Efficiency Wage Hypothesis in Pakistan

By

Syed Kanwar Abbas

A DISSERTATION

SUBMITTED TO

International Institute of Islamic Economics

International Islamic University, Islamabad.
Pakistan
2006 A.D (1427)

بسم الله الرحمن الرحيم

MASTER OF PHILOSOPY
(Economics)   2006

International Islamic University
Islamabad

TITLE: *Efficiency Wage Hypothesis---The Case of Pakistan*

AUTHOR: SYED KANWAR ABBAS

SUPERVISORY COMMITTEE:

Prof. Dr. Asad Zaman ———————————————Supervisor
Prof. Dr. Ramzan Akhtar   Internal Supervisor
Prof. Dr. Mueen Nasir   External Supervisor

DATE OF VIVA VOCE EXAMINATION: November 15, 2006

This thesis has been accepted (towards partial fulfillment of the requirements for award of degree of MASTER of PHILOSOPHY in Economics) as an evidence of the candidate's ability to do independent research. The satisfaction of the committee members and the external examiner does not necessarily mean endorsement of/agreement with the conclusions of the thesis.

Acknowledgment

Abstract

The Efficiency Wage Hypothesis is tested on Pakistani data. We analyze the inter-industry wage structure and wage differentials among industries. Dispersion in industry wages is very high ranging from .15 to .42 for Pakistani economy. Our results confirm the findings of Krueger and Summers (1988) who suggest that developed countries have larger variation in wages than LDC's. We find that variation in wages increases as development takes place over time. There is no secular trend in the inter-industry wage structure over 30 years in Pakistani data, although there is some evidence of increasing fluctuations. It has also been found that the only textile sector appears to offer efficiency wage because their wages differ significantly from overall average industrial wage. However, other sectors conform to the neoclassical competitive labor market theory. Contrary to classical/neoclassical theory but in conformity with the efficiency wage hypothesis, for Pakistani industrial wages we find that the output elasticity with respect to wage is positive and statistically significant. Moreover, the 'Solow Condition' [Solow (1979)] holds: in equilibrium, the marginal cost of increasing wages is exactly offset by the increased productivity of labor due to the higher wages. Earlier authors (like Saygili (1998), Huang *et al* (1998) etc.) have rejected the Solow condition in their empirical studies on the efficiency wage. A typical finding (Wadhwani and Wall (1991), Huang *et al* (1998), and others) of the efficiency wage literature is that that increased unemployment leads to increased productivity of firm workers – effort is increased because the greater cost and risk of job loss. However, we could not document this effect in Pakistani aggregate data. In general, all of our findings for Pakistan gave strong support to the efficiency wage hypothesis and went against the predictions of the neoclassical theory.

Contents

List of Tables

List of Figures

CHAPTER # 1

Introduction

1.1 Foundations of the Classical/neoclassical Theory and Efficiency Wage Hypothesis

According to classical and/or neoclassical labor theory, there is no involuntary unemployment and workers who are willingly to work get jobs in the labor market. Wage rate is determined by the intersection of supply and demand schedules and equilibrium wage will be automatically restored.
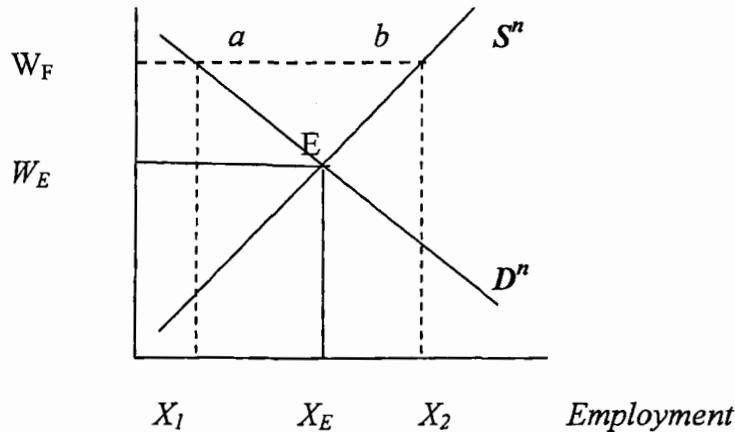
The supply of labor (S^n) and demand for labor (D^n) are determined by real wages. W_E is the Competitive or equilibrium wage and X_E is the equilibrium employment. From this figure, the Classical Model (CM) suggests the following important propositions:

CM.1   There is no involuntary unemployment at X_E in the labor market. Workers get jobs at the competitive wage W_E. However, there can be voluntary unemployment i.e. workers themselves are not willingly to work at going wage rate/ competitive wage.

CM.2   If there is involuntary unemployment in the labor market, it will be transitory or frictional unemployment. The excess supply of labor will put down ward pressure on wage rate and ultimately it converges towards W_E.

CM.3   There will be same wage i.e. competitive wage for identical workers on the similar jobs. It implies that there will be no wage differentials for equivalent workers.

CM.4   Wage rate depends upon workers characteristics (i.e. education, age, skill, experience etc.) and not on industry affiliation.

CM.5   The amount of unemployment (X_2-X_1) does not affect the productivity of the firm. Moreover, this excess supply of labor exerts a downward pressure on the wage rate.

Contrary to classical/neoclassical theory, efficiency wages (EW) suggest that there will be involuntary unemployment (Eb) and workers who want to work at the going wage rate remain unemployed in the labor market. Firms willingly pay high wages $W_F> W_E$ to workers. Efficiency wage models predict that:

EW. 1   Wages are endogenous to a firm's own optimizing behavior and wage rate is not determined by the forces of supply and demand in the labor market.

EW. 2   Firms pay high wage (more than competitive wage) to elicit higher effort level from workers. The consequent unemployment works as 'discipline device'

EW. 3   Firms do not cut wages even in the presence of out side unemployment because they know that it will reduce effort level, hurt morale etc.

EW. 4   The effort level per worker is a function of real wage. The relationship between wages and productivity do not remain same across industries. Therefore, there will be wage differentials for identical workers in the labor market.

EW. 5   Contrary to classical/neoclassical theory, the quantity of unemployed workers affect productivity of firms.

1.2 Research Design

1.2.1   Motivating Factors of the Study

The simple neoclassical characterization of a single aggregate labor market with instantaneous labor mobility, little unemployment and perfect wage equality for equivalent workers contrasts with the complexities of the actual labor market.

The law of one salary is the notion that workers with same attributes receive the same compensation package as per the law of one price which states that one object cannot be sold at two different prices postulating the absence of transaction and transportation cost. However, the persistent existence of wage differential is observed in the labor market and workers having same attributes (i.e. age, education, experience etc.) performing the same work in the same locality receives different wages. Economists have consensus on the

existence of wage differentials [1] but the consensus on the explanation of wage differentials has not been developed yet. Its explanation is differently described through the lens of the competitive and non-competitive theories (i.e. Efficiency Wage Models).

1.2.2 Significance and objectives of the study

This is a unique study in its nature, which concentrates on the theoretical basis of the competitive and non-competitive models and puts together the results of the laboratory examination, the empirical examination and the field survey examination on the efficiency wage hypothesis from the extensive literature in a symmetric way. This investigation also pins down the old and new controversial developments from the enormous literature. Precisely, the present study is marked by the following purposes:

1. It is important to analyze issue of the persistent existence of involuntary unemployment and wage differentials through the lines of the economic theory and efficiency wage hypothesis.

2. It is necessary to examine alternative models of the efficiency wage theories to see if any of these models can explain the inter-industry wage pattern.

3. We plan to review the theoretical and empirical controversies among economists on efficiency wage theories.

4. We plan to test the main predictions of the efficiency wage hypothesis with the empirical data and field survey examination in Pakistan.

5. We plan to analyze stability and pattern of the inter-industry wage structure.

---

[1] Fehr and Gachter (1998)

6. We plan to study the near rational behavior, which deviates from full optimization level and pin down the psychological and sociological insights behind this kind of behavior.

1.3 Plan of the Thesis

Chapter 1 includes introduction, research design, and plan of the thesis.

In Chapter 2, we attempt to trace out some important empirical evidences which are contrary to the classical/neoclassical theory but consistent with the efficiency wage hypothesis. We report that contrary to classical/neoclassical theory, it is observed that market forces do not ensure full employment and workers are unable to get jobs at the going wage rate (i.e. the equilibrium wage). This situation is not temporary and the forces of supply and demand do not correct this disequilibrium. The outside involuntary unemployment does not reduce wages rather it affects productivity of the firms. We also discuss neoclassical point of view about market efficiency, existence of wage differentials for identical workers and criticism on efficiency wage hypothesis. Moreover, we also check compatibility of the empirical findings with experimental laboratory results on the efficiency wage hypothesis and report that the experimental studies are consistent with the earlier empirical results of the efficiency wage hypothesis.

Chapter 3 presents an analysis of the interindustry wage structure and wage differentials for Pakistani economy over period of 30 years. We use different measures of dispersion to analyze the interindustry wage structure. We also run different regressions for the family of Pakistani industries. These industries include Textile, Engineering, Mineral and Metals, Chemical and Dyes, Paper and Printings, Wood stone and Glass, Skin and Hides and Miscellaneous. Here, we test the neoclassical claim that differences in the specific industry

and the overall average wage will be a chance or random phenomena. It implies that there will be no wage differentials and, in each period, wages are exogenously determined. Conversely, the efficiency wage hypothesis suggests that there will be a pattern in wages and these differences in wages are not subject to the chance or random fluctuation because determination of wages is endogenous to firms. We find that the neoclassical claim does not come to true and the wages of the textile sector significantly differ from the overall average wage. However, the other industries appear to confirm the neoclassical Proposition.

In Chapter 4, we plan to direct estimate the production function for the textile sector which offers significantly different wages from rest of the industries. Here the claim of the neoclassical theory is tested that it is the only capital and labor inputs which determine output where as wage does not do so. It means that the coefficient on wage should not be statistically significant. Contrary to neoclassical theory, we find that wage level is a significant factor in determining output as per efficiency wage hypothesis. Moreover, the 'Solow Condition' (i.e. the equality of two coefficients of employment and wages) also holds in our present case of Textile sector. This contrasts with Saygili (1998) and Huang *et al* (1998). However, the coefficient of unemployment is not statistically significant in this investigation which is also contrary to the findings where it does in the literature like Wadhwani and Wall (1991), Huang *et al* (1998) etc.

In Chapter 5, we discuss the findings of our field survey study which tests basic predictions of the efficiency wage hypothesis in the labor market. We select workers associated with multiple professions to test the explanatory power of the efficiency wage hypothesis. These are skilled or unskilled workers working in the hotels, construction sector, PCOs, harvesting in agricultural fields, from pharmacy and medical clinics, loading luggage etc. Contrary to neoclassical theory, we repot that workers having the same characteristics,

working in the same locality, performing the same work, receive different wages on their jobs as per efficiency wage hypothesis.

Chapter 6 is a summary and conclusion of the research.

CHAPTER # 2

Empirical Debates between Conventional Economic Theory and Efficiency Wage Theory

2.1 Empirical Evidences against Neoclassical Theories

The standard classical/neoclassical model rests on the belief that there is always full employment in the economy without policy assistance and deviations from full employment are transitory and short-lived phenomenon. The logical framework of the model is based upon the forces of supply and demand which rules out the possibilities of deviations from full employment and ensures that there will be no involuntary unemployment in the economy. Any one willing to work will get job on the going wage rate...the competitive wage rate. However, it does not work and workers remain unemployed even for a long period of time. They are not able to find jobs at the competitive wage contrary to neoclassical theory. Firms hire workers at more than market clearing wage and these higher wages lead to more productivity of the firms. This practice continues and wages do not fall despite outside involuntary unemployment. Now we discuss these anomalies of the labor market and provide some key empirical evidences which contradict the classical/neoclassical theories.

2.1.1 The Crash of 1929

The Great Depression showed economists that full employment equilibrium was not an automatic and natural outcome of the market. The classical tenets that economy absorbs shocks and equilibrium through automatic forces of supply and demand across different

markets in general and the labor market in particular were collapsed miserably. The Great Depression was such a serious economic disaster as 25% of total work force, 12,830,300 people became unemployed in the US in 1933. The unemployed were forced to migrate from one corner to the other in search of jobs but they were unable to find means of income for their family and all the doors of jobs were closed on them. All this created a sense of long-lasting restlessness among the unemployed. Factories, mills, business units etc. all were seriously victimized by the Great Depression. This depression continued till 1941 and after this, the period of World War II opened the locks of kismet for the people and they were employed in military, defense and war industries.[2]

The classical economists were unable to offer convincing explanation of this real world economic phenomenon ---the crash of 1929. In the scenario of Great Depression, Keynes attacked and rejected the classical propositions that automatic forces of supply and demand would instantaneously ensure full employment in the labor market. He commented on the internal instability of the classical economic system that there is no built-in-mechanism for the full employment equilibrium without active participation of the government. Although he himself did not pin down the particular reasons behind this occurrence,

> "He (Keynes) merely assumes that full employment is a "special" case in capitalist
> economics-that labor markets clear at reasonably high levels of employment only
> during certain special periods of full employment----and that the natural course of
> capitalist economics---- the "general" case--- is for employment levels to fall well
> short of full employment".[3]

---

[2] See www.todaysteacher.com

[3] See Futurecasts online magazine (2005), vol (7)

2.1.2 Higher wages lead to higher productivity

Keynes as well as his followers (New Keynesians) point out that it is the rigidity of wages and prices which causes involuntary unemployment in the labor market. In this regard, Keynesians advanced many thought-provoking ideas of market imperfection, asymmetric information, efficiency wage models etc. as explanation of unemployment equilibria. Efficiency wage models are one of those intuitive ideas which put forward the reasons behind existence of involuntary unemployment.[4]

Efficiency wage models are contrary to the common belief that union density and government intervention via minimum wage legislation create obstacles to reduction in wage, but they project the third factor that the firms themselves willingly pay more than competitive wage to workers despite excess supply of labor. The hypothesis behind paying high wage more than competitive wage is that effort per worker is a function of real wage and any reduction in wages lowers the productivity of all employees already on jobs. Conversely, the classical/neoclassical theory points out that the law of supply and demand determines equilibrium wage implying that the excess supply of labor will put downward pressure on wage rate. However, it does not work in the labor market and firms pay high wages despite outside cluster of involuntary unemployment. The high wage i.e. efficiency wage increases effort level of the workers and hence productivity of the firms. These propositions have been empirically supported by the well referred case studies of Stanford Linear Accelerator Centre and Ford Motor Company. These studies are related to the relationships between wages and productivity. The higher wages lead to higher effort level, lower quit rates, higher productivity etc. of the firms as per efficiency wage hypothesis.

---

[4] More over, Efficiency wage models also provide solid microeconomic foundations for the Keynesian economics.   [For detail see Akerlof, George and Janet Yellen (May 1987), Yellen (1984)]

Stanford Linear Accelerator Center did not reduce wages to avoid the best workers quit despite workers' offer when it announced a 10% reduction in the work force. Raff and Summers (1987) focus on Ford Motor Company when Henry Ford announced the five-dollar day wage policy which resulted higher rate of profit for the company. The productivity of Ford Motor Company increased from 30% to 70% with the increase in daily wages from $2.34 to $5.00 wage policy.

Increasing wages has two effects: it increases labor costs, but also productivity and hence output. In equilibrium, firms will set wages so that these two exactly offset each other. This implies that the coefficient of employment (E) and relative wage (Wi/W*) should be same. This well-known result of the standard efficiency wage model is due to Solow (1979) and is known as the Solow condition. It implies that percent change in wage should lead to an equal percentage change in effort level, measured in suitable units. Since this is often not observed empirically, Akerlof and Yellen (1986) have given explanations of why unitary effort-wage elasticity might not hold in practice. We find that the Solow condition holds in Pakistani data. Levine (1992) tests this hypothesis with Cobb-Douglas production function and runs OLS. He uses data about 2000 business units of North American manufacturing companies from Strategic Planning Institute (SPI) over the period 1970-1985. His findings show that increase in relative wage leads to increase in output per worker. He points out that:

> "For firms whose relative wage declined or was constant over a three year period, real output per worker grew by a total of 2%; for firms whose relative wage increased, real output per worker grew 12% over the three years".

