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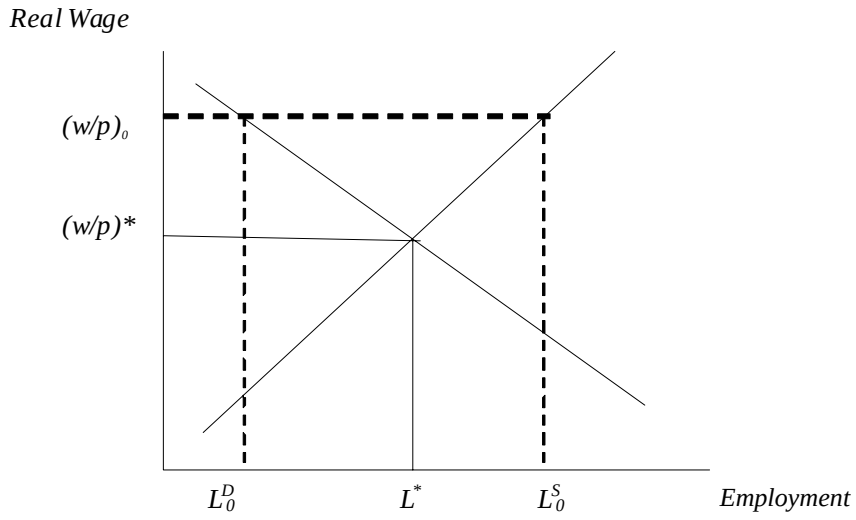
Efficiency Wage Hypothesis—The Case of Pakistan

SYED KANWAR ABBAS and ASAD ZAMAN

I. PROBLEMS WITH THE CLASSICAL THEORY OF LABOUR MARKETS

The goal of this section is to point out the observed difficulties with the classical/neoclassical theory of labour markets. According to classical and neoclassical economics, the labour market is a market like any other market. The equilibrium wage is determined by the intersection of the supply and demand for labour.



It is important to note that the labour supply and demand are determined by real as opposed to nominal wages. As depicted, the equilibrium wage is real $(w/p)^*$ and the equilibrium labour supply is L^*. If this classical theory is correct, then it has

Syed Kanwar Abbas, lives and works in Kasur. Asad Zaman is Director-General, International Institute of Islamic Economics, Islamabad.

several important observable consequences. We list some of them, which are relevant to our study below:

(1) **Theory.** There is no *involuntary unemployment.* All unemployment is voluntary since those who are unemployed are on the portion of the labour supply curve above the equilibrium real wage (w/p)*. This means that these people are willing to work only if the real wage is higher than the equilibrium wage. In particular, anybody who wishes to work at the going wage rate can find a job.

Observation. We find many people who are *involuntarily unemployed.* These people want to work at the going wage rate, but cannot find jobs. A recent Islamic University ad for Naib-Qasids produced a 1000 applicants for 10 positions. All these people were willing to work for the going wage rate, but they could not find jobs at that rate. This is in contradiction to the supply-demand equilibrium theory of classical/neoclassical economics.

(2) **Theory.** Classical theory offers some possible explanations for the observed involuntary unemployment. One is transitional or frictional unemployment. People change jobs for various reasons; firms may expand or contract due to changes in demand for their products. As people transit from one job to another, they may be temporarily unemployed. The unemployment we observe is of this kind—people who are temporarily unemployed and will soon find jobs (as our theory predicts) in equilibrium.

Observation. This means that the condition of involuntary unemployment is only temporary and should not persist for a long period of time. The Great Depression, and many other historical episodes, show that this is not true. Large numbers of people want jobs at existing and prevailing real wage rates, but cannot do so for long periods of time.

(3) **Theory.** Another possibility, closely related to (2) above, is that we may have temporary disequilibrium. The real wage may be higher than the equilibrium wage. In this case we see people who wish to work at the going wage, but cannot find jobs. Such disequilibrium must be temporary according to classical/neoclassical theory. The *mechanism* which will eliminate disequilibrium is the following. Those who are unemployed will offer to work for less than the going wage rate. The firm will have every incentive to hire new workers at lesser wage, and fire/retire other workers who are currently working at a wage above equilibrium. This process will lower the real wage until it reaches equilibrium.

Observation. This process does not seem to work in practice. Even when there were a thousand applicants for the Naib-Qasid job, the university did not reduce the prescribed real wage. Nor did the applicants offer to work for less. Similarly, there are many historical situations where, despite large

and widespread unemployment, the wages of those who are employed are not reduced. Workers equivalent in skill to existing workforce and willing to work for substantially lower wages are not hired.

