



**Discussion Papers in Economics**

**STICKY WAGES IN A DEVELOPING COUNTRY:  
LESSONS FROM STRUCTURED INTERVIEWS IN PAKISTAN**

By

Waqas Ahmed

(State Bank of Pakistan)

M. Ali Choudhary

(State Bank of Pakistan & University of Surrey)

Sajawal Khan

(State Bank of Pakistan)

Saima Mahmood

(State Bank of Pakistan)

&

Gylfi Zoega

(Birkbeck College, University of London)

DP 02/13

Department of Economics  
University of Surrey  
Guildford  
Surrey GU2 7XH, UK  
Telephone +44 (0)1483 689380  
Facsimile +44 (0)1483 689548  
Web [www.econ.surrey.ac.uk](http://www.econ.surrey.ac.uk)  
ISSN: 1749-5075

# Sticky Wages in a Developing Country: Lessons from Structured Interviews in Pakistan<sup>1</sup>

WAQAS AHMED,<sup>§</sup> M. ALI CHOUDHARY,<sup>♦</sup> SAJAWAL KHAN,<sup>‡</sup> SAIMA MAHMOOD<sup>†2</sup> and GYLFI ZOEGA<sup>\*</sup>

<sup>§</sup> Research Department, State Bank of Pakistan, I.I. Chundrigar Road, Karachi 74000, Pakistan (e-mail: waqas.ahmed@sbp.org.pk)

<sup>♦</sup> Research Department, State Bank of Pakistan, I.I. Chundrigar Road, Karachi 74000, Pakistan and University of Surrey, Guildford, Surrey GU2 7XH, UK (e-mail: ali.choudhary@sbp.org.pk)

<sup>‡</sup> Research Department, State Bank of Pakistan, I.I. Chundrigar Road, Karachi 74000, Pakistan (e-mail: Sajawal.Khan@sbp.org.pk)

<sup>†</sup> Research Department, State Bank of Pakistan, I.I. Chundrigar Road, Karachi 74000, Pakistan (e-mail: saima.mahmood@sbp.org.pk)

<sup>\*</sup> Department of Economics, University of Iceland Saemundargata 2, 101 Reykjavik, Iceland and Department of Economics, Birkbeck College, University of London, Malet Street, London WC1E 7HX, UK (e-mail: g.zoega@bbk.ac.uk)

26 November 2012

## ABSTRACT

We contribute to the growing literature on the empirical evidence for wage rigidity using structured interviews for Pakistan. The novelty of the study consists of using data from a developing country which provides the basis for a comparison with studies performed in the developed countries. Our sample of 1189 managers finds widespread support for downward nominal wage rigidity while real wage rigidity is less pronounced although still present. Concerns about the adverse effects of wage reductions on effort, morale, the most productive workers leaving (adverse selection) and the minimum-wage largely explain the presence of nominal wage rigidity. All sectors, irrespective of time, take minimum-wage changes into account when setting wages so that the law very much sets wage expectations.

Keywords: Wage rigidity; structured interviews.

JEL: *E5; F4; O1*

---

<sup>1</sup> We thank John Leahy, Chris Woodruff, Shamshad Akhtar, Salim Raza, Shahid Kardar, Yaseen Anwar, Riaz Riazuddin, Mushtaq Khan, Shahzad Ahmed, FPCCI and the Chambers of Commerce of Karachi and Lahore for their support, and participants at Private Enterprise Development in Low-Income Countries (PEDL) 2012 CEPR/DFID workshop in London. We also acknowledge the field work at the statistical bureaus of Sindh and Punjab with special appreciation for Shamim Rafique and Sajid Rasool from Punjab and Manzoor Ahmed Memon and Qazi Masood from the Sindh Bureau of Statistics. The project was undertaken by a large team of researchers at the central bank consisting of Hassan Abbas, Amjad Ali, Shahid Hussain Javaid and Amna Saeed, and a team of translators Mansoor Ahmed, Shujat Ali, Suhail Anjum, Alia Atta Karim and Zeeshan Suleman. Finally, we appreciate the help of Carl Campbell who provided the questionnaire of the U.S. survey and Zeenat Hisam for providing information on minimum-wage laws in Pakistan. Finally, we thank the editorial team for their comments and efforts.

<sup>2</sup> Corresponding author. Pakistan: Tel: +92 (0)21 3245 3858; Fax: +92 (0)21 9921 8136

## Non-Technical Summary

The unemployment-inflation trade-off has been the subject of unremitting interest since Keynes' General Theory and remains at the core of monetary policy decision making. The underlying intuition is that firms find it difficult to cut 'nominal' wages, i.e. there is nominal wage rigidity. The result is that labour market adjustments to adverse economic shocks are limited because real labour costs, i.e. the *real* wage, are above their market-clearing levels. This effect can be self-sustaining in an economy consisting of multiple sectors and shocks Tobin (1972). In such a situation, inflation can unblock labour market adjustments by increasing the range of real-wage cuts firms can implement leading to a situation of lower equilibrium unemployment than what would prevail otherwise. In this paper, we revisit the validity and universality of nominal-wage rigidity hypothesis but from a developing country perspective.

The current literature, largely focused on developed economies, has sought to investigate the existence of downward nominal-wage rigidity (henceforth DNWR) using three independent avenues

The first avenue rests on testing one implication of DNWR which is that real wages are anticyclical. However, the empirical case for this is weak see for example Abraham and Haltiwanger (1994) and Fleischman (1997), Lebow, Saks and Wilson (1999) and Nickell and Quintini (2003).

The second avenue is more micro based and there are essentially two categories: (a) self-reported panel data of households and (b) employee data from establishments. Combining both these categories, the large study of 15 European economies including U.S. of Dickens et. al (2006) looks at 31 million wage changes of jobs stayers. In this study two relevant findings on the distribution of wage changes deserve highlighting: (i) nominal wage cuts are uncommon and (ii) wage growth is typically indexed to expected inflation rates. Although, the extent of these rigidities vary across countries but the implications for nominal and real-wages rigidities are all too clear.

The third avenue of investigation is based on structured surveys of (i) employees and (ii) employers. In the case of employees, Shafir, Diamond and Tversky (1997), Kahneman, Knetsch and Thaler (1986), Genesove and Mayer (2001) highlight the negative sentiment attached with nominal wage cuts. In our opinion, these surveys strongly reinforce the notion of money illusion and keeping-up with the wages of the Joneses. This latter line of research was initiated by Kaufman (1984) by asking wage-setters directly about what prevented them from cutting wages. Many notable contributions towards both theoretical and institutional reasons for wage rigidity are Bewley (1999), Blinder and Choi (1990) for US, Agell and Lundborg (1995) for Sweden and more recently Zoega and Karlsson (2006) for Iceland. The idea of directly asking wage-setters also caught the attention of the European Central Bank which carried out coordinated country level surveys of 17000 firms by the central banks of 17 countries during 2007-2008.<sup>3</sup>

The results of these surveys are collated in Druant et al.(2009)<sup>4</sup>, Galuscak et al. (2010), Babecky et al. (2009), and Bertola et al. (2010). Of interest to us is the confirmation of existence of wage rigidities across Europe, and more so than in the U.S., with a particular emphasis on various models of efficiency-wage theory, in particular the shirking model of Shapiro and Stiglitz (1984) and Weiss's (1980) adverse-selection models, and the fair-wage hypothesis of Solow (1979) and Akerlof and Yellen (1990) as tangible explanations.

Clearly, the literature focusing on the survey of employers is growing fast and this is precisely where the contribution of this paper lies. A lack of high frequency macro and micro employee level establishment data sets leaves us with no choice but to conduct a national survey. To our knowledge, this is the first attempt of this nature and some parts have been harmonized with European Central Bank survey enabling us to make direct comparisons. The survey questionnaire has questions: (i) about the firm and its employees, (ii) wage-setting and wage changes, (iii) wage rigidity and shocks (iv) wage setting for new employees and (v) the linkages with the informal economy. Here we focus on (i)-(iv) which relate to wage setting mechanism, wage flexibility and theoretical reasons for wage changes. We do not discuss the linkages to the informal

---

<sup>3</sup> The countries included are Austria, Belgium, Czech Republic, Estonia, France, Greece, Hungary, Italy, Ireland, Lithuania and Luxembourg, Netherlands, Poland, Portugal, Slovenia, Slovakia and Spain. German survey was not fully harmonized with the others. In 2009 similar surveys were also conducted for Slovakia, Cyprus, Bulgaria and Malta

<sup>4</sup> For detailed country-by-country results see the literature therein.

economy in this paper.

We present the results of 1189 face-to-face structured interviews carried out in 2009 to 2011 with entrepreneurs representing formal firms in the manufacturing and services sector of Pakistan. By formal, it is meant that our firms are officially registered, tax liable and also report data to employment agencies. Therefore, these firms necessarily take part in the official GDP and employment statistics. This study is focused on *regular* employees and is therefore comparable to similar research work in developed countries. Moreover, key questions were benchmarked to the pioneering works in the area of Campbell and Kamlani (1997), Bewley (1999) and Druant et al. (2006).

Based on the results, we establish eleven stylized facts about the labour market behaviour in Pakistan's manufacturing and services sectors. In doing so, we make cross-country comparisons where possible. While making these comparisons, one must bear in mind that sectors covered vary and international surveys were conducted under different economic circumstances (European surveys were conducted in 2007-08 and ours a year later). The facts are:

1. The implied typical wage spell for Pakistan is 13.5 months while in the Europe the range is 15-14.7 months implying the wages are marginally less rigid in Pakistan. Moreover, wages in the manufacturing sector tend to be less rigid relative to the services sector- a fact consistent with other surveys. A direct implication for monetary policy is that it would be less effective in Pakistan than in Europe;
2. Wage rigidity is considerably greater than price rigidity in Pakistan (see Choudhary et al. (2011) for a price-setting study of the same employers used for this study). This fact sets Pakistan apart from the developed world where both types of rigidity are close (Taylor 1999);
3. The lower level of wage rigidity in Pakistan relative to developed economies reflects its higher steady-state inflation of 8 per cent for the period of 2000-2010. This find compares favourably with studies such as Cecchetti (1987), Fregert and Jonung (1986), Card and Hyslop (1997) which observe that during periods of high average inflation a smaller proportion of employees experience a duration of wage spells greater than one year;
4. Wage cuts are found to be rare with less than two percent of firms having reported the wage cut in the last 5 years. For Europe this number is close to 1.8-6.4 per cent;
5. In line with previous work, adverse selection (quit version), gift exchange model and relative wage comparisons act as important deterrents for nominal wage cuts;
6. 35 and 45 per cent of wage revisions take place at the beginning of the financial and the fiscal year respectively. While 83 per cent of wage changes are reported to take place in any given month. These results suggest that there is some concentration in wage revisions but at economy-wide level wages are not synchronized. A very similar is also valid for the European surveys however there are only 54 per cent of managers admit wages change in a given month;

*Now some facts particular to Pakistan*

7. Wages in the services sector and for white-collar employees take the longest time to revise;
8. Relative to rare cuts in the basic wage, adjustments through the flexible component are more common and firms vary temporary employment adjustments and working hours to trim labor costs;
9. Direct wage indexation to inflation is low but there is strong evidence for minimum-wage indexation. This result is in contrast with previous research;
10. Wages in the manufacturing sector are lower than the services sector;
11. Main determinants of wage change are company policy and the minimum wage. Collective bargaining remains the least important factor.

