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Wage Setting Behaviour of Firms in Industrial Estates of Khyber Pakhtunkhwa, Pakistan

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ABSTRACT

Development The objective of the study is to analyze the wage setting behaviour of firms. For this study four major industrial estates of Khyber Pakhtunkhwa. Using stratified random sampling, data is collected from 342 firms. Multinomial logistic model is used to estimate the effects of determinants on wage change. Most of the firms change wage rate once in a year. Majority of the firms follow time-dependent wage policy. Half of the firms, which are following time-dependent wage policy, change the wage rate at the end or start of the fiscal year. Most of the firms are not found to index wages. Moreover, the percentage of firms not involved in wage indexation is higher for daily workers than for permanent worker. Labor productivity, employment level in the economy, government regulations, taxes, demand for the product, and inflation are important factors of wage change, but the most important factor is the labour productivity and least important is pressure from the labour union. Imperfect competition and size of the firms are the important determinants of wage flexibility, while wage indexation, information set of expected inflation and fringe benefits provided to workers are the important determinants of wage rigidity. It is important for Pakistan to avoid wage cuts at the times of recession and disinflationary policies be carefully designed as sacrifice ratio, albeit moderate, is not zero.

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1. Introduction

Wage setting behaviour is important dimension in the context of policy effectiveness. The concept of wage flexibility/rigidity is the major controversy between schools of thought. According to

the Keynesians, wages are assumed rigid, so monetary and fiscal policy are useful in the short run. According to the Classical, the wages are assumed flexible, that's why the policy is ineffective and in this case, policy change will bring only nominal changes giving rise to classical dichotomy and money neutrality. So, it is very important to analyze the wage-setting behaviour at micro level.

How firms change their wages? What are the causes of variations in the frequency of wage change of firm? Why some of the firms change its wages more often than the other firms? According to literature heterogeneous behaviour of wage setting is because of different factors. Taylor (1979) is the pioneer study using wage contract data of workers to check the Staggered Wage setting theories. Extensive research has been done on the wage setting behaviour in the 2000s after the creation of Wage Dynamic Network (WDN). The wage setting are staggered and unsynchronised with the respect to time. Even if wage setting is time-dependent, still they are unsynchronised across different sectors and areas (Bryan, Meyer, and Parker 2015), but within the sector, there is a large amount of synchronisation and similarity in wage setting behaviour (Baye, Pagel and Wey 2016). Avouyi-Dovi et al. (2013) find large up's and downs in the duration of wage contracts over a year. The wage setting behaviour is staggered over the 12 months duration both at the micro level and aggregate level, with some evidence of seasonality. Bughin and Vannini (2003) show that wage changes follow seasonal arrangement, i.e. in January and June nominal wages are mostly increased. Most of the studies show that wages are fixed for one year. Wages do not change according to random shocks. Wages are predetermined and expected changes are incorporated in advance. Empirical evidence strongly support that majority of the firms adopts time-dependent wage policy. According to the literature, the average duration of wage contract is higher than the average duration of price contract (Iqbal & Amin, 2019). Moreover, the occurrence of wage change is less than the number of time changes occur in prices (Barattieri et al. 2014). Moreover, Egger and Ertel (2014) explore evidence of a cyclical pattern in the frequency of wage modifications. The degree of heterogeneity and unsynchronization is very high in wage in all aspects, i.e. between products, countries, types of workers in different categories and even same categories, between different and same sectors etc (Eijffinger, Grajales-Olarte & Uras, 2020). There is no evidence of homogeneity in wage setting behaviour. Wages in some industries are time-dependent, while in another they are state dependent, some firm change yearly, while other quarterly or monthly. Wages of unskilled workers change with high frequency than the wages of skilled workers. This mixed result of wage setting behaviour is pointing toward the need of homogeneity for better policy recommendations (Mellacher & Scheuer, 2020).

The current literature suggests that to find any consensus of the behaviour of wages, is to survey the firm directly. The present study is to analyse the wage setting behaviour on the data directly collected from the firms on a wider range, which would help the policy maker in the framework of monetary policy because different reasons of rigidity have a different effect.

