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Inter-industry Wage Differentials in Pakistan

SHABBAR JAFFRY, YASEEN GHULAM, and VYOMA SHAH

1. INTRODUCTION

The essential feature of a perfectly competitive labour market is that workers who accept jobs can expect to receive compensation equal to their opportunity cost. Firms pay a wage which is just sufficient enough, to attract workers of the quality they desire and no higher [Krueger and Summers (1988)]. Overall, the markets do not follow the law of one price, contradicting the competitive framework. This is where the problem of wage differentials across different industries needs to be assessed, and has also been the focus of many studies over the years, mainly in the industrialised countries, e.g. USA, European Countries. However, the issue of wage differentials has been addressed by very few studies in the developing countries [Arbache (2001) and Erdil, *et al.* (2001)]. Wage differentials analysis in developing countries should also have equal importance as in the industrialised countries, in order to gauge the effect of the corporate culture and centralisation/decentralisation on the different industries and labour market of those developing countries.

Numerous wage differential studies have been carried out in the recent years [Krueger and Summers (1988), Lucifora (1993), Rycx (2002)]. Krueger and Summers (1988), who were pioneers in this study area, demonstrated that pay differentials existed in the USA amongst workers with the same working conditions and individual characteristics in different sectors. This study was the start of the growth of literature in this area, around the world. In contrast, obtaining the appropriate data in developing countries is the main challenge, as the data may not be reliable or detailed data in not available.

This paper attempts to fill the gap of the inter-industry wage differentials in developing countries. This paper is the first to examine industry wage differentials in Pakistan using the advanced econometric techniques. It estimates: (i) inter-industry wage differentials (ii) dispersion of industry wage differentials (iii) inter-industry wage differentials by different regions and education level (iv) changes in the trend of wage differentials during a fourteen year period.. The wage differential has been calculated using the methodology used by Rycx (2003). The pseudo-panel approach coined by Deaton (1985) has been used, as the data used in the analysis is not normal panel data. In order to find the wage differentials information from the Labour Force Survey (LFS), which is carried out by the Federal Bureau of Statistics (FBS) Government of Pakistan, data is used for eight different surveys during a fourteen year time period, between 1990-91 and 2003-04.

The remainder of this paper is organised as follows. Section 2 reviews some empirical literature in this area, Section 3 describes the data, Section 4 explains the

Shabbar Jaffry <shabbar. jaffry@port.ac.uk> is Reader in Economics and Director of the Postgraduate Programme in Economics, Yaseen Ghulam <ghulam@port.ac.uk> is Senior Lecturer, and Vyoma Shah <vyoma.shah@port.ac.uk> is a PhD Student at Portsmouth Business School, University of Portsmouth, UK.

methodology and Section 5 gives an overview of the empirical findings. Section 6 gives the conclusion.

2. LITERATURE REVIEW

The existence of unrelenting and systematic wage differentials amongst industrial sectors has been known for many years as demonstrated by the seminal US work by Slichter (1950). Differences in average wages across industries can reflect differences in the composition of their workforces in terms of skills and productivity. However, in more recent years a wide range of studies in different countries have found, that workers with comparable measured characteristics associated with productivity- notable education and experience—earn different wages depending on the industry in which they are employed. Moreover, this pattern of wage differentials across industries has been found to be highly stable over time, so transitory differences in demand across industries cannot be the explanation. Furthermore, the pattern is very similar across industrialised countries, in that the same industries seem to be high-versus low-paying ones having controlled for measured worker characteristics. [e.g. Krueger and Summers (1988)].

This empirical regularity clearly poses a challenge to labour market theory. According to the simplest neo-classical competitive model of wage determination, two individuals with the same productive capabilities should have the same marginal productivity and thus receive the same wage irrespective of the industry in which they are working. It has long been recognised that wage differentials between identical individuals could persist in equilibrium, because higher wages would be needed to compensate workers for less attractive non-wage attributes of particular jobs, such as unpleasant or even hazardous working conditions. Therefore the standard competitive theory of wage setting recognises that there may have to be compensating differentials between jobs with different non-wage attributes that enter into the employee's utility function.

The existence of sectoral effects on workers' wages is well documented in the economic literature [Krueger and Summers (1988); Lucifora (1993); Rycx (2002)]. Krueger and Summers (1988) contributions was particularly prominent, as they used cross-sectional US data with (individual and their job attributes,) and also longitudinal data, which allowed them to analyse individual fixed effects. They found that taking these into account did not reduce measured industry effects on earnings, indeed if anything it increased them. The Analysis of two longitudinal datasets also found substantial industry effects for workers who change jobs, which they saw as evidence against unmeasured labour quality being the main explanation for inter-industry differentials.

Although the exact scale of inter-industry wage differentials is still questionable, [Abowd, *et al.* (1999), Björklund, *et al.* (2004), Gibbons and Katz (1992), Goux and Maurin (1999)], there is some agreement on the fact that these effects are fairly persistent, closely correlated from one country to another [Helwege (1992)], and of varying dimensions in the industrialised countries [Hartog, *et al.* (1997)]. In addition, a number of studies suggest that sectoral effects are significantly weaker in countries having strong corporate traditions? [Edin and Zetterberg (1992); Hartog, *et al.* (1999); Kahn (1998); Rycx (2003)]. There have been few studies, which have carried out cross-country comparisons of inter-industry wage differentials. Moreover, while various explanations based on efficiency wage mechanisms or rent sharing have been put forward

[Benito (2000); Krueger and Summers (1988); Thaler (1989); Walsh (1999)], the existence of industry wage differentials remains a complex and unresolved puzzle.

While the investigation of why similar individuals in similar jobs might be rewarded differently in different industries goes on, other studies have argued from within the strictly competitive framework, that unobserved differences in abilities and jobs in fact account for much of the explanation for inter-industry differential. Goux and Maurin's (1999) study, using longitudinal earnings data for France, infers the importance of unmeasured ability across individuals by focusing on those switching industries. In contrast to Krueger and Summers (1988), they find that inter-industry wage differentials for such workers are very much less than in cross-sectional data. They argue that this difference probably arises because Krueger and Summers(1988), in their longitudinal analysis use a highly aggregated industrial breakdown distinguishing only seven sectors, Goux and Maurin (1999), in contrast, were able to distinguish 99 industries, and demonstrate that aggregating these and repeating their analysis of job switcher did indeed lead to much higher inter-industry differentials.

While Goux and Maurin(1999), discount the importance of "true" inter-industry wage effects, they explore and find substantial differences across firms in France. They find that the average differential in wages paid to the same worker by two different firms is between the range of 20–30 percent, and that most of this is within rather than between industries. Within a given industry, wages rise with the firm size and capital intensity. They thus see modest inter-industry differentials as reflecting cyclical factors, while arguing that inter-firm differences are compatible with efficiency wage models. Larger firms or more capital-intensive ones, find monitoring more costly and are particularly anxious to retain workers with high levels of firm-specific human capital.

There has been limited literature for wage differentials in the context of developing countries. Arbache (2001) has investigated the wage differentials and wage determination in Brazil using the micro-data for 1980s and 1990s, using models with segmentation, which are explained by efficiency wages. The authors also found that unmeasured abilities and efficiency wage models play an important role in wage determination. They have used different wage theories in order to find the wage differential. Erdil, *et al.* (2001) has compared the inter-industry wage structure for industrialised and developing countries, to find whether the industry wage differentials are consistent and stable independent of time and space. Erdil, *et al*. (2001) found that the size of inequality in wage differentials is rising and wage differential patterns are similar for both industrialised and developing countries.