# 1 Introduction

The objective of this paper is to study wage setting and wage rigidity in a developing economy and compare our results with what has been found in the developed world. The wage setting process in Pakistan, which is our country of study, takes place in an environment which differs from that in the developed countries where the vast majorities of studies of wage setting have been performed. In particular, the system of unemployment benefits is absent, labour unions are very weak, a modern welfare state is non-existent, there is a large underground economy and poverty is widespread.

We present the results of 1189 face-to-face structured interviews carried out in 2009 to 2011 with entrepreneurs in formal firms in the manufacturing and service sectors of Pakistan. By formal, it is meant that our firms are officially registered, tax liable and also report data to employment agencies. Therefore, these firms necessarily are a part of the official GDP and employment statistics. This study is focused on *regular* employees and is therefore comparable to similar research done in the developed countries. Moreover, key questions were formulated based on the pioneering works in the area of Campbell and Kamlani (1997), Bewley (1999) and Druant et al. (2006) to facilitate a comparison of survey results.

## Literature

The current literature on wage rigidity is focused on developed economies and has sought to investigate the existence of downward nominal-wage rigidity (henceforth DNWR) using two independent approaches.

The first avenue is more micro based and uses either self-reported panel data of households or employee data from establishments. Here there is weak evidence for DNWR.<sup>5</sup> However, Akerlof, Dickens and Perry (1996) track jobs instead of individuals using establishment data and find that due to measurement errors DNWR may be more widespread than found in other work using establishment data. Considerable DNWR is also observed by Lebow for the U.S.<sup>6</sup> There is also a large study of 15 European economies, and also including the U.S., by Dickens et al (2006), which looks at 31 million wage changes of job stayers. These authors find that nominal wage cuts are uncommon and that wage growth is typically indexed to expected inflation rates. The latest addition to this literature is Bihan et al (2012) who also find support for downward wage nominal wage

---

<sup>5</sup> See for example Lebow, Stockton and Wascher (1995), Card and Hyslop (1996), Kahn (1997) and McLaughlin (1994, 1998) all of whom use the *Panel Study of Income Dynamics* data set from the U.S.

<sup>6</sup> See also Saks and Wilson (1999), Groshen and Schweitzer (1996) and Wilson (1999).

rigidity on french firm-level data. Although the extent of these rigidities varies across countries the implications for nominal and real-wage rigidities are all too clear.

The second track of investigation is based on structured surveys of employees and employers. Many of these studies highlight the negative sentiment attached to nominal wage cuts.<sup>7</sup> This latter line of research was initiated by Kaufman (1984) who asked wage-setters directly about what prevented them from cutting wages. Notable contributions include Bewley (1999), Blinder and Choi (1990) for the US, Agell and Lundborg (1995) for Sweden, Campbell and Kamlani (1997) for the U.S. and more recently Zoega and Karlsson (2006) for Iceland.

Our study falls into the second class of research where the idea is to directly ask wage-setters. We use data from a developing country and attempt to harmonize our questions with the European Central Bank survey enabling us to make direct comparisons. This was a survey of 17000 firms in 17 countries, performed in 2007-2008.<sup>8</sup> The results are described in Druant et al. (2009)<sup>9</sup>, Galuscak et al. (2010), Babecky et al. (2009), and Bertola et al. (2010). Of particular interest to us is the presence of nominal wage rigidity across Europe and in the U.S. that can be explained with various models of efficiency-wages.<sup>10</sup>

The rest of the paper is organized as follows. Sections 2 and 3 describe the country background and the survey design. Sections 4 and 5 discuss wage setting and wage adjustment, Section 6 contains results for the determinants of wage decisions and Section 7 studies wage rigidity. Section 8 concludes.

## 2. The survey and the economy of Pakistan

Prior to going into details of the survey, we first describe the labour market and the macroeconomic situation in Pakistan at the time when the survey was carried out.

According to the *Economic Survey of Pakistan* (2009/10), Pakistan ranks as having the 9th largest labor force in the world, with 54.9 million people (77 per cent male), with an official unemployment rate of 5 per cent under a very loose definition of employment. Figure 1 presents an overview of the

---

<sup>7</sup> See, amongst others, Shafir, Diamond and Tversky (1997), Kahneman, Knetsch and Thaler (1986), Genesove and Mayer (2001).

<sup>8</sup> The countries included are Austria, Belgium, Czech Republic, Estonia, France, Greece, Hungary, Italy, Ireland, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovenia, Slovakia and Spain. The German survey was not fully harmonized with the others. In 2009 similar surveys were also conducted for Slovakia, Cyprus, Bulgaria and Malta.

<sup>9</sup> For detailed country-by-country results see the literature therein.

<sup>10</sup> In particular the shirking model of Shapiro and Stiglitz (1984) and Weiss's (1980) adverse-selection models and the fair-wage hypothesis of Solow (1979) and Akerlof and Yellen (1990) provide possible explanations.

employment distribution in Pakistan. Employment is predominantly agriculture based, 41.66 per cent of the total labour force, followed by the service sector with manufacturing being the third largest. Overall, about 77% of the labour force works in the informal sector, assuming that agricultural sector employment is part of the informal economy.

The survey took place in Punjab and Sindh between December 2009-March 2010 and June 2010-October 2011 respectively. The macroeconomic situation of Pakistan at the time of the interviews (Dec 2009-Jun 2011) was dire. In November 2008, Pakistan entered a 23 month IMF program (the 11th since 1988) after a balance-of-payments crisis in May 2008. The average annualized inflation rates for Pakistan during the three months of the interviews in Punjab was 12.5%, and during the one year of interviews in Sindh it was 14%; which is 4-6% above Pakistan's 50 year trend. During the fiscal year 2010 (i.e. July 2009-June 2010) real GDP was projected to grow at 4% and the annual unemployment rate was 5.5%. Monetary policy was conducted under a dirty-float with implicit inflation and money growth rate targets of 9% and 3.3% respectively.

The survey was carried out in collaboration with the statistical agencies of Pakistan. As explained earlier, a lack of high-frequency macro data and employee level data made employer-structured interviews necessary. We avoided approaching CEOs through email or mail because this would have been culturally inappropriate. To carry out the interviews, we selected experienced interviewers with local know-how and provided them with specialized training, both theoretical and practical. The Central Bank also conducted a pilot study before launching the formal interviews. For a further quality check, economists from the Central Bank randomly audited 10% of live interviews.

Turning to the questionnaire, it covers a wide range of characteristics including labour composition, employment size, remuneration structure, cost-cutting- and hiring strategies, measures of and reasons for wage rigidity and links with the informal sector<sup>11</sup>. We also queried about factors determining wage changes and typical propagation lags.

The questions were directed at regular employees defined as workers on formal contracts, registered with social-security or the *Employment and Old Age Benefit Institute* (EOBI), and recorded in firms' official documentation. For the service sector, regular employees are defined only on the basis of formal contracts. The narrow focus on regular employees increases our confidence in the responses.<sup>12</sup> Furthermore, we suspect a fraction of the labour force may be unregistered. Therefore, querying about temporary employees would run the risk of higher refusal rates.

---

<sup>11</sup> The informal sector is not discussed in the paper.

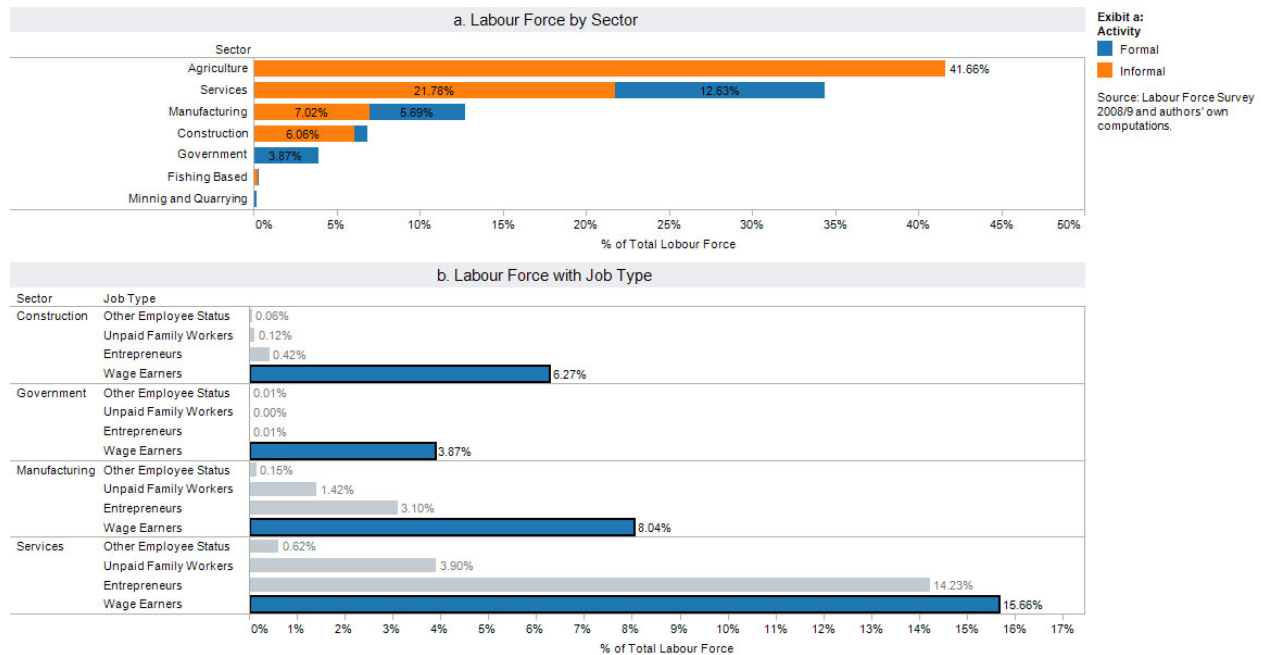
<sup>12</sup> Bewley (1999) shows that the wage-setting behavior differ between employees in long-term and temporary jobs.

To bring more focus and substance to the questionnaire, key questions were designed with specific reference to the *main* socio-occupational group of regular employees — the type of employees representing the highest proportion of workers in firms. This practice is consistent with Campbell and Kamlani (1997) who show that the remuneration structure and the degree and reasons for wage rigidity differ across socio-occupational status. We, therefore, asked CEOs to break down their labour force into three socio-occupational categories: (i) white collar, (ii) skilled blue collar and (iii) unskilled blue collar. Irrespective of the occupational category, a total of 66 per cent of regular employees comprised the main occupational group in our sample. In particular, skilled blue collar employees (63 per cent) account for the main occupational group in the manufacturing sector while in the service sector it is white collar employees (62 per cent), see Table 1. Looking at the data by firm size we find that small and medium sized firms employ mostly skilled blue-collar workers while large firms employ mostly white-collar workers as regular employees.

### **3 The sample**

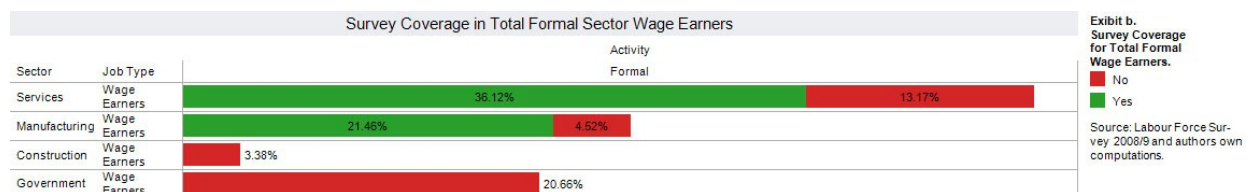
The focus of this paper is formal-sector manufacturing and services which together account for 18.32 per cent of the labour force. We further focus on wage-earners and it turns out that this is the top work-type category, excluding agriculture, accounting for 33.84% of the labour force in Pakistan (see part b of Figure 1). Therefore, our survey focuses on the top two non-agricultural sectors in the formal economy and the top work-type category.