The objective of the study is to determine how firm characteristics, economic and institutional factors affect the frequency of wage and to explore whether the firms follow time-dependent or state-dependent policy in wage setting in Industrial estates of Khyber Pakhtunkhwa.

The rest of the study is organized as; section two consists of theoretical background related to wage setting behaviour, section three explained econometric methodology, section four elaborated questionnaire design, section five discussed construction of variables, section six explained area of study, sampling and data collection; section seven consists of descriptive analysis, results based on

analytical techniques and interpretation; section eight is about conclusion of the study and policy recommendation, and in the end references.

2. Theoretical Background

The basic feature of staggered wage model is consistent with the behaviour of wage setting, because according to the model wage value depends on the past value of price, wage and the behaviour of other firms. The cost theory of adjustment, the fixed and random interval of wage setting is mostly used in the formal determination of wage. However, the necessary condition for wage setting require some degree of market power in both imperfect and perfect competitive markets. Even in competitive markets there exists some degree of market power, while setting the wage (Arrow, 1959). Imperfect competitive market structure are used mostly in the macroeconomic model of wage rigidity. The model assumed that firm face explicit cost while adjusting wage, and their demand curve is downward sloping, using these two assumptions, literature has developed a wage setting rule, in which the actual wage adjusts gradually toward the optimal wage set by the imperfect competitive firm. This approach is alternative to staggered wage model (Ramos, Duque and Suriñach, 2010).

Blanchard and Fischer (1989) combine monopolistic competition with staggered wage model to develop a dynamic form of the model and develop a wage setting equation in two steps. Akerlof et al., (1990) developed the equation directly from the monopolistic competition through maximization. Lucas (1986) model showed that wage contract did not depend on the market power and developed a staggered wage contract for the competitive firm.

3. Econometric Model

According to the literature discussed, theoretical background and in the context of study objectives, the empirical model constructed for wage setting is given below.

$$l\left(\frac{p_i}{1-p_i}\right) = \alpha_o + \alpha_1 mktstructure_i + \alpha_2 wageindexation_i + \alpha_3 fringebenefits_i + \alpha_4 firmsize_i + \alpha_5 informationset_i + \mu_i \quad (1)$$

Equation (1) shows the determinants of wage setting that may affect the probability of wage change and estimated through multinomial logistic model. The dependent variable the frequency of wage change. The firms are asked that on average, how often the wages of workers are changed: twice a year; once a year; or once in two years. These options are ranked from 1 to 3.

Market structure is proxied through the degree of market power. To measure the degree of market power, the information in questionnaire is used to classify the firms into competitive, monopolistic competitive, oligopolistic and monopolistic. The market structure will be perfect competition, if the price is set at the level prevailing in the market. If the price of the main competitors is used as a reference, then the market structure is monopolistic competition. If the price is set jointly with other competitive firms, then the market structure is an oligopoly, and if a mark-up is applied to the unit variable costs, then the market structure is monopoly. All categories are assigned numbers from 1 to 4.

The firms are asked both for permanent workers and daily wagers that whether the wages are indexed to inflation? If the response is yes, then they are further asked are they indexed with the past inflation or with expected inflation.

To capture the fringe benefits, firms are asked directly about provision of fringe benefits to workers? To construct binary variable, categories are assigned number, i.e. for yes = 1, for no = 0. Firm size is taken in continuous form; the total number of workers.

For the wage setting, expected inflation is an important variable. To find expected inflation rate firms may use a set of information including many indicators like exchange rate, interest rate, money, price of energy and raw material, and business condition. Expanded is the information set, more accurate is the inflation forecast. To determine information set of a typical firm, the firm is asked about a set of variables to be incorporated in the information set while expecting the future inflation. All these options are assigned values 1 or 0, which are then added to measure the set of information for expecting future inflation.

Wage setting is of two types i.e. time-dependent and state-dependent. To capture this behaviour, the firms are asked that is there any month(s), when wages are most likely to change? If yes (1) then firm follows time-dependent wage policy and if response is no (0) then firm follows state-dependent wage policy.

To find the importance of change in labour productivity, inflation rate, change in taxes, the effect of change in demand for product, employment level, minimum wage law and labour union in the decision of wage setting, the firm was asked to rank it from 1 to 4. For these variables responses are ranked according to the scale: 1 for unimportant, 2 for less important, 3 for important and 4 for very important.