He reports positive relationship between changes in relative wage and changes in output of the firm. The magnitude of the elasticity of output with respect to relative wage is according to the efficiency wage prediction. He states that:

> "The elasticity of changes in output with respect to changes in the firm's relative wage is .46 (S.E=.19). The point estimate is not statistically significantly different from labor's total share in manufacturing scales (about .27), the coefficient that efficiency wage theories predict"

Huang et al (1998) carry out a similar exercise. While they confirm the basic finding of efficiency wages, that productivity increases with wages, they do not find the unitary elasticity predicted by the Solow condition. Using a Cobb-Douglas production function and industry data (1968-1991) from Current Population Survey (CPS) and monthly bureau of labor statistics' employment and earnings, their results suggest that the magnitude of the elasticity for wage varies from (.19) to (.61). The positive output elasticity for wage as well as magnitudes less than the output elasticity for employment (.64) to (.68) is consistent with efficiency wage proposition. They point out that:

> "Consistent with the efficiency wage proposition that paying wages above the market norm will raise worker productivity. Paying wages 10 % above the market norm increases output by between 2% and 6%".

Almost all the empirical work of the efficiency wage hypothesis has been produced with respect to the developed countries. However, according to Riveros and Bouton (1994), the efficiency wage hypothesis has very important macroeconomic structural, stabilization implications and importance in the context of the developing countries. In this behalf, Saygili (1998) has conducted a study "Is the Efficiency Wage Hypothesis Valid for

Developing Countries? Evidence from the Turkish Cement Industry". This study tests directly the effect of wage increase on performance of the firm using data from a Turkish cement producers association (TCPA) and clinker statistics. He uses a wage augmented Cobb-Douglas frontier production function:

$$\text{LnY}_{ft} = \alpha_0 + \sum_{i=1}^{n} \alpha_i \ln x_{ift} + \beta \ln w_{ft} + \gamma T + (\gamma_{ft} - \mu_{ft})$$

Where f indexes plants or firms, T denotes time. Y is output. X_t is factor inputs (labor and capital etc.) and W_{ft} is the wage level.

The researcher uses two measures of wages 'wage level relative to average wage in the cement industry (WIND) and the wage level relative to other cement plants in the same region (WREG)'. His estimated coefficient of labor input is (.37) [t-ratio, 10.02] while WIND is (.16) [3.11] and on WREG is (.12) [2.13]. The efficiency wage hypothesis holds because the coefficient of wage is positive such that wages have positive effect on output. Wage level significantly determines efficiency at the firm level in the Turkish cement industry. However, in Saygili's (1998) estimation, it is reported that the estimated coefficient of wages is less than the estimated coefficient of labor input i.e. 'Solow Condition' does not hold.

All these evidences show that there is positive relationship between wages and productivity in contrary to the classical/neoclassical theory. Firms do not hire workers at the competitive wage rather they willingly pay more than competitive wage to the workers. The payment of higher wages leads to higher productivity of the firms.

2.1.3 *Industrial Wage Differentials*

Law of one price (LOP) is one of the paramount principles of microeconomics, which states that with integrated markets, one object cannot be sold at two different prices. The basic postulates are the absence of transaction, full information and transportation cost. The market structure tends to the equilibrium eliminating the existence of any arbitrage i.e. capitalizing on a discrepancy in quoted prices. This law does not seem to function in the labor market. It has been fairly well established that equivalent workers receive different wages in industries contrary to conventional economic theories. The well-documented existence of the dispersion in wages dates back to the epoch of Slitcher (1950) who carried an extensive piece of work to show a large degree of variation in average wages of the 20 US manufacturing industries from 1923 to 1946. He reports high rank correlation (.73) of industry wages which shows stability in industry wage structure i.e. wage differentials are stable overtime. This stability proves that the differential (which violates the Law of One Price) can not be a temporary and disequilibrium phenomena.

Neoclassicals therefore need to find an explanation of wage differentials. One explanation which does not violate market efficiency is that of human capital. In this way, the story of wage differentials changed when human capital was used as part and partial of the supply side. Economists produced research including human capital variable and its ingredients i.e. industrial experience, occupation etc. to draw out influence in the determination of wages. The next phase of research in the seventies and eighties was a step forward to include both human capital and demographic variable with industrial variables in the analysis of wage differential. Freeman and Medoff (1981) opine that industry firm size is a significant factor, which increases average wage of the workers.

The efficiency wage hypothesis states that even after controlling for human capital, demographic and occupational variables, wage differentials still exist for homogeneous workers. It is the industry affiliations which have an impact on wages of the similar workers. Krueger and Summers (1988) is a key article in this context. The researchers control worker's characteristics of age, education, experience, occupation, sex etc. and then add industry dummies to check industry affiliations. All dummy variables remain statistically significant and the larger wage differentials still exist even after controlling for relevant worker's characteristics. The workers associated with petroleum industry earn higher wages despite having identical characteristics. They point out that:

> "In 1984, the industry differentials ranged form a high of 37 per cent above the mean in the petroleum industry to a low of 37 per cent below the mean in the private household services".

Krueger and Summers note that manufacturing and chemical industries tend to pay high wages than wholesale, retail and services industries which pay low wages with similar workers' characteristics.

> "In 1984, for instance, workers in the capital intensive technological sophisticated chemical industry were paid 22 per cent more than the average employee, while workers in the customer oriented retail trade industries were paid 16 per cent to 19 per cent less than the average employee, all else constant".

They suggest that industry affiliations have a sizeable impact on wages despite controlling for human capital, demographic variables etc as per efficiency wage hypothesis.

Romaguera (1991) follows the estimation methodology used by Krueger and Summers (1988) to test efficiency wage hypothesis on the Chilean labor market. She tests the effect

of industry affiliation which leads to increase in wages as per efficiency wage hypothesis. She uses data from three sources (i) manufacturing census (ii) Employment Household Survey (iii) Occupational Wage Survey for selected large firms. After controlling for education, age, sex, occupation etc., she estimates interindustry wage differentials for 1969, 1978 and 1987. Her estimated wage equation is as given below:

$\ln w = X\alpha + Y\beta + \varepsilon$

Where X is a matrix of worker characteristics. Y is a vector of industrial dummies. ε is error term.

H_1: Industry affiliation has no affect on wages as per neoclassical theory, [$\beta = 0$].

H_2: Industry affiliations have an impact on wages as per efficiency wage hypothesis, [$\beta \neq 0$].

The industry dummies are jointly statistically significant implies that industry affiliation has significant impact on wages as per efficiency wage hypothesis. Romaguera finds the following industry effects for 1987:

Financial services and insurance 49 per cent, Retail trade -17 per cent, public utility services 26 per cent, Health services -17 per cent, Laundries -12 per cent, public administration -27 per cent, paper and printing 15 per cent and so on.

In another study, Katz's (1986) which is also a survey article of the efficiency wage hypothesis, tests the main prediction of the efficiency wage hypothesis that it is the industry affiliation (and not the personal characteristics i.e. talent, experience, age etc.) which leads to increase in wages. Katz follows the estimation techniques of Krueger and Summers (1988). He runs regression of log hourly earnings on industry dummies after controlling

human capital, demographic and geographic variables of private sector workers from 1983

Current Population Survey (CPS). Katz finds industry effects for 1983:

Mining +29 per cent, Transportation and Public Utilities +15 per cent, Retail Trade −16 per

cent, Services −6 per cent and so on.

He reports that:

> "The industry variables have a sizeable impact on wages. For example, workers in
>
> mining and transportation and public utilities earn approximately 45 and 32 percent
>
> more than observationally equivalent workers in retail trade".

2.1.4 Effect of unemployment on productivity

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 analyzed adding human capital, demographic

and occupational variables. In an article titled "A Direct Test of the Efficiency Wage Model

using UK Micro-Data", Wadhwani and Wall (1991) test these theoretical tenets of the

neoclassical theory. They use Cobb-Douglas production function and use data from

published accounts of 219 UK manufacturing companies over the period 1972-1982.

Wadhwani and Wall use the following Equation.

$$y_{it} = \alpha k_{it} + \beta l_{it} + \beta_1 w_{it} - \beta_1 w^*_{it} + \beta_2 \mu_{it} + \varphi_t$$

All lower case letters denote logarithms. yi denotes output of firm i in period t. ki is capital, li is labor. μ is unemployment rate. w is wage rate, w^* is the alternative wage (industry wages). φ is the error term.

They use econometric techniques of OLS and GMM to estimate the model.

H_1: Efficiency wage hypothesis requires that:

1. The outside cluster of unemployment positively affects the output of the firm, $[\ \beta_2\ >\ 0\ ]$.

2. The estimated coefficient on relative wage (w/w*) should be positive i.e. output is positively correlated with wages, $[\ \beta_1 > 0\ ]$.

H_2: The neoclassical wage theory states that:

1. Outside unemployment does not have any impact on the output of firms, $[\ \beta_2\ =\ 0\ ]$.

2. Wage rate does not affect and/or determine output of the firms.

Results: H_1 is accepted:

1. The coefficient of relative wage is positive and statistically significant. (.39) (t-ratio 4.89) while the coefficient on employment is also statistically significant (.65) (13.66).

2. Coefficient of unemployment is positively signed and statistically significant (.05) (2.12).

3. Coefficient on relative wage (.39) is significantly less than the estimated coefficient on labor input (.65), i.e. Solow condition does not hold in their study.

The direct tests show that wage significantly determines output and, on the other hand, outside unemployment is also not neutral rather the outside changes in unemployment lead to changes in productivity of the firms contrary to the neoclassical labor theory but in conformity with the Efficiency wage hypothesis.

The researchers have also conducted field surveys and enquired from the managerial authorities about the effect of unemployment on productivity. As per Efficiency wage hypothesis, the effort level of the workers should increase during higher rates of unemployment. In this behalf, Blinder and Choi (1990) interviewed managers of 19 firms. A majority of their respondents believed that outside higher rate of unemployment would elicit higher effort level from workers on their jobs. In another survey, Agell and Ludborg (1995,1999, and 2003) report that, according to managers, workers provide more effort when unemployment rate is high as in 1998 then in 1991 when it was lower. All these results are contrary to the classical/neoclassical theory but consistent with the efficiency wage hypothesis. Moreover, Huang *et al.* (1998) have also directly tested the impact of unemployment rate on productivity. When they add unemployment rate to the regression, the magnitude of output elasticity for wage varies between (.22) to (.58) while the unemployment output elasticity is positive and ranges from (.06) to (.11) which is also consistent with efficiency wage hypothesis. They confirm that:

"When inputs are held constant a 10 per cent increase in the unemployment rate is associated with a 1 per cent increase in output".

2.2 Neoclassical Response to the Efficiency Wage Hypothesis

It was the Great Depression which led to the downfall of classical economics. There was large scale and widespread unemployment for the long period of time which the classical

economists were unable to explain. One of the main contributions of Keynes was to say that the market forces did NOT guarantee full employment. He argued that the labor market was peculiar and different from other markets. One could have large scale and persistent unemployment. Suitable government policy is needed to increase effective demand for products to achieve full employment. The level of employment and output are determined by the Aggregate Demand in the product market rather than in the labor market contrary to classical/neoclassical theories. Keynesian views remained dominant in economics until the 70's 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 believe that the labor market is just like the other markets and forces of supply and demand ensure full employment instantaneously. If there is unemployment in the labor market, it will be due to higher real wages for the workers. This situation is transitory and the wage rate will converge to the equilibrium wage through the operation of supply and demand. Thus this involuntary unemployment will be transitory in the labor market. They defended this idea by offering the alternative explanation of the GD that it was government mismanagement of the money supply which led to the GD. This explanation was put forward by M. Friedman, the father of monetarism and a leader of the neoclassicals.[5] The neoclassicals also criticized the 'Keynesian Economics' as 'Economics of Disequilibrium' where markets can stay in disequilibrium for a long period of time. Keynes himself did not provide explanation of it. He said that wage bargains were conducted in nominal terms rather than in real terms which was not rational, but this was how the world worked. The main justification offered for failure of equilibrium in labor

market was "sticky wages". Real wages could not be pushed downwards. There was no explanation of why this was the case.

Under pressure from the neoclassical attack in the 70's neo-Keynesians tried to defend the idea of sticky wages. They wanted to find an explanation of why the labor market failed to function like other markets. One of the main arguments that have been developed in this context is the "Efficiency Wage" hypothesis. According to this hypothesis, higher wages lead to more efficient performance by the workers. However, the classical and neoclassical have a strong ideological commitment to the idea that 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 neoclassicals have strongly resisted and attacked the idea of efficiency wages. In order to defend efficiency of market, they offer the following three alternative explanations of the observed wage differentials for the equivalent workers in the labor market.

2.2.1 Transitory Differentials

According to neoclassicals, it is change in the labor demand, which produces transitory wage differential across industries for equally skilled workers, but this pattern of wage dispersion will narrow as labor market converges to the equilibrium state in times to come. However, contrary to neoclassical theory, the researchers report that wage differentials remain substantial, persistent and time invariant as per the efficiency wage hypothesis. In this context, Krueger and Summers (1988) report that wage differentials are substantial and not transitory overtime because wage dispersion measured by standard deviation in 1984 was 14 per cent, in 1979 was 11 per cent and in 1974 was 13 per cent.

---

[5] There is an enormous literature on the causes of the Great Depression, and the issue is of vital importance to

Romaguera (1991) rules out the competitive explanation of transitory wage differentials because wage dispersion measured by standard deviation for three years 1969, 1978 and 1987 ranges from .11 to .15. She concludes that:

> "Competitive explanations based on the short run immobility of labor or transitory demand shocks should have a minor role or no role at all in explaining such differentials".

In another study, Katz (1986) also points out that interindustry wage differentials for similar workers are persistent and stable over time contrary to neoclassical theory but consistent with the efficiency wage hypothesis.

2.2.2 Labor Characteristics

Another neoclassical counter attack against efficiency wage models is that there are some unmeasured hidden labor characteristics (i.e. age, education, skill etc.) which cause wage differential for similar worker. A hidden variable is human capital and apparent success of efficiency wages is because these theories neglect human capital. Murphy and Topel (1987) relate wage differentials of the labor market to the human capital abilities (i.e. personal characteristics of the workers). They opine that it is talent and abilities of the workers that determine wages across firms in the labor market. More talents and scarce personal characteristics receive higher wages in the suitable industry. However, Krueger and Summers (1988) run regression of the log wage rate on the worker's characteristics of age, education, experience, occupation, sex, marital status etc. and report larger interindustry wage differentials despite controlling these individual characteristics of human capital, along with demographic and occupational variables. They provide evidence that:

---

appropriate macroeconomic policy as well as efficiency wages. This lies outside the scope of our thesis.

"The average employee in the mining industry earns wages that are 24 per cent higher than the average employee in all industries, after controlling for human capital and demographic background".

Huang *et. al.* (1998) discuss that either wage premiums are correlated with human capital as per neoclassical theory or wage premiums received by workers in the labor market are different and uncorrelated with the observable human capital as per efficiency wage hypothesis. They suggest that:

"The portion of the wage correlated with human capital and the wage premium uncorrelated with observable human capital are distinct inputs consistent with efficiency wage theory".

2.2.3 *Job Characteristics*

If labor characteristics are the same, but different industries pay different wages, another possibility consistent with neoclassical theory is that the wage differences reflect job characteristics. If some jobs are unpleasant, hazardous, require hard work, or incur loss in prestige, for example, then such jobs would require higher wages to attract equivalent workers. In this case, the wage differential are called "compensating differentials" – they compensate for the unpleasant characteristics of the job. This neoclassical explanation of wage differential across industries is also tested by Krueger and Summers (1988) using data from university of Michigan's Quality of Employment Survey (QES) 1977. They use 10 jobs characteristics variables of weekly hours worked, health hazard on job, nature of working conditions on the job etc. If interindustry wage differences reflect compensating differentials, they should be decreased substantially when working conditions are

controlled. However, these working controls do not have significant impact on the industry wage as per efficiency wage hypothesis. They report that:

"Working conditions variables do not substantially alter the pattern of industry wages. The standard deviation of the industry log wage premiums actually increases from (.11) to (.12) when the working conditions controls are added to the equation".