**Figure 1: Labour Force Survey Overview 2008/9**

There is also the issue how broad-based our sample is, that is the sample of wage earners in the formal sector in manufacturing and services. To answer this question, we compare the sub-sector coverage of wage earners in our survey with that of Pakistan’s labor force. Figure 2 provides a snapshot of the distribution of wage-earners by sub-sector as well the percentage covered by our survey. First, we cover about 57% of the formal wage-earning labour force. Second, within the formal wage-earner category we cover 82% of the manufacturing sector and and 69% of the service sub-sector. The wide coverage of our survey sets it apart from the studies that have been conducted in the developed countries.



**Figure 2**

Turning to representation in terms of GDP, we focus on formal sector entities in the manufacturing and service sectors. At the national level the formal manufacturing and service sectors account for 71.4 per cent of GDP. We concentrate on the two largest provinces, i.e. Sindh and Punjab while the other two provinces, Khyber Pakhtun-khuwa and Baluchistan, are not a part

of the study due to security issues. The manufacturing sample is drawn from data registers maintained by the *Bureau of Statistics of Punjab and Sindh* for census of manufacturing industries (CMI). The manufacturing sample covers firms with economic activity codes from 15 to 36 (excluding 30 since this sector (office equipment and computers) does not have any private firm) according to the *Pakistan-Standard-Industrial-Classification* (PSIC) system.<sup>13,14</sup> Similarly, firm size in the manufacturing industry was defined on the basis of employment; firms in the manufacturing sector were split into three employment brackets: 10-50, 51-250 and more than 250 employees defined as small, medium and large sized firms respectively. Based on these criteria, a random sample of 1200 manufacturing firms was drawn from 63 mutually exclusive strata, along with a 50 per cent extra replacement sample.<sup>15</sup>

Pakistan has no formal database for the service sector that can be used as the main population frame for our survey. To overcome this issue, we decided to use the database of the *Securities and Exchange Commission of Pakistan* (SECP) which maintains a list of all firms registered with them. Yet, the SECP register has its own limitation; it lacks information on firm size and whether firms are dormant or non-dormant. Before utilizing the SECP database we applied filters to circumvent this limitation. For example, to minimize the chance of selecting dormant firms from a very large database, we only selected firms that had been registered within the last ten years and if registered before that time period have reported to the SECP at least once in the last ten years.<sup>16</sup> Also to avoid too many small firms, firms with paid-up capital of more than RS. 2,000,000 (USD 23500) were selected. Our final service sector sample of 270 firms includes firms from transport and telecommunication, hotels and restaurants and education and health care services, while construction, real state, financial services, wholesale and trade sectors were dropped due to the problem of defining main service.<sup>17</sup>

With population frame, economic activity and firm size serving as pivots, we draw a stratified-

---

<sup>13</sup> The activities are: 15-(food products & beverages), 16-(tobacco products), 17-(manufacture of textiles), 18-(wearing apparel), 19-(leather products), 20-(wood & wood products), 21-(paper & paper products), 22-(publishing, printing & reproduction), 23-(petroleum), 24-(chemicals & chemical products), 25-(rubber & plastics products), 26-(other non-metallic mineral products), 27-(basic metals), 28-(fabricated metal products), 29-(machinery & equipment N.E.C.), 31-(electrical machinery & apparatus N.E.C.), 32-(radio, TV & communication equipment), 33-(medical & optical instruments), 34-(motor vehicles & trailers), 35-(other transport equipment), 36-(furniture).

<sup>14</sup> These economic activities are in line with the *International Standard Industrial Classification* (ISIC).

<sup>15</sup> In case of non-response, a firm from a particular stratum was randomly replaced by another firm from the same stratum to maintain an unchanged sectoral representation.

<sup>16</sup> Every firm registered with SECP has the obligation to report statistics on an annual basis but few do so on a regular basis.

<sup>17</sup> Indeed, this is because we used the same sample for a separate price-setting survey where it was necessary to include firms involved in economic activities when it was possible to clearly identify their main product/service.

random sample for each sector. The selection rests upon per strata shares to population. However, sample size was deliberately increased for the smaller strata to raise the power of the statistical inference. In the end, we carried out 1189 structured interviews. In total, 86 per cent came from the manufacturing sector of which Sindh province represented 28 per cent of the firms sampled. In the services sector, Sindh province accounted for 37 per cent of the sample. Clearly, our survey underrepresents the service sector, also common in related studies, on the basis of both GDP and employment shares. With these limitations, the results for the service sector should be interpreted cautiously as they only reflect wage-setting behavior for selected services.

Table 1  
Sample Details

	Manufacturing	Services	Total
<b>Overall economy</b>			
% GDP shares in Pakistan 2009	18.3	53.1	71.4
% of employment share <sup>b</sup>	13.2	14-16.4	27.2-29.6
<b>Sample</b>			
% of GDP represented in sample <sup>a</sup>	12.2	13-15	25.2-27
% of sector representation in sample	86	14	100
Sindh Representation	28%	37%	
Small	55.9	62.8	56.9
Medium	28.4	24.4	27.8
Large	15.7	12.8	15.3
White Collar	10.7	62.2	32.8
Skilled Blue Collar	63.4	33.3	50.5
Unskilled Blue Collar	25.9	4.5	16.7
a: This percentage is used for reweighting the manufacturing and services sector estimates			
b: These employment estimates include informal employment			

To draw valid inferences from the population, we do post stratification to control for closure, non-responses and possible economic activity shifts. We have also dropped observations when firms were pure exporters since we are only concerned about price setting in Pakistan. The reasons for dropping export-only firms are discussed in detail in Choudhary et al. (2011). Furthermore, large firms suffered from a low response rate but their decisions are likely to be more important. As a result, the observations required adjustment for firm size as well. These adjustments were done differently for the manufacturing and service sector because the frame came from separate sources.<sup>18</sup>

Finally, estimates for the aggregate economy are presented as weighted averages based on the

<sup>18</sup> Appendix C presents the post-stratification schemes.

sectoral contribution of manufacturing and service sectors to GDP. Generally, the manufacturing and service sectors combined accounted for 71.4% of GDP in 2009, while taking only into consideration the sub-sectors covered in our interviews. Our sample is a good representation of decision-makers that produce 25.2-27 per cent of GDP and that of formal sector wage-earners in our chosen sectors. Specifically, out of 1189 respondents, the sample of 1025 in the manufacturing sector is 9 per cent of the target population, but the sample from the service sector is smaller and based on a derived population. We use final post-stratification to reduce sectoral bias as per their contribution towards GDP. Interestingly, the employment shares of these two economic sectors are consistent with their GDP shares, hence all the estimates reported can be interpreted as both weighted by respective shares in GDP and/or employment.

In terms of an international comparison this study is the seventh largest with a respectable response rate. Table 2 provides a comparison. To date our study entails one of the largest number of structured-interviews at the national level. To conclude, given the attention paid to various aspects of sample selection, we believe that our survey gives an accurate picture of the *wage-setting* behavior of the private formal sector manufacturing and service-sector employees in Pakistan.

## 4 Wage setting and levels

We find in Table 2 that 2 per cent and 91 per cent of firms ranked unions and company owners as either important or very important for wage-setting respectively, which provides a justification for asking CEOs about wage setting and wage rigidity.

Table 2  
How important are the following in wage related decisions in your company?

	Mean Score <sup>a</sup>	% important <sup>b</sup>
Owners of the company	1.41	91.1
Executive management of parent company	2.79	45.4
Unions	3.92	2.2

a: 1, 2, 3 and 4 denote “very important,” “important,” “of minor importance” and “unimportant”

b: percentage of firms responding “important” or “very important”

We asked CEOs to indicate the wage bracket of their main occupational group. Results in Table 3 show that a majority of firms choose to reward their employees close the minimum-wage level

announced by the government.<sup>19</sup>We also find that mean manufacturing sector wages are lower than average wages in the survey. In particular, we find that the wages of 70 per cent of firms in manufacturing are clustered close to the minimum wage level. In the service sector however, the wage distribution has a higher variance as well as higher average wages. Although the official minimum wages is binding in Pakistan we observe that 10.2 per cent of firms admitted paying wages lower than the official minimum wage rate. Notice that the bulk of employees in the minimum-wage category are unskilled workers of small firms.

Furthermore, wage comparisons across the main occupational groups reveal interesting, although not unexpected, results. The white-collar group has the highest wage of 15-25 thousand rupees while the average wages of skilled and unskilled blue-collar are in the lower brackets. Notice how the wages of skilled blue-collar employees are concentrated near the minimum wages (for 67 per cent of firms). The dispersion of the average increases positively with firm size.

Table 3  
Average (monthly) Wage Distribution (Percentage)

Wage in thousand Rupees	≤ 6	6-10	10-15	15-25	> 25	Average Wage Group
Pakistan	10.2	52.7	15.7	14.6	6.9	10-15
<i>By Socio-occupation</i>						
White collar Employees	1.3	24.7	21.9	33.2	19.0	15-25
Skilled-Blue Collar Employees	9.8	67.0	14.7	7.3	1.2	6-10
Unskilled-Blue Collar Employees	28.8	64.6	6.6	0	0	6-10
<i>By Economic Activity</i>						
Manufacturing	17.4	69.1	10.5	2.8	0.3	6-10
Services	0.8	31	22.5	30.2	15.5	10-15
<i>By Firm Size</i>						
Small	11.1	55.8	14.6	14.9	3.5	10-15
Medium	7.1	51.8	22.4	7.1	11.8	10-15
Large	4.3	26.5	19.7	17.9	31.7	15.25

Other than the basic wage, we also asked firms about the use of bonuses in their organizations. About 57 per cent of firms reported giving bonuses to their employees. We then asked CEOs about

<sup>19</sup> In the Punjab survey, the minimum wage limit is rupees 6000, while it was revised to 7,000 at the time we started doing the Sindh survey. We therefore, revised upwards the lower two brackets wage to: 7000 or below and 7001-10,000 while the remaining categories remained unchanged.

the reasons for using such incentives. The most common reason these firms cited for giving bonuses is the sharing of profits. Around 36 per cent of firms give bonuses based on profits and this is more popular in firms with a large number of employees. The second most common reason given for paying out bonuses, cited by 29 per cent of firms, is the celebration of religious festivals irrespective of profits and individual performance. Finally, a quarter of bonuses are linked to individual performance. These performance-based bonuses are more common for production workers, 34 per cent skilled blue collar employees whose output is easily observable getting them.. Annual traditional bonuses are more common for unskilled workers with 43 per cent of such workers being rewarded this way.

## **5 Wage Adjustment Decisions**

Wage adjustments play a pivotal role in determining the effectiveness of monetary policy transmission as the more frequently wages are revised the less tempting it becomes to exploit the unemployment-inflation trade-off. The main questions on wage dynamics in our survey are centered on the frequency of wage changes, their timing, key reasons and rapidity with which wages respond to shocks.