3. DATA

This study uses data drawn from the nationally representative Labour Force Survey (LFS) for Pakistan between 1990-91 and 2003-04, which was conducted by Federal Bureau of Statistics Government of Pakistan. The data collection for the LFS is spread over four quarters of the year in order to capture any seasonal variations in activity. The survey covers urban and rural areas of the four provinces of Pakistan as defined by the Population Census. The LFS excludes the Federally Administered Tribal Areas (FATA), military restricted areas, and protected areas of NWFP. These exclusions are not seen as significant since the relevant areas constitute about 3 percent of the total population of Pakistan.

The working sample, based on those who are engaged in wage employment and have positive earnings, comprises a total of 97,122 workers, once missing values and unusable observations are discarded over the time period. This includes variables such as pay, age, gender, education and working characteristics of individual. Estimation covers nine basic industries, which are: *Agriculture and Fishing*; *Mining and Quarrying*; *Manufacturing*; *Electricity*, *Gas and Water Supply*; *Construction*; *Wholesale and Retail Trade*, *Hotels and Restaurants*; *Transport, Storage and Communication*; *Financial Intermediation and Community*, *Social and Personal Services*, which are classified by Pakistan Standard Industrial Classification. The analysis will go on to distinguish 41 sub-sectors within the industries covered.

Table 1 depicts the means and standard deviations of selected variables for overall, as well as for urban and rural areas. There is a clear difference in average characteristics between urban and rural areas. On average, the wages and number of hours worked are higher in urban area, whilst the experience and numbers of job holders in a household are higher in rural areas.

Table 1

Means and Standard Deviations of Selected Variables[1]

	Overall		Urban		Rural	
Characteristic	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Real Hourly Wage (in PKR)[2]	2.73	0.76	2.85	0.77	2.54	.699
Prior Potential Experience[3]	21.23	13.38	20.62	13.24	22.15	13.53
Number of Hours Worked in a Year	2532.72	613.49	2535.78	600.91	2528.06	632.07
Number of Job Holders in a Household	2.18	1.34	2.17	1.30	2.19	1.40
Number of Observation	97122	97122	58550	58550	38572	38572

4. METHODOLOGY

The methodology adopted to estimate inter-industry wage differentials is consistent with that of Rycx (2003). A key methodological issue is that the LFSs are only cross-sectional, while ideally, one would like to have a panel of individuals or households that can be traced through time, in order to investigate the changing wage structure and returns to education. In addition, estimation with the cross-section data can be seriously affected by unobserved individual heterogeneity. However, this problem can be circumvented, or at least mitigated, by tracking cohorts as suggested by Deaton (1985), and estimating relationships based on cohort means.

Starting with a simple model, suppose that base panel regression equation could be written as:

$$y_{it} = x_{it}'\beta_t + \alpha_i + \varepsilon_{it}, \qquad t = 1,.....,T,$$

where i = index individuals and t = time periods. Unfortunately, in the LFSs, the same individuals are not observed in subsequent surveys. Hence we do not have a genuine

[1]In addition to these variables we have used education levels, regions, occupations, industries, marital status and quarters dummies. We have also used dummies for different employment status, gender and area.

[2]The real hourly wage is calculated as weekly income/number of hours worked per week and then deflated with GPI (General Price Index) for that particular year.

[3]Experience has been computed as: age-6-years of education.

panel data available to estimate such an equation. In such circumstances, the approach first developed by Deaton (1985) proceeds as follows. Define a set of C cohorts, based on a district in a province say, such that every individual *i* is a member of one and only one cohort for each *t*. Averaging over the cohort members:

$$\bar{y}_{ct} = \bar{x}_{ct}'\beta_t + \bar{\alpha}_{ct} + \varepsilon_{ct}, \qquad c = 1,.....,C,$$

where $\bar{y}_{ct}$ is the average of the y_{it} for all members of cohort *c* at time *t*. this is a so-called 'pseudo-panel'. The 'cohort fixed effects', $\bar{a}_{ct}$, will, in fact, vary with *t* since they comprise different individuals in each cohort *c* at time *t*, but can be treated as constant if the number of individuals per cohort is large. Estimation can then proceed with the standard fixed-effects estimator on the cohort means, thus eliminating any unobserved differences between individual cohorts.

Deaton (1985), argues that there is a potential measurement error problem arising from using $\bar{y}_{ct}$ as an estimate of the unobservable population cohort mean and an adjustment based on errors-in-variables techniques is therefore needed. However, researchers typically ignore this if the number of observations per cohort is reasonably large. Moreover, Verbeek and Nijman (1992) suggest that when the cohort size is at least 100 individuals, and the time variation in the cohort means is sufficiently large, the bias in the standard fixed-effects estimator will be small enough that the measurement error problem can be safely ignored. Although, this issue will be considered in the analysis, given the size of the LFSs, suitably chosen cohorts should fulfil this size criterion, hence this is the approach used in this paper.

The construction of the pseudo-panel data is undertaken by computing cohort or cell means in each available cross-section, where the cells are defined by the four-digit district codes, age of the individual, provinces and the type of industry in which the individual is working.[4] Thus in total, it results in a group between 6000 and 8000 approximately, in each pseudo-panel for each cross-section. Next we present the methodology, which is used in the paper according to the pooled as well as the pseudo panel method in estimation of inter-industry wage differentials.

(a) The Wage Equation

The general framework for analysis of inter-industry wage differentials is given by a standard wage equation. It rests upon the estimation of the following semi-logarithmic wage equation:

$$\ln w_i = \alpha + \sum_{j=1}^{J} \beta_j X_{j,i} + \sum_{k=1}^{K} \psi_k Y_{k,i} + \sum_{l=1}^{L} \delta_l Z_{l,i} + \varepsilon_i \qquad \ldots \qquad \ldots \qquad \ldots \qquad (1)$$

where w_i represents the gross hourly wage of an individual of i = 1,…,n; *X* represents a vector of individual characteristics of the workers and their job; *Y* is a set of industry dummy variables; and *Z* is a vector of firm characteristics; α is the constant, β, ψ, and δ are the parameters to be estimated and ε_i is the error term.

[4]We choose to use the four-digit district codes, age, provinces and industry type to allow for unobserved differences between these similar individuals such as differences in the quality of their education, their skills and attitudes etc to be controlled via fixed effects.

Inter-industry Wage Differentials Controlling for Individual and Employer Characteristics

In order to obtain "net" inter-industry wage differentials having controlled for other factors, we estimate the wage equation using the sectoral dummies as well as individual and employer characteristics. In this case, the constant no longer refers to the wage of the average worker in the reference sector. Next, the average wage differential of all the sectors compared to the reference is calculated, as the product of the weighted employment share by the estimated sector co-efficient:

$$\pi = \sum_{k=1}^{K} \overline{p}_k \hat{\psi}_k \, . \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

The differentials are then calculated as the sector co-efficient less the average wage:

$$d_k = \hat{\psi}_k - \pi \text{ , where } k = 1,\ldots,K. \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

and for the omitted sector; the differential is the average wage in Equation (2):

$$d_{K+1} = -\pi \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

The standard deviation of the inter-industry wage differential adjusted for sampling error and weighted by the sectoral employment shares is computed as follows:

$$WASD(d_k) = \sqrt{\sum_{k=1}^{K+1} - p_k \left(d_k - \frac{\sum_{k=1}^{K+1} d_k}{K+1} \right)^2 - \frac{\sum_{k=1}^{K+1} \text{var}(\hat{d}_k)}{K+1} + \frac{\sum_{k=1}^{K+1} \sum_{l=1}^{K+1} \text{cov}\left(\hat{d}_k, \hat{d}_l \right)}{(K+1)^2}} \quad \ldots (5)$$

5. RESULTS

The wage theories that attempt to explain inter industry wage differentials suggest that the skills and tasks of certain jobs might play an important role. Table 1 (see Appendix) shows the mean hourly wage Pakistan over the sample period in basic industries classified by different occupations. The size of wage differences among industries for given occupation is striking. For example, the wage of Legislators, Senior Officials and Managers range from Rs 20.78 per hour in Trade and Hotels to Rs 79.44 per hour in the Financial Institution industry and the wages of professionals range from Rs 23.00 per hour in Agriculture to Rs 49.31 per hour in Construction. For most occupations, the Table I reveals a clear pattern of higher wages in industries which have the overall higher wages compared to the average wage in the economy.