4. Questionnaire Design

The design of the study questionnaire follows Blinder et al. (1998). Section "A" of the questionnaire consists of general information of firms. Section "B" of the questionnaire is about the price setting behaviour. Section "C" is about wage-setting behaviour. It gives us information about type of workers, frequency of wage change, wage indexation, information regarding expected inflation, time-dependent or state-dependent wage policy, and importance of different factors that might cause the firms to change the wage rate.

5. Sampling Plan

There are 14 main industrial estates in Khyber Pakhtunkhwa, Pakistan. In which six are major industrial estates, while remaining nine are small industrial estates. Exporting Processing Zone Risalpur and Dera-Ismail Khan industrial estate are major industrial estate, but they are not selected in the initial population, because it is still under developmental stage and number of operating unit is less. So for this study four major industrial estates i.e. Peshawar, Hattar, Gadoon and Nowshera are selected. To collect data through structured questionnaire, 342 sample is selected from the list of registered firms with Sarhad Chamber of Commerce of Khyber Pakhtunkhwa. The data is collected through stratified random sampling technique.

6. Results

To analyze the frequency of wage change, the firms are asked on average, how often are the wages changed in their firms of permanent/contract workers and daily workers. The options are: twice a year, once a year, once in two years or any other period. According to figure 1, it is evident that most of the firms change wage rate once a year both for permanent workers and daily wagers.

Fig 1 Frequency of Wage Change

According to figure (2) 70% of the firms change wage in a particular month, while 30% of the firms do not have a specific month in which wage is most likely to change. It means the majority of the firms follow time-dependent wage policy. According to figure 3 majority of firms out of 70%, change the wage in June and July and then in December and January. It means half of the firms, which are following time-dependent wage policy, change the wage rate at the end or start of the fiscal year. That's why the result of figure 3 has an apparent spike in June and July, and then in December and January.

Fig 2 Time Dependent and State Dependent Wage Policy

Fig 3 Month when wages are most likely to change

According to the empirical evidence, wage indexation with inflation is a common practice, especially in case of the inflationary environment. To analyze this in our sample, the firms are asked about wage indexation with inflation. Surprisingly majority of the firms are not found to index wages for permanent workers and daily wagers. Moreover, the percentage of firms not involved in wage indexation is higher for of daily worker than permanent worker as shown in figure 4. To analyze how the firms, do wage indexation, they are asked that whether they do wage indexation with past inflation or with future inflation. According to figure 5, 63% of the firms in case of permanent workers and 70.3% of the firms in case of daily wagers, use past inflation to adjust the wage rate instead of expected inflation. It means firms are backward-looking.

Fig 4 Wage indexation with inflation

Fig 5 Wage Indexation with Past inflation and Expected Inflation

According to economic literature the main determinants of wage change are: change in the labour productivity, employment level in the economy, government regulations (e.g. minimum wage law), change in taxes, changes in demand for the product, change in the inflation and pressure from the labour union. According to the results in table 1, the mean values of importance of all factors are greater than 2 except for labour union; it means all factors are important determinants of wage change except pressure from the labour union. Table 1 shows that, the most important factor for wage change is the labour productivity and least important is pressure from the labour union.

Table 1: Determinants of Wage Change

Variables	1	2	3	4	Mean	T-stat	S. E
Labour productivity	58	42	66	176	3	49.2***	.06
Employment level in the Economy	56	48	88	150	2.9	49.4***	.06
Government regulations	52	62	86	142	2.9	49.4***	.05
Taxes	128	66	64	84	2.3	35.3**	.06
Demand for the product	142	74	58	68	2.2	34.1***	.06
Inflation Rate	138	94	40	70	2.1	34.1**	.06
Labour union	196	64	50	32	1.8	31.9	.05
1=Unimportant; 2=Less Important; 3=Important & 4=Very Important. ** & *** means 5% and 1% significance level. Mean show the average of the importance of factors in wage change.							