### **5.1 Frequency of wage adjustments**

Managers were asked to state the frequency of wage changes as either (i) quarterly (ii) bi-annually (iii) annually (iv) once in every two years or (v) never. We also asked managers to assign a frequency to each of the following reasons: Inflation, tenure or other (such as productivity, profits and turnover). Our frequency variable is non-continuous and a composite one and it is deliberately designed this way so that a comparison could be drawn with other similar studies, such as Druant et al. (2009).

Table 4 shows two measures of wage rigidity. The first method uses the distribution of wage changes from our menu of frequencies and compares it with countries in Druant et al. (2009). Wages are relatively rigid as nearly 85 per cent of firms reported changing their wages only annually. This figure is higher in Pakistan than in both the euro and the non-euro European economies where only 60 per cent of firms change wages annually. However, more than twice as many firms in the European countries admit revising wages after a year, 28.3 against 12.5 per cent. The overall implication is that wage rigidity appears greater in the developed economies than in Pakistan.

The literature has developed an alternative measure of nominal wage rigidity, known as wage-

duration, which estimates the length of time for which wages are fixed. Frequency of wage changes along with wage duration can give a better estimate of DNWR. There are two distinct methodologies to derive wage duration and they make use of the composite frequency of wage changes we discussed earlier along with additional assumptions about the distribution function of wage changes. For the sake of completeness we provide the wage duration using both methodologies.

The first methodology follows Druant et al. (2009). Here, wage change frequencies are split into three broad categories: more frequently than a year, annual wage changes and less frequently than a year. These divisions are based on assumption that the underlying duration is log normally distributed. The deep parameters of the log-normal distribution are estimated by observing the wage frequencies from the survey results and wage-duration for each time interval are then obtained using conditional expectations (see Druant et al, (2009) for details).<sup>20</sup> The longest wage spells are for white-collar employees and the service sector, while the shortest spells are for unskilled workers whose wages change almost annually. An analysis of wage duration across firm size shows that wages are more rigid in large firms, while the shortest wage spells are in medium size firms where wages change every 12.5 months.

An alternative methodology was developed by Montornes and Sauner-Leroy (2009). They assumed that wage changes are uniformly distributed across time intervals so that quarterly, biannual and annual changes are translated into wage change frequency of 4, 2 and 1 respectively. Similarly, once in every two years is translated into 0.5 changes per year and for the option ‘never’ we assume 0.4 changes per year implying one wage change in 4 years. The duration of wage spells is then directly calculated using the inverse of these frequencies. Based on this, the estimates of wage spells in Pakistan is 14.1 months.<sup>21</sup>

---

<sup>20</sup> A technical document is available upon request.

<sup>21</sup> We do not report the detailed results for this method as euro and non-euro area statistics for comparisons are available for the first method only. However, details are available upon request.

Table 4  
Frequency of Wage change

	Less than Annual	Annual	Greater than Annual	Wage Duration <sup>c</sup>	Wage Duration <sup>d</sup>	Wage cuts
Euro area	11.4	59.5	26.4		15.0	1.3
Non-Euro area	14	59.5	23.2		14.7	6.4
Total EU <sup>a</sup>	12.1	59.7	28.2		14.9	
<i>By Economic Activity (all EU)</i>						
Manufacturing	12.3	59.1	26.5			
Services	10.9	59.8	23.1			
Pakistan <sup>b</sup>	2.7	84.8	<b>12.5</b>	14.1	13.5	1.8
<i>Reasons</i>						
Inflation	1.8	53.5	44.8			
Tenure	0.4	79.1	20.5			
Other, e.g. profits, turnover	0.8	52.5	46.7			
<i>By Socio-occupation</i>						
White collar	1	73.8	<b>25.1</b>	16.5	15.2	1.5
Skilled blue collar	3.2	90.6	6.2	12.9	12.7	2.4
Unskilled blue collar	5	88.9	6	12.8	12.6	1.0
<i>By Economic Activity</i>						
Manufacturing	3.5	89.8	6.6	13.0	12.7	1.2
Services	1.6	78.1	<b>20.4</b>	15.6	14.5	2.5
<i>By Firm Size</i>						
Small	2.4	85.2	12.3	14.1	13.5	2.0
Medium	8.2	85.9	5.9	12.6	12.5	1.2
Large	0.9	80.3	18.8	15.3	14.2	0

a: Estimates from Druant et al. (2009), pages 6-7.

b: Figures weighted by employment weights, rescaled for non-responses.

b: Each firm was assigned the highest frequency of wage change for any reason.

c: Wage spells with uniform distribution.

d: Wage spell with log-normal distribution.

Results show that (see Table 4) on average wages revisions occur every 13.5 months in Pakistan. A comparison with Druant et al. (2009) reveals that, as expected, this wage duration is a little shorter than both in the euro area (15 months) and in the non-euro area (14.7 months). In terms of sectoral differences, wages are revised after 12.7 months in the more flexible product market of the manufacturing sector, for the services sector the average duration is 14.5 months. In Pakistan the frequency of price changes in the manufacturing sector is three times higher<sup>22</sup>, hence more flexible, when compared with the service sector where price changes occur twice a year. In contrast however

<sup>22</sup> See Choudhary et al. (2011).



the results in Druant et al. (2009) show no significant differences in wage duration between the manufacturing and service sectors. This finding compares favorably with studies such as Cecchetti (1987), Fregert and Jonung (1986), Card and Hyslop (1997) who observe that higher inflation (i.e. lower price rigidity) and lower wage rigidity go hand in hand. However, it remains a *remarkable* find that even with a steady-state inflation of 7-8% in Pakistan, wage durations exceed a year which is not too far from Europe.

In our line of inquiry, we also asked managers about the most common reason for the frequency of wage changes discussed above. Almost 90 per cent of the managers cited tenure as being the reason and 89 per cent of these managers also admitted changing wages at an annual frequency. Tenure based wage changes are less common for white-collar employees and large firms (78 per cent). Inflation based wage revisions were observed for 60 per cent of the firms and most of these are conducted at an annual frequency (87 per cent of firms). Here again white-collar employees are less likely to be compensated for inflation (52 per cent of managers admitting to it). In contrast, Druant et al. (2009) shows that wage changes are most commonly due to inflation especially in Austria, Belgium and Spain where 80 per cent of firms change wages annually or more frequently due to inflation. We should note that these countries differ from Pakistan in that they are among the richest countries in the world measured by GDP per capita, have lower levels of steady-state inflation and strong labour unions whereas Pakistan is around 150<sup>th</sup> place in income per capita, has high inflation and almost very limited labour union power. In sum, there are wage rigidities in Pakistan but wages are less rigid than in the developed economies. Wages are more flexible in the manufacturing than in the service sector.

Before turning to the next Section, it is worthwhile to note that our findings on wage stickiness have important implications for policy-making in Pakistan in that monetary policy is expected to be less effective in Pakistan due to its greater wage flexibility. This argument is demonstrated in detail in Appendix 12.

## **5.2 Rules for and Timing of Wage Revisions**

We now turn to the pattern of wage changes, which determines the way nominal disturbances are incorporated into wages which in turn determines the persistence of real effects of aggregate nominal perturbations. The results in Table 5 indicate that almost 77 per cent of firms use purely time-dependent rules and an additional 13 per cent follow these rules under normal circumstances. This finding is consistent with Euro-area surveys but there 61 per cent used time-dependent rules.

However, in the non-euro area the picture is different with only 34 per cent of managers claiming to follow these rules. Our finding of time-dependant rules fits well with the previous section where we found that tenure accumulation is most often the cause of wage revisions.

Table 5  
Time and State Dependent Wage Revision Rules  
(percentage)

	Time Dependent	State Dependent	Both
Pakistan	77.3	9.8	12.9
<i>By Socio-occupation</i>			
White collar	73.8	12.9	13.4
Skilled blue collar	79.1	9.3	11.5
Unskilled blue collar	78.9	5.1	16.1
<i>By Economic Activity</i>			
Manufacturing	80.3	5.0	14.7
Services	73.1	16.3	10.6
<i>By Firm Size</i>			
Small	76.6	10.9	12.5
Medium	83.7	7.0	9.3
Large	77.6	2.6	19.8

The existence of time-dependent rules implies that wage changes may be concentrated in specific months. This is important, as the exact timing of wage decisions and shocks co-determine the strength of shock transmission. Olivei and Teneryro (2008) find that the adjustment to shocks actually depends on the timing of wage changes and economic disturbances. They show that monetary policy innovations in Japan that occur during the first half of the year, when most wages are reset, have a relatively smaller effect on output than those occurring later in the year.

Relative to other surveys, there is strong evidence for the concentration of wage changes. Indeed 83 per cent of firms revise wages in a given month whereas only 54 per cent of firms do so in Druant et al (2009). We also asked managers exactly which months they prefer the most and the results show that wage changes are clustered around July (the start of fiscal year) or January (the beginning of the financial year).

To sum up, we learn that wages are rigid in Pakistan but less so than found in comparable surveys in the European economies. Nominal wages in the manufacturing sector are less rigid than in the services sector. When wages do change, they do so at a 12 month time interval and on a set date typically at the start of the financial (January) or the fiscal year (June).

## 6 Determinants of Wage Decisions

We now turn to the factors that influence wage decisions.

### 6.1 Main Factors

Managers were given a list of possible factors, chosen from the literature, that are likely to impact wage-setting, and we report the responses in terms of mean score, rank and the percentage of managers choosing factors as being important or very important in Table 6. The top three factors cited as the most important are company-policy, that is firm- or employee-specific factors (76.8 per cent), the minimum wage (73.9 per cent), and labour productivity (57.1 per cent). The informal sector (4.2 per cent) and trade unions (2.5 per cent) ranked lower for wage setting.

Table 6  
Importance of factors driving Wage Revisions

Reasons	Mean Score <sup>a</sup>	% Important <sup>b</sup>
Firm- or employee specific factors	1.9	76.8
Impact of minimum wages on all employees	2	73.9
Increase in worker productivity	2.5	57.1
Increase in profits	2.6	56.8
Increase in wages of competing companies	2.6	55.3
Increase in turnover	2.7	46.1
Inflation level	3	36.8
Increase in wages in public sector	3	36.4
Increase in price of your product	3.1	27.3
Contract renewal	3.3	24.7
Demand and supply of labour	3.3	25.3
Informal sector	3.8	4.2
Union pressure	3.9	2.5

a: 1, 2, 3 and 4 denote very important, important, of minor importance and unimportant.  
b: percentage of firm said important or very important

Table 7 shows that when it comes to asking about actually passing on the shocks, the minimum wage ranked first, wages of other firms second, and public sector pay came in third. Although, the mean lags indicate that most of these factors are incorporated within a one year interval, corroborating our frequency results in Section 5, the impact of the minimum wage stands out. This comes to us as a surprise with more than half of the managers claim to incorporate it within 3 months – twice as fast as any other factor.

We followed up this question by asking about the time it takes for each of the above factors to be incorporated into wage revisions. The managers were presented with a menu of 1, 3, 6, 9 and 12 months which we gave the weights from 1 through to 5 respectively to obtain an appropriately weighed aggregate measure for the mean lag.