2.2.4 *Industry Characteristics*

The neoclassical theory also offers some other possibilities which can lead to wage differentials for identical workers in the labor market. In this context, according to insider-outsider theory associated with Lindbeck and Snower (1988), the workers currently working in a firm are insiders who have controls or influence over management of the firm. They resist any cuts in wages or replacement by outsiders who offer to work at lower wages. The insight behind this theory is that the employed workers develop specific skills and hence become important for firms. Firms do not like to dismiss current workers (i.e. insiders) and hire the unemployed (i.e. outsiders) at a lower wage because it involves the hiring and training costs. Another factor is that the insiders can harass and, not cooperate with new comers hired by replacing dismissed insiders.

The neoclassical theory suggests that in the highly unionized industries, real wages are higher more than competitive wage for both union members and nonunion members. Dickens (1986) presented a model to rationalize the payments of wage more than competitive wages focusing on the threat of collective actions by workers. In order to maintain harmonious relations or industrial activities, firms willingly decide to pay higher wages to the members of union; it is the threat of the collective action, which enables workers to have strong bargaining power in raising the payment of wages more than

competitive wage. The neoclassicals highlight that the higher wages in non-unions firms are also possible to avoid the emergence of union.

Levine (1992) analyses the possibilities of relationship between higher wages and productivity in the context of union density, asymmetric information and imperfect mobility of the workers. He rejects all these possibilities because efficiency wages do exist despite keeping these factors into account. He points out that:

> "Consistent with efficiency wage theories, the relationship between changes in wages and changes in productivity was weaker at business with high unionization. The observed variation in wages is too persistent to be explained by immobility or lack of information".

Krueger and Summers (1987) calculated interindustry wage differentials applying modern kit of econometric techniques using controls for human capital, union density, and demographic variables. They have provided well-documented evidences of the existence of interindustry wage differentials for equivalent workers in the labor market and confirm the theoretical interpretation of efficiency wage models.

2.3 Alternative Explanations for Efficiency Wages

The idea behind the efficiency wage models is the hypothesis that the effort per worker is a function of real wage. This hypothesis explains the reasons for wage rigidity in the presence of involuntary unemployment because any reduction in wages lowers the productivity of all employees already on the job. The idea can be traced back to the writings of Adam Smith (1776):

"The liberal reward of labor, as it encourages the propagation, so it increases the industry of the common people. The wages of labor are encouragement of industry, which like every other human quality improves in proportion to the encouragement it receives. A plentiful subsistence increases the bodily strength of the labor, and of ending his ends perhaps in ease and plenty, animates him to exert that strength to utmost, where wages are high, accordingly, we shall always find the workmen more active, diligent and expeditious than where they are low".

If there is involuntary unemployment, it is the indication that firms, for some reasons or the other wish to pay more than the market clearing wages. This is the heart of any Efficiency wage models. Efficiency wage theories appeared with the explanation why employers have strong incentives to pay workers more than the minimum necessary to attract them. Such "Efficiency Wages" are above the market clearing level. Workers willing to work at competitive wage are not hired and, as a result, we find involuntary unemployment in the labor market.

According to classical/neoclassical theory output is simply a function of number of the workers. However, the efficiency wage production function specifies that output is a function of the product of the number of workers times the amount of effort each worker supplies.

$$Y = f[e(w) . N] \qquad e'(w) > 0$$

Thus along with the number of workers output also depends on how much effort each worker supplies. The firm determines wages, which depend upon the properties of the effort function, rather than demand and supply conditions in the labor market in general.

From figure 1, if w < w*, increase in wage rate will increase the Productivity of worker by an even larger percentage amount. In this range, the firm can actually increase its profits by increasing wages. If w* < w, productivity does not rise as fast and, firm earns profits by lowering the wage rate. The level of optimal wage is where wage increases come with productivity increases in the same percentage amount i.e. the elasticity of e (w) equals 1.

The efficiency wage models provide the plausible explanation of the involuntary unemployment in the labor market. These models state that, in the presence of involuntary unemployment, if any worker offers his services at lower wage than the current market wage rate, firms do not hire him because they perceive that fall in wages brings a larger percentage fall in the worker's effort and/or productivity. On the other hand, if unemployed workers can get low wage jobs in other sectors of the economy, there will be no unemployment. In this scenario, the model fulfils the characteristics of 'Dual-labor Market Hypothesis' with the existence of persistent, non-compensating wage differentials across firms.

There are different alternative types of Efficiency Wage Models that describe the relationship between wage rate and level of productivity. They highlight the facts of involuntary unemployment; reasons for downward wage rigidity and provide justification for wage productivity relationship in their own distinctive way. Now we discuss these models one by one in detail as given below.

FIGURE 1
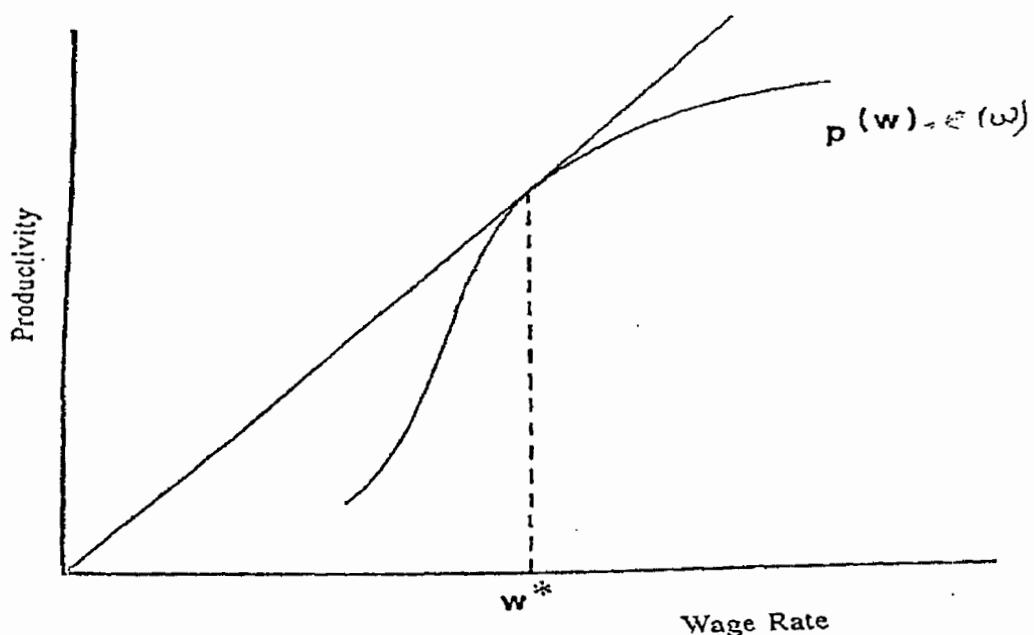
2.3.1 The Nutritional Model

This model dates back to the pioneer work of Leibenstein (1957) in the literature of economic development. He linked up workers' physical health (therefore productivity) with payment of wages in the less developed countries. The insight behind the model is that if firms pay higher wages to the workers, they get healthier and hence more productive. The level of wages through consumption pattern affects health of the workers. Suppose 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. The higher wage will allow him to feed himself properly and hence his contribution to output at work will increase. 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 laborers 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.

2.3.2 The Adverse Selection Model

The model is attributed to Weiss (1980). The model propounds the notion 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. The average quality of workers in the pool need not

be an increasing function of wages but the average quality of those hired must be. If the firms can select better quality workers, they have an incentive to pay higher wages because there is positive correlation between the average quality of the worker and wage rate. Note that "Quality" refers to hidden and unobserved characteristic of workers, such as enthusiasm, team spirit, loyalty, hard work, initiative etc. It does not refer to measurable and quantifiable items such as experience and degrees, because the firm can set these as standards or requirements for the job. Among equally well qualified people, larger wage offers will cause more applicants for a job. 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 wages.

2.3.3   The Sociological or Normative Models

These models present the social norms rather than conventional Individualistic models. Many factors can affect worker's productivity on the job. An able or shrewd leader can take from his subordinate better work than his other counterparts without changing monetary rewards. These factors or qualities cannot be directly measured.

Partial gift exchange hypothesis by Akerlof (1982:1984) is one of the remarkable efficiency wage theories. This model takes into account 'non economic variables'. The model answers why firms willingly pay higher wages than competitive wage and why there is involuntary unemployment. 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 "labor market as partial gift

exchange", the loyalty of workers is exchanged for high wages, and this loyalty results in high productivity of the firm.

Fehr, Ernst and coauthors (1997) have conducted some laboratory experiments to test the gift-exchange model. They report that when experimental firms offer higher wages more than competitive wage, the experimental workers consider it 'gift' and hence they provide non-minimal effort level.

2.3.4 The Fair Wages Theory

Stacy Adam (1965) examines that workers compare the inputs (skill, effort etc) they bring to a job and outcomes (pay and non-pecuniary benefits) from the job. If they feel under compensated relative to their comparisons, they perceive inequality and readjust their inputs downward (shirking), leaving job (turnover) or choosing new level of inputs. Similarly, if they feel overcompensated in the spirit of the Efficiency Wage Theory argument, they improve their performance by choosing higher effort level or reducing turnover. Fehr and Gachter (1998) also report that 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:

1. 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.

2. 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 wage.

3. Fair reference wage may also depend upon previous wage periods and wages paid to the workers across different firms with similar human characteristics like age, education etc.

2.3.5 *The Shirking Model*

The problem confronting the employers is to minimize shirking because employees shirk on their jobs whenever they find opportunity. This practice becomes more common in team production where effort per worker becomes difficult to monitor on the job. If firm hires monitor to have a check on the productive activities of the employee, 'who will monitor the monitor'.[6]

The Shirking version of the Efficiency wage theory associated with Shapiro and Stiglitz (1984) is essentially a theory of involuntary unemployment, which arises because of moral hazard problems. The insight behind this model is the discretion concerning the work performance of the worker. 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 considered an effective way to discourage shirking. The cost of losing one's job depends positively on the wage; a higher wage induces fewer workers to shirk. At the competitive wage of the labor market, workers have no cost or risk of losing jobs. 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 favor of worker to shirk on the job. Another hypothesis associated with Romaguera (1991) is that firms should pay high

---

[6] The change of the economic system (capital and socialistic systems etc.) into Islamic economic system can resolve many social and economic problems (Hasni (1989) i.e. lockouts, strikes (Tabakoglo; pp.77-91) and shirking problem (Ramzan, 1992).

wages to the workers in the occupation where poor work performance can cause larger damage to the firm.

Fehr *et.al.* (1998) have conducted laboratory tests to test many useful explanations of efficiency wage models. They report that the shirking efficiency wage model receives impressive support in the experimental labor market. Detail of these tests is given in next section.

Models of efficiency wages utilizing shirking are subject to certain theoretical objections which we discuss in the next section.

2.3.5.1 Theoretical Critiques of Shirking Theory

It has been suggested that firms can use other alternative efficient measures to check shirking problem rather than paying higher wages (i.e. efficiency wages) in the labor market. In practice, these devices are not seen in the labor market, so this critique does not seem operationally relevant.

Becker and Stigler (1974) firstly introduced bonds along with paying efficiency wages and much of debate has focused on this issue. To them, firms should ask for entrance fees or employment fees from workers to hire them on efficiency wages. Moreover, unemployed workers should be willing to pay entrance fees to be hired at efficiency wage. However, firms in the labor market do not exercise this kind of practice. One of the alternative bonding schemes is that firms can post performance bonds and claim the bond if workers are caught shirking. [7] The payment of bonds again to get employment checks the shirking problem. As a result, there are no logical reasons to pay efficiency wages and involve involuntary unemployment excusing that they create the sense of threat of dismissal.

---

[7] For details see Katz (1986)

Stoft (1982) introduces the employment fees to clear the labor market. Fees lower the labor costs, giving firms an incentive to hire more laborers. Also, charges of fees from workers at the time of hiring discourage shirking on the job.

Bhattacharya (1984) has the thesis of tournament contracts to cope with the shirking problem. He comes in with the view that the firm can plan a fixed wage in which only a fraction of workers are paid higher wages while others lower wages after randomly ranking effort level of the workers.

The protagonists of the shirking efficiency wage theory emphatically argue that an unemployed person is not able to buy the employment bond. If, on the other hand, firms post bonds then the moral hazard problem arises. Firms can claim the bond by excusing that the worker has cheated and, ultimately fire him.

2.3.6 The Turnover Model

This model is associated with Salop (1979) and Stiglitz (1974: 1987). It is assumed that turnover is a function of wages which is costly to firms. Firms bear costs if workers quit so they adopt a policy of higher wages to reduce quit and increase average labor productivity. No firm likes to dismiss its trained workers. Stiglitz (1987) argues that firms do regret quits because workers are not paying all the training and hiring costs. Firms offer higher wages to reduce costly labor turnover despite the existence of involuntary unemployment. In a study, Stiglitz (1974) has also explained rural-urban wage differentials for less developed countries in terms of the turnover model. To him, hiring and training costs are higher in the urban area than in the rural sector. In order to reduce turnover rates, firms pay higher wages to the urban workers than rural workers.

This model states that if there is no unemployment and all firms offer similar wage to the workers, turn over rates may be high. However, with the increase in wages above the market clearing level, quit rates go down. Moreover, adopting this practice by all firms can again lead to rise in the turnover rates. The structure of this model is similar to the Shirking version of the efficiency wage theories. As in the Shirking model, equilibrium is achieved when unemployment rate is high and quit rate is lower.

2.3.7   The Dual Labor Market Model

This hypothesis originates from the writings of Doeringer and Priore (1971). Jobs are of two types in the primary and secondary sector. The Primary sector jobs have stability, low quit rates, good working conditions, rapid promotions, acquisitions of skill and good pay while the secondary sector jobs are marked by higher quit rates, harsh discipline, little chance of promotions, low acquisition of skills and poor pay.

The difference between good pay and poor pay (or alternatively between primary sector and secondary sector jobs) can be seen as the difference between wages in excess of market clearing and wages at market clearing level respectively. The primary sector firms set the wage they prefer. The Dual labor Market hypothesis in itself is an Efficiency wage theory of the labor market. The empirical studies, which support the Dual labor market hypothesis in fact, support Efficiency wage theory of unemployment.

2.3.8   The Implicit Contract Theory

The formal structure of the efficiency wage models has relevance with Implicit Contract Theory. Azariadis (1975) shows that wage and working hours are observable to both the firms and workers so they are verifiable variables while effort level is unobservable to both the parties so it is a non-verifiable variable. The explicit contracts are written on verifiable

variables: wages to be paid and, working hours that the firm and worker specify at the time of writing contract. Implicit contracts are collection of promises not written down but everyone expects to fulfill i.e. effort level, which the worker promises to provide on the job, and the firm promises to renew contract if and only if it receives the desired effort level. This series of promises constitute a self-enforcing implicit contract if it is in each party's interest to continue relationship. Kaufman (1984) interviewed in 26 British firms during high unemployment. He reports that firms do not replace workers with cheaper one because of long run employment relationships. This supports the implicit contract interpretation of efficiency wages.

2.4   Efficiency Wages in the Laboratory Test

The insight behind this section is to establish a linkage between the results of the empirical testing and laboratory examination. The results of both empirical and laboratory studies are analyzed here. However, the major focus is on the laboratory results of experimental economists on the efficiency wage hypothesis. This section firstly represents some important work done regarding testing of the Efficiency wage models by the experimental economists. We address detail, procedure and conclusions of these tests. Secondly, the laboratory results are compared with the empirical findings of Efficiency wage theories.