(4) **Theory.** Real wages depend only on worker characteristics, and not on firm/industry characteristics. There is an aggregate demand for labour (of any type) which is the sum of the demand functions over all the firms. Similarly, there is an aggregate supply curve. The intersection determines the equilibrium wage. A less technical way to make this point is to say that all firms compete in the same market. If one firm offers higher wages than other firms (for unskilled workers, say) all workers will flock to this firm. By the equilibrating mechanism described in (3) above, the excess supply of labour available to this firm will drive down the wage until it reaches equilibrium. Similarly, if one firm offers less than what other firms are offering for unskilled labour, no one will be available to work for the firm and the firm will be forced to increase its wages to hire anyone.

Observation. There are large and persistent wage differentials across industries. Unskilled labourers with equivalent qualifications have different wages in hospitals, construction sector, government sector, etc. Such differences could arise in temporary disequilibrium, but should get eliminated in the long run as wages move towards equilibrium. However, the data shows no such tendency for wage differentials to become less over time.

(5) **Theory.** A large pool of involuntarily unemployed labourers will exert a downward pressure on real wages, but will not have an effect on the productivity of firms.

Observation. While we find that wages are resistant to change even in presence of large pool of unemployed labourers, we find that productivity of the firms increase in presence of such a pool. This is in conflict with the classical/neoclassical view of labour markets.

The above observations show that there are several difficulties with the classical and neoclassical view of how labour markets work. The efficiency wage theory provides an alternative model for labour markets which seems to be more compatible with the observations described above.

II. HISTORICAL BACKGROUND FOR THE EFFICIENCY WAGE HYPOTHESIS

It was the Great Depression which led to the downfall of classical economics. The large-scale unemployment which persisted for a long period of time was impossible to explain by classical theories. One of the key ideas of the classical economists was that the market regulates itself and provides the best possible

outcomes without any interference from the government. It was plain for all to see that the Great Depression was not the best possible outcome—the economy had been capable of functioning in a much better way, providing more goods and services to all of the population. One of the main contributions of Keynes (1936) was to say that the market forces did *not* guarantee full employment. He argued that the labour market was peculiar and different from other markets. One could have large scale and persistent unemployment. Suitable government policy was needed when the effective demand for products was not sufficient to generate full employment. In such situations, appropriate government policy would increase demand and lead to full employment. Keynesian views were dominant in economics until the 70s when classical theories made a comeback. This was possible mainly because the Great Depression had faded from memories of most of the population. Furthermore, problems of stagflation created by the oil crisis showed up some weaknesses in Keynesian theories.

The neoclassicals argued that the labour market *was* just like other markets and *did* reach equilibrium rapidly. It was necessary for them to find an alternative to labour market failure to explain the Great Depression. Friedman and Schwartz (1963), argued that government mismanagement of the money supply led to the Great Depression. Other authors have offered other explanations. See for example Bernanke (2004) who argues that the rigid Gold Standard was the main contribution factor in the Great Depression. The causes for the Great Depression have been hotly disputed and it is not our intent to go into this controversy here. Rather, we will focus on arguments developed in support of Keynesian ideas, sometimes labeled "new Keynesian" economics. One of the key weaknesses of the Keynesian position was the idea that the labour market can stay in disequilibrium for a long period of time—it requires government intervention to fix this problem. Why should this be? Keynes himself did not provide an explanation. He said that wage bargains were conducted in nominal terms rather than real terms, and also that this was not rational, but this was how the world worked. The main justification offered for failure of equilibrium in labour market was "sticky wages". Real wages could not be pushed downwards. Observations from the Great Depression and other episodes of long term high unemployment provided empirical support for this idea, but there was no theoretical explanation of why this should be the case.

Under pressure from the neoclassical attack in the 70s neo-Keynesians tried to defend the idea of sticky wages. They wanted to find an explanation of why the labour market fails to function like other markets. One of the main arguments that has been developed in this context is the "Efficiency Wage" hypothesis. According to this hypothesis, higher wages lead to more efficient performance by the workers. If true, this would explain a lot of the observed phenomena discussed in the previous section. The classical and neoclassical have a strong ideological commitment to the idea the free markets work and provide best possible outcomes for society.

Efficiency wages support Keynesian ideas that government interference is required to fix problems arising from free markets. Therefore neoclassical have strongly resisted the idea of efficiency wages and have attempted to find alternative explanations for these phenomena. They have also attacked the idea of efficiency wages on many different grounds. Our goal in this paper is to review the evidence for and against efficiency wages in the literature, and also especially in the context of the labour market in Pakistan.

III. VARIANTS OF THE EFFICIENCY WAGE HYPOTHESIS

Before proceeding to examine the evidence, we provide some more detail about the efficiency wage hypothesis. Why does paying higher wages increase efficiency? There are many possible mechanisms which have been postulated for this purpose. Each of these leads to a different variant of the efficiency wage hypothesis.