Table 7  
Lags of Adjustment for Factors Driving Wage Revisions

Time Lag	Mean Lags <sup>a</sup>	Within 1 Month <sup>b</sup>	Within 3 Months <sup>b</sup>
Impact of minimum wages on all employee	3.2	35.1	18.5
Increase in wages of competing companies	4.4	8.7	12.2
Increase in wages in public sector	4.6	13.4	9.3
Increase in worker efficiency	4.9	2.2	4.3
Rise in labour demand	5	0.7	5.2
Increase in profits	5.1	0.3	1.8
Increase in turnover	5.1	0.7	1.6
Fall in labour supply	5.1	6.1	5.1
High inflation level	5.2	0.7	2.4
Increase in price of your product	5.3	1.2	1.0
Low inflation level	5.5	0.5	1.1
Increase in wages in informal sector	5.6	1.2	1.7

a: 1, 2, 3, 4 and 5 denote wage revisions within 1, 3, 6, 9 and 12 months, while 6 represents no change.

b: percent of firms revising their wages within 1 and 3 months respectively.

## 6.2 The Role of the Minimum Wage

Another important determinant of wages in Pakistan that has received scant attention is the minimum wages. In Appendix 13 we explore a brief history of the minimum-wage and its consequence on labour force evolution.

In our survey, the results show that 73.9 per cent of managers have selected minimum wages as either an important or a very important factor for wage-revisions and the top ranked factor forcing speedy wage adjustments. The emphasis is stronger for the manufacturing sector where this law applies more and where wages tend to be clustered near the minimum-wage floors as documented in

Table 4.<sup>23</sup> This goes to suggest that the announcement of the minimum wage seems to work beyond a wage floor, it rather acts as a reference point for setting wages and wage levels end up clinging to these official wage floors where they are applicable.

Moreover, for overall low wage levels, especially in the manufacturing sector, the magnitude of increase in minimum wages is also likely to determine *expected* wage growth. Similar results, but using employee-level data, are observed for Mexico (see Estevao and Filho, 2012). A related observation is that for the service sector the changes in the official minimum wage are not binding in that average wages are higher than the minimum wage. Yet, 60.1 per cent of the service sector employers admit to incorporating minimum-wage changes into wage revisions (See Table 8). Our interpretation of these observations is that though minimum-wage levels are not relevant for the service sector, the growth in the minimum-wage is and it is likely to play an important role in anchoring nominal-wage growth expectations

To assess the minimum-wage indexation argument in our data, we disaggregate by looking at the timing of wage changes of 73.9 per cent of managers who consider the minimum-wage as the 2nd to top factor for wage determination. Doing so, we find in Table 8 that 27 per cent, 39 per cent and 20 per cent of these managers revise wages in January, July or at some other time of the year respectively. For the 39 per cent of the firms the timing of wage revisions coincides with minimum wage announcements, it would be interesting if the announcement of minimum wages still remains important for firms where the two time points do not overlap. To test for this we divided the firms into two categories (i) where wage revisions typically happen in July and (ii) where typical wage changes do not happen in July. We rework the percentage of firms ranking minimum-wages as being important or very important for wage revisions. This goes to show that the consequences of minimum-wages for wage changes go well beyond the month of July, where the timing of wage changes coincides with minimum-wage revisions. This fact is supported for socio-occupational cadres as well as sectors showing the importance of the minimum-wage factor in Tables 6 and 7.

To sum up, these findings suggest that wage levels in Pakistan are indexed to the minimum wage level where this law applies, and changes in minimum wages build an *expectation* for wage revisions robustly for all occupational groups and economic sectors.

Table 8

---

<sup>23</sup> Interestingly, despite its significance the minimum wage laws are not ‘practically’ enforced, as 10.3 percent of employers in Pakistan admit paying a wage lower than the official wage. The fact applies especially to the manufacturing sector but it is unskilled blue collar workers- the cadre 1969 ordinance is designed to protect.

The Impact of the Minimum Wage ( <i>percentages</i> )			
	<i>Important or very Important</i>		
	Overall	July Only <sup>b</sup>	Non July <sup>c</sup>
Pakistan	73.9	28.9	45
White collar	59.1	18.5	40.6
Skilled blue collar	81.3	31.9	49.3
Unskilled	79.2	39.1	40.1
Manufacturing	83.9	38.9	45
Services	60.1	15.1	45

a: Percentage of managers treating minimum-wage as being important or very important.  
b: Percentage of managers typically change wages in July  
c: Percentage of managers typically change wages in month other than July

## 7

### Sticky wages

Thus far, we have discovered that over a one-year horizon nominal wages are inflexible without considering the underlying reasons. We now turn to this question for both nominal and real wages.

#### 7.1 Nominal wage stickiness

In this section we consider four issues. First, in what direction do wages tend to change? Second, do managers use indirect methods to curb labour costs? Third, are there structural impediments to wages being revised in a certain direction? Fourth, which non-structural reasons explain the overall wage inflexibility?

##### 7.1.1 The first ingredient: Direction of Wage Changes

We ask managers if they had cut wages in the last five years, and if they had what dictated that choice.<sup>24</sup> Results in Table 9 are remarkable and show that wage cuts are a rarity with only 1.8 per cent of firms having reported a wage cut in the last five years. A further breakdown shows that these reductions were mainly implemented by smaller firms, especially in the services sector. On the other end of the scale, we know from Table 4 that 88 per cent of firms revise wages upwards annually or more frequently. The European surveys pose a similar question and there 1.3 per cent and 6.4 per cent of firms reported cutting wages in the last five year in the euro and non-euro areas respectively. However, looking closer, relatively more manufacturing sector firms in the Euro-area surveys reported trimming wages (see Babecky et al. (2008) for the euro area and Table 9). The difference is

<sup>24</sup> Most of the survey literature on nominal wage rigidity takes into account both wage cuts and wage freezes as rigidity measures, however, we did not include any wage freeze questions in our questionnaire.

explained by the fact that in Pakistan wages in the manufacturing sector are not only close to but also allegedly indexed to minimum wages.

Instead of trimming wages, 41.7 per cent of firms in Pakistan admit using other cost-cutting strategies. Interestingly, this number is significantly smaller for both Euro and Non-euro area surveys. We next turn into a detail discssuion on these strategies.

Table 9  
Wage cuts and other strategies

	Small	Medium	Large	Pakistan	Euro	Non Euro
Wage cuts in 5 years <sup>a</sup>	2	1.3	0	1.8	1.3	6.4
Manufacturing				2.5	2.8	
Services				1.2	3.1	
% flexible wage components	6.2	9.4	23.5	8.2		
Cost minimizing strategy	43	38.4	34.5	41.7	64.5	60.4

a: Percentage of firms

### 7.1.2 The second ingredient: Cost-minimizing strategies

Nominal wages are clearly downwardly rigid. However, managers may use other cost-cutting measures during times of distress. We asked managers if and how they attempt to shed labor costs. The list and the results are shown in Table 10. About 42 cent of managers admitted using at least one of the listed cost-cutting measures, the laying off of temporary employees being the top choice. As shown in the table, Pakistani firms are more likely to adjust work hours than their counterpart in the euro and non-euro area and significantly less likely to use early retirements. They also reduce temporary employment to a much greater extent. In the case of the euro and non-euro area 63 per cent of managers report using at least one of the listed strategies with hiring of cheaper staff coming on top for curbing costs (see Babecky et al. (2009)). In contrast, Bewley (1999) reports that in the U.S. managers mostly use smaller bonuses, layoffs and frozen pay in bad times.

Table 10  
Cost Reducing Strategies

	Pakistan	Euro area	Non-euro area	Total EU
Reduction of bonuses	20.6	20.5	26.7	20.5
Reduction of non-pay bonuses	17.1	14.6	14.9	14.7
Adjustment of work hours	26.6	21.2	16.3	19.1
Slow promotions	12.3	24.6	13.4	20.6
Cheap hires	26.2	38.7	20.7	32.3
Early retirement	5.6	20.3	9.7	16.5
Reduced temporary employments	57.7			
Used at least one strategy	41.7	64.5	60.4	63.1

Data source: Babecky et al. (2009)

In Pakistan a large fraction of labour force in temporary employment because it is difficult to fire formal workers, impossible to fire permanent workers. In particular in the public sector and in the private sector litigation is necessary.

Smaller firms are more likely to be affected by an economic downturn and hence, in theory, should display lower downward wage-rigidity and more willingness to use alternative cost-minimizing strategies. Results are consistent with this fact as both the frequency of wage cuts and the percentage of managers admitting using at least one cost-cutting strategy are inversely correlated with firm size. Larger firms, having a higher proportion of flexible-wage components in their wage-bill tend to adjust labor costs by changing such payments. Furthermore, white collar employees with highly rigid wages are faced with a significantly higher probability of having bonuses cut and also non-pay benefits but have a lower probability of the temporarily-employed being laid off.<sup>25</sup>

### 7.1.3 The third ingredient: Structural impediments to DNWR

We now turn to structural impediments to wage reductions in the labour market. In the previous section we described minimum-wage indexation in Pakistan. Moreover, we discussed that as far as manufacturing sector goes and in particular those firms paying their workforce close to the minimum wage, minimum-wage indexation plays a leading role in determining wage levels and their growth. We also showed that managers not bound by the minimum-wage law also tend to pay attention to minimum wage shocks. Therefore, this feature of Pakistan labour market is an important structural element that explains DNWR.

<sup>25</sup> Results are available upon request.



### 7.1.4 The final ingredient: Non-structural impediments to DNWR

We now address reasons for wage rigidity that are independent of the minimum wage. For this assessment, we have the benefit of decades of research on wage rigidity. In most cases, the empirical validity of these theories is not easy to assess as the available data is often not sufficient to distinguish between individual theories. For example it is not possible to quantify the notion of morale, shirking or fairness. As a result, Kaufman (1984) and Blinder and Choi (1990) initiated a distinct strand of literature by asking wage-setters directly about what prevents them from cutting wages, based on a selection of theories proposed by economists.<sup>26</sup>

#### Asking about Wage Rigidity

Based on these theories, we presented managers with a series of short statements in common language and asked them to rank the importance of those statements from very “important,” “important,” “of minor importance” to “not important” (scaled from 1 to 4 respectively) for the decision not to cut wages. The statements are taken from Druant et al. (2009) in order to facilitate a comparison with studies of more developed countries. Table 11 reports the weighted mean scores along with an international comparison.

Table 11  
Rating Theories on Wage Stickiness

Theories	Mean Score <sup>a</sup>	% important <sup>b</sup>	p-value <sup>c</sup>	EU-Mean Score <sup>d</sup>
Adverse selection (quit version)	1.8	84.2	0.000	1.7
Gift exchange	1.9	81.7	0.016	2
Relative wages	2.0	81.1	0.937	2.4
Efficiency wages – effort	2.0	79.8	0.000	1.9
Adverse selection (hire version)	2.3	59.3	0.972	2.2
Insider-outsider theory	2.3	61.7	0.009	
Turnover model	2.4	56.6	0.000	2.2
Implicit contracts	2.5	54.6	0.000	2.6
Collective agreements	3.1	33		

a: 1, 2, 3 and 4 denote very important, important, of minor importance and unimportant.

b: Percentage of firm rating the theory as important or very important.

c: Refers to the null-hypothesis that theory's mean score is equal to the theory just ranked below.

d: Excludes Germany and Greece. Source: Montornès and Saures-Leroy (2009), P. 43.

<sup>26</sup> Other notable contributions using this methodology, mostly for developed countries, are Campbell and Kamlani (1997), Agell and Lundborg (1995) for Sweden, Babecky et al. (2009) and Druant et al. (2009) for Europe wide surveys and Zoega and Karlsson (2006) for Iceland.

The overall results indicate that the efficiency wage model, in particular adverse selection (quit version), considerations of moral (gift exchange), relative wages and the shirking models as the top three deterrents to cutting wages. However, a detailed look at the data reveals other interesting results.