2.4.1   Empirical vs. Lab Testing

Testing of Economic theory in the experimental set up has become popular in the recent period. Economists seek laboratory evidence to test economic theory whenever it becomes difficult to test a theory with the empirical field data research. Econometric testing may not provide satisfactory results, as it cannot control many factors or characteristics to decide about the validity of the theory. According to Fehr and Gachter (June 1998):

"Theories which have no explanatory power even under the controlled circumstances of the laboratory will not apply to the much more complicated field".

Krueger and Summers (1988) have confirmed wage differentials through the lens of efficiency wage models. However, the controversies regarding the explanation of wage differential goes a long way. Moreover, the neoclassical school of thought does not agree to the explanation of efficiency wage models on wage differential as well as the persistent existence of involuntary unemployment. They resort to the competitive theory of labor market, which explains that workers are paid according to their opportunity cost and wages depend on workers' abilities. Murphy and Topel (1990) try to show that observed wages compensate for unobserved abilities or working conditions. Contrary to this logical point of view, the development of the idea behind efficiency wage models is that the firms themselves willingly pay more than competitive wage. However, this intuition is difficult to test. Although a large variety of empirical research has been conducted to analyze positive relationship between wage and effort level (i.e. wage-effort hypothesis) but Raff and Summers (1987) note that:

"The very impediment to evaluating workers ability, motivation and stability that might lead employers to pay efficiency wages makes conventional testing of efficiency wage theories difficult".

We quote Mary L. Rigdon (2002):

"Testing these theories (E.W.Ms) using econometric methods is hampered by the problem that variations in wages across firm or firms are not likely exogenous, which of course complicates the issue of identification in a model".

The inability of empirical testing to capture all characteristics of the labor market has led to the search for alternative methods (i.e. laboratory test) to reach a conclusion. In experimental labor market, we can control factors like unobservable heterogeneity in working conditions or skill levels, on which the field data does not provide convincing explanation.

Fehr and Gächter (June 1998) have conducted laboratory tests to test many useful explanations of efficiency wage models regarding existence of wage differentials. The Fair wage-effort hypothesis and Shirking version of the efficiency wage models receive impressive support in these experiments. This presentation is a landmark addition to the series of experiments. Here the authors invoke two leading versions of Efficiency wage models i.e.

1. The Fair Wage-Effort Hypothesis

2. The Shirking Efficiency Wage Model

2.4.1.1 The Fair Wage Effort Hypothesis

It is actually a gift exchange model associated with Akerlof (1982). The Model provides basic insights that higher wages more than competitive wage by firms are considered a "gift" which is exchanged by providing non minimal effort level from workers. Moreover, workers have some idea of the fair wage and firms have to pay according to this perceived fair wage.

(i) Experimental Design

The experimental design consists of the following characteristics:

- The subjects are experimental workers and experimental firms.

- Number of workers is greater than number of firms to create the competitive environment.

- In the Incomplete Contracts, workers have discretion in exerting effort level.

- It is a three-stage game with anonymity to avoid reputation building.

Stage 1

Each firm with different profitability of an employed person (redemption value) posits wages and effort level.

Stage 2

Workers decide whether to accept or reject the offer. If they accept the offer, they will decide about providing the actual effort level observing redemption value of their firms. This can create the reciprocal environment.

Stage 3

Firms compare the desired effort level to the actual effort level and reward or punish if actual effort level does not equal to desired effort level.

(ii)   Null Hypothesis

According to classical & neoclassical economic theory, workers' choice of effort level is independent of firms' profit opportunities or wage level and, hence firms pay only opportunity cost.

(iii)   Results

The classical/neoclassical predictions that wages are independent of the profit-opportunities of the firms are contrary to the efficiency wage hypothesis proposition that effort level of the workers also depend positively on the rent-share. Firms have to pay wages higher (i.e.

Fair wages perceived by the workers) than competitive wage; if they pay less wages, workers reciprocate with providing less effort level on the job. Therefore, there are fairness-induced wage differentials, contrary to the neoclassical theory. The results of the Fehr and Gachter experiments show that firms offer wages which are positively correlated with their profit opportunities. Both firms and workers behave reciprocally. Workers provide higher effort level if wages are higher as per Fair Wage Effort Hypothesis. Figure 2 supports the fair-wage effort hypothesis and there are stable fairness-induced wage differentials. Moreover, Fehr and Falk (1997) point out that:

> "This positive wage effort relation turns out to be very robust not only within but also across different institutions."

2.4.1.2 The Shirking Efficiency Wage Theory

The Shirking Model is associated with Shapiro and Stiglitz (1984).The model prescribes to prevent workers from shirking. At the competitive wage, the workers have incentive to shirk on the job so the payment more than competitive wage is a rational behavior by the firms. Fehr and co-authors quote the experiment conducted by Fehr, Kirchesteiger and Riedle (1996) to test Shirking Model.

(i) Prediction and Results

The main prediction under this paradigm is that there are non- compensating wage differentials. The optimal wage paid to the workers increases with the increase in redemption value. From Fig 3, the White bars are for actual wage and Black bars for theoretical predicted wages. The actual wage level matches the predicted wage level quite well and job rents are increasing in the redemption value. To cut short, both versions of efficiency wage models i.e. The Fair Wage Effort version and the Shirking version receive support from the controlled laboratory test.

Figure # 2

Intertemporally stable wage differentials in the Fair Wage-Effort Model: firms' wage payments increase in the redemption value because workers' effort levels depend positively on the rent share.

Workers' reciprocal effort choices induce firms to actually pay wages in posted-bid markets that increase in the profitability of a worker for them, i.e., there are fairness-induced wage differentials. Data are from 4 sessions with 8 workers and 6 firms in each session.

Prediction in the absence of fair wage-effort motives: firms pay wages that are independent of their redemption values (i.e., there are no wage differentials).

■ mean wages (over all 16 periods) firms offered for a given redemption value
□ mean wages (only the last 3 periods) firms offered for a given redemption value

Mean wages

Firms' redemption values (= profitability of a worker for the firm)

Source: Fehr, Gächter and Kirchsteiger (1996).

Figure # 3

Wage differentials in the Shirking-Model: theoretically predicted (black bars) and actual wages (white bars).

Firms' actual wages in posted-bid markets qualitatively conform to the theoretical predictions, since the actual mean wages per redemption value (white bars) are similar than the predicted wages (black bars). However, actual wages are a bit lower than predicted. Data are from 5 sessions with 5-6 workers and 7-9 firms per session.

Theory predicts that equilibrium wages increase in the redemption value, i.e., there are wage differentials. The reason is that firms with higher redemption values want higher effort levels and therefore have to pay higher wages to prevent shirking.

Mean actual and predicted wages

Firms' redemption values (= profitability of a worker for the firm)

3.5 and 3.7   4.7   5 and 5.5   6

Source: Fehr, Kirchsteiger and Riedl (1996).

2.4.2 Complete and Incomplete Labor Contracts

Fehr and Falk (1999) confirmed the existence of downward wage rigidity in their series of double auction experiments. Their experimental design consists of the following propositions:

- Workers as well as firms can make wage offer.

- Supply of labor is greater than the Demand for labor as eight firms and twelve workers.

- A worker who accepts the contract has costs of 20 and in the presence of competitive environment, the competitive wage was 20.

They conducted experiment with two conditions.

- A Complete labor contract: The experimenter determines effort level.

- An Incomplete labor contract: Employees themselves choose effort level between a minimum and maximum level while experimenter is neutral in this case.

Fig 4 presents the behavior of worker's wage offers (dashes) and mean offers accepted by firms (connected dots) over ten periods in typically double auction with incomplete contract. Fig 5 considers the case of complete contract. The results are different in each case and authors report that in the case of complete contract, employers hire workers who offer lower wages and, as a result, wages are close to the competitive level. On the contrary, in incomplete contracts, when workers choose effort level, employers hire workers on higher wages.

Figure 4

Workers' Offers and Mean Contract Wages in the Double Auction
Market with Incomplete Contracts

Figure 5

Workers' Offers and Mean Contract Wages in the Double Auction
Market with Complete Contracts
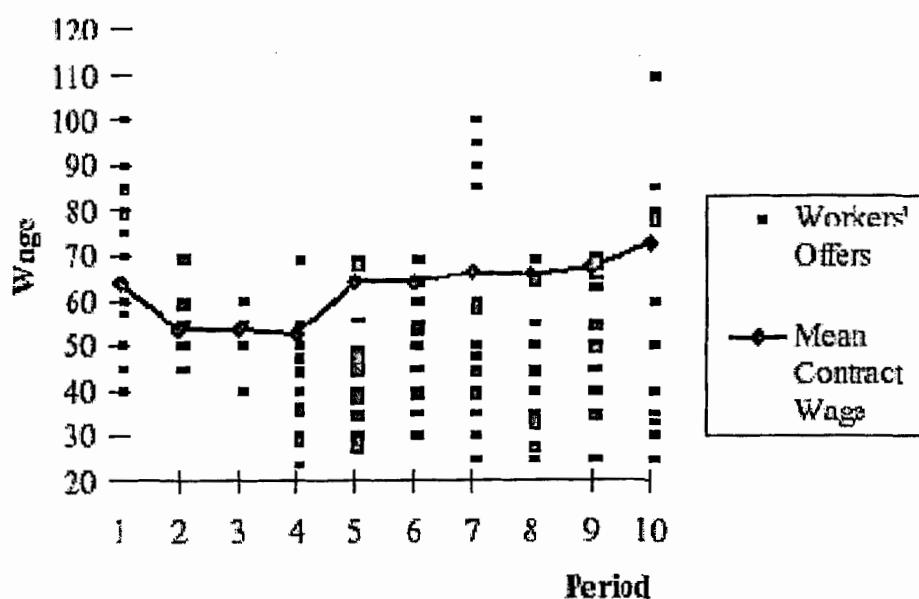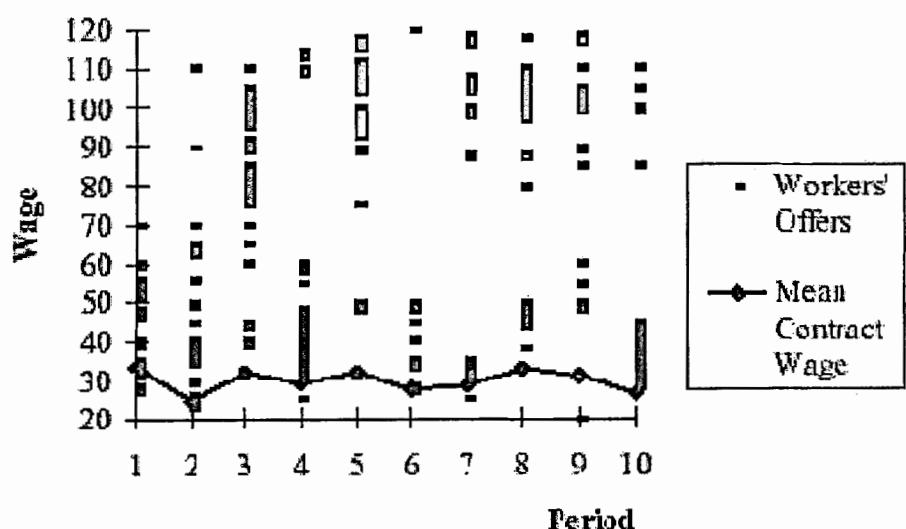
Source: Fehr and Falk (1999)

Workers compete with each other to obtain job and offer lower wages but employers refuse to hire them. The experimental firms' behavior is according to the real firm behavior where firms do not hire workers who offer low wages. The authors point out that in the incomplete contracts, reciprocal workers can punish the firms that offer lower wages by choosing lower effort level and hence, firms have to make generous offers. However, on the other hand, in the complete contract, reciprocal workers have no option to punish the firms except rejecting the job offer. Firms take advantage of this situation and hire workers on lower wages.

In the incomplete contracts, the effort level is a discretionary characteristic from workers, which is not an observable variable. The employer can trigger the degree of "cooperation" from reciprocal workers with generous compensation package. The reciprocal workers with generous wage offer reciprocate with higher effort level. [8] In the controlled laboratory experiments, there are two types of subjects, experimental firms and experimental workers (employees). Firms offer a binding wage with desired effort level ($e^\wedge$) and workers observe wages and if they accept the offered wage, decide the actual effort level (e) between a minimum and maximum level. The employers are bound to pay the contractual wage irrespective of actual effort level (e) exerted by the workers. The effort level can take different values as 1 to 10. The choice of higher effort level is costly to the worker but firms welcome it.

(i) Payoff Function

Payoff to Employer: $\Pi = 10e - W$

Payoff to Worker: $\Pi = W - C(e)$

---

[8] For details see Ernst Fehr and Gachter Simon (2000)

There is an excess supply of labor than firms to create competitive convergence. An employer can hire only one worker and a worker can work for only one employer. Workers cannot build up reputation as complete anonymity is built into the experimental settings. Experiment ranges from 10-20 periods to check convergence or divergence to equilibrium over time. The self-interest paradigm hypothesizes that self-interested workers do not provide effort level above the minimum level e=1. On the other hand, the self –interested employers anticipating this behavior offer the smallest possible wage to the workers so that they may agree to conclude the contract. Though reciprocal workers offer non-minimal effort level at generous compensation packages.

(ii)   Results

These experiments turn out the startling results that employers offer generous wage and workers exert non-minimal effort level. Moreover, worker's average effort increases with higher offered wages. Although most of them do not meet the desired effort level, they choose above the minimal effort level. Though all workers do not behave in the reciprocal fairness, a minority of workers about 30% still exert e=1. In general, there is a strong positive correlation between effort level and offered wages indicating the presence of positive reciprocity: Gift-Exchange.

Fig 6 shows positive effort wage relationship suggesting that generous offers lead to non-minimum effort level. These findings support the gift exchange model or Fair Wage Effort Hypothesis by Akerlof (1982) which posits that increase in wages raise worker's effort level. Therefore, the Keynesian belief of downward wage rigidity is an observable practical behavior in the labor market and in these experiments competition among workers to get

Figure # 6

Effort-wage relation in the gift exchange game
(Source: Fehr, Gächter and Kirchsteiger 1997)
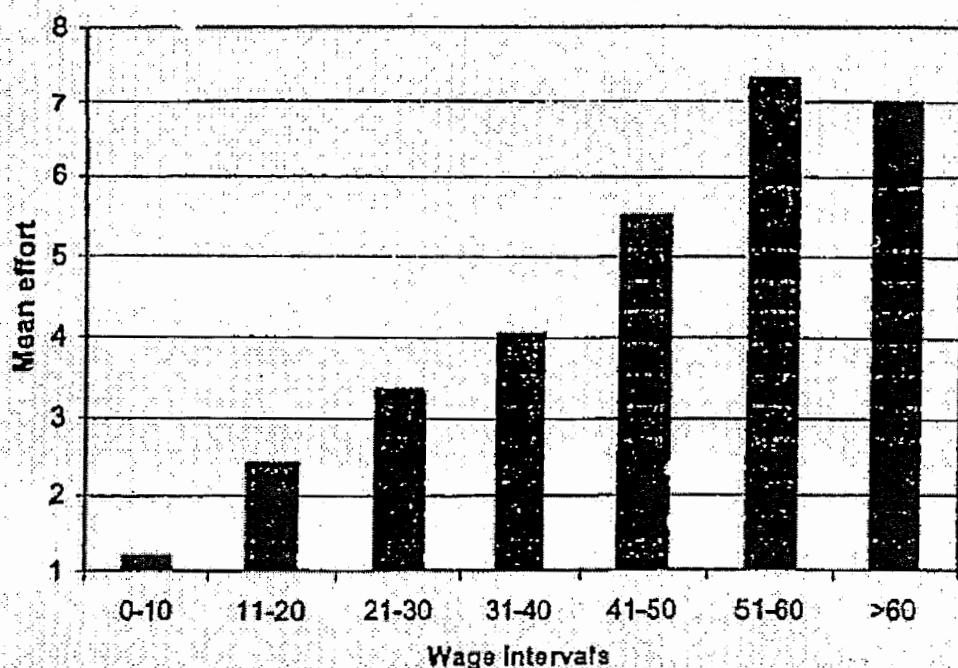
job does not hamper compensation packages. In another treatment, we consider two more possible cases from Fehr and Gachter (2000).