(1) **"Nutritional Efficiency".** An early idea due to Leibenstein (1957) is that the equilibrium wage is so low that workers cannot feed himself and his family properly. In this case he will not have enough energy to work well. Giving him a higher wage will allow him to feed himself and will increase his output at work. If correct, this effect would operate only for low wage earners—white collar workers and other high wage earners should not be subject to this effect. Substantial rise in real wages in the developed countries has reduced or eliminated the number of labourers working at or near the subsistence level, so this hypothesis is no longer seen in the literature. Efficiency wages are seen at higher wage levels as well, so that some other effect must be responsible. Nonetheless, the hypothesis may still have some validity in LDC's where many wage earners earn very low wages. Some empirical evidence for this "nutritional effect" may be available by looking at sick leaves and/or medical insurance payments for low wage earners and comparing them with the same for high wage earners.

(2) **The Adverse Selection Model.** This model, due to Weiss (1980), assumes that better workers have better alternative offers. Firms set higher wages to attract a large "hiring pool'' of the applicants who are heterogeneous in their ability to work and, in this way, they select the best workers from large pool. Firms have an incentive to pay higher wages if there is positive correlation between the average quality of the worker and wage rate. Simply, firms like to have a good pool of applicants for their jobs so that they may select among them. If the firm does a good job at selection via its tests and interviews, it will be able to pick up workers of better quality than otherwise. This gives the firm incentive to offer higher than equilibrium wages.

(3) **The Gift Exchange Model.** Partial gift exchange hypothesis by Akerlof (1982, 1984) is an efficiency wage theory based on sociological factors. This model takes into account 'non economic variables'. Akerlof argues that people will work hard with higher wages when there is even no threat of dismissal from job. He interprets the model as a "gift-exchange" between the firm and its workers. Simply, when firms pay higher wages in excess of the competitive wage, the workers feel obliged and reciprocate with repaying in the form of the gift of higher effort level. According to the basic idea of the "labour market as partial gift exchange", the loyalty of workers is exchanged for high wages, and this loyalty results in high productivity of the firm.

(4) **Fair Wages.** This model was developed by Akerloff and Yellen (1990). Workers have some fair-reference wage, and firms have an incentive to pay wages that are closer to worker's fair reference wage. Firms which pay less than the fair wage create dissatisfaction, low morale, high quit rates, shirking and absenteeism on the job, as therefore receive less productivity from their workers. Fair reference wage depends upon a number of factors as given below:

   (i) Fair reference wage may correlate with firm's profit opportunities and hence high profit firms are forced to pay higher wages to draw out the required level of effort.
   (ii) If higher profit opportunities are associated with higher marginal product of effort, firms have an incentive to exploit higher profits by paying higher wages more than competitive wages.
   (iii) Fair reference wage may depend upon the previous wage periods and wages paid to the workers across different firms with similar human characteristics like age, education etc.

(5) **The Shirking Model.** This version of Efficiency Wage Theory has been developed by Shapiro and Stiglitz (1984), Bowles (1985), Fehr (1986) and others. The problem confronting the employers is to minimise shirking because employees shirk on their jobs whenever they find opportunity. Monitoring is imperfect and costly for the firms so the payment of wages to the workers in excess of the current competitive market wage is an effective way to discourage shirking. At the competitive wage, workers fired for shirking can easily find other jobs at the going wage rate. In equilibrium, all workers are paid above the market-clearing wage and, as a result, the consequent unemployment acts as a 'worker discipline device'. In this way, cost of job loss will increase the firm's output. The firm can hire a worker at low wage but it knows that it is in favour of worker to shirk on the job. Another hypothesis associated with the Shirking Model is that firms should pay high wages to the workers in the occupation where poor work performance can cause larger damage to the firm. [Romaguera (1991)].