The adverse selection model remained the most important for wage revisions, with 84.2 percent of firms ranking it as a high importance factor (either as important or very important). These firms avoid lowering wages out of fear of losing their better workers. However, we found less success with the hire-version of the adverse selection model, coming in at fifth place, still around 60 percent of firms considered it a high importance factor. Labor morale, which includes the gift-exchange model, is the second highest ranked theory preventing wage cuts, 81.7 per cent of firms ranked that either important or very important . The third and fourth relevant theories are relative wage concerns and the wage-effort relationship; the two theories are statistically indistinguishable. Collective wage agreements received the weakest support of the models and this supports the conventional wisdom that wages are predominantly negotiated in an individual wage-bargaining' system. The turnover-training model came third last, which implies that concerns about keeping productive individuals override a desire to save on training costs overall.

The reasons for wage rigidity may vary across different occupational groups, firm size and economic activity in the product market (see Campbell and Kamlani,1997, and Agell and Lundborg, 1995). The adverse selection (quit version) received top rank for not cutting wages except for unskilled blue-collar employees. This is to be expected as wages for such workers are covered by the minimum-wage law. The quit-version of the adverse selection theory also remains a top ranked theory for the higher cadre pool i.e. white collar and skilled blue collar employees. Overall however, the top four theories remain robust among all the sub classification of size, occupation and economic sector, with minor changes across groups, see Table 12 below. Interestingly, the shirking model is more relevant for skilled blue-collar workers where output is not easily observed. Relative wages are more relevant for white-collar workers for whom there exist usually few options within firms so they have very few people to make intra firm comparisons (see Agell and Lundborg, 1992).

Table 12  
Ranks for Wage Stickiness Theories

	Overall	WC	SBC	UnS	Small	Medium	Large	Manuf	Services
Collect Wage Agreements	9	9	9	9	9	9	9	9	9
Efficiency Wage Theory	4	4	3	4	4	4	4	4	3
Gift Exchange	2	3	2	3	2	3	3	3	2
Adverse Selection (Quit)	1	1	1	2	1	1	1	1	1
Adverse Selection (Hire)	5	5	6	7	6	7	5	5	6
Turnover model	7	7	7	6	7	5	6	7	7
Implicit Contract Model	8	8	8	8	8	6	7	8	8
Comparative Wages	3	2	4	1	3	2	2	2	4
Insider-Outsider Theory	6	6	5	5	5	8	8	6	5

WC: White Collar; SBC: Skilled Blue Collar; UnS: Unskilled

Table 11 lists nine reasons for wage rigidity. In this table they are ranked so that the number 9 implies that the listed reason is least important and the number 1 implies that it is the most important reasons. For example, adverse selection (quit) is the most important reasons for all groups except unskilled workers where it is the second most important reason.

Bewley (1999) carried out a similar study for US firms and his non-structured survey showed a strong concern about fairness when lowering wages. We find interesting differences in the literature between countries in the validity of the adverse selection model (hiring and quit versions). While most of the supporting research seems to be related to adverse selection for quits as in Campbell and Kamlani (1997),<sup>27</sup> the evidence for the hiring version in Pakistan is not as strong as found by Blinder and Chio (1990) and Agell and Lundborg (1995).<sup>28</sup> In our survey we probed both the ‘quit’ and the ‘hire’ versions of the adverse selection model by inquiring if cutting wages would (i) imply that the most productive workers may quit their jobs or (ii) would create difficulties in attracting employees. While we have strong evidence for the adverse selection prediction for quits, 84 per cent of firms ranked this option as either important or very important, the hiring version of the theory got somewhat lower support i.e. from 60 per cent of employers.

We also asked an underbidding-productivity question in parallel to both Blinder and Choi (1990)

<sup>27</sup> Campbell and Kamlani (1997) show strong support for adverse selection.

<sup>28</sup> Adverse selection in hiring does not get any support in Blinder and Choi (1990), while data in Agell and Lundborg (1995) supports adverse selection with similar questions. The conflicting evidence for adverse selection can be explained by the categorical nature of the answers; contrary to the yes/no options in Blinder and Choi (1990), Agell and Lundborg (1995) asked questions allowing different levels of agreement and found results to be supportive of the adverse selection model even at the entry level. More importantly, around 67 percent of responses lie between the lukewarm support categories that are lost in the binary categories.

and Agell and Lundborg (1995). The respondents can answer only in yes or no. Results show that 79 per cent of firms categorically deny any relationship between underbidding and the productivity of workers at entry level. Though the strength of this wage-productivity denial in our survey is less than in Blinder and Choi (1990) the evidence is still not supportive of adverse selection at the hiring level.

Turning to the remaining international results, Radowski and Bonin (2008) for Germany show that employees' morale, labor regulations and collective agreements are most important reasons for wage stickiness. Relative wage and motivational issues are important deterrents for wage cuts in a sample of 179 firms from Swedish manufacturing industries in Agell and Lundborg (1995). Agell and Bennmarker (2007) also reveal how the nature of wage rigidity depends on firm size. Zoega and Karlsson (2006) use data from Iceland and find support for the quitting version of the adverse-selection model – cutting wages will cost the firms its better employees as well as raising the quit rate overall. In the case of Europe-wide surveys in Druant et al. (2009) the fairness-theory and the efficiency wage type argument based on morale and productivity explain downward rigidity as can be seen in Table 11. Babecky et al. (2009) also find support for the insider-outsider model in addition to efficiency wage models in Europe with the difference being that their survey was conducted before the 2008 crisis. The insider-outsider theory came in sixth in our survey.<sup>29</sup>

## 7.2 Real Wage Stickiness

According to Tobin (1972) worker's resistance to nominal wage cuts in a low inflation environment may result in higher unemployment. We have found such resistance in Pakistan. In the presence of nominal wage rigidity, the inflation can then facilitate labor market adjustment by reducing real labour costs (Akerlof et al, 1996). We would like to explore whether real wages are rigid in Pakistan. Following Druant et al. (2009) we define real-wage rigidity on the basis of the direct indexation to inflation, though real wage rigidities may also arise even if wages are only partially tied to inflation.

Wage indexation is especially relevant when (i) wage negotiations are costly and (ii) when

---

<sup>29</sup> Finally, an interesting theory for the existence of wage rigidity that we do not directly discuss with managers but is indirectly not accepted by our data is the intertemporal model of Elsby (2009). Here, workers dislike wage cuts making wage increases irreversible. Knowing this, forward-looking firms refrain from large wage increases to cover against the possibility of future wage cuts; in other words downward wage rigidity may cause wage compression. In fact, Dickens et al. (2007) using wage change distributions in 31 different data sets of 16 countries have found no evidence of such compression. In our survey, we find no significant differences in average wages paid by firms that experienced wage cuts compared to firms who never experienced wage cuts during the last five years (p-value= 0.545). Furthermore, we applied an alternative test by comparing the wage-setting behavior of managers who reported being more forward-looking than others. We classify managers using forward-looking information to set the price of their main product as forward-looking managers. Using this distinction we were unable to statistically distinguish forward-looking managers from backward looking ones in terms of wage rigidity.

workers are more risk averse than employers as in the implicit-contract theory (see Keeney and Lawless, 2010). Costly negotiations usually increase the time between two negotiations that may erode the real value of earnings between negotiations. So even when wages are negotiated optimally, the actual real wage level will be set above the optimal real wage at the beginning of the contract but will be below the optimal level at the end of the contract period. Typically, well-informed workers value their real earnings and demand complete indexation to negotiation costs. The second reason for wage indexation is the risk distribution between employers and workers. Implicit contract theory assumes that workers are more risk averse than firms, so they demand a risk premium against the unexpected variation in inflation. Employees become more concerned about relative wages and cost of living when high inflation erodes nominal wages. Empirically, wage indexation is an important component of wage-setting arrangements in some countries (e.g. Belgium, Italy, Malta and Cyprus and most of Scandinavian countries in the 70s and early 80s), while in other economies wage indexation is very limited (e.g. the US) or even prohibited by law (e.g. Germany). In Pakistan there exists no official wage indexation policy but there exists the *Cost of Living Allowance Ordinance* 1973, which the government uses to adjust wages intermittently.<sup>30</sup>

Table 13  
Wage Indexation

	Pakistan	Euro area	Non-euro-area	Total
No Indexation	64.0	70.3	63	68.3
Indexation	36.0	29.7	37	31.7
Complete indexation	7.0	17.3	8.1	14.8
Partial Indexation	29.0	12.3	28.8	16.7
Past <sup>b</sup>	67.3	73.0	66.7	71.1
Expected <sup>b</sup>	32.7	27.0	33.3	28.9

a: Data Druant et al. (2009)

b: Estimates of past and expected inflation are given combinations the option with their respective weights

We asked managers about the extent to which wages are indexed to past or expected inflation. The responses indicate strong similarity of indexation behavior of Pakistani firms with ‘non-euro’ area countries in Druant et al. (2009). In our survey 36 per cent of firms admit to indexing their wages, either completely or partially, to inflation; this proportion of indexation is very close to non-euro countries (37.2 per cent). But a large majority, 76 per cent of firm, claim that wages are not

<sup>30</sup> There is evidence in the 1985-1986 budget that Government indexed wages to 80% of the prevailing inflation. See Khan (1988).

inflation-indexed implying that real wages are mostly flexible in Pakistan. For the euro-area countries around only 30 per cent of firms index their wages to inflation. Similarly, as in the non-euro area, the percentage of firms with 'complete' indexation is less than half compared to euro area (7 per cent in Pakistan, 8 in non-euro area against 17 per cent in Euro Area). Juxtaposing the results of indexation with reason for wage revisions shows that although the majority of firms report wage changes on the basis of tenure, yet a higher degree of wage indexation implies that inflation considerations are indeed embedded indirectly into their wage negotiations.

The choice of a reference inflation rate for indexation has important policy implications. Earlier literature on wage indexation assumed that wages were indexed to current inflation (see Gray, 1976, and Fischer, 1977). Both studies, while studying the effects of wage indexation on the magnitude of macroeconomic fluctuation, found stabilizing effects of full indexation from monetary disturbances. Later research which included inflation lags in indexation shows the negative consequences of lagged indexation for macroeconomic stabilization (see Simonsen, 1983, Fischer (1985, 1988) and Jadresic, 1996). Perez (2003) found a higher degree of contemporaneous inflation explained by past inflation, hence the inflation series may behave as if there were backward-looking expectations in the presence of lagged wage indexation (see Vargas et al, 2009; Fraga et al, 2003). Backward-looking indexation is not very surprising for developed countries with a stable inflation rate over time, however it is more important for developing countries where wage indexation is found to be more common than in developed economies (see Moreno, 2009, Lefort and Schmidt-Hebbel, 2002, and Druant et al, 2009).

To analyze reference inflation for indexation, we asked managers to select from past or expected inflation or a combination of the two. The results reveal that 55 per cent of managers index wages to past inflation exclusively while 19 per cent index to expected inflation and 26 per cent said they considered a combination of both past and expected inflation. Our survey also inquired about the weight given to past and expected inflation for indexation. Table 13 reports the weight given to past inflation is surprisingly very close to non-euro area countries where two-third of decisions are based on past inflation. In the euro area the wage indexation to past inflation is even higher (73 per cent) and this high backward-looking nature can be explained by their low steady-state inflation level.