The comparison has not included other industries as in other industries higher wages are more likely to be affected by the level of education. The wage differences included the return to education, which results in high wage. Thus, education plays an important role in deciding the wage level. As Table II (see Appendix) reveals, the Legislators, Senior Officials and Managers, who likely to have minimum education up to the graduate level are earning on and average Rs 28.91 per hour compared to skilled Agricultural and Fishery workers and Elementary Occupations, who are earning on an average only Rs 7.90 and Rs 11.57 per hour, respectively.

The wage differences presented in Tables 1 and 2 are tested in the later analysis of inter-industry wage differentials.

Table 1 below presents the inter-industry wage differentials and their dispersion for one-digit nomenclature for the pooled sample as well as the pseudo panel. The results show that wage differentials exist between workers employed in different sectors, even after controlling for individual characteristics and job characteristics. These differentials are significant both in individual terms (with exception of two sectors) and globally at the 5 percent level of significance. We further note, that the results are more or less same for the pooled and pseudo panel estimation, so the discussion in the paper has only focused on the pseudo-panel approach.[5] *Financial intermediaries, Mining and Transport* have found to be the best-paid industries. Furthermore, traditional industries like A*griculture, Trade* and *Restaurants*, were found to have the lowest wages.

Table 1

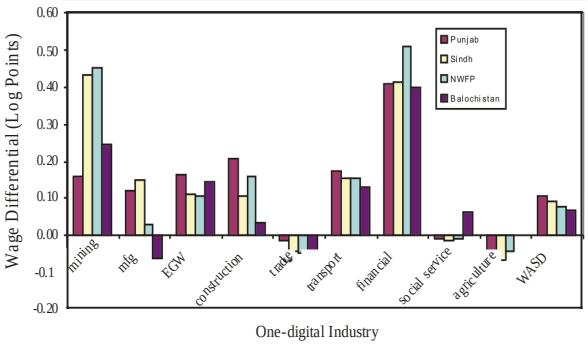
Single Digit Industry Wage Differential in Pakistan

Industry	Pooled Estimation	Pseudo Estimation
Mining	0.2790	0.2927
Manufacturing	0.0957	0.1121
Electricity, Gas and Water	0.1117	0.1317
Construction	0.1511	0.1609
Trade and Restaurants	–0.0436	–0.0357
Transport	0.1497	0.1607
Financial Intermediaries	0.4176	0.4315
Social Services	–0.0030*	–0.0106*
Agriculture	–0.0592	–0.0666
Weighted Adjusted Standard Deviation	0.0855	0.0927
R^2	0.4719	0.4822
F-statistic	884.66	346.57
No. of Observations	97102	60580

*–Shows that the wage differential is statistically insignificant.

The analysis of wage differentials is performed at different perspectives for Pakistan. One of them is by *provinces*. Pakistan has four provinces (Punjab, Sind, Balochistan and NWFP). Figure 1 represents the wage differential of each industry by

Fig. 1. Industrial Wage Differentials in Provinces of Pakistan

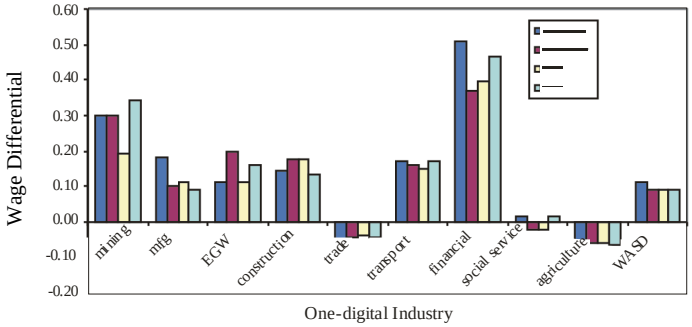


[5]Results obtained from pooled estimation are available from the author on request.

provinces and the last? is the wage dispersion for each province. The highest paid sector is again *Financial Intermediaries* for all provinces except for Sindh, where *Mining* is the highest paid sector but less paid than by the NWFP. The lowest paid sector is *Trade* and *Agriculture*. For Balochistan, the *Social Services* sector is paying more compared to all the other provinces, while the lowest paid sector is *Trade*, which is also the case in Balochistan. By looking at wage dispersion among the provinces, the results suggest that Punjab has the highest wage dispersion i.e. 0.105 log points, while Balochistan has the lowest wage dispersion of 0.067 log points.

Looking at the wage differentials by the sector of the particular industry that are *public* or *private* sectors, findings show that the wage dispersion and differentials are higher in the public sector than in the private sector, except in the *Construction* and *Electricity, Gas and Water* industry sectors. This is represented in Figure 2, which also shows the differentials for *urban* and *rural* areas of Pakistan. Wage dispersion is almost same in both urban as well as rural areas. However, in the rural area, wages are relatively higher in *Mining*, *Electricity*, *Gas and Water*, *Financial* and *Transport* industries compared to the urban area.

Fig. 2. Industrial Wage Differentials and Dispersion by Area and Type of Employment



The analysis covers eight different surveys during a 14 year time period, so that each year's differential gives an insight into the trend of wage differential and also the wage dispersion trend over almost a decade. Figure 3 shows the wage differential and wage dispersion for the period between 1990-91 and 2003-04.

Fig. 3. Industrial Wage Differentials and Dispersion by Survey Year

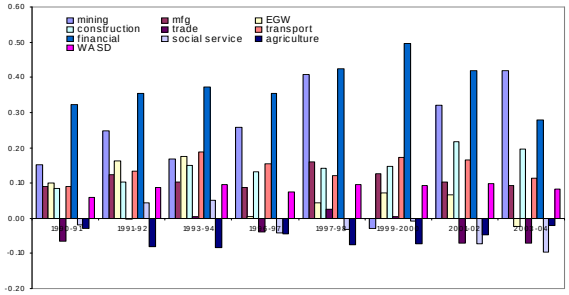
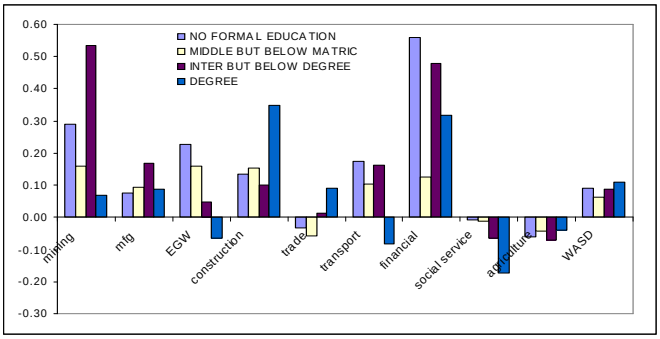


Figure 3 shows that the wage differential has increased almost year on year and wage dispersion has increased from 0.05 to 0.08 over the fourteen years. In the mining industry wage, the differential is almost doubled from 0.15 in the period 1990-91 to 0.42 in the period 2003-04.