III. WAGE DIFFERENTIALS ACROSS INDUSTRIES

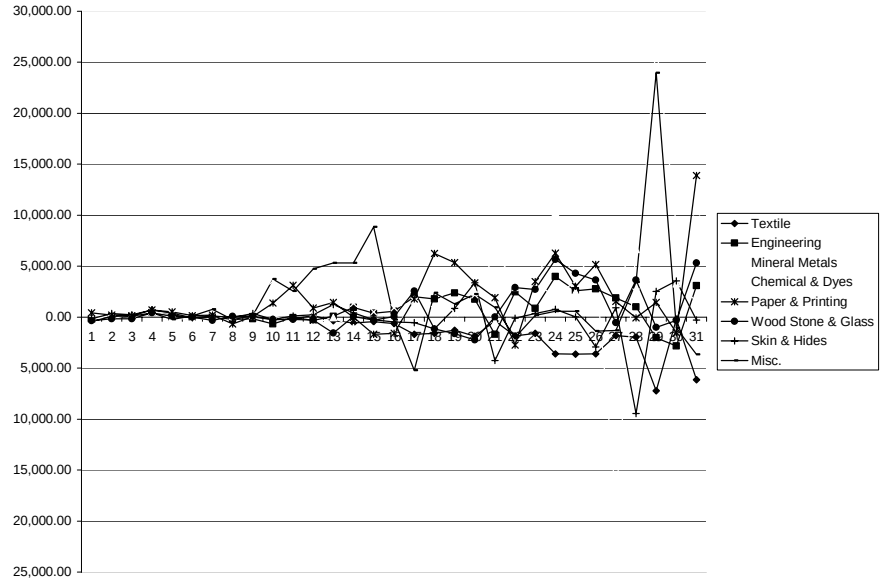
An important piece of evidence in favour of the EWH is that there are stable and persistent differentials in real wages across industries. Early studies which established the existence of such differentials were Slitcher (1950) and Dunlop (1957). More sophisticated recent studies will be discussed later. If labour is homogenous, and job characteristics are the same, then this observation contradicts the neoclassical theory which maintains that there should be only one equilibrium wage in the labour market as a whole. This section examines the data on wage differentials in the context of Pakistan.

For Pakistan, Nasir (2000) has calculated wage differentials taking into account personal and structural factors that determine compensation package for public and private sector. He concluded that private sector pays higher wages for the identical characteristics.

Based on annual industry level wage data given in government publication *50 Years of Pakistan*, we analysed wage differential in eight industries for which a complete time series from 1964 to 1994 was available. These were Textile, Engineering, Minerals and Metals, Chemical and Dyes, Paper and Printings, Wood Stone and Glass, Skin and Hides and Miscellaneous. The data is given in the table below:

Year	All	Textile	Eng.	Mineral and Metals	Chemical and Dyes	Paper and Printing	Wood Stone and Glass	Skin and Hides	Misc.
1964	1564	1387	1381	1377	1491	1999	1217	1390	1113
1965	1452	1473	1502	1645	1280	1665	1283	1801	1529
1966	1572	1730	1660	1583	1835	1733	1401	1818	1641
1967	1131	1822	1582	1660	1721	1836	1547	1825	1553
1968	1644	1897	1625	1553	1966	2166	1727	2027	1432
1969	1887	1811	1885	1656	2033	2046	1864	1802	1998
1970	1833	1716	1859	1711	2012	2027	1525	1934	2584
1971	1807	1855	1594	1864	2533	1161	1882	1754	1544
1972	1955	1969	1786	2091	2153	1994	2043	2322	2141
1973	3036	2766	2378	3199	6578	4421	2802	2824	6773
1974	3630	3458	3577	3138	4521	6752	3392	3749	6185
1975	4243	4394	3911	3616	4667	5135	3967	4483	8981
1976	4661	4325	4731	4619	5669	6122	3095	5895	9971
1977	5860	5284	6807	4842	7217	5837	5913	6276	11185
1978	7346	6910	7747	6183	7874	5665	7046	7075	16190
1979	7600	6976	8185	6239	8532	6005	7647	7115	7334
1980	7099	5420	9106	8866	8657	8893	9668	6574	1902
1981	7527	5940	9313	8437	8273	13767	6367	6387	9899
1982	8436	7157	10806	12363	8853	13800	6822	9281	9726
1983	9023	7165	10787	11484	11217	12375	6799	12389	11284
1984	8561	8193	6879	8095	14715	10471	8594	4303	9525
1985	10579	8758	13054	13516	14319	7843	13479	10478	8602
1986	11138	9542	12005	13491	14557	14623	13867	11501	11324
1987	13905	10313	17889	24176	15860	20186	19568	14656	14499
1988	13571	9930	16153	16032	17127	16592	17860	13596	14137
1989	15477	11866	18250	20014	22547	20625	19126	12567	14100
1990	20820	19008	22687	2969	27889	22344	20299	21749	19517
1991	16314	14365	17330	22976	18776	16254	19967	6851	19746
1992	24259	17042	22234	21564	51179	25719	23249	26801	48217
1993	18019	17828	15197	21280	26837	16495	17691	21578	16961
1994	23469	17330	26560	25037	33082	37368	28776	23187	19801

A graph of the differences between the sectoral wage and the overall average across all industries is presented below. While there is widespread fluctuation in these wages, there does not seem to be any overall stability or persistence in the differences across industries. This is in contrast to the evidence from USA, where there are stable and persistent differences in wages across industries. A number of different methods were tried to assess the existence of a wage differential. In all cases, the textile industry appeared to offer significantly different wages from the rest, while in all other industries, there was no significant differential between the industry specific wage, and the overall wage in all industries. Below we indicate two methods, both of which led to this same conclusion.