## **8 Stylised facts**

Based on the results, we establish ten stylized facts about the labour market behaviour in Pakistan's

manufacturing and services sectors. In doing so, we make cross-country comparisons where possible.<sup>31</sup> The facts are:

- ◇ The implied typical wage spell for Pakistan is 13.5 months while in Europe the range is 14.7-15-months implying that wages are marginally less rigid in Pakistan. This is remarkable given 7-8% steady inflation in the country. Moreover, wages in the manufacturing sector tend to be less rigid relative to the service sector;<sup>32</sup>
- ◇ Wage rigidity is considerably greater than price rigidity in Pakistan;<sup>33</sup> This fact sets Pakistan apart from the developed world where both types of rigidity are close (See Taylor 1999);
- ◇ Wage cuts are found to be rare with less than two percent of firms having reported a wage cut in the last 5 years. For Europe this number is close to 1.8-6.4 per cent;
- ◇ In line with previous work, adverse selection (quit version), gift exchange, shirking and relative wage comparisons act as important deterrents to nominal wage cuts;
- ◇ We find that 35 and 45 per cent of wage revisions take place at the beginning of the financial and the fiscal year respectively. While 83% of wage changes are reported to take place in any given month. These results suggest that there is some concentration in wage revisions but at economy-wide level wages are not synchronized. A similar pattern is found in European surveys where however only 54 per cent of managers admit wages change in a given month;
- ◇ Wages in the services sector and for white-collar employees are revised least frequently;
- ◇ Relative to rare cuts in the basic wage, adjustments through the flexible component are more common and firms vary temporary employment and working hours to trim labor costs.
- ◇ The level of direct wage indexation to inflation is low but there is strong evidence for an indexation to the minimum wage.
- ◇ Wages in the the manufacturing sector are lower than the services sector.
- ◇ The main determinants of wage changes are company policy – that is firm- and worker-specific factors – and the minimum wage. Collective bargaining remains the least important factor in contrast to what has been found in many developed countries.

---

<sup>31</sup> While making these comparisons, one must bear in mind that sectors covered vary and international surveys were conducted under different economic circumstances (European surveys were conducted in 2007-08 and ours a year later).

<sup>32</sup> This finding compares favorably with studies such as Cecchetti (1987), Fregert and Jonung (1986), Card and Hyslop (1997) who observe that during periods of high average inflation a smaller proportion of employees experience a duration of wage spells greater than one year.

<sup>33</sup> See Choudhary et al. (2011) for a price-setting study of the same employers used for this study.

## 9 Conclusions

The survey results support reveal downward nominal wage rigidity in Pakistan with less than 2% of managers ever cutting wages over a period of five years and 85% of firms fixing nominal wages for a 12-month interval. Real wages on the other hand are found to be less rigid with 64% of managers not indexing wages to inflation. Those managers indexing wages to inflation tend to largely use lagged inflation as a reference point. Efficiency wage theory (shirking and adverse selection), gift exchange, relative wages and indexation to the minimum-wage for employees at the margins of the minimum-wage are found to be the prime explanations for wage rigidity in Pakistan. Beyond a certain level, wage-setting in Pakistan appears to be largely based on 'individual-bargaining,' but the extent of government intervention for the group at the fringes of the minimum wages is impressive. This tendency acts as a drag on the options of service sector wage-setters as well as for those managers not setting wages in the month of July when minimum-wage changes take effect. The implication is profound in that minimum wage revisions are likely to affect expectations of future wage growth.

At the disaggregate level, our results reveal that levels of average wages in the manufacturing sector, where minimum-wage law largely apply, are lower than in the service sector and at the margin of the minimum wage. In real terms, this implies that real wages have been falling in the former while the latter has benefited from a higher relative real wage, which partly explains the growth of service sector employment in Pakistan. It is also true that wage spells are relatively longer in the service sector.

In comparison with studies done for developed countries several similarities and differences have emerged. Similar to what has been found in these studies we have found for Pakistan that downward wage rigidity can be explained by concerns about losing the more productive workers, affecting workers' loyalty through gift exchange, concerns about effort and concerns about relative wages. Among differences we can list the importance of minimum wages for wage setting, not just for the lowest paid but also for workers higher up in the wage distribution. In contrast collective bargaining is not important in Pakistan. There is also a difference in that wages are more rigid than prices in Pakistan. Finally Pakistani firms vary temporary employment and working hours to trim labor costs while European firms tend to use early retirement, cheap hires and slow promotions to a greater extent and in the US managers mostly use smaller bonuses, layoffs and frozen pay in bad times.





## References

- [1] ABRAHAM, K.G. and HALTIWANGER, J.C., 1995. Real Wages and the Business Cycle. *Journal of Economic Literature*, **33**(3), p. 1215-1264.
- [2] AGELL, J. and LUNDBORG, P., 1992. Theories of Pay and Unemployment: Survey Evidence from Swedish Manufacturing Firms. Uppsala - Working Paper Series.
- [3] AGELL, J. and BENNMARKER, H., 2007. Wage Incentives and Wage Rigidity: A representative view from within. *Labour Economics*, **14**(3), p. 347-369.
- [4] AGELL, J. and LUNDBORG, P., 1995. Theories of Pay and Unemployment: Survey Evidence from Swedish Manufacturing Firms. *The Scandinavian Journal of Economics*, **97**(2), p. 295-307.
- [5] AKERLOF, G.A., 1982. Labor Contracts as Partial Gift Exchange. *The Quarterly Journal of Economics*, **97**(4), p. 543-569.
- [6] AKERLOF, G. A., DICKENS, W. R. PERRY, G. L. 1996. The Macroeconomics of Low Inflation. *Brookings Papers on Economic Activity*, Economic Studies Program, The Brookings Institution **27**, p. 1-76.
- [7] AKERLOF, G.A. and YELLEN, J.L., 1990. The Fair Wage-Effort Hypothesis and Unemployment. *The Quarterly Journal of Economics*, **105**(2), p. 255-283.
- [8] ALL, A., CHOUDHARY, M. A., and KHAN, S., FORTHCOMING. On the Timing of Policy Changes.
- [9] BABECKY, J.,P., DU CAJU, P., KOSMA, D., LAWLESS, M., MESSINA, J. and ROOM, T., 2008. Downward wage rigidity and alternative margins of adjustment: survey evidence from European firms. *mimeo (WDN)*.
- [10]BABECKY, J., DU CAJU, P., KOSMA, T., LAWLESS, M., MESSINA, J. and ROOM, T., 2009. Downward Nominal and Real Wage Rigidity: Survey Evidence from European Firms. European Central Bank.
- [11]BAILY, M.N., 1974. Wages and Employment under Uncertain Demand. *The Review of Economic Studies*, **41**(1), p. 37-50.
- [12]BATINI, N., LEVINE, P. and LOTTI, E., 2010. The Costs and Benefits of Informality. School of Economics Discussion Papers 0211, School of Economics, University of Surrey.
- [13]BERTOLA, G., DABUSINSKAS, A., HOEBERICHTS, M., IZQUIERDO, M., KWAPIL, C., MONTORNES, J. and RADOWSKI, D., 2010. Price, Wage and Employment Response to Shocks - Evidence From the WDN Survey. European Central Bank.
- [14]BEWLEY, T.F., 1999. *Why Wages Don't Fall During a Recession*. Harvard University Press.
- [15]BLINDER, A.S. and CHOI, D.,H., 1990. A Shred of Evidence on Theories of Wage Stickiness. *The Quarterly Journal of Economics*, **105**(4), p. 1003-1015.
- [16]BIHAN, H., MONTORNES, J. and HECKEL, T (2012), Sticky Wages: Evidence from Quaterly Micro Data, *American Economic Journal: Macro*, **4**, p. 1-32.

- [17]BOERI, T., 2012. Setting the Minimum Wage. *Labour Economics*, **19**(3), p. 281-290.
- [18]CALVO, G.A., 1983. Staggered Prices in a Utility-Maximizing Framework. *Journal of Monetary Economics*, **12**(3), p. 383-398.
- [19]CALVO, G.A., 1982. Involuntary Unemployment and Inventories: An Exploratory Model of Equilibrium and Pure Competition. *Journal of Macroeconomics*, **4**(3), p. 253-275.
- [20]CAMPBELL, C.M.,III and KAMLANI, K.S., 1997. The Reasons for Wage Rigidity: Evidence From a Survey of Firms. *The Quarterly Journal of Economics*, **112**(3), p. 759-789.
- [21]CAPLIN, A.S. and SPULBER, D.F., 1987. Menu Costs and the Neutrality of Money. *The Quarterly Journal of Economics*, **102**(4), p. 703-726.
- [22]CARD, D. and HYSLOP, D., 1997. Does Inflation Grease the Wheels of the Labor Market? National Bureau of Economic Research, Inc, p. 71-122.
- [23]CARD, D. and HYSLOP, D., 1996. Does Inflation Grease the Wheels of the Labor Market? National Bureau of Economic Research Working Paper Series, No. 5538.
- [24]CASTELLS, M. and PORTES, A., 1989. *World underneath: the origins, dynamics, and effects of the informal economy*. in Portes, A., Castells, M. and Benton, L. (eds) *The Informal Economy: Studies in Advanced and Less Developed Countries*, Baltimore and London: Johns Hopkins University Press p. 11-37.
- [25]CECCHETTI, S.G., 1987. Indexation and Incomes Policy: A Study of Wage Adjustment in Unionized Manufacturing. *Journal of Labor Economics*, **5**(3), p. 391-412.
- [26]CHOUDHARY, M.A., NAEEM, S., FAHEEM, A., HANEEF, N. and PASHA, F., 2011, Formal Sector Price Discoveries: Results from a Developing Country. School of Economics, University of Surrey, 1011.
- [27]CHRISTIANO, J. C. and EICHENBAUM, M., 2005, Nominal Rigidities and Dynamic Effects of a Shock to Monetary Policy, *Journal of Political Economy*, **113**(1), p. 1-45.
- [28]DICKENS, W.T., GOETTE, L., GROSHEN, E.L., HOLDEN, S., MESSINA, J., SCHWEITZER, M.E., TURUNEN, J. and WARD, M.E., 2007. How Wages Change: Micro Evidence from the International Wage Flexibility Project. *Journal of Economic Perspectives*, **21**(2), p. 195-214.
- [29]DRUANT, M., FABIANI, S., HERNANDO, I., KWAPIL, C., LANDAU, B., LOUPIAS, C., MARTINS, F., MATHA, T., SABBATINI, R., STAHL, H. and STOKMAN, A., 2006. What Firms' Surveys Tell Us about Price-Setting Behavior in the Euro Area. *International Journal of Central Banking*, **2**(3), p. 3-47.
- [30]DRUANT, M., FABIANI, S., KEZDI, G., LAMO, A., MARTINS, F. and SABBATINI, R., 2009. How Are Firms' Wages and Prices Linked: Survey Evidence in Europe. Working paper No 1084, European Central Bank.
- [31]DRUANT, M., FABIANI, S., KEZDI, G., LAMO, A., MARTINS, F. and SABBATINI, R., 2008. How Are Firms' Wages and Prices Linked: Survey Evidence in Europe. in Eurosystem Wage Dynamic Network Conference, Frankfurt European Central Bank, .
- [32]ELSBY, M.W.L., 2009. Evaluating the Economic Significance of Downward Nominal Wage Rigidity. *Journal of Monetary Economics*, **56**(2), p. 154-169.