To decompose inter-industry wage differentials, these differentials were estimated for various education groups. Figure 4 below, shows that *Financial Institutions*, *Mining* and *Construction* industries are the best paid sectors for the person who is well educated, while *Manufacturing* and *Electricity, Gas and Water* are the best paid sectors for a person who has no education or the education is less than the matriculation level . The wage dispersion is higher for the person who has a degree or higher qualifications, as compared to the others with less education. So, a person acquiring the degree or higher education has a more favourable chance to move from one industry to another as compared to those who do not have a degree or higher education. As the dispersion is 0.1090 for them (with degree and higher qualification).

Fig. 4. Industrial Wage Differentials and Dispersion by Level of Education



In order to obtain more detailed results, a two digit industry analysis has also been undertaken. Table 2 represents the wage differentials for two-digit industry sectors. The results show that *Financial Institutions*, *Crude Petroleum* and *Natural Gas*, *Fishing*, *CRM of Pipeline for Transportation* are among the best-paid sectors, whilst *Retail trade*, *Personal and Household services*, *Social and related Community Services* and *Agriculture* are the lowest paid sectors.

Overall, the results show higher wage dispersion for pseudo panel estimates than the pooled estimates, i.e. 0.1349 and 0.1063, respectively. The wage dispersion for the two-digit industry wage differentials is also higher than the one-digit industry wage differentials. For, the two digit wage differential, the wage dispersion is 0.1349 while for the one-digit wage differentials, the wage dispersion is only 0.0927 (according to pseudo-panel estimation).

The estimation of the two-digit wage differentials is carried out by looking at different regions, sectors, education level and area of living, in the same manner as that carried out in one-digit wage differentials. The pseudo-panel estimation results are only reported for these industrial sectors here.[6] Table 2A (in the Appendix) shows the results of the wage differential by sector and area of living is shown in Table 2B (see Appendix). For the p*ublic* sector, the highest paid sectors are *CRM of Sports Projects*,

[6]One digit pooled estimation results are available on request.

Table 2

Two-digit Wage Differentials for Pseudo Panel and Pooled Estimation

	Pseudo Results		Pooled Estimation	
Industry	Wage Diff	Tstat	Wage Diff	Tstat
CRM of pipe line for transportation	0.5783	3.0125	0.5207	2.7652
Financial Institutions	0.5679	23.4669	0.5510	29.6057
Crude petroleum and natural gas production	0.4908	5.1787	0.4600	4.8657
Fishing	0.4809	12.8634	0.5017	13.5331
International and Other Extra-territorial Bodies	0.4723	4.9593	0.4870	5.6342
CRM of sports projects	0.4384	1.2962	0.4243	1.3123
CRM of sewerage, water mains and storm water drains	0.4306	3.2254	0.3611	3.0280
Other Mining	0.3831	6.5996	0.2896	5.3176
CRM of docks and communication project	0.3566	5.9544	0.2269	2.6520
Insurance	0.3406	5.6065	0.3272	5.9143
Mfg of chemicals and chemical, petroleum, coal, rubber and plastic products	0.2824	11.7091	0.2501	11.1953
Basic metal industries	0.2769	9.0124	0.1546	5.7004
Coal Mining	0.2718	5.5097	0.2760	6.9681
Electricity, gas and steam	0.2509	12.1414	0.1783	12.4290
Communication	0.2496	11.4626	0.2046	11.5588
CRM of streets, roads, highways and bridges	0.2324	9.3948	0.1982	7.7247
Other manufacturing industries	0.2313	7.7754	0.1540	6.3214
Transport and storage	0.2237	15.8011	0.1681	18.7410
Real estate and business	0.2176	4.7117	0.1785	4.2280
Public administration and defence services	0.2139	14.3924	0.1531	16.4301
Mfg of wood and wood products	0.2025	7.3571	0.0943	4.5149
Mfg of non-metallic mineral products	0.1981	8.8373	0.0866	4.5621
Construction projects	0.1895	1.3391	0.1174	0.8177
Manufacture of fabricated metal products, machinery and equipment	0.1887	5.3141	0.0548	1.8191
Mfg of paper and paper products	0.1745	5.6258	0.0560	1.5319
Building construction	0.1684	12.2476	0.1588	19.0002
Forestry and logging	0.1561	3.9820	0.1500	4.0300
Wholesale Trade	0.1475	5.4840	0.1120	5.0838
CRM of irrigation, flood control, drainage, reclamation and hydro-electric project	0.1441	2.2895	0.1373	2.1218
Water work and supplies	0.1373	5.0199	0.0623	2.8258
Mfg of food, beverages and tobacco	0.1363	7.7775	0.0677	4.0052
Mfg of textile, wearing apparel and leather industries	0.1265	8.6287	0.1070	10.7220
Crude Metal or Mining	0.1236	0.7171	–0.0126	–0.0585
Restaurants and Hotels	0.1212	4.9837	0.0664	3.0805
Recreational and cultural services	0.1118	1.7488	0.1065	1.7964
Activities not adequately defined	0.1033	2.2333	-0.0079	–0.1220
Sanitary and similar services	0.1007	2.0950	0.0408	0.9858
Retail trade	–0.0319	–1.9090	–0.0661	–5.4366
Social and related community services	–0.0322	–1.7456	0.0088	0.9771
Personal and household services	–0.0559	–3.4658	–0.0601	–5.3640
Agriculture, livestock and hunting	–0.1083	–13.7539	–0.0740	–12.5543
WASD	**0.1349**		**0.1063**	

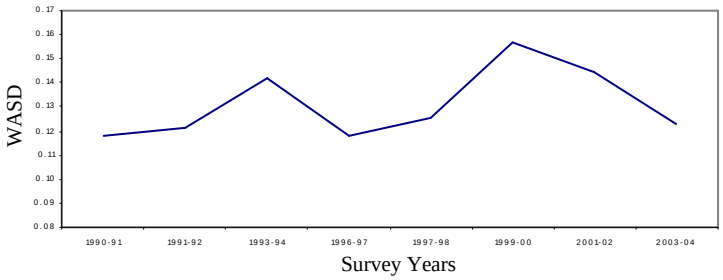
Financial Institutions, *Coal Mining* and *Real Estate Businesses* while for the p*rivate* sector, *CRM of Pipeline for Transportation* and *CRM of Drainage* and *Financial Institutions* are the highly paid sectors. The wage dispersion is higher in the public sector than in the private sector i.e. 0.1472 and 0.1347, respectively.

Table 2C shows that except for one or two years, during the sample years *Crude Petroleum* and *Natural Gas Production*, *Fishing*, *Financial Institutions*, *Manufacturing of Chemicals*, remained in the top ten sectors. . While *Agriculture*, *Personal Household Services*, *Social Services* and *Trade* sectors have remained in the bottom of the list during the fourteen years sample period.

The wage dispersion over the sample period is shown in Figure 5 below. The figure shows that the wage dispersion has increased during the sample period, but it has decreased from

0.1570 to 0.1233 in the last two survey years. This shows that during the 14 years period, the wage dispersion increased, but from the beginning of 2000 it has started to decrease.

Fig. 5. Industrial Wage Dispersion by Survey Years



When analysing wage differentials for different education levels, Table 2D (see appendix) findings suggest that a person with no education, or with education less than the matriculation level, is earning a higher wage in the labour intensive sectors. For example in the *CRM of Drainage*, *CRM of Pipeline for Transportation*, *Mining*, *and Fishing* sectors compared to a person with an education level below the degree and degree or more than a degree qualification. For this person the highest paid sectors are *CRM of Sports Projects*, *Financial Institutions*, *Coal Mining*, and *Building Construction*. The wage dispersion is higher for uneducated workers than the person with the education less than the matriculation level, i.e. 0.1436 and 0.0744, respectively, while the wage dispersion is less for the person with a degree or higher qualification as compared to a person without a degree qualification, 0.1777 and 0.1969, respectively.