Method 1. The graph of the wages clearly shows that there is substantial and increasing heteroskedasticity with time. Let $Wi(t)$ be the wage in the ith industry in year t, and let $W(t)$ be the overall wage in all industries. According to conventional theory, any difference between the wage in the ith industry and the overall wage $Di(t) = Wi(t)–W(t)$ can only be due to chance and random fluctuations. In particular, there should be no relation between $Di(t)$ and $Di(t–1)$. Thus, in a regression of $Di(t)$ on $Di(t–1)$, the coefficient on Di(t–1) should not be significant. In running this regression, it is crucial to take care of the heteroskedasticity which is evident from the graphs of the wage data. A number of ways of estimating the standard deviation and adjusting the data for heteroskedasticity were tried, all of which led to the same result. In all cases, the regression coefficient of $Di(t–1)$ was not significant *except* for the textile industry. The table below presents the coefficient estimates for the eight

regressions of $Di(t)$ on $Di(t–1)$. For heteroskedasticity, we partitioned the data in three time periods: (i) 1964-72, (ii) 1973-86, and (iii) 1987-96. For the three periods, we estimated the standard errors to be std(1)=220, std(2) = 2200, std(3) = 5500. The data was divided by these estimated standard errors prior to running the regressions reported in Table 1.

Table 1

	Coefficients	Standard Error	*t*-stat	*P*-value	Eight Regressions
Intercept	–0.07	0.14	–0.55	0.59	Let TW*(t) be the wage in Textiles in year t divided by Std. Error. We regress TW*(t) on constant and TW*(t–1). The constant is estimated to be –0.07, with t-stat –0.55. The coefficient on TW*(t–1) is 0.51 with the only significant t-stat (3.01) in the table.
Textile	0.51	0.16	3.09	0.00	
Intercept	0.19	0.13	1.52	0.14	
Engineering	0.23	0.18	1.27	0.21	
Intercept	0.28	0.21	1.34	0.19	
Mineral Metals	–0.07	0.19	–0.36	0.72	
Intercept	0.97	0.29	3.34	0.00	
Chemical and Dyes	0.16	0.19	0.86	0.40	
Intercept	0.44	0.26	1.69	0.10	
Paper and Printing	0.31	0.18	1.70	0.10	
Intercept	0.09	0.14	0.66	0.51	
Wood Stone and Glass	0.27	0.17	1.60	0.12	
Intercept	0.25	0.19	1.30	0.20	
Skin and Hides	0.11	0.19	0.57	0.57	
Intercept	0.77	0.32	2.41	0.02	
Misc.	0.05	0.18	0.29	0.77	

Except in the case of Textiles, the coefficients on last periods wage differential are not significant, showing that fluctuations away from overall average wage do not persist, and are temporary only. However, the differential between the textile wage and the overall industry wage is significant and also persistent across time.

Method 2. Another way of taking care of heteroskedasticity is to look at the rate of change. Define $di(t) = \log(Wi(t)/W(t))$ to be the log of the ratio of the wage in the ith industry to the overall industry average. If wages across industries conform to the competitive labour market theory, then $di(t)$ should be a purely random fluctuation, unrelated to $di(t–1)$. If there are significant differences in wages across industries, then the regression of $di(t)$ on a constant and $di(t–1)$ should yield a significant coefficient for $di(t–1)$. Running these regressions led to the same result as before—only the textile industry had a significant coefficient on lagged wage differential, while the other industries conformed to the competitive model.

	Coefficients	Standard Error	*t*-stat	*P*-value	Eight Regressions
Intercept	–0.05	0.03	–1.58	0.13	This table gives the results for regressions of di(t) on di(t-1) for each of the eight sectors indicated. The first two lines show that di(t)= -0.05+0.53 di(t-1) for the textile industry. The coefficient 0.53 of lagged di=ln(Wi/W) is significant only for the textile industry and not significant in all other industries.
Textile	0.53	0.17	3.14	0.00	
Intercept	0.04	0.03	1.60	0.12	
Engineering	0.27	0.18	1.52	0.14	
Intercept	0.01	0.08	0.13	0.90	
Mineral Metals	–0.15	0.19	–0.81	0.43	
Intercept	0.21	0.05	3.81	0.00	
Chemical and Dyes	0.14	0.18	0.80	0.43	
Intercept	0.11	0.05	2.11	0.04	
Paper and Printing	0.31	0.18	1.67	0.11	
Intercept	0.02	0.03	0.58	0.57	
Wood Stone and Glass	0.33	0.17	1.91	0.07	
Intercept	0.01	0.05	0.15	0.88	
Skin and Hides	–0.06	0.19	–0.34	0.73	
Intercept	0.11	0.08	1.42	0.17	
Misc.	0.28	0.18	1.58	0.13	

Overall, we may summarise our findings for Pakistan by concluding that the wage differential for the textile industry appears to be stable and persistent across time, contrary to the neoclassical theories of the labour market. Other industries appear to conform to the competitive labour market structure, with wage differing by random and non-persistent amounts from the overall wage average.