- Effort level in contracts with no incentive

- Effort level in contracts with explicit incentives

Fig 7 plots job rents against actual effort level with no disincentive for shirking (black dots), higher effort levels are accompanied by higher offered job rents implying the successful laboratory examination of the gift exchange hypothesis. With explicit disincentive for shirking or explicit incentives, firms preannounce fine up to a maximal level in case $e^\wedge > e$. In this case, workers exert less effort despite threatening of fines. The total surplus is lower.

Figure # 7

Effort levels in contracts with no incentives and with explicit incentives
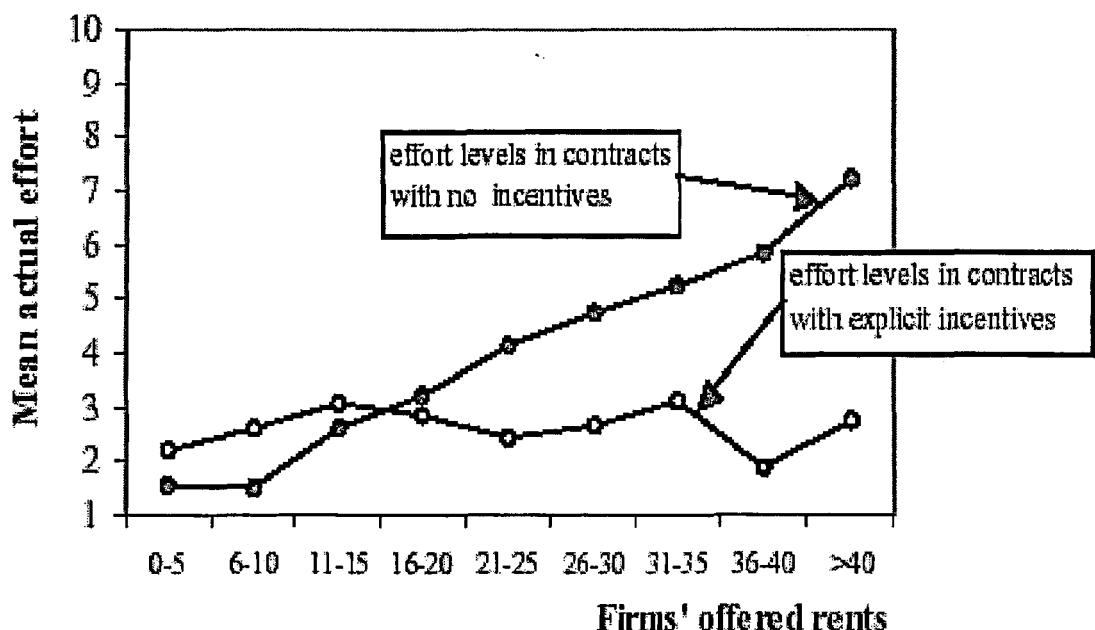
2.4.3 Laboratory Conclusions

The results drawn from the laboratory examination are compatible with the econometric results associated with Krueger and Summers (1987) and other studies. The estimated wage differentials are positively correlated with industry profitability. The neoclassical explanation that firms pay the opportunity cost and profit opportunities do not affect the market opportunity cost of a worker, do not receive support in the experiments because laboratory results are completely at odds with these explanations. The following results are concluded:

1. Actual Average wages do not converge to the competitive wage and firms themselves willingly pay more than competitive wage.

2. Wage level is positively correlated with effort level. Higher wage level results in higher effort level via reciprocal consideration.

3. There is evidence against providing minimal effort level and minimum wage level.

4. Firms can improve the rate of profit by paying "fair wages" supporting the Gift- Exchange Hypothesis.

5. The Shirking version of efficiency wage models also receives support in the laboratory test.

The efficiency wage models have explanatory power and the payment of wages more than necessary is possible and not counterintuitive idea. Efficiency wage models provide the convincing and down to earth approach to pin down the reasons for wage rigidity and involuntary unemployment. It turns out that, if workers are homogeneous, differences in the relative wage can affect firms' output and, the higher wages lead to the higher efforts level of the worker.

2.5 Evidence of Field Surveys on Efficiency Wage Hypothesis and Wage Settlements.

Researchers have conducted direct field surveys to delve into the mechanical settlement of wages. The purpose of these studies was to solve the riddle 'why few wage cuts' is seen in the labor market despite the fact that it lowers the labor cost. Questionnaires were sent to the managers and their responses were matched with the theoretical predictions of the most common versions of the efficiency wage hypothesis (i.e. the Shirking efficiency wage theory, the Adverse selection efficiency wage theory, etc.) Here in this section, we briefly present the previous field survey findings to know the managerial experience and workers' views on the wage-related issues.

Kaufman (1984) interviewed in 26 British firms during high unemployment. He reports that firms do not replace workers with cheaper one because of skill and long run employment relationships. Supervision is costly; employers rely "heavily on the goodwill of their employees". Workers view wages as "a reward for performing competently". In addition, wage cut is seen as "affront". Hiring new workers at lower wages than existing wages creates "intolerable frictions" between the old and the new workers. Moreover, the new workers become disgruntled about the two-tier wage structure.

Blinder and Choi (1990) interviewed managers of 19 firms. They found little evidence to support Andrew Weiss' idea that "job candidate's wage demands are useful indicators of productivity". The majority said that effort would decrease if morale of a worker were hurt. A majority of their respondents also believed that higher unemployment would elicit higher effort level from workers. They reported that wage cut results in labor turnover and the

firms, which exercised this practice, had to experience labor quits. Their findings also show that workers care about relative wages, which is an obstacle to the reduction in wages.

Levine (1993) conducted a survey to focus the determination of wages rather than pin down reasons for the downward wage rigidity. He sent questionnaire on the pay policy to 139 managers of large American corporations. Contrary to the neoclassical theory, His findings show that the outside cluster of unemployment leads to higher productivity of the firm as per efficiency wage hypothesis.

Campbell and Kamlani (1997) sent questionnaire to the managers of 194 firms. Their concern was with the turnover issue, hiring and training costs. They found less support of the idea that wage cuts could become a problem for firms to hire new workers. They also found no support for the shirking model. They report that Managers' concern is disloyalty which decreases effort level rather than wage cuts. The employers-employees relationships matter to egg workers on providing higher effort level rather than offering higher wages, close supervision and existence of unemployment. They also found no support for the insider-outsider theory. Most of the managers did not support the idea that firing some of the current workers and replacing them by hiring new ones at lower wages could result in harassment and un-co-operation with the new comers from workers already on their jobs.

Agell and Ludborg (1995, 1999, and 2003) reported the findings of a questionnaire survey from managers of Swedish manufacturing firms obtaining responses from 179 firms in 1991 and from 157 of those firms in a follow up survey in 1998. According to managers, workers provide more effort when unemployment rate is high as in 1998 than in 1991 when it was lower. Moreover, majority of respondents viewed that the nominal wage cuts are

resisted by employees. They found no support for the shirking model. They pointed out that:

> "Employees who were repeatedly caught shirking were punished by a simple verbal rebuke."

Their findings on the management-worker relationships coincide with Campbell and Kamlani (1997) that the employer-employee relationships are important to elicit higher effort level on the job and workers should be involved in decision making which stimulate their working activities. Like Blinder and Choi (1990), Agell and Lundborg (1995, 1999, and 2003) also found little support for Weiss's idea that "job candidates' reservation wages are a useful signal of productivity".

Jennifer Smith (2002) collected nine years data (1991-1999) of 600 employed workers from the British household panel study. She concentrates on the workers who did not change employer in this period. She analyses changes of the workers' satisfaction and their monthly income. Her data includes monthly income and responses of questions about pay and job. She reports that workers who suffered wage-cuts in her sample period in a typical month were less satisfied than those who enjoyed the pay increases. Her findings are against the morale theory of wage rigidity. She reports that satisfaction was similar for both workers who suffered wage-cuts and those with frozen salaries. However, Truman Bewley (2004, pp.16) criticizes her findings and states that:

> "Job and pay satisfactions are probably not good measures of morale".

Truman Bewley (2004) finds support for the morale theory. He conducted interviews with 246 company managers and labor leaders in the northeast of the United States in early 1990s when unemployment rate was high. He is of the view that the resistance to the wage cuts comes from the managerial class rather from the labor class.

Conclusion

An economic model is an ideal world. We compare the 'actual' with the 'ideal' and deviations are possible. To improve models, we need to learn the factors which cause deviations between observations and theory.

Decisions of the economic agents are subject to rationality that endorses self-interest motive and the whole story of economics revolves around the propositions of maximization. On the contrary, this composition of economic realms collapses when the non-economic variables (i.e. fairness, equity etc.) affect economic decisions. We should incorporate this type of non-optimal behavior in economic literature because economic decisions are largely affected by these non-economic factors.

According to efficiency wage models, wages are not determined according to the law of Demand and Supply in the labor market. Involuntary unemployment should result in falling the wage rate as per classical and/or neoclassical theory but historical experience does not conform to this. Firms willingly pay higher wages despite involuntary unemployment to elicit higher effort level on the job. The payment of wages more than alternative wage leads to high morale, lower turnover and reducing shirking etc., which affect productivity of the firms. These arguments are associated with efficiency wage models.

Contrary to classical/neoclassical theory, the efficiency wage models suggest that effort per worker is a function of real wages and this wage-productivity relationship does not remain same across industries and causes wage differentials for equivalent workers on same jobs. In this behalf, researchers have reported substantial wage differentials for similar workers controlling labor, job and industry characteristics. According to the efficiency wage hypothesis, it is industry affiliation which affects wages of the identical workers. Another

interesting issue on which the neoclassical theory is silent is the effect of outside rate of unemployment on productivity of the firms. Accordingly, the classical/neoclassical theory suggests that the outside excess supply of labor should only put down word pressure on the wage rate. However, it is noted that wage rate remains higher and, does not fall even in the presence of outside involuntary unemployment. On the other hand, contrary to neoclassical theory but consistent with the efficiency wage hypothesis, this outside cluster of unemployment also affects productivity of the firms.

CHAPTER #3

Differential between Industry Specific Wage and Overall Wage

3.1 Interindustry Wage Structural Pattern and Wage Differentials

The persistent pattern of interindustry wage differentials is a pervasive fact, which exhibits regular norm. It is amazingly seen that workers having identical characteristics receive different packages of compensation on their jobs. It is a research question to the economic models to put forward explanation of this existing day-to-day practice.

Efficiency wage models have primary concern about the factors which play an important role to determine wages of a worker. These models provide logical insight that the industry affiliation causes wage differentials. Therefore, it is possible that with similar attributes, a worker can receive different wages within different industries despite performing similar work. The empirical work of efficiency wage models has primarily focused interindustry wage structure. Large differences in wages for the same work in the same locality have been empirically proved.

The purpose of this chapter is to present an analysis of the Pakistani industry wage structure over time 1964-1994 utilizing available data. We use regression analysis for the family of industry wages and draw wage differentials using the industry specific wage and the overall wage in all industries. We test the propositions of the conventional theory that differences which arise between the wage in any industry and the overall average wage are actually a chance and random fluctuation. In other words, wage in each period is determined exogenously and the pattern of wage in one time period will not have any relation with the

other period. Contrary to the neoclassical theory, the efficiency wage hypothesis suggests that there will be a pattern in wages because these differences in wages are not subject to the chance or random fluctuation because determination of wages is endogenous to firms. Technically speaking, in a regression of Di(t) on Di(t-1) [where Di(t) = Wi(t) − W(t)], the coefficient on Di(t-1) should not be significant according to neoclassical theory, since wage differentials between i-th industry and overall industrial wages are random.

3.2   Features of Data

The data used in this study is based upon different sources of data collection. However, data for this chapter is drawn from '50 years of Pakistan in Statistics' Volume II (1947-1997), Federal Bureau of Statistics, Statistics Division, Government of Pakistan. It presents information on employed persons by major industries, occupation groups, average annual earnings of factory workers in Perennial industries, number of reporting factories and daily number of workers employed in them etc.

3.3   Wage Structure through Time

According to Krueger and Summers (1987), dispersion in wages is counter-cyclical in the short run so that it increases in economic downturns while decreasing in economic upturn. H.G Lewis (1963) analyzed dispersion in industry wages for U.S economy over a long period. He found no increasing or decreasing tendency in the industry wage dispersions. Moreover, he noted the greatest dispersion in annual wages of industries in 1932, the boom of the Great Depression and less dispersion in wages during economic revival, period of post-world War II. He concluded no secular trend in the dispersion of industry wages over span of 30 years. Wachter (1970) also supports the counter-cyclical dispersion in industry

wages while Bell and Freeman (1985) report non-cyclical upturn in the dispersion of industry wages in 1970's.

It is argued that dispersion in wages is high in developed countries (DCs) and low in less developed countries (LDCs). Krueger and Summers (1987) report that there is lower dispersion of wages in less developed countries than developed countries while Romaguera (1991) doubted the proposition that developed countries have greater dispersion in wages than less developed countries.

In this section, according to the availability of data, we examine industrial wage structure of major industries in Pakistan over time from 1964 to 1994. Industries include Textile, Cotton/Ginning & Pressing, Engineering, Mineral Metals, Chemical and Dyes, Paper and Printings, Wood Stone and Glass, Skin and Hides, Ordinance Factories, Mints and Food and Drinks. Table # 1 presents Standard Deviation of industry wages. The dispersion in wages is noted from table # 1. The last decade has increasing trend.

Table # 1

Wage Structure through Time

Standard Deviation of Log Annual Earnings

YEAR	S.D
1964	0.14
1969	0.33
1974	0.40
1979	0.31
1984	0.34
1989	0.42

Sample Period: 1964-93

Table # 2

Standard Deviation of Log Ave Wages

Year	S.D
1964	0.045
1974	0.088
1984	0.336

Table # 2 also represents dispersion in wages based upon decades to analyze industry wage structure. Dispersion of wages has increased substantially from .045 to .34 over time. The variation in wages is comparatively lower between 1964 and 1974 ranging from .045 to .088 than 1974 and 1984 ranging from .088 to .34. It can be seen that as development takes place, dispersion in wages increases as pointed out by Krueger and Summer (1988). This result can also be supported by looking at Graph # 1 which is a plot of average industrial wages and shows the pattern of wages in three decades. The plot of average wages for 1964 is very smooth. However, latter on variation in wages goes on increasing over time. The data support the idea that the larger dispersion in wages is due to the economic growth of the economy.

3.4   Sectoral wage and overall wage

In Graph # 2, we present the difference between the sectoral wage and the overall average across all industries. These industries include Textile, Engineering, Mineral and Metals, Chemical and Dyes, Paper and Printings, Wood stone and Glass, Skin and Hides and Miscellaneous. We note widespread fluctuation in wage which does not come down even over time across industries. This pattern confirms our findings of the previous section 3.2 where we report Standard Deviation of industry wages ranging from .14 to .42.