CONCLUSIONS

This paper has examined the inter-industry wage differentials in Pakistan, and has utilised the data drawn from the Pakistan Labour Force Surveys. This paper is the first to estimate the wage differentials and wage dispersion in Pakistan, with the aid of supplicated econometrics techniques with the focus of (i) inter-industry wage differential (ii) dispersion of industry wage differential iii) inter-industry wage differential by different regions and education levels (iv) changes in trend wage differential during the fourteen years of the sample period.

The paper has utilised the Rycx (2003) methodology for the eight surveys of Pakistan LFS, and has represented two-digit as well as one-digit results. The Empirical findings show that wage differentials exist between workers employed in different sectors, even when controlling for individual and job characteristics. Estimations have been carried out using pooled data as well as pseudo-panel data. In this study, both of the approaches have produced almost similar results. Therefore, only pseudo-panel approach results are reported.

From the regional perspective the average wages are higher in the Punjab province, in the C*onstruction*, E*lectricity*, *Gas and Water* and *Transportation and Communication* sectors, compared to the other provinces of Pakistan. In the NWFP, the highest wages are paid in the *Mining* and *Finance* sectors while *Manufacturing* is the highest paid sector in the Sindh province.

In terms of public and private sectors, it was found that in the public sector, wages are higher as compared to the private sector, except for *Electricity*, *Gas and Water* and

Construction sectors. In the urban areas, the wages are higher than in the rural area except in industries like *Mining* and *Electricity, Gas and Water*. Our findings also suggest that the hierarchy of sectors in terms of wage differentials is quite similar with the reported in the literature. During the fourteen year sample period, results show that the wage differential for each industry has increased and the *Financial Institutions* sector being the top amongst all sectors. The wage dispersion has generally increased but has decreased slightly after 2000.

For the two digit industry structure, the results are similar for all the different perspectives. *Petroleum*, *Financial Institutions*, *Fishing* and *CRM of Pipeline* being the highest paid sectors and *Agriculture*, *Retail Trade* and *Personal and Household Service*s are lowest-paid sectors. The analysis by the level of education shows that a person with no education is found to have lower wages than the person with education or with some education, except in the labour industries like *Mining* and *Agriculture* where the requirement of education is(not important)? The person with a degree and a higher qualification had an advantage over persons with just a degree qualification, and was found to earn higher wages in *Financial Institution*, *Insurance*, *Real Estate and Business* and in *Construction* industry than those persons whose education level was below the degree level. The wage dispersion is also lower for the person with a degree and above degree qualifications compared to the person who has less education than the degree level. Overall, the wage dispersion for two-digit industry is higher than the one-digit industry.

The wage differences presented in Table 1 and 2 (see Appendix) are confirmed by inter-industry wage differentials presented above. One explanation suggests that wage premiums are paid in an effort to ameliorate work place problems, such as shirking, by increasing the cost of job loss to the employee. Jobs for which the configuration of duties and tasks are especially costly to monitor should for this reason, be paid higher premiums than those that are not as expensive. This can be seen in Mining industry, the table shows that technicians and associate professionals are earning roughly 37 percent more than the average wage of the technician. Job conditions are also the important source of wage variations as it depends on the degree of workers' exposure to risky or hazardous conditions on the job. In comparison of overall wages in industry Agriculture, Mining and Trade and Hotels, the result suggest that Mining industry found to pay more to its workers in all different occupations involved in that industry compared to other two industry because of risky nature of this industry.

Thus, the wage differential can be explained by the level of skill required in the particular industry, job conditions and the education plays a vital role in deciding the wage premium across different industries. High skilled worker are likely to earn more compared to semi-skilled or skilled worker. Nature of different industries requires different level of skill for e.g. Financial Industry required more highly skilled worker compared to Agriculture and Trade and Hotel industry. Different occupation share in industry shows that in the Agriculture industry almost 88 percent workers are low skilled compared to 84 percent highly skilled worker in Financial industry, which could explain the wage gap between Agriculture and Financial industry.

In conclusion, results show that the magnitude of industry wage differentials vary substantially over the years and amongst different regions. This analysis suggests that a broad labour policy will not be sufficient to tackle the high wage dispersion and wage differentials in Pakistan. Our findings indicate that policies need to be tailored to the very specific context of the labour market in Pakistan.

Appendix

Table 1

Mean Hourly Wages of Occupations in Basic Industries

Occupation	Industry									Average Wage
	Agricul-ture	Mining	Manufac-turing	Electricity, Gas and Water	Construction	Trade and Hotels	Transport -ation	Financial Institution	Social Services	
Legislators, Senior Officials and Manages	26.1219	33.3581	41.7393	36.5462	33.5658	20.7856	42.2613	79.4410	21.5245	28.91267
Professional	23.0009	32.7199	41.7047	47.6373	49.3120	30.9649	45.4365	41.3551	36.8811	38.25718
Technicians and Associate Professionals	12.6344	28.1743	16.2670	18.1658	15.1839	14.4296	15.8097	24.6113	22.3397	20.63367
Clerk	21.5746	23.7133	20.7932	26.2785	22.5994	8.1760	26.3882	33.9685	26.0441	20.72142
Service Workers	9.9355	7.6128	16.1869	19.0936	10.1105	13.0371	12.2079	19.8938	12.4464	12.94138
Skilled Agricultural and Fishery Workers	6.9696		19.0416	14.9358	9.2092	11.6460	12.1555	7.0685	13.0684	7.897704
Craft and Related Trade Workers	17.6576	15.0342	12.5220	29.6086	20.0304	12.7897	17.0052	20.4212	13.4236	14.22085
Plant and Machine Operators	12.2202	12.5402	12.3830	15.7401	12.7178	13.7168	16.5810	23.4406	13.6101	14.57857
Elementary Occupations	9.9647	12.5775	12.4122	16.3891	10.8017	11.4083	10.5101	17.9216	14.7913	11.57454

Table 2

Occupational Share in Basic Industry

Occupation	Industry									Average Wage
	Agricul-ture	Mining	Manufac-turing	Electricity, Gas and Water	Construction	Trade and Hotels	Transport -ation	Financial Institution	Social Services	
Legislators, Senior Officials and Manages	1%	5%	3%	7%	1%	5%	3%	26%	16%	28.91267
Professional	1%	2%	2%	7%	1%	1%	2%	19%	11%	38.25718
Technicians and Associate Professionals	3%	8%	4%	20%	1%	4%	12%	24%	23%	20.63367
Clerk	1%	6%	3%	12%	1%	22%	4%	15%	6%	20.72142
Service Workers	1%	2%	3%	6%	1%	53%	8%	7%	17%	12.94138
Skilled Agricultural and Fishery Workers	35%	0%	0%	2%	0%	0%	0%	0%	1%	7.897704
Craft and Related Trade Workers	0%	28%	55%	12%	17%	1%	6%	1%	8%	14.22085
Plant and Machine Operators	4%	5%	12%	21%	1%	0%	33%	2%	4%	14.57857
Elementary Occupations	53%	44%	17%	14%	78%	14%	34%	6%	14%	11.57454