Since the finding of wage differentials has been well established on US data, there has been substantial work on explaining why these wage differentials arise. Several explanations which conform to the neoclassical theory have been offered—these allow one to defend the neoclassical idea of efficiency of markets. Other explanations consistent with the efficiency wage hypothesis have also been offered. For a more complete discussion of the strengths and weaknesses of these alternative explanations for persistent and stable differentials in industry wages, [see Abbas (2006)]. It would be worth exploring in future research why the wages in the textile sector differ significantly from overall wages in over the time period examined in Pakistan, and also why there are no significant differences between wages in the other industries.

V. EFFICIENCY WAGES IN THE TEXTILE SECTOR IN PAKISTAN

From our preliminary investigation of the wage differential, it appears that the textile industry offers efficiency wages, while the others are competitive. In this

section, we do a direct test of the efficiency wage hypothesis for the textile sector, replicating similar studies by Wadhwani and Wall (1991), and Levine (1992). We test the efficiency wage hypothesis at industry level rather than at the firm level because data is not available at firm level in Pakistan. A regression of log (Q), output of the textile industry, on capital, labour, and the relative wage variable log (W/W^*), W is wages and W^* is the Average Wage level in textile industry yields the following estimates:

$$\text{Log}(Q) = 3.93+0.13\ \text{Log}(K)+0.60\ \text{Log(E)}+0.60\ \text{Log}(Wi/W)+\text{error}\ [R^2=0.985]$$
$$(1.08)(0.07)\qquad(0.87)\qquad(0.04)\qquad(0.082)$$

The numbers in parentheses are the standard errors. All coeffients are significant at levels above 99 percent except the coefficient of Log(K) which has a p-value of 6.9 percent.

Data and Variables. The data used in this regression is obtained from various issues of Censes of Manufacturing Industries (CMI) for 19 years. The variables are:

- Q: the value of production of Textile industry (Rs million) at the end of the year.
- K: We use value of fixed assets (Rs million) at the end of the year.
- E: the reported number of workers.
- Wi: is calculated by dividing sum of total employment costs (Rs million) by Average number of workers employed during the year for textile industry.
- W: is the Average Wage level in the manufacturing industry.

We use manufacturing price index with 1980-1981 as base year to deflate.

Discussion of Results. Our coefficients on all the variables are positive, significant and plausible in magnitude. The sum of the coefficients on capital and labour is nearly unity, so that constant returns to scale is observed. The key observation is that the coefficient on log (Wi/W) is positive and significant. According to neoclassical theory, the inputs of Capital and Labour determine the output, and coefficient of the wage ratio should not be significant. Indeed, the wage ratio Wi/W should be one in equilibrium and differences from 1 only represent temporary disequilibrium which should not impact on production. The significant positive coefficient corresponds to the prediction of efficiency wage hypothesis, according to which higher than equilibrium wages will result in increased output. Our estimated coefficient for log (Wi/W) is (.60) [t-ratio, 14.89]. In comparison, Levine reports (.46), Wadhwani and Wall (.39), Huang, Hallam, Orazem and Pater (1998) estimate ranged between (.19) to (.61) and Şeref Saygili (.15). Our high coefficient shows that there is a significant impact of increased wages on productivity.

Solow Condition. Profit maximisation in an efficiency wage setting requires that the productivity gain from increasing wages should exactly offset the loss due to increased wage bill. It can be shown that this requires the coefficients of *E* and *Wi*/*W** to be the same. This well-known result of the standard efficiency wage model is due to Solow (1979) and is known as the Solow condition. The efficiency wage theory suggests that Solow condition holds which implies that percent change in wage should lead to percentage change in effort level to such an extent it will be unity. However, if it does not hold, equilibrium is not achieved with unemployment in Efficiency wage models [Akerlof and Yellen (1986)].[1] Imposing the Solow condition, the results for the constrained regression are as follows:

$$\text{Ln}\,(Q)=5.39+\underset{(0.43)}{0.12}\,\text{Log}(K)+\underset{(0.07)}{0.60}\,\text{Log}\,(E)+\underset{(0.04)}{0.60}\,\text{Log}\,(Wi/W)+\underset{(0.04)}{\text{error}}\,[R^2=0.0984]\quad(0.085)$$

The *F*-statistic for the constraint is 1.04 with *p*-value 0.37, comfortably far from rejection.