Graph # 1

Average Industrial Wages
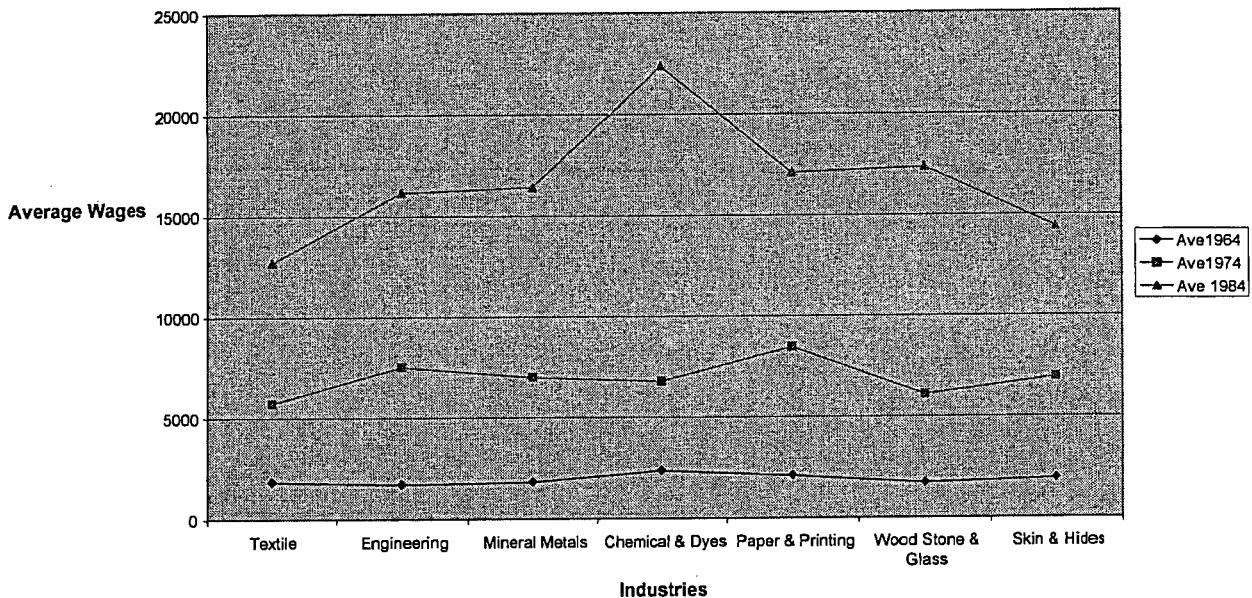
Graph # 2

Difference between the sectoral wage and the overall average wage
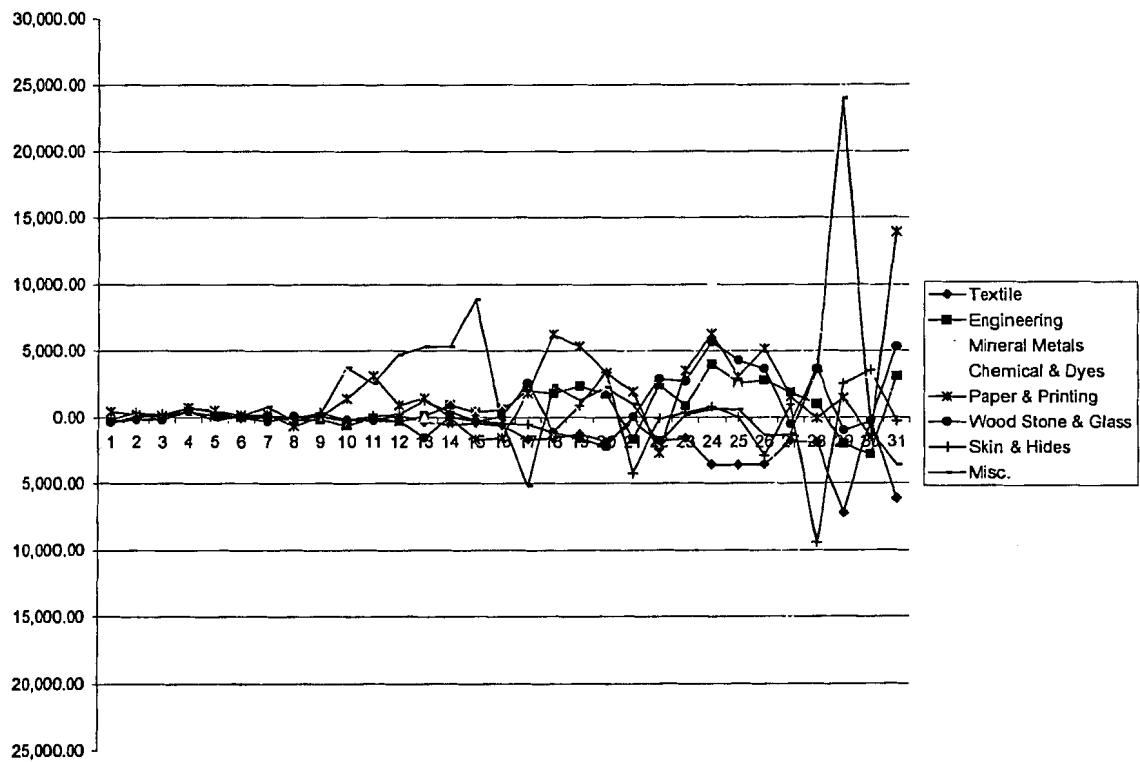
It is observed that the structural pattern of Textile industry is very different from the rest of all the industries. When we compare wage rate of industries to the overall wage in all industries, it is found that there is no significant differential between the industry specific wage and the overall wage in all industries except for Textile industry. All this shows that the textile industry appears to offer significantly different wages from the rest. Below we indicate two methods, both of which led to this same conclusion.

3.5 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 i-th 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 i-th 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.

Table # 3 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 3.

Table # 3

Eight regressions (With Absolute Differences)

	Coefficients	Standard Error	t Stat	P-value
Intercept	-0.07	0.14	-0.55	0.59
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 & Dyes	0.16	0.19	0.86	0.40
Intercept	0.44	0.26	1.69	0.10
Paper & Printing	0.31	0.18	1.70	0.10
Intercept	0.09	0.14	0.66	0.51
Wood Stone & Glass	0.27	0.17	1.60	0.12
Intercept	0.25	0.19	1.30	0.20
Skin & 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

To guide the reader in interpreting the table, we explain the numbers in the first two lines, which give the results for the textile industry. 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. Except in the case of Textiles, 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.

3.6   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 i-th industry to the overall industry average. If wages across industries conform to the competitive labor market theory, then $di(t)$ should be a purely random fluctuation, unrelated to $di(t-1)$. If there are significant and persistent differences in wages across industries, then the regression of $di(t)$ on a constant and $di(t-1)$ should yield a significant coefficient for $di(t-1)$. Table # 4 presents results of eight regressions with rate of change. After running these regressions we led to the same result as in the Table # 3 – only the textile industry had a significant coefficient on lagged wage differential, while the other industries conformed to the competitive model.

Table # 4

Eight Regressions (With Rate of Change)

	Coefficients	Standard Error	t Stat	P-value
Intercept	-0.05	0.03	-1.58	0.13
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 & Dyes	0.14	0.18	0.80	0.43
Intercept	0.11	0.05	2.11	0.04
Paper & Printing	0.31	0.18	1.67	0.11
Intercept	0.02	0.03	0.58	0.57
Wood Stone & Glass	0.33	0.17	1.91	0.07
Intercept	0.01	0.05	0.15	0.88
Skin & 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

This table gives the results for regressions of $d_i(t)$ on $d_i(t-1)$ for each of the eight sectors indicated. The first two lines show that $d_i(t) = -0.05 + 0.53 d_i(t-1)$ for the textile industry. The coefficient 0.53 of lagged $d_i = \ln(W_i/W)$ is significant only for the textile industry and not significant in all other industries.

3.7 Wage Differentials between Public and Private sectors

Public and private sectors are two major sectors of an economy. Fringe benefits including job stability and retirement benefits make the public sector very attractive in Pakistan. The degree of employment also varies between these sectors. Many researchers who have analyzed earning differences between public and private sectors have concluded that after including fringe benefits and leave policy, public sector wages are higher than that of private sectors. [9]

In Pakistan, private sector is further divided into private formal and private informal sectors. It is quite important to trace out the degree of wage variation between these sectors. In this behalf, a study conducted by Zafer Mueen Nasir (2000) provides a useful comparison of wage differentials between public and private sector. The author pins down the earning differentials taking into account personal and structural factors that determine compensation package using LFS (1996-97). He estimates the earning function for each sector separately. He states that:

> "Earning advantage due to personal characteristics and endowments in the public sector
> is offset by the wage structure of private sector that pays compensation at higher rates
> for the same characteristics relative to the public sector".

His findings are not counterintuitive to the Dual-Labor market Hypothesis, a version of efficiency wage models, associated with Doeringer and Priore (1971). This model defines differences in wages in a way that the Primary sector wages are always in excess of the market clearing level while determination of wages for the Secondary sector is subject to the market-clearing proposition.

---

[9] See Lindauer and Sabot (1983), Mann and Kapoor (1988) and Terrell (1993)

Conclusion

We analyze the interindustry wage structure and wage differentials for Pakistani economy. We find that dispersion in wages go on increasing as the economic development occurs. This finding is consistent with Krueger and Summars (1988) who states that the dispersion in wages is higher for developed countries while lower for less developed countries. Another finding for Pakistan is that the wage differential for the textile industry appears to be stable and persistent across time, contrary to the neoclassical theories of the labor market. However, other industries appear to conform to the competitive labor market structure, with wage differing by random and non-persistent amounts from the overall average wage.

CHAPTER # 4

Efficiency Wages in Textile Sector in Pakistan

Up to this stage, we have observed that it is the only textile industry which seems to offer efficiency wages while other industries do not have significant wage differentials from overall industrial wages in Pakistan. In this Chapter, replicating similar studies by Wadhwani and Wall (1991) and Levin (1992), we perform a direct test of the efficiency wage hypothesis for the textile industry to test further whether the basic standard predictions of efficiency wage hypothesis about size and signs of the coefficients remain valid. Moreover, we test the efficiency wage hypothesis at industry level rather than at the firm level because the firm level data is not available.

Most of the researches have used standard wage-augmented Cobb-Douglas production function to test the Efficiency wage hypothesis [10] which requires entering effort into the production function in the labor-augmented fashion, implying unit effort elasticity with respect to wage. In this behalf, we also use standard Cobb-Douglas production function following Levine (1992) for empirical testing of the Efficiency wage hypothesis. In this PF the rate of unemployment is not included.

$$Q = AK^{1-b}(e^{\alpha}L)^{b}\varepsilon$$

We test another empirical form of the efficiency wage hypothesis associated with Wadhwani and Wall (1991). Their empirical testable form of the Efficiency wage hypothesis is as given below.

---

[10] See for instance, Wadhwani and Wall (1991), Levine (1992), and Seref Saygili (1998)

$$Y_{it} = A K_{it}^{\alpha} L_{it}^{\beta} e^{\varphi t}$$

Replacing L_{it}^{β} by $(e(w).L_{it})^{\beta}$

$$Y_{it} = K_{it}^{\alpha} (e(w).L_{it})^{\beta} e^{\varphi}$$

As effort level depends on $(\dfrac{w}{w^*})^{\beta}$ and $\mu_{it}^{\beta_2}$

$$Y_{it} = K_{it}^{\alpha} (w/w^*)^{\beta_1} \mu_{it}^{\beta_2} L_{it}^{\beta} e^{\varphi t}$$

$$\ln Y_{it} = \alpha \ln K_{it} + \beta \ln L_{it} + \beta_1 (\ln w - \ln w^*) + \beta_2 \ln \mu_{it} + \varphi t$$

$$y_{it} = \alpha k_{it} + \beta l_{it} + \beta_1 w_{it} - \beta_1 w^*_{it} + \beta_2 \mu_{it} + \varphi t \text{ --------Eq 1}$$

All variables are in logs. yi denotes output of firm i in period t. ki is capital, li is labor. μ is unemployment rate. w is wage rate, w^* is the alternative wage (industry wages). φ is the error term.

4.1 Data and Definition of Variables

Data used in this chapter is obtained from various issues of Census of Manufacturing Industries (CMI) for nineteen years. These years are 1965, 1966, 1969, 1970, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1990. [11]

CMI is a major source of information on industries. The used data is highly reliable because it is not based on sample selection.

The Variable Definition and Summary Statistics are given in Table # 1 and Table # 2 respectively. The precise introduction of variables is as given below:

Y is the value of production of Textile industry (Rs million) at the end of the year.

---

[11] See Wizarat (2002) for discussion on CMI data and other related issues.

K: We use value of fixed assets (Rs million) at the end of the year.

E is the reported number of workers.

W is calculated by dividing sum of total employment costs (Rs million) by Average number of workers employed during the year.

The relative wage variable is W/W*. Where W is the wage level and W* is the Average wage level.

U is the rate of unemployment (% per annum).

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

Table # 1

Variable Definition

Variable	Description
Y	Value of production of Textile industry
K	Value of fixed assets
L	Number of workers
W	Wages
W/W*	Relative Wage
U	Unemployment Rate

Table # 2

Summary Statistics of Variables

Variable	Mean	Standard Deviation
Y	9.52	0.62
K	8.61	0.56
L	5.26	0.10
W	10.76	7.90
U	1.03	0.44

4.2 Estimation Techniques

1. We apply OLS and GMM to estimate the model. Lagged input values of K, L, and W are used as instruments.

2. We use 't-test' to test significance of the variables at 5% and 10% level of significance.

3. We employ exclusion tests for each input of the production function under the null that a variable can be excluded.

4.3 Estimation Results

Table # 3 and Table # 4 report our results. According to the neoclassical theory, the inputs of capital and labor determine the output, and coefficient of the wage ratio should not be significant. However, our coefficients on all the variables are positive, significant and plausible in magnitude. OLS estimates of the output elasticity with respect to wage are also positive and significant which is the heart of the efficiency wage hypothesis. Its magnitude is (.59) [t-ratio, 14.89]. However, Levine reports (.46), Wadhwani and Wall (.39), Huang, Hallam, Orazem and Pater (1998) estimate ranged between (.19) to (.61) and Seref Saygili (.15). Our coefficient on employment is (.86) [4.55] while Wadhwani and Wall report (.65), Huang, Hallam, Orazem and Pater ranged (.64) to (.68). Our coefficient of capital (.13) is less than that of the coefficient on employment. The sum of the coefficients on capital and labor is nearly unity so that constant return to scale is observed. Our coefficients do not vary significantly by the use of the GMM estimation. Now the estimated coefficient on wage is (.66) [10.25] while the estimated coefficient on employment is (.83) [2.74].

Table # 3

Ordinary Least Squares Estimation

****

Dependent variable is Q

19 observations used for estimation from   1 to   19
****

Regressor	Coefficient	Standard Error	T-Ratio	[Prob]
A	3.9301	1.0815	3.6340	[.002]
E	.86831	.19062	4.5552	[.000]
K	.13036	.066619	1.9568	[.069]
W	.59553	.039987	14.8932	[.000]

****

R-Squared	.98577	R-Bar-Squared	.98292
S.E. of Regression	.081397	F-stat. F(3, 15)	346.2574[.000]
Mean of Dependent Variable	9.5253	S.D. of Dependent Variable	.62279
Residual Sum of Squares	.099381	Equation Log-likelihood	22.9459
Akaike Info. Criterion	18.9459	Schwarz Bayesian Criterion	17.0570
DW-statistic	1.4920		

****

Diagnostic Tests

****
*   Test Statistics *   LM Version   *   F Version   *
****
*   *   *   *
* A:Serial Correlation*CHSQ(1)= .82650[.363]*F(1, 14)= .63670[.438]*
*   *   *   *
* B:Functional Form *CHSQ(1)= 2.1149[.146]*F(1, 14)= 1.7536[.207]*
*   *   *   *
* C:Normality   *CHSQ(2)=   .86634[.648]*   Not applicable   *
*   *   *   *
* D:Heteroscedasticity*CHSQ(1)= .89897[.343]*F(1, 17)= .84429[.371]*
****
A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

Table # 4

Generalized Method of Moments

Dependent Variable: DQ (where D denotes the first difference)
Method: Generalized Method of Moments
Sample (adjusted): 4 18
Included observations: 15 after adjusting endpoints
White Covariance
Convergence achieved after: 21 weight matricies, 22 total coef Iterations
Instrument list: DE (-1) DE (-2) DE (-3) DK (-1) DK (-2) DQ (-2) DW (-2)
DW (-3) DUN (-1) DUN (-2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.039828	0.027172	-1.465755	0.1734
DE	0.832468	0.303709	2.741009	0.0208
DK	0.111546	0.055396	2.013607	0.0717
DW	0.668712	0.065187	10.25844	0.0000
DUN	0.246637	0.102278	2.411426	0.0366

R-squared	0.803235	Mean dependent var	0.144000
Adjusted R-squared	0.724528	S.D. dependent var	0.212764
S.E. of regression	0.111670	Sum squared resid	0.124702
Durbin-Watson stat	2.173213	J-statistic	0.457477

The efficiency wage hypothesis requires that the coefficient of employment and wage should be same and this property is known as 'Solow Condition'. In our regression above, the equality of the two said coefficients can not be rejected. Therefore, the 'Solow Condition' holds for efficiency wages in our case of Textile industry.[12]

4.4 Effects of Unemployment

Another important variable relevant to efficiency wage hypothesis is unemployment which requires that the output elasticity with respect to unemployment should be positively signed and statistically significant in efficiency wage propositions. However, when we add unemployment rate to the above equation, it does not yield the statistically significant coefficient in the OLS results. This finding is contrary to the efficiency wages which suggest that outside changes in unemployment would increase productivity in the present case of textile industry in Pakistan. [13]

Table # 5 represents test of serial correlation of residuals (OLS). Exclusion tests for each input are also reported in Table # 6 and our null hypothesis of excluding a variable is rejected in every case.