Table 2A

Industry Wage Differential for Different Provinces

Industry	Punjab	Sindh	NWFP	Balochistan
CRM of sports projects	0.2826	0.7471	–0.2884	0.1343
Crude petroleum and natural gas production	0.2734	0.6786	0.5114	0.6658
CRM of docks and communication project	0.3026	0.6118	–0.0178	0.2962
CRM of pipe line for transportation	0.9271	0.5546	–0.1573	0.2309
Fishing	0.3668	0.5444	0.1616	0.4583
Financial Institutions	0.6680	0.5120	0.5949	0.5626
Insurance	0.2778	0.4265	0.4288	–0.3443
Basic metal industries	0.2702	0.3890	–0.0434	0.3003
CRM of sewerage,water mains and strom water drains	0.2845	0.3775	0.8728	0.1808
Coal Mining	0.1613	0.3580	0.2844	0.2426
Other manufacturing industries	0.2252	0.3204	0.1526	0.1345
Mfg of paper and paper products	0.1418	0.3133	0.1204	0.3249
Mfg of chemicals and chemical, petroleum, coal, rubber and plastic products	0.3685	0.3123	0.0569	0.1984
Manufacture of fabricated metal products, machinery and equipment	0.1881	0.3017	0.0767	–0.0089
International and Other Extra-territorial Bodies	0.6872	0.2537	0.1671	0.4869
Transport and storage	0.2317	0.2528	0.2001	0.1832
Mfg of textile, wearing apparel and leather industries	0.1114	0.2295	0.0187	–0.0492
Mfg of wood and wood products	0.1969	0.2235	0.2162	0.1008
Mfg of non-metalic mineral products	0.2485	0.2192	0.0464	0.0568
Forestry and logging	0.0574	0.2162	0.1884	0.2085
Electricity, gas and steam	0.3465	0.2072	0.2446	0.2457
Real estate and business	0.2325	0.2033	0.3320	0.2097
Communication	0.3116	0.1955	0.2896	0.2922
CRM of streets, roads, highways and bridges	0.3320	0.1668	0.1983	0.1866
Sanitary and similar services	0.0769	0.1607	–0.0213	0.3087
Restaurants and Hotels	0.1578	0.1593	0.2305	–0.1092
Building construction	0.2605	0.1517	0.1682	–0.0104
CRM of irrigation, flood control, drainage, reclamation and hydro-electric project	0.2097	0.1416	0.5081	–0.0281
Wholesale Trade	0.2143	0.1408	–0.0044	0.1382
Mfg of food, beverages and tobacco	0.1844	0.1338	0.1310	0.0379
Public administration and defencse services	0.2935	0.1236	0.2680	0.2394
Other Mining	0.2920	0.1149	0.5038	–0.0214
Recreational and cultural services	0.0429	0.1039	0.3645	0.3643
Water work and supplies	0.1880	0.0975	0.1687	0.2515
Personal and household services	–0.1069	0.0651	–0.0919	–0.0175
Activities not adequately defined	0.2979	0.0412	–0.1036	0.1343
Crude Metal or Mining	–0.1247	0.0412	0.1868	0.4958
Retail Trade	0.0212	–0.0141	–0.0485	–0.1539
Construction projects	0.3498	–0.0463	0.7645	0.1343
Social and related community services	0.0126	–0.1277	0.0396	0.1002
Agriculture, livestock and hunting	–0.1444	–0.1299	–0.0848	–0.0324
WASD	0.1663	0.1550	0.1183	0.1013

Table 2B

Industry Wage Differential for Area of Living and Sector

Industry	public sector	private sector	Urban	Rural
Agriculture, livestock and hunting	-0.1158	-0.1055	-0.0831	-0.0755
Forestry and logging	0.1222	0.1654	0.0956	0.1673
Fishing	0.2829	0.4952	0.3882	0.5862
Coal Mining	0.5470	0.2556	0.2515	0.2823
Crude petroleum and natural gas production	0.4813	0.5086	0.4433	0.4997
Crude Metal or Mining	0.0323	0.3346	0.1031	–0.0640
Other Mining	0.3304	0.3793	0.1059	0.5167
Mfg of food, beverages and tobacco	0.1572	0.1333	0.0876	0.1115
Mfg of textile, wearing apparel and leather industries	0.1105	0.1260	0.0954	0.0561
Mfg of wood and wood products	0.2647	0.1937	0.1488	0.1670
Mfg of paper and paper products	0.3343	0.1520	0.1631	–0.0200
Mfg of chemicals and chemical, petroleum, coal, rubber and plastic products	0.4544	0.2471	0.2875	0.1905
Mfg of non-metalic mineral products	0.2192	0.1939	0.1371	0.1066
Basic metal industries	0.4662	0.2211	0.2055	0.0912
Manufacture of fabricated metal products, machinery and equipment	0.2651	0.1618	0.1163	0.0813
Other manufacturing industries	0.2037	0.2243	0.2132	0.1565
Electricity, gas and steam	0.2619	0.2800	0.1859	0.2851
Water work and supplies	0.1486	0.1648	0.0981	0.0961
Building construction	0.1460	0.1772	0.1989	0.1452
CRM of streets, roads, highways and bridges	0.2026	0.2659	0.2249	0.2160
CRM of irrigation, flood control, drainage, reclamation and hydro-electric project	0.2465	0.1134	0.1808	0.0943
CRM of docks and communication project	0.1456	0.3847	0.2557	0.2577
CRM of sports projects	0.7820	–0.0358	0.6310	–0.2384
CRM of sewerage, water mains and storm water drains	0.2610	0.5473	0.4250	–0.0650
CRM of pipe line for transportation	0.2207	0.6379	0.5825	0.3818
Construction projects	0.4307	0.1386	0.3168	0.0189
Wholesale Trade	0.2379	0.1365	0.1261	0.1428
Retail Trade	–0.0413	–0.0267	-0.0667	–0.0991
Restaurants and Hotels	0.0724	0.1245	0.1089	0.0394
Transport and storage	0.2502	0.2259	0.1856	0.1952
Communication	0.2937	0.2004	0.2079	0.2463
Financial Institutions	0.6384	0.5255	0.5588	0.6728
Insurance	0.4023	0.2718	0.3426	0.1740
Real estate and business	0.5314	0.1608	0.1738	0.2100
Public administration and defencse services	0.1995	0.2629	0.1408	0.2293
Sanitary and similar services	0.1856	0.0199	0.0893	–0.0549
Social and related community services	–0.0140	–0.0792	–0.0260	0.0802
Recreational and cultural services	0.2308	0.0823	0.1016	0.1743
Personal and household services	–0.0676	–0.0458	–0.0514	–0.0951
International and other Extra-territorial Bodies	0.1550	0.5363	0.4932	0.5819
Activities not adequately defined	–0.0143	0.1281	–0.0300	0.1832
WASD	0.1472	0.1347	0.1164	0.1202