Thus it appears that the Solow condition holds for efficiency wages in the textile industry. This contrasts with findings of Saygili (1998) for the Turkish cement industry, where the estimated coefficient on wages is significantly smaller than the estimated coefficient on labour input. Similarly, Wadhwani and Wall (1991) also report that for selected UK manufacturing industries, the coefficient on relative wage (.39) is significantly less than the estimated coefficient on labour input (.65). Thus, while efficiency wages are present, the Solow equilibrium condition for efficiency wage models does not hold in the Turkish cement industry or in the UK manufacturing industries tested.

Effects of Unemployment. Conventional propositions of the standard neoclassical theory hold that the outside changes in the cluster of unemployment do not affect productivity of the firm. Conversely, the efficiency wage hypothesis suggests that the outside rates of unemployment have an impact on productivity of the firms. In this context, in earlier nineties, the effect of rate of unemployment on firm's productivity was analysed. Wadhwani and Wall (1991) using OLS and GMM techniques test the impact of unemployment on productivity with Cobb-Douglas production function with the data from published accounts of 219 UK manufacturing companies over the period 1972-1982. Efficiency wage hypothesis requires that the outside cluster of unemployment positively affects the output of the firm. Their findings show that the coefficient of unemployment is positively signed and statistically significant (.05) (2.12). On the other hand, when Huang, *et al.* (1998) add unemployment rate to the regression, the unemployment output elasticity is positive and ranges from (.06) to (.11) which are also consistent with efficiency wage hypothesis.

[1]For details see Akerlof and Yellen (1986) who discuss that there can be situations where 'equilibrium effort-wage elasticity' can be lower.

In contrast to these typical findings reported above, unemployment, when added to the equation for textile industry in Pakistan, does not have significant coefficients. Thus, in contrast to predictions of the efficiency wage theories, outside pool of unemployment does not increase productivity in the textile industry in Pakistan. This finding supports "Fair Wage" and "Gift Exchange" models, but not the "Shirking Model" since large pools of unemployment would increase losses from shirking. Alternatively, at sufficiently high levels of unemployment, the loss from being fired may be so high that no one shirks. In such cases, further increases in unemployment would not change productivity. More investigation is needed to discover exactly why unemployment fails to affect productivity in the textile sector in Pakistan.

VI. CONCLUSIONS

Our main findings are that the textile sector in Pakistan offers efficiency wages, which differ significantly from overall average industrial wages. Other industries appear to be competitive, in that their wages do not differ significantly from overall industrial wages. Further investigation is needed to discover factors which result in efficiency wages in the textile sector but not in the other sectors. A direct estimate of the production function shows that the ratio of wages in textile industry to average wage level significantly affects textile production. This is impossible according to neoclassical theory, since their should be no significant differences between wages in textile sector and overall industrial wage. Efficiency wage theory predicts a positive coefficient for this variable, and also suggest that the coefficient on relative wage should equal that of log(labour)—the Solow equilibrium condition. While typical estimates in literature reject the Solow condition, our estimates for Pakistan accept the Solow condition. We also find that the outside pool of unemployed labour does not affect productivity in the textile sector. Again this last result is in contrast with typical findings in the literature. Thus, our investigation of efficiency wages in Pakistan show strong empirical support for the hypothesis, together with interesting local variations from results reported elsewhere. Further research is needed to determine the reasons for the variations.

REFERENCES

Abbas, Syed Kanwar (2006) Efficiency Wage Hypothesis in Pakistan. M.Phil Dissertation. International Islamic University, Islamabad, Pakistan.

Akerlof, George (1982) Labour Contracts as Partial Gift Exchange. *Quarterly Journal of Economics* 97:4, 543–63.

Akerlof, George (1984) Gift Exchange and Efficiency-Wage Theory: Four Views. *American Economic Review* 74, 79–83.

Akerlof, George, and Janet Yellen (1986) *Efficiency Wage Models of the Labour Market.* Cambridge: Cambridge University Press.

Akerlof, George, and Janet Yellen (1990) The Fair Wage-Effort Hypothesis and Unemployment. *Quarterly Journal of Economics* 105, 255–283.

Bernanke, B. S. (2004) *Essays on the Great Depression*. Princeton University Press.

Bowles, Samuel (1985) The Production Process in a Competitive Economy: Walrasian, Neo-Hobbesian and Marxian Models. *American Economic Review* 75, 16–36.

Dunlop, J. (1957) The Task of Contemporary Wage Theory. In J. Dunlop (ed.) *The Theory of Wage Determination*. London: Macmillan.