---

[12] For discussion on Solow-Condition, please see Kanwar Abbas and Asad Zaman (2006)
[13] For discussion see Kanwar Abbas and Asad Zaman (2006)

Table # 5

Test of Serial Correlation of Residuals (OLS case)

```
********************************************************************
Dependent variable is Q
List of variables in OLS regression:
A        E        K        W
 19 observations used for estimation from   1 to   19
********************************************************************
```

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
OLS RES (- 1)	.31191	.31167	1.0008[.331]
OLS RES (- 2)	-.33606	.30041	-1.1187[.279]

```
********************************************************************
```

Lagrange Multiplier Statistic   CHSQ (2) = 2.4223[.298]
F Statistic   F (2, 13) = .94978[.412]

```
********************************************************************
```

Table # 6

Variable Deletion Test (OLS case)

```
********************************************************************
Dependent variable is Q
List of the variables deleted from the regression:
K
 19 observations used for estimation from   1 to   19
********************************************************************
```

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
A	4.7727	1.0762	4.4347[.000]
E	.92364	.20450	4.5166[.000]
W	.66239	.022535	29.3944[.000]

```
********************************************************************
```

Joint test of zero restrictions on the coefficients of deleted variables:
Lagrange Multiplier Statistic   CHSQ (1) = 3.8639[.049]
Likelihood Ratio Statistic   CHSQ (1) = 4.3198[.038]
F Statistic   F (1, 15) = 3.8292[.069]

```
********************************************************************
```

Variable Deletion Test (OLS case)

```
***************************************************************************
```
Dependent variable is Q

List of the variables deleted from the regression:
E

19 observations used for estimation from   1 to   19
```
***************************************************************************
```

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
A	8.1075	.85688	9.4617[.000]
K	.17537	.098479	1.7808[.094]
W	.57056	.059207	9.6366[.000]

```
***************************************************************************
```
Joint test of zero restrictions on the coefficients of deleted variables:

Lagrange Multiplier Statistic	CHSQ (1) = 11.0280[.001]
Likelihood Ratio Statistic	CHSQ (1) = 16.5015[.000]
F Statistic	F (1, 15) = 20.7500[.000]

```
***************************************************************************
```

Variable Deletion Test (OLS case)

```
***************************************************************************
```
Dependent variable is Q

List of the variables deleted from the regression:
W

19 observations used for estimation from   1 to   19
```
***************************************************************************
```

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
A	-1.4208	3.9243	-.36205[.722]
E	.47912	.72641	.65957[.519]
K	.97814	.13314	7.3467[.000]

```
***************************************************************************
```
Joint test of zero restrictions on the coefficients of deleted variables:

Lagrange Multiplier Statistic	CHSQ (1) = 17.7965[.000]
Likelihood Ratio Statistic	CHSQ (1) = 52.4246[.000]
F Statistic	F (1, 15) = 221.8061[.000]

```
***************************************************************************
```

Variable Deletion Test (OLS case)

```
************************************************************************
Dependent variable is Q
List of the variables deleted from the regression:
 E        K        W
19 observations used for estimation from   1 to  19
************************************************************************
Regressor        Coefficient    Standard Error    T-Ratio [Prob]
A                  9.5253          .14288          66.6669[.000]
************************************************************************
Joint test of zero restrictions on the coefficients of deleted variables:
 Lagrange Multiplier Statistic    CHSQ (3) =  18.7295[.000]
 Likelihood Ratio Statistic       CHSQ (3) =  80.7895[.000]
 F Statistic                      F (3, 15)  = 346.2574[.000]
```

Conclusion

The neoclassical theory suggests that, contrary to Efficiency wage propositions, it is only capital and labor inputs that determine output where as wages do not have any effect on output of the firms. In this chapter, we directly test predictions of the efficiency wage hypothesis in the textile sector of Pakistan. Our estimated coefficients of all the variables are plausible and statistically significant. The positive sign of the estimated coefficient of relative wage level satisfies the basic prediction of the efficiency wage hypothesis. We find that wage level is a significant factor in determining output contrary to the neoclassical theory but in conformity with the efficiency wage propositions. Moreover, the 'Solow Condition' also holds for the efficiency wages in our present case of textile industry. However, the coefficient on unemployment is not statistically significant which is contrary to the efficiency wage hypothesis.

CHAPTER # 5

The Field Survey Tests of the Efficiency Wage Hypothesis

In this chapter, we present our findings of a field survey. [14] Our field study is entirely different from previous field surveys which addressed the reasons for few wage cuts. However, the focus of our survey is to test whether with the same attributes of workers, different wages can be offered as per efficiency wage hypothesis in the labor market. The present survey is conducted for the following purposes:

1. Whether workers performing similar work with similar characteristics receive different wages on their jobs in the similar locality.

2. Whether working hours differ with similar work and attributes of age, experience etc. for workers.

3. Whether education level and job experience increase income level.

5.1 Method of Conducting Survey

The approach adopted in this survey is not based on questionnaire because it was difficult for unskilled workers to read and fill it in a correct way. Therefore, we went worker to worker to collect information. We chose medicine pharmacies and doctors' clinics to collect information on wage and working hours. We visited 22 clinics and pharmacies. We asked questions on experience, education, age and income. A person engaged with the same profession was with us to get correct information about wages. We visited ten hotels and five PCO's to collect information on wages and working hours of the skilled and unskilled

---

[14] I am grateful to my friends, Atiq-ur-Rehman, Mudassar Nazir, Zafar Abbas who helped me in conducting field surveys.

workers. We visited markets where the luggage is loaded on trucks to note working hours and wages for loading a truck. We visited villages to collect information about working hours in the fields. Information on both skilled and unskilled workers is collected separately so that wage differentials may be analyzed for both types of workers.

5.2   Places of Survey

Financial constraint did not allow us to conduct survey on macro level. We chose area where cost was least for us. These surveys were conducted in Kasur and Islamabad. The villages of Kasur were chosen to analyze the working hours and wages of people who work in the fields. We visited selected areas for small hotels and PCOs. We collected information about workers associated with medical pharmacies and medical clinics in Kasur.

5.3   Findings of the Present Survey

5.3.1   Workers in hotels

Wages are usually paid on monthly basis to the skilled workers while unskilled workers work on daily wages. In hotels, two to three year experience is required for cook. We noted large variation in the wage rates for skilled workers (cooks). Payment to cook ranges Rs.4500/- to Rs.8000/- with same experience. The highest payment was Rs.8000/- while the lowest payment was Rs.4500/- to the cook in a same locality. At two places, the same payment of Rs.6000/- was reported and it was said that they were paying at the 'market rate'. The payment of wages to unskilled workers was different from skilled workers. Some like to pay them on monthly basis while others pay on daily basis. Wage differential is higher for unskilled workers. In one hotel, the payment to unskilled worker was only Rs.1200/- per month and in the same locality at a nearby distance, it was Rs.3600/- for

equally likely characteristics. At one place, it was said that, with some experience, they pay Rs.3500/- per month and Rs.3000/- with no experience.

In the following sections, we present wage rate per day, per hour for skilled and unskilled workers.

5.3.2 For skilled workers

Working hours are important to calculate wage rate per hour. With Rs.6000/- per month to the skilled workers, the working hours are 14. Therefore

Wage rate per day   =6000/30=200

Hourly wage rate per day   = 200/14 = 14.28 ≈15/-

They earn about Rs.15/- per hour in a day.

Those who also report Rs.6000/- per month, their skilled workers work 12 hours.

Wage rate per day   =6000/30=200

Hourly wage rate per day= 200/12 = 16.7 ≈17/-

They earn about Rs.17/- per hour in a day.

Those who also reported Rs.8000/- per month, their skilled workers work 12 hours.

Wage rate per day   =8000/30=266.6 ≈ 267/-

Hourly wage rate per day   = 267/8 = 33.3 ≈34/-

5.3.3 For unskilled workers

We consider first unskilled workers of hotels who report 14 hours. They pay Rs.3000/- to the unskilled workers.

Wage rate per day   = 3000/30 = 100

Hourly wage rate per day   = 100/14 = 7.1 ≈ 7/-

The unskilled workers earn about Rs.7/- per hour in this hotel. At another place,

Pay is Rs.1200/- per month, the working hours are same.

Wage rate per day $= 1200/30 = 40$

Hourly wage rate per day $= 40/14 = 2.8 \approx 3/-$

The unskilled workers earn only Rs.3/- per hour in this hotel.

Those who reported Rs.120/- per day to unskilled workers, their working hours was 8, so

Wage rate per month $= 120 \times 30 = 3600$

--- --- day $= 120$

Hourly wage rate per day $= 120/8 = 15/-$

The unskilled worker earns Rs.15/- per hour in this hotel. This hotel is paying the highest wage rate per hour to the unskilled workers in our selected hotels. The workers associated with this hotel earn more than double than all other hotels where having the same characteristics, working in the same locality, performing the same work, workers receive different wage rate per hour as per the efficiency wage hypothesis.

5.4   Fringe benefits

We noted no larger variation in fringe benefits. All hotels are providing meal, accommodation etc. to their workers.

5.5   Return from education and experience (evidence from pharmacy and medical clinics)

Experience is considered a major factor which increases wages. In this survey, it has been seen that experience does not matter in the determination of wages (from no.2, no.5, 9 and 12 Table # 1) except working in the same firm. Workers who work consecutive years in a unit/firm are rewarded with some extra amount. However, it is also possible that other similar workers performing the similar work can earn more with less experience in the market.

Table # 1

Workers Working in Pharmacies and Clinics

Name	Age (Year)	Experience (Year)	Income Rs.	Pharmacy/Clinic

Education: F.A Status: Dispenser

Name	Age	Experience	Income	Pharmacy/Clinic
1. M Ashfaq	24	4	3000	Dr. Munir Gohar
2. M. Saleem	26	6	2500	Dr. Abdul Qadir
3. Tahir	20	2	1500	Dr. Abdul Qadir
4. Gaffar	20	4	2000	Dr. Zulfiqar
5. Imran	25	6M	3000	Dr. Safdar
6. Noman	18	2M	800	Dr.Abdul-Rehman Qamar
7. Adnan	20	2 ½	1800	Dr. Inayat Ullah

Education: Matriculation Status: Dispenser

Name	Age	Experience	Income	Pharmacy/Clinic
8. Sheikh Bilal	25	10	2500	Dr. Zulfiqar
9. M. Azeem	21	3 M	2000	Dr. Munir Gohar
10. M. Ali	22	8 M	1000	Dr. Abdul-Rehman Qamar
11. Naveed	22	2	2200	Dr. Abdul Quddos
12. Ghulam Nabi	21	4	2000	Rehman Hospital
13. Shabbir	25	4	2000	Rehman Hospital
14. Hafiz	25	8 M	2000	Dr. Inayat
15. Tufail	26	5 ½	2500	Dr. Salamat

Education: F.A Status: Salesman

Name	Age	Experience	Income	Pharmacy/Clinic
16. Shakil	24	3	3000	Muslim Medicose
17. Mustafa	21	6 M	3000	Muslim Medicose
18. Shafiq	22	4 ½	3500	Muslim Medicose
19. Qasim	22	4 ½	2000	Imran Pharmacy
20. Mushtaq	26	10	3500	Imran Pharmacy

Education: Matriculation Status: Salesman

Name	Age	Experience	Income	Pharmacy/Clinic
21. Ramazan	26	8	2500	Bhatti Pharmacy

From no.17 and 20, a worker having six month experience and intermediate qualification earns Rs.3000/- per month while in another pharmacy a worker with ten years experience and intermediate qualification earns Rs.3500/- per month. An experience of decade rewards him only Rs.500/-.

- In case of 18 and 19, a worker with F.A and 4 ½ years experience earns Rs.3500/- per month while a worker in another pharmacy with same experience, qualification and working hours earns Rs.2000/- per month.

- From 11 and 12, persons (with less experience) earn higher wages with the same level of education.

- From 10 and 14, with same education and experience, differential in the wages of workers is doubled.

5.6 Workers loading luggage

We visited market where heavy trucks are loaded to compare wage rates of unskilled workers. 'Collie' works hard than workers of the hotels. A collie works almost three to four hours to load a truck. His wages range from Rs.100/- to Rs.150/- which vary case to case. When trucks are loaded (with fruit, vegetables etc. in villages), parties call the 'professional workers' and with negotiation, wages are settled.

Wage rate per hour at Rs.100/- is Rs.25/- while wage rate per hour at Rs.150 is Rs.38/- for a collie who loads trucks. Wag rate per hour of the unskilled workers who work in hotels vary from Rs.15/- to Rs.20/- and the highest wage rate per hour was noted Rs.34/- in our selected hotels.

5.7 Workers in PCO's

Experience is not required in PCO's. Working hours are almost same and workers work from 7 am to 12 pm. The payment of wages ranges from Rs.1500/- to Rs.2000/- per month. Fringe benefits do not vary from one to another place. Rs.20/- per day is given to workers for lunch. We find negligible wage difference for workers working in PCO's.

5.8 Workers in Fields

An acre of field is harvested at Rs.100/- for male and Rs.50/- for female on daily basis. This is a bench mark for equally skilled and unskilled workers (i.e. experienced or inexperienced).

In table # 2, we summarize our field survey statistics of wages discussed above in 5.3.2, 5.3.3 and 5.4. We find that CV is extremely higher for unskilled workers such that variation in wages for unskilled workers is higher than that of skilled workers. Moreover, it is obvious that workers having the same labor and job characteristics receive different wages even in the same locality as per efficiency wage hypothesis.

Table # 2

Summary Statistics of Field Surveys

Category	Average Wages	Standard Deviation	CV
For skilled Workers	6125	1243.73	20.30
For unskilled workers	2600	1019.80	39.22
For Medical clinics and Pharmacy	2324	700.95	30.16

Conclusion

The efficiency wage hypothesis states that affiliation with a firm or an industry is a source of wage differential for workers having equally likely attributes of age, experience, qualification etc. In the present survey, we chose workers associated with multiple professions to analyze wage differentials. It has been found that workers having the same characteristics, working in the same locality, performing the same work, receive different wages. Moreover, it is also possible that workers having less experience than experienced workers can earn higher wages in the same localities, performing similar work. However, the fringe benefits do not vary in the surprising way.

CHAPTER # 6

Summary and Conclusion

This study investigates the practical implication of the economic theory, which is often said not to be compatible with the worldly practice. The theory, which fits the real world, is not according to the rational maximization behavior because the economic agents are not fully rational and give weight to the non-economic factors (i.e. fairness, equity etc) in their economic decisions. In this context, deviations from full-optimization behavior are possible because the economic agents do not incur significant losses from this deviation and a firm's non-optimal behavior i.e. paying more wages despite outside involuntary unemployment, is actually a 'near rational' behavior. This deviation results in high morale, lower turnover, and reducing shirking on the job etc.

