1318	1979	.2184	3140	.139	.048	14590	.096	.067	.238
14.	Basic Metals	1600	2090	.2989	3240	.100	.211	6090	.084	.167	.088
15.	Metal Products except Machinery and Transport Equipment	1245	1752	.3456	1510	.167	.026	7800	.144	.028	.094
16.	Machinery except Electrical Machinery	1296	1588	.3394	1650	.187	.085	2680	.136	.184	.133
17.	Electrical Machinery and Appliances	1444	2381	.5026	2580	.143	.109	6960	.140	.133	.224
18.	Transport Equipment	1578	2061	.3601	3300	.121	.001	1260	.172	.020	.109
19.	Miscellaneous Manufacturing Industries	1161	1507	.2000	4090	.037	.064	11200	.025	.090	.071

Source : See text.
*Estimates based on 1963-64 data.

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