Fehr, Ernst (1986) A Theory of Involuntary Equilibrium Unemployment. *Journal of Institutional and Theoretical Economics* 142, 405–430.

Friedman, M., and A. Schwartz (1963) *A Monetary History of the United States.*

Huang, Tzu-Ling, Arne Hallam, Peter F. Orazem, and Elizabeth M. Peter (1998) Empirical Tests of Efficiency Wage Models. *Economica* 65, 125–43.

Keynes, J. M. (1936) *General Theory of Employment, Interest, and Money.*

Leibenstein, H. (1957) The Theory of Underdevelopment in Densely Populated Backward Area. In H. Leibenstein (ed.) *Economic Backwardness and Economic Growth*. New York: Wiley.

Levine, David (1992) Can Wage Increase Pay for Themselves? Test with a Production Function. *The Economic Journal* 102, 1102–15.

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

Pakistan, Government of (Various Issues) *Census of Manufacturing Industries*. Islamabad: Federal Bureau of Statistics.

Pakistan, Government of (Various Issues) *Economic Survey*. Islamabad: Economic Advisor's Wing, Ministry of Finance.

Romaguera, Pilar (1991) Wage Differentials and Efficiency Wage Models: Evidence from the Chilean Economy. University of Notre Dame. (Kellog Institute Discussion Working Paper No. 153.) <http://kellogg.nd.edu/publications/workingpapers/>

Saygili, Şeref (1998) Is the Efficiency Wage Hypothesis Valid for Developing Countries? Evidence from the Turkish Cement Industry. Studies in Economics, University of Kent at Canterbury, Kent. (Discussion Paper No. 9810.)

Shapiro, and Joseph Stiglitz (1984) Equilibrium Unemployment as a Worker Discipline Device. *American Economic Review* 74, 433–44.

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

Solow (1979) Another Possible Source of Wage Stickiness. *Journal of Macroeconomics* 79–82.

Wadhwani and Wall (1991) A Direct Test of the Efficiency Wage Model Using U.K Micro-Data. *Oxford Economic Papers* 43, 529–48.

Weiss (1980) Job Queues and Layoffs in Labour Markets with Flexible Wages. *Journal of Political Economy* 88, 526–38.

Comments

The paper under discussion tests the Efficiency Wage Hypothesis (EWH) for the textile industry of Pakistan and concludes that for the period under study there is empirical evidence to support the EWH. In view of strengthening the overall theoretical and empirical analysis presented in the paper, the following points need to be taken into consideration by the authors:

(1) It is not clearly mentioned in the paper as to what is the period under study. Which year's Census of Manufacturing Industries (CMI) has or CMIs have been used. Table 2 gives summary statistics for the variables used but does not mention the source of data. What is U? (Mean U=1.03 ??) Is source of data on unemployment, the Labour Force Survey and if so, for which year?

(2) Regarding stable and persistent differentials in real wages across industries, the Table on Page 7 gives correlation coefficients for wages across industries in Pakistan. Given that the EWH is being tested specifically for the textile industry in Pakistan, how valid is the inference drawn from the correlation coefficients for the aggregate industry wage data.

(3) On Page 8, the authors claim that their research confirms the basic idea that workers with similar characteristics receive different wages in different industries. How are they controlling for similar characteristics, especially if this result is being inferred from the simple correlation coefficients in the Table on Page 7.

(4) How realistic is the perceived linkage from higher wages to higher productivity, (according to EWH), given that the thrust of current macroeconomic and socio-economic policy and planning framework in Pakistan is on promoting skill development linked with higher productivity leading to higher wages and lower unit costs of production!

(5) According to the LFS 2003-2004, the overall labour force profile of the Pakistani labour force reveals that only 13.73 percent of the employed persons 10 years and older are employed in the manufacturing industry (11.25 percent male + 2.49 percent female) in contrast with 43.05 percent employed in the agriculture sector. The authors should contextualise their results for the textile industry with the distribution of the employed labour force in Pakistan.

(6) Even though the paper does not contain any policy recommendations, it is worth noting that it draws attention to the importance of a Wage Monitoring Mechanism both at the aggregate as well as at a disaggregated level, especially in the context of tracking the wage-productivity relationship.

(7) As part of the on-going labour policy reform, the Government intends to build upon the institutional arrangements under the labour policy framework by establishing a National Wage Commission to work on a range of wage-related issues, including minimum wages. The purpose, specific functions, and operational arrangements for the National Wage Commission, including its technical and secretariat support requirements, will be elaborated in a separate and detailed policy paper to be prepared in close consultation with employers' and workers' organisations.

Aliya H. Khan

Quaid-i-Azam University,
Islamabad.