Table 2C

Industry Wage Differential for Year 1990-91 to 1996-97

Industry	Year 9091	Year 9192	Year 9394	Year 9697
Agriculture, livestock and hunting	–0.0915	–0.1105	–0.1297	–0.0846
Forestry and logging	–0.1857	0.1240	0.2934	0.1318
Fishing	0.6402	0.4193	0.3876	0.4693
Coal Mining	–0.1169	0.2393	0.2104	0.1851
Crude petroleum and natural gas production	0.9430	0.3213	0.2069	0.5736
Crude Metal or Mining	0.2802	0.3205		–0.0143
Other Mining	0.2627	0.2597	0.0449	0.4045
Mfg of food, beverages and tobacco	0.1430	0.1443	0.1393	0.0849
Mfg of textile, wearing apparel and leather industries	0.1499	0.1227	0.1753	0.0988
Mfg of wood and wood products	0.2619	0.1572	0.0441	0.1412
Mfg of paper and paper products	0.1739	0.0959	0.1962	0.2182
Mfg of chemicals and chemical, petroleum, coal, rubber and plastic products	0.2774	0.0420	0.2590	0.3122
Mfg of non-metalic mineral products	0.2387	0.1490	0.1812	0.2495
Basic metal industries	0.1580	0.2718	0.2088	0.1789
Manufacture of fabricated metal products, machinery and equipment	0.0669	0.2129	0.1628	0.1792
Other manufacturing industries	0.0575	0.2495	0.1035	0.2313
Electricity, gas and steam	0.2181	0.2386	0.2632	0.1741
Water work and supplies	–0.1106	0.0655	0.1996	0.0209
Building construction	0.1637	0.1033	0.1739	0.1091
CRM of streets, roads, highways and bridges	0.2432	0.2323	0.1684	0.1512
CRM of irrigation, flood control, drainage, reclamation and hydro-electric project	–0.0606	0.1671	0.2488	0.0677
CRM of docks and communication project	0.1856	0.5684	–0.0936	0.5057
CRM of sports projects	0.1708	–0.1522	–0.0341	
CRM of sewerage, water mains and storm water drains			0.0592	0.2998
CRM of pipe line for transportation	0.0603	-0.1605	0.0472	0.8313
Construction projects				0.2923
Wholesale Trade	0.0081	0.0632	0.1511	0.1652
Retail Trade	–0.0233	0.0090	0.0085	–0.0900
Restaurants and Hotels	0.0683	0.1786	0.1708	0.1053
Transport and storage	0.1993	0.2091	0.2874	0.2758
Communication	0.2419	0.1474	0.2460	0.1456
Financial Institutions	0.4856	0.4435	0.4539	0.4356
Insurance	0.3475	0.1117	0.1309	0.4691
Real estate and business	0.1573	0.1076	0.1620	0.2113
Public administration and defencse services	0.1583	0.2369	0.2542	0.1278
Sanitary and similar services	0.4183	0.0010	0.1661	0.1262
Social and related community services	–0.0942	–0.0121	0.0527	–0.0559
Recreational and cultural services	0.0003	0.3546	–0.0526	0.1330
Personal and household services	–0.0449	–0.0050	0.0358	–0.0444
International and other Extra-territorial Bodies	0.2798	0.2361	0.2443	0.0457
Activities not adequately defined	0.1087	0.1173	0.1192	–0.0580
WASD	0.1183	0.1213	0.1420	0.1181

Table 2D

Industry Wage Differential for Year 1997-98 to 2003-04

Industry	Year 9798	Year 9900	Year 0102	Year 0304
Agriculture, livestock and hunting	–0.0852	–0.1437	–0.1147	–0.0577
Forestry and logging	0.0695	0.3096	0.0893	0.2294
Fishing	0.4518	0.4830	0.5665	0.3564
Coal Mining	0.3990	0.0943	0.2458	0.4359
Crude petroleum and natural gas production	0.4571	–0.9639	0.3554	0.8110
Crude Metal or Mining	0.5248			0.3731
Other Mining	0.5249	–0.0383		0.2280
Mfg of food, beverages and tobacco	0.1507	0.1514	0.1247	0.1570
Mfg of textile, wearing apparel and leather industries	0.1483	0.1565	0.1312	0.0963
Mfg of wood and wood products	0.1808	0.2453	0.1717	0.2739
Mfg of paper and paper products	0.0436	0.0984	0.1041	0.2227
Mfg of chemicals and chemical, petroleum, coal, rubber and plastic products	0.3482	0.3749	0.2743	0.2455
Mfg of non-metalic mineral products	0.2982	0.1323	0.2410	0.1360
Basic metal industries	0.4408	0.3120	0.1934	0.3339
Manufacture of fabricated metal products, machinery and equipment	0.1419	0.3426	0.3722	0.0439
Other manufacturing industries	0.2667	0.3081	0.1988	0.2494
Electricity, gas and steam	0.1754	0.3037	0.2383	0.2318
Water work and supplies	0.1391	0.2193	0.1014	0.0291
Building construction	0.1206	0.1183	0.2406	0.2294
CRM of streets, roads, highways and bridges	0.3152	0.2881	0.2442	0.0932
CRM of irrigation, flood control, drainage, reclamation and hydro-electric project	0.2951	0.0439	–0.0934	0.1406
CRM of docks and communication project	0.2175			0.5194
CRM of sports projects	1.6543			
CRM of sewerage, water mains and storm water drains	–0.1326	0.9728		
CRM of pipe line for transportation	0.6742			
Construction projects	0.0187			
Wholesale Trade	0.2502	0.3075	0.0868	0.1246
Retail Trade	–0.0029	0.0442	–0.0552	–0.1181
Restaurants and Hotels	0.1119	0.1642	0.1764	–0.0042
Transport and storage	0.1526	0.1963	0.2319	0.1964
Communication	0.2233	0.2902	0.2382	0.2700
Financial Institutions	0.5761	0.7153	0.5658	0.6355
Insurance	0.5503	0.2543	-0.0133	0.3532
Real estate and business	0.1713	0.3961	0.4605	–0.0945
Public administration and defencse services	0.1464	0.2391	0.1803	0.1911
Sanitary and similar services	–0.0250	0.2284	–0.0064	–0.0951
Social and related community services	–0.0234	0.1337	–0.1189	–0.1783
Recreational and cultural services	0.5822	-0.1953	0.0684	–0.2146
Personal and household services	–0.1504	-0.0501	–0.0363	–0.0482
International and other Extra-territorial Bodies	1.2532	0.6190	0.9748	0.4788
Activities not adequately defined	0.1606	-0.1292		0.2041
WASD	0.1255	0.1570	0.1447	0.1233

Table 2E

Industry Wage Differential for Different Education Levels

Industry	No Formal Education	Middle but Below Matric	Inter but Below Degree	Degree
Agriculture, livestock and hunting	–0.1096	0.0098	–0.1639	–0.1150
Forestry and logging	0.2163	0.2052	–0.0842	–0.2112
Fishing	0.5721	0.2198	0.3359	–0.0304
Coal Mining	0.1931	0.1180	1.7218	0.2378
Crude petroleum and natural gas production	0.4985	0.7537	0.4417	–0.1711
Crude Metal or Mining	-0.4233		0.1624	–0.0078
Other Mining	0.5218	0.1601		–0.6637
Mfg of food, beverages and tobacco	0.1378	0.1098	–0.0785	–0.2554
Mfg of textile, wearing apparel and leather industries	0.0290	0.0519	0.1201	0.1290
Mfg of wood and wood products	0.1664	0.1420	–0.0391	–0.0896
Mfg of paper and paper products	0.2185	0.0220	0.2541	–0.0017
Mfg of chemicals and chemical, petroleum, coal, rubber and plastic products	0.2684	0.1039	0.2974	0.0821
Mfg of non-metalic mineral products	0.2166	0.0691	0.1256	–0.3608
Basic metal industries	0.3436	0.0799	0.3207	0.0254
Manufacture of fabricated metal products, machinery and equipment	0.2234	0.0999	0.0745	–0.0155
Other manufacturing industries	0.1802	0.0712	0.3997	0.2753
Electricity, gas and steam	0.3531	0.2346	0.1057	–0.1557
Water work and supplies	0.2184	–0.0029	0.1118	–0.3523
Building construction	0.1410	–0.0505	0.6439	0.9474
CRM of streets, roads, highways and bridges	0.2494	0.2842	0.0053	–0.3115
CRM of irrigation, flood control, drainage, reclamation and hydro-electric project	0.1088	–0.0859	0.5212	–0.5553
CRM of docks and communication project	0.3327			
CRM of sports projects	-0.1253	0.1435		0.9758
CRM of sewerage, water mains and storm water drains	0.7316			–0.2154
CRM of pipe line for transportation	0.6612	0.8609	0.2619	
Construction projects	0.2903	–0.2526	0.4838	
Wholesale Trade	0.1221	0.1832	0.0081	0.0208
Retail Trade	-0.0112	–0.1231	0.0956	0.1408
Restaurants and Hotels	0.1609	-0.0783	0.3548	0.3112
Transport and storage	0.2929	0.1303	0.1996	–0.0229
Communication	0.1539	0.1761	0.2675	–0.2797
Financial Institutions	0.6892	0.3560	0.5515	0.1586
Insurance	0.3218	–0.0715	0.1936	0.0681
Real estate and business	0.3001	–0.0892	0.0458	0.0659
Public administration and defencse services	0.3348	0.1639	0.0475	–0.0774
Sanitary and similar services	0.1925	–0.1301	0.4005	–0.0643
Social and related community services	-0.0563	–0.0371	–0.1683	–0.2576
Recreational and cultural services	0.1807	–0.0491	0.2460	0.1162
Personal and household services	-0.0807	–0.1825	–0.0429	–0.1120
International and other Extra-territorial Bodies	0.3992	0.3969	0.2823	0.4474
Activities not adequately defined	0.2466	–0.2526	–0.0583	–0.1952
WASD	0.1438	0.0744	0.1969	0.1777