New Keynesians introduced many remarkable innovations, which base upon the real world problems. The issue of the involuntary unemployment caused by stickiness in wages has been deeply analyzed since the emergence of Keynes *General Theory*. Efficiency wage hypothesis is one of those intuitive ideas, which provide explanation of the behavior of economic agents. This hypothesis mainly pins down the reasons for wage rigidity and involuntary unemployment. New Keynesians present the psychological and sociological factors in economic thoughts, which provide important explanation of the behavioral practices of the economic agents. These factors once considered uneconomic, now are given place in the economic models. The present study discuses these non-economic factors, which become the root cause of deviation from the self-interest paradigms. We recommend that their inclusion is must when economic models are chalked out.

It is amazingly observed that firms willingly pay higher wages despite involuntary unemployment in the labor market. Efficiency wages provide an important discussion on this behavior within macroeconomic framework. Efficiency wage hypothesis states that the effort per worker is a function of the real wage and firms pay more than competitive wage because any reduction in wages lowers productivity of all employees already on the job. This is the heart of Efficiency wage models. The Efficiency wage hypothesis pins down the proposition "the higher are the wages, the higher are the efforts level".

Different versions of the efficiency wage hypothesis suggest the reasons behind existence of noncompetitive wage determination and wage differentials in the labor market. These models prescribe that output and wages positively correlate with each other and, with similar characteristics differences in wages can affect firms' output. In this regard, many remarkable studies of Krueger and Summers (1988), Wadhwani and Wall (1991), Levine (1992), Saygili (1998) etc. empirically test predictions of the efficiency wage hypothesis and provide evidences in favor of the efficiency wage hypothesis contrary to the efficiency wage hypothesis. The persistent and stable interindustry wage differentials exist despite controlling all the relevant variables of human capital, demographic and geographic characteristics of the workers. The efficiency wage hypothesis suggests that, it is the industry affiliations which significantly impact wages of the workers and, as a result, the identical workers receive different wages on their jobs. Moreover, the outside unemployment rates also affect firms' output while quit rates have negative association with wages as per efficiency wage hypothesis. Experimental economists also tested leading versions of the efficiency wage models and, these results are compatible with the earlier empirical results. However, the neoclassical explanations of compensating wage

differentials, unmeasured labor quality and transitory wage differentials are quite weaker and, do not provide realistic behavior of the labor market.

We analyze the interindustry wage structure and wage differentials among industries for Pakistani economy. Our Standard Deviation of industry wages ranges from .14 to .42. In comparison with Romaguera (1991) who measures for the manufacturing sectors ranging from .34 to .40 for the Chilean economy and reports that dispersion in wages is higher even for Less Developed countries. We observe that dispersion in wages increases over time as the economic development takes place. This is consistent with Krueger and Summers (1988) proposition that there is larger dispersion in wages for Developed countries while lower for Less Developed countries. We also replicate the well-known models of Wadhwani and Wall (1991) and Levine (1992). Our main finding in this investigation suggests that the predictions of the efficiency wage hypothesis holds only in the textile sector of Pakistan which differ significantly from overall average industrial wages. However, the other industries appear to be competitive because their wages are not significantly different from overall industrial wages. We further perform the direct estimate of the production function for the textile industry in which the ratio of wages in textile industry to average wage level significantly affects textile production. This finding is contrary to the neoclassical theory which states that only capital and labor input determine output whereas wage does not do so. We find a positive and statistically significant coefficient on wage as per efficiency wage hypothesis. Our estimates for textile industry of Pakistan also accept the 'Solow Condition'. Another typical finding is that the outside pool of unemployment does not affect productivity in the textile sector which is contrary to the findings where it does in the literature like Wadhwani and Wall (1991), Huang et al (1998).

We have also directly tested the theoretical predictions of the efficiency wage hypothesis in the labor market through conducting field surveys. Our survey findings satisfy the basic predictions of the efficiency wages hypothesis that workers having the same characteristics working in the same locality, performing the same types of job receive different compensation packages on their job as per the efficiency wage hypothesis.

The present research is a sum of the laboratory examination, the empirical examination and the field survey examination of the efficiency wage hypothesis. Efficiency wage models have explanatory power. In particular, firms can profitably pay real wages above equilibrium wages. This means that the labor market may not automatically clear in equilibrium, as suggested by classical theory. In fact, clear empirical evidence for this is in front of our eyes as the high and persistent involuntary unemployment which has existed in Pakistan for many years.

Bibliography

1. Adam Smith. (1776), "An Inquiry into the Nature And Causes of the Wealth of Nations" (http://www.adamsmith.org/smith/won-index.htm)

2. Agell, Jonas and Par Lundborg. (1995), "Theories of Pay and Unemployment: Survey Evidence from Swedish Manufacturing Firm", Scandinavian Journal of Economics, 97, pp.295-301.

3. Agell, Jonas and Par Lundborg. (1999), "Survey Evidence on Wage Rigidity and Unemployment: Sweden in the 1990's, Office of Labor Market Policy Evaluation, Uppsala, Sweden, Discussion Paper.

4. Agell, Jonas and Par Lundborg. (2003), "Survey Evidence on Wage Rigidity and Unemployment: Sweden in the 1990's", Scandinavian Journal of Economics, 105, pp.15-29.

5. Akerlof, George. (1982), "Labor Contracts as Partial Gift Exchange", Quarterly Journal of Economics, 97 (4), pp.543-63.

6. Akerlof, George. (May 1984), "Gift Exchange and Efficiency Wage Theory: Four Views", American Economic Review, papers and proceedings, 74, pp.79-83.

7. Akerlof, George A. and Yellen, Janet L. (May 1987), "Rational Models of irrational Behavior", American Economic Review, Papers and Proceedings, 77(2), PP.137-42.

8. Azariadis. C. (1975), "Implicit Contracts and Unemployment Equilibria", Journal of Political Economy, 83 (6), pp.1183-1202.

9. Becker, Gray and George, Stigler. (1974), "Law Enforcement, Malfeasance and Compensation of Enforces", Journal of Legal Studies, 3 (1), pp. 1-18.

10. Bell,L.and R.B.Freeman. (April 1985), "Does a Flexible Industry Wage Structure Increase Employment? The U.S Experience", NBER working paper # 1604.

11. Bhattacharya S. (1984), "Tournament and Incentives; Heterogeneity and Essentiality", Berkley Business School (Mimes).

12. Blinder and Choi. (1990),"A Shred of Evidence and Theories of Wage Stickiness", Quarterly Journal of Economics, 105, pp.1003-15.

13. Campbell and Kanal, Kamlani. (1997), "The Reason for Wage Rigidity: Evidence from Survey of Firms", Quarterly journal of Economics, 112, pp.759-89.

14. Dickens, W. (1986), "Wages, Employment and the Threat of Collective Action by Workers" NBER working paper#1856.

15. Doeringer and Priore. (1971), "Internal Labor Markets and Manpower Analysis". Lexington M.A: Dc Health.

16. Dunlop, J. (1957), "The Task of Contemporary Wage Theory" in J. Dunlop (ed.), The Theory of Wage Determination, London: Macmillan.

17. Fehr, Ernst and Falk, Armin. (1997), "Reciprocity in Experimental Markets" Discussion Paper, University of Zurich.

18. Fehr, Ernst and Falk, Armin. (Feb 1999), "Wage Rigidity in a Competitive Incomplete Contract Market", Journal of Political Economy, 107 (1), pp.106-34.

19. Fehr, Ernst and Gachter, Simon. (June 1998), "Wage Differentials in Experimental Efficiency Wage Market", Discussion paper.

20. Fehr, Ernst and Gachter, Simon. (Summer 2000), "Fairness and Retaliation: The Economics of Reciprocity", Journal of Economic Perspectives, 14 (3), pp.159-81.

21. Fehr, Ernst., Gachter Simon., Kirchsteiger, George. (1996), ""Reciprocal Fairness and non-compensating Wage Differentials", Journal of Institutional and Theoretical Economics, 152, PP.608.

22. Fehr, Ernst., Gachter Simon., Kirchsteiger, George. (1997), "Reciprocity as a Contract Enforcement Device", Econometrica, 65, (1997), 833-860

23. Fehr, Ernst. Kirchsteiger, George and Riedle, Arno. (1998), "Gift Exchange and Reciprocity in Competitive Experimental Markets", European Economic Review.

24. Freeman. R B. and J Medoff. (1981), "The Impact of Percentage Organized on Union and Non-Union Wages", Review of Economics and Statistics, 63.

25. Government of Pakistan. "The Economic Survey", (Various issues), Economic Advisor's Wing, Ministry of Finance.

26. Government of Pakistan. "Census of Manufacturing Industries", (various issues), Federal Bureau of Statistics.

27. H. G. Lewis. (1963), "Unionism and Relative Wages in the US". Chicago: University of Chicago press.

28. Hasni, Maqsood. (1989). "Kia Moiashi Nazaam Ki Tabdili Tamam Masail Ka Hul Ha? ", Discussion working paper.

29. Huang, Tzu-Ling. Arne Hallam. Peter F. Orazem and Elizabeth M, Peter No. (1998), "Empirical Tests of Efficiency Wage Models", Economica, 65, pp.125-43.

30. John Maynard Keynes. (2005), "The General Theory of Employment, Interest & Money", Futurecasts online magazine, vol 7, No6.

31. Jennifer Smith. (2002), "Pay Cuts and Morale; a test of Downward Nominal Rigidity", Warwick Economic Research paper# 649.

32. Katz, Lawrence. (April 1986), "Efficiency Wage Theories: A Partial Evaluation", NBER working Paper # 1906.

33. Kanwar Abbas and Asad Zaman. (2006), "Efficiency Wage Hypothesis—The Case of Pakistan" Forthcoming in Pakistan Development Review.

34. Kaufman, Rager. (1984), "On Wage Stickiness in Brittan's Competitive Sector", British Journal of Industrial Relations, 22, pp. 101-112.

35. Krueger, Allan and Summers, Lawrence. (1988), "Efficiency Wages and The Interindustry Wage Structure", Econometria, 56 (2), pp.259-93.

36. Krueger, Alan and Summers, Lawrence. (1987), "Reflections On Inter-Industry Wage Structure", Unemployment and The Structure of Labor Markets, (Ed) K. Lang and J. Leonard, Basil Blackwell, New York.

37. Lawson. T (1982), "On the Stability of the Interindustry Structure of Earning in the UK: 1954-1978", Cambridge Journal of Economics, (6), pp.249-66.

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

39. Levine, David. (1988), "Tests of Efficiency Wage and Rent Sharing Theories: The Pay Productivity Relation", University of California, Berkeley.

40. Levine, David. (Sep. 1992), "Can Wage Increase Pay for Themselves? Test with a Production Function", The Economic Journal, 102, pp.1102-15.

41. Levine, David I. (1993), "Fairness, Market and Ability to Pay; Evidence from Compensation Exclusives". American Economic Review, 83, pp. 1241-59.

42. Lindauer and Sabot. (1983), "Labor Market Discrimination in a Poor Urban Economy", The Journal of Development Studies. 19, pp.67-87.

43. Lindbeck and Snower. (1988), "Cooperation, Measurement, and Involuntary Unemployment: An Insider–Outsider Approach", American Economic Review, 78, pp.167-88.

44. Mann and Kapoor. (1988), "Earnings Differentials between Public, Private and Joint Sectors in Punjab (India)", The Journal of Development Studies, 25, pp.97-111.

45. Mary. L. Rigdon. (July29, 2002), "Efficiency Wage in an Experimental Labor Market", Discussion Working Paper. University of Texas, Austin.

46. Mueen Nasir. (2000), "Earnings Differential between Public and Private Sectors in Pakistan", The Pakistan Development Review, 39 (2), pp.111-130.

47. Murphy, Kevin and Robert Topel. (1987), "Unemployment, Risk and Earnings: Testing for Equalizing Wage Differences in the Labor Market", in Kevin Lang and Jonathan S. Leonard, eds., Unemployment and the structure of Labor Markets, London, Basil Blackwell.

48. Murphy, Kevin and Topel, Robert. (1990), "Efficiency Wage Reconsidered; Theory and Evidence", Macmillan.

49. Papola and Bharadwaj. (1970), "Dynamics of Industrial Wage Structure; an Inter-country Analysis", The Economic Journal, 80, pp. 72-90.

50. Raff, Daniel and Summers H. Lawrence. (Oct 1987), "Did Henry Ford Pay Efficiency Wages?" Journal of Labor Economics, 5 (4), pp.557-86.

51. Ramzan Akhtar (1991), "An Islamic Framework for Employer-Employee Relationships", The American Journal of Islamic Social Sciences, 9(2),pp.202-18.

52. Riveros Luis A. and Lawrence, Buton. (Apr. 1994), "Common Elements of Efficiency Wage Theories: What Relevance for Developing Countries?" The Journal of Development Studies, 30 (3), pp.696-716.

53. Romaguera, Pillar. (March 1991), "Wage Differentials and Efficiency Wage Models: Evidence from the Chilean Economy", Discussion working paper # 153.

54. Salop, Steven. (1979), "A Model of The Natural Rate of Unemployment", American Economic Review, 69 (1), pp.117-25.

55. Seref, Saygili. (April 1998), "Is the Efficiency Wage Hypothesis Valid for Developing Countries? Evidence from the Turkish Cement Industry", Discussion Paper, University of Kent at Canterbury, Turkey.

56. Shapiro and Stiglitz, Joseph. (1984), "Equilibrium Unemployment as a Worker Discipline Device", American Economic Review, 74, pp.433-44.

57. Slitcher, S. (1950), "Notes On the Structure of Wages", Review of Economics and Statistics, 32, pp.80-91.

58. Solow, Robert. (Aug 1979), "Alternative Approaches to Macroeconomic Theory: A Partial View", Canadian Journal of Economics, 12, pp.339-54.

59. Stacy, Adam J. "Inequality in Social Exchange" Berkowitzed ed. (1965), "Advances in experimental social psychology", (2), New York: Academic press, pp.267-99.

60. Stiglitz, Joseph. (March 1974), "Wage Determination and Unemployment in L.D.C's: The Labor Turnover Model", Quarterly Journal of Economics, 88, pp.194-227.

61. Stiglitz, Joseph. (March 1987), "The Economic Consequences of the Dependence of Quality on Price", Journal of Economic Literature.5 (1), pp.1-48.

62. Stoft, Steven. (May 1982), "Cheat Threat Theory: An explanation of Involuntary Unemployment" ,Mimeo, Bostan University,

63. Tabakoglo, Ahmad. "Labor and Capital Concepts", in Islamic Economics and Distribution in macroeconomic Framework: An Islamic Perspective, edited by Fahim Khan. Pp.77-91.

64. Tarling and Wilkinson. (1982), "Changes in the Interindustry Structure of Earnings in the Post-war Period", Cambridge Journal of economics, 6, pp.231-48.

65. Terrel, Katherine. (1993), "Public-Private Wage Differential in Haiti; Do Public Servants Earn a Rent?" Journal of Development Economics, 42, pp.293-314.

66. Truman, Bewley. (May. 2004), "Fairness, Reciprocity and Wage Rigidity", Discussion Paper.IZADp.1137.

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

68. Wachter, M. (1970), "Cyclical Variation in the Interindustry Wage Structure", American Economic Review, 60, pp.75-84.

69. Weiss. (1980), "Job Ques and Layoffs in Labor Markers with Flexible Wages", Journal of Political Economy, 88, pp.526-38.

70. Wizarat, Shahida. (2002), "The Rise and Fall of Industrial Productivity in Pakistan". Oxford University press. Karachi, Pakistan.

71. Yellen, Janet. (May 1984), "Efficiency Wage Models of Unemployment", American Economic Review, Papers and Proceedings, 74, pp. 200-05.