Table 2 discusses that how firm characteristics and other factors affect the frequency of wage per year. According to results in table 2, if a firm operating in an imperfect competitive market structure (i.e. monopolistic competition, oligopoly and monopoly) instead of perfect competitive market structure, then there are more likely that firm will change wage twice a year or once a year instead of once in two years. So, it can be concluded that the wage rate of firms become more flexible as the degree of market power increases from perfect competition toward monopoly, because firms with high market power does not need to minimize its labor cost for profit maximization (Van Reenan, 1996), because they can change the price easily, secondly to reduce turnover of labour, to increase efficiency of labour and to win loyalty of labour (Malik et.al 2008). It is supported by the prominent theories of unemployment, i.e. efficiency wage model and insider-outsider models (Jager, Schoefer, Young, & Zweimüller, 2020).

According to results in table 2, if wages are indexed with the past and expected inflation instead of no indexation then there are less likely that firm will change wage twice a year or once a year instead of once in two years. Clark and Davig, (2008) shows that expected inflation affect wage-setting and its effect is more in the long run than in the short run on the frequency of wage change because long term expected inflation affect the actual inflation more than short-run expected inflation. According to Ahmed et al., (2013) show that wage indexation is the source of wage rigidity, especially in case of minimum wage law.

According to results in table 2, if a firm does provide fringe benefit to workers then there are less likely that firm will change wage once a year instead of once in two years. Because the firm who provide fringe benefit, e.g. transport, house, children schooling to their workers, then the frequency of wage change will be low in these firms, because they compensate it another form (Forth & Millward, 2000).

According to results in table 2, the number of time firm change wage rate is dependent on the size of the firm, because as the size of firm increases then there are more likely that firm will change wage once a year instead of once in two years. So, it can be inferred that as the size of the firms increases, from small toward large firm, the wages become more flexible (Agell & Bennismarker, 2007).

According to results in table 2, if the set of information about expected inflation is more instead of less, then there are less likely that firm will change wage twice a year instead of once in

two years, which implies that if a firm set of information about expected inflation lead to wage rigidity, it may because of implicit contract between worker and firms (Campbell & Kamlani, 1997). Secondly, as the set of information increases, expected inflation will be measure more accurately and so the chances of wage contract will be according to condition, which minimize the frequency of wage change (Druant et al, 2009).

Table 2: Wage Setting Behaviour

Reference Category: Once in two years		Once a year				Twice a Year			
Variables	Categories	B	SE	Sig	Exp(B)	B	SE	Sig	Exp(B)
	Intercept	-1.2	1	.3		-3.2	1.5	.03	
Market Structure	Monopoly	.4	.4	.3	1.5	.8	.6	.1	2.3
	Oligopoly	1.3	.6	.02	3.6	2.7	.74	.0	15
	Monopolistic Competition	1.0	.8	.2	2.7	1.6	1	.1	5
	Competition	0				0			
Wage Indexation	Yes	-.8	.4	.03	.7	-.9	.5	.02	.5
	No	0				0			
Fringe Benefits	Yes	-.9	.6	.06	.7	.01	.9	.9	1
	No	0				0			
Firm size		1.5	.4	.0	4.8	1.8	.5	.0	6.2
Information Set*		-.4	1	.7	.6	-2.9	1.4	.04	.05
*Information set regarding Expected inflation									

7. Conclusion

Most of the firms change wage rate once a year and majority of the firms follow time-dependent wage policy. Half of the firms, which are following time-dependent wage policy, change the wage rate at the end or start of the fiscal year. Majority of the firms are not found to index wages. Moreover, the percentage of firms not involved in wage indexation is higher for daily workers than permanent workers. Labor productivity, employment level in the economy, government regulations, taxes, demand for product, and inflation are important factors of wage change except labour union, but the most important factor is the labour productivity and least important is pressure from the labour union. Imperfect competition and size of the firms are the important determinants of wage flexibility, because it increases the frequency of wage change, while wage indexation, information set of expected inflation and fringe benefits provided to workers are the important determinants of wage rigidity, because these factors decrease the probability of a firm to change the wage rate. Wages are found less flexible as compared to prices; therefore, real wages are counter cyclical in case of demand shocks and pro-cyclical in case of supply shocks. In this case, making arrangements to cut wages in recessions is not a good policy option as it would render economy even in deeper recession through low aggregate demand induced by wage cuts.

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