REFERENCES

Abowd, J. M., and T. Lemieux (1993) The Effect of Product Market Competition on Collective Bargaining Agreements: The Case of Foreign Competition in Canada. *Quarterly Journal of Economics* 108:4, 983–1014.

Abowd, J. M., F. Kramarz, and D. N. Margolis (1999) High Wage Workers and High Wage Firms. *Econometrica* 67:2, 251–333.

Arbache, J. S. (2001) Wage Differentials in Brazil: Theory and Evidence. *The Journal of Development Studies* 38:2, 109–130.

Benito, A. (2000) Inter-Industry Wage Differentials in Great Britain. *Oxford Bulletin of Economics and Statistics* 62, 727–46.

Blinder, A. S. (1973) Wage Discrimination: Reduced Form and Structural Variables. *Journal of Human Resources* 8:4, 436–65.

Björklund, A., B. Bratsberg, T. Eriksson, M. Jäntti, and O. Raaum (2004) Inter-Industry Wage Differentials and Unobserved Ability: Siblings Evidence from Five Countries. (IZA Discussion Paper 1080.)

Deaton, A. (1985) Panel Data from a Time-series of Cross-sections. *Journal of Econometrics* 30, 109–126.

Edin, P. A., and J. Zetterberg (1992) Interindustry Wage Differentials: Evidence from Sweden and a Comparison with the USA. *American Economic Review* 82:5, 1341–49.

Gannon, B., R. Plasman, F. Rycx, and I. Tojerow (2005) Inter-Industry Wage Differentials and the Gender Wage Gap: Evidence from European Countries. (IZA Discussion Paper 1563.)

Gibbons, R., and L. F. Katz (1992) Does Unmeasured Ability Explain Interindustry Wage Differentials? *Review of Economic Studies* 59:3, 515–35.

Goux, D., and E. Maurin (1999) Persistence of Inter-Industry Wage Differentials: A Reexamination Using Matched Worker-Firm Panel Data. *Journal of Labour Economics* 17:3, 492–533.

Hartog, J., R. Van Opstal, and C. N. Teulings (1997). Inter-Industry Wage Differentials and Tenure Effects in the Netherlands and the U.S. *De Economist* 145:1, 91–9.

Helwege, J. (1992) Sectoral Shifts and Interindustry Wage Differentials. *Journal of Labour Economics* 10:1, 55–84.

Haisken-DeNew, J. P., and C. M. Schmidt (1997) Interindustry and Interregion Differentials: Mechanics and Interpretation. *Review of Economics and Statistics* 79:3, 516–21.

Horrace, W. C., and R. L. Oaxaca (2001) Inter-Industry Wage Differentials and the Gender Wage Gap: An Identification Problem. *Industrial and Labour Relations Review* 54:3, 611–18.

Kahn, L. M. (1998) Collective Bargaining and Interindustry Wage Structure: International Evidence. *Economica* 65:260, 507–34.

Krueger, A. B., and L. H. Summers (1988) Efficiency Wages and Inter-Industry Wage Structure. *Econometrica* 56:2, 259–93.

Lucifora, Claudio (1993) Inter-Industry and Occupational Wage Differentials in Italy. *Applied Economics* 25:8, 1113–24.

Oaxaca, R. L. (1973) Male-Female Wage Differentials in Urban Labour Markets. *International Economic Review* 14:3, 693–709.

Reilly, K. T., and L. Zanchi (2003) Industry Wage Differentials: How Many, Big and Significant? *International Journal of Manpower* 24:4, 367–98.

Rycx, F. (2002) Inter-Industry Wage Differentials: Evidence from Belgium in a Cross-National Perspective. *De Economist* 150:5, 555–68.

Rycx, F. (2003) Industry Wage Differentials and the Bargaining Regime in a Corporatist Country. *International Journal of Manpower* 24:4, 347–66.

Slichter, S. (1950) Notes on the Structure of Wages. *Review of Economics and Statistics* 32, 80–91.

Thaler, R. H. (1989) Anomalies: Interindustry Wage Differentials. *Journal of Economic Perspectives* 3:2, 181–93.

Verbeek, M., and T. Nijman (1992) Testing for Selectivity Bias in Panel Data Models. *International Economic Review* 33:3, 681–703.

Walsh, F. (1999) A Multisector Model of Efficiency Wages. *Journal of Labour Economics* 17:2, 351–376.

Comments

This paper estimates the inter-industry wage differentials in Pakistan. The authors very rightly point out that there is paucity of research on this topic and it is important to understand the dynamics of labour markets in Pakistan to make informed policies for labour, skill development etc. The paper starts by saying that it is important to analyse inert-industry wage differential in order to assess the effectiveness of corporate culture and decentralization on different industries and labour market but the paper sheds no light on this problem as the authors do not follow it up.

The review of literature is nicely done, however it misses a couple of studies on wage differentials in Pakistan [Nasir (2000) and Hyder and Reilly (2005)]. The review proposes many testable hypotheses regarding wage differentials (though authors do not put forward their own): (1) Workers with comparable characteristics (education, experience) earn different wages in different sectors; (2) sectoral effects are weaker in countries with strong corporate culture; (3) Efficiency wage mechanism-firms pay higher wages to attract and retain workers and to deter them from shirking; (4) intra-industry wage differentials i.e., within a given industry wages rise with firm size and capital intensity. The empirical part however does not test any one of these hypotheses except for the basic hypothesis about inter-industry wage differentials.

The main finding of the study is that wage differentials exist between workers employed in different industries, even after controlling for individual and job characteristics. The paper, however, does report some interesting results. The public sector wages are found to be higher than the private sector wages. Another result indicates that construction is the best paid industry for the educated while manufacturing industry is best paid for uneducated. These results seem counter-intuitive and it would be nice to have the authors through some light on this peculiar phenomenon.

Lubna Hasan

Pakistan Institute of Development Economics,
Islamabad.

REFERENCES

Hyder, A. and B. Rielly (2005) The Public and Private Sector Pay Gap in Pakistan: A Quantile Regression Analysis. *The Pakistan Development Review* 44:3, 271–306.

Nasir, Z. M. (2000) Earnings Differential Between Public and Private Sectors in Pakistan. *The Pakistan Development Review* 39:2, 111–130.