- [33] ESTEVAO, M. and FILHO, D.C., 2012. Institutions, Informality, and Wage Flexibility: Evidence from Brazil. International Monetary Fund.
- [34] FISCHER, S., 1988. Real Balances, The Exchange Rate, and Indexation: Real Variables in Disinflation. *The Quarterly Journal of Economics*, **103**(1), p. 27-49.
- [35] FISCHER, S., 1985. *Contracts, Credibility, and Disinflation*, in J. W. Neville and V. Argy (eds.), Inflation and Unemployment. George Allen and Unwin (London).
- [36] FISCHER, S., 1977. Wage Indexation and Macroeconomics Stability. *Carnegie-Rochester Conference Series on Public Policy*, **5**(0), p. 107-147.
- [37] FLEISCHMAN, C., A., 1999. The Causes of Business Cycles and the Cyclicity of Real Wages. Board of Governors of the Federal Reserve System (U.S.).
- [38] FRAGA, A., GOLDFAJN, I. and MINELLA, A., 2003. Inflation Targeting in Emerging Market Economies. National Bureau of Economic Research Working Paper Series, No. 10019.
- [39] FREGERT, K. and JONUNG, L., 1986. Monetary Regimens and the Length of Wage Contracts. Unpublished, University of Lund.
- [40] FRIEDMAN, M., 1968. The Role of Monetary Policy. *The American Economic Review*, **58**(1), p. 1-17.
- [41] GALUSCAK, K., KEENEY, M., NICOLITSAS, D., SMETS, F., STRZELECKI, P. and VODOPIVEC, M., 2010. The Determination of Wages of Newly Hired Employees - Survey Evidence on Internal Versus External Factors. European Central Bank.
- [42] GENESOVE, D. and MAYER, C., 2001. Loss Aversion and Seller Behavior: Evidence from the Housing Market. *The Quarterly Journal of Economics*, **116**(4), p. 1233-1260.
- [43] GORDON, D.F., 1976. A Neo-Classical Theory of Keynesian Unemployment. *Carnegie-Rochester Conference Series on Public Policy*, **1**(0), p. 65-97.
- [44] GRAY, J.A., 1976. Wage Indexation: A Macroeconomic Approach. *Journal of Monetary Economics*, **2**(2), p. 221-235.
- [45] GROSHEN, E., L. and SCHWEITZER, M., E., 1997. The Effects of Inflation on Wage Adjustments in Firm-Level Data: Grease or Sand? Staff Reports No 9, Federal Reserve Bank of New York (U.S.).
- [46] HART, J.E., 1973. The Wages of Crying Wolf: A Comment on Roe v. Wade. *The Yale Law Journal*, **82**(5), p. 920-949.
- [47] HISAM, Z., QURESHI, S., HARA, N., ERCELAWN, A., ALI, K., WIZARAT, S., ALI, B. and SHAUKAT, Z., 2010. *Labour Rights in Pakistan, Declining Decent Work and Emerging Struggles*. Karachi: Pakistan Institute of Labour Education Research.
- [48] IREGUI, A.M., MELO, L.A. and RAMIREZ, M.T., 2010. Downward Wage Rigidities and Other Firms' Responses to an Economic Slowdown: Evidence from a Survey of Colombian Firms. *Borradores de Economía*, No. 612; p. 1-48.
- [49] IRFAN, M., 2009. *Pakistan's Wage Structure, during 1990-91 to 2006-07*. Pakistan Institute of Development Economics.
- [50] JADRESIC, E., 1996. Wage Indexation and the Cost of Disinflation. Staff Papers -

International Monetary Fund, **43**(4), p. 796-825.

- [51]KAHN, S., 1997. Evidence of Nominal Wage Stickiness from Microdata. *The American Economic Review*, **87**(5), p. 993-1008.
- [52]KAHNEMAN, D., KNETSCH, J.L. and THALER, R., 1986. Fairness as a Constraint on Profit Seeking: Entitlements in the Market. *The American Economic Review*, **76**(4), p. 728-741.
- [53]KARDAR, S., 2005. ECONOMY: The Budget for 2005-06, (June 17, 2005). *Daily Times*.
- [54]KAUFMAN, R.T., 1984. On Wage Stickiness in Britain's Competitive Sector. *British Journal of Industrial Relations*, **22**(1), p. 101-112.
- [55]KEENEY, M.J. and LAWLESS, M., 2010. Wage Setting and Wage Flexibility in Ireland:Results from a Firm-level Survey, Working Paper Series No 1181, Feb 2010, European Central Bank.
- [56]KEYNES, J.M., 1936. *The General Theory of Employment, Interest and Money*. Palgrave Macmillan.
- [57]KHAN, M.T., 2008. Industrial Relations: Role of Labor Unions in Organizational Climate in Pakistanâ€™S Perspective. *Unpublished Phd thesis*, National University of Modern Languages, Islamabad.
- [58]KHAN, M., 1988. *Labour Administration: Profile on Pakistan*. International Labour Organization, Asian and Pacific Regional Centre for Labour Administration (ARPLA), Bangkok.
- [59]KWAPIL, C., BAUMGARTNER, J. and SCHARLER, J., 2005. The Price-Setting Behavior of Austrian Firms - Some Survey Evidence. Working Paper No 464, European Central Bank.
- [60]LEBOW, D.E., STOCKTON, D.J. and WASCHER, W.,L., 1995. Inflation, Nominal Wage Rigidity, and the Efficiency of Labor Markets. Board of Governors of the Federal Reserve System (U.S.).
- [61]LEBOW, D.E., SAKS, R.E. and WILSON, B.A., 2003. Downward Nominal Wage Rigidity: Evidence from the Employment Cost Index. *Advances in Macroeconomics*, Berkeley Electronic Press, **3**, article 2.
- [62]LEFORT, F. and SCHMIDT-HEBBEL, K., 2002. Indexation, Inflation and Monetary Policy: An Overview. Central Bank of Chile, p. 1-18.
- [63]LINDBECK, A. and SNOWER, D.J., 1988. Cooperation, Harassment, and Involuntary Unemployment: An Insider-Outsider Approach. *The American Economic Review*, **78**(1), p. 167-188.
- [64]MARTINS, P., 2005. The Inter-Industry Wage Structure of U.S. Multinationals. *Economics Bulletin*, **10**(1),p. 1-7.
- [65]MCLAUGHLIN, K.,J., 1999. Are Nominal Wage Changes Skewed Away From Wage Cuts? Review, Federal Reserve Bank of St. Louis, (May), p. 117-132.
- [66]MCLAUGHLIN, K.J., 1994. Rigid Wages? *Journal of Monetary Economics*, **34**(3), p. 383-414.
- [67]MONTORNES, J. and SAUNER-LEROY, J.B., 2009. Wage-setting Behavior in France: Additional Evidence from an Ad-hoc Survey. Working Paper Series No 1102, European Central Bank, .

- [68]MORENO, R., 2009. Some Issues in Measuring and Tracking Prices in Emerging Market Economies. Bank for International Settlements, p. 13-51.
- [69]MOSER, C.O.N., 1978. Informal Sector or Petty Commodity Production: Dualism or Dependence in Urban Development? *World Development*, **6**, p. 1041-1064.
- [70]NICKELL, S. and QUINTINI, G., 2003. Nominal Wage Rigidity and the Rate of Inflation. *Economic Journal*, **113**(490), p. 762-781.
- [71]OLIVEI, G., and TENREYRO, S. D., 2008. *Wage Setting Patterns and Monetary Policy: International Evidence*. CEP Discussion Papers dp0872, Centre for Economic Performance, LSE.
- [72]PAKISTAN, G.O., 2010. *Pakistan Economic Survey (2009-10)*. Islamabad: Ministry of Finance.
- [73]PAKISTAN, G.O., 2010. *Labour Force Survey (2009-10)*. Islamabad: Federal Bureau of Statistics, Statistics Division.
- [74]PAKISTAN, G.O., 2009. *Labour Force Survey (2008-09)*. Islamabad: Federal Bureau of Statistics, Statistics Division.
- [75]PAKISTAN, G.O., 2006. *Census of Manufacturing Industries (2005-06)*. Islamabad: Federal Bureau of Statistics, Statistics Division.
- [76]PAKISTAN, G.O., 1973. *Employees' Cost of Living (Relief) Act, 1973*.
- [77]PAKISTAN, G.O., 1969. *Pakistan Minimum Wages for Unskilled Workers Ordinance, 1969*.
- [78]PAKISTAN, G.O., 1961. *The Minimum Wages Ordinance, 1961*.
- [79]PAKISTAN. FEDERAL BEAURU OF STATISTICS, 2007. *Pakistan Standard Industrial Classification of All Economic Activities (PSIC-2007)*.
- [80]PEREZ, J.I.G., 2003. *Non-stationary Job Search When Jobs Do Not Last Forever: A Structural Estimation to Evaluate Alternative Unemployment Insurance Systems*. Centro de Estudios Andaluces.
- [81]PERRY, G.E., MALONEY, W.F., ARIAS, O.S., FAJNZYLBER, P., MASON, A.D. and SAAVEDRA-CHANDUVI, J., 2007. *Informality : Exit And Exclusion*. World Bank Publications.
- [82]PHELPS, E.S., 1968. Money-Wage Dynamics and Labor-Market Equilibrium. *Journal of Political Economy*, **76**(4), p. 678-711.
- [83]RADOWSKI, D. and BONIN, H., 2008. Sectoral Differences in Wage Freezes and Wage Cuts: Evidence From a New Firm Survey. Deutsche Bundesbank, Research Centre.
- [84]RAMOS, R., DUQUE, J.C. and SURINACH, J., 2010. Is the Wage Curve Formal or Informal? Evidence for Colombia. *Economics Letters*, **109**(2), p. 63-65.
- [85]SHAFIR, E., DIAMOND, P. and TVERSKY, A., 1997. Money Illusion. *The Quarterly Journal of Economics*, **112**(2), p. 341-374.
- [86]SHAPIRO, C. and STIGLITZ, J.E., 1984. Equilibrium Unemployment as a Worker Discipline Device. *The American Economic Review*, **74**(3), p. 433-444.
- [87]SHESHINSKI, E. and WEISS, Y., 1988. *Staggered and Synchronized Price Policies by Multiproduct Monopolies*. Harvard Institute of Economic Research, Harvard University.
- [88]SIMONSEN, M.H., 1983. *Indexation: Current Theory and the Brazilian Experience*, in Dornbusch,

- R. and M. Simonsen (eds), Inflation, Debt, and Indexation. The MIT Press.
- [89]SMETS, F. and WOUTERS, R, 2003. An Estimated Dynamic Stochastic General Equilibrium Model of the Euro Area. *Journal of the European Economic Association*, **1**(5), p. 1123-1175.
- [90]SOLOW, R.M., 1979. Another Possible Source of Wage Stickiness. *Journal of Macroeconomics*, **1**(1), p. 79-82.
- [91]STATISTICS DIVISION, U.N., 1989. *International Standard Industrial Classification of All Economic Activities, Rev.3.1*. United Nations Organization.
- [92]STIGLITZ, J.,E., 1986. Theories of Wage Rigidity. National Bureau of Economic Research Working Paper No. 1442.
- [93]STIGLITZ, J.,E., 1974. Equilibrium Wage Distributions. Cowles Foundation for Research in Economics, Yale University.
- [94]STIGLITZ, J.E., 1974. Alternative Theories of Wage Determination and Unemployment in LDC's: The Labor Turnover Model. *The Quarterly Journal of Economics*, **88**(2), p. 194-227.
- [95]TAYLOR, J.B., 1999. Staggered Price and Wage Setting in Macroeconomics. Handbook of Macroeconomics, in: J. B. Taylor, M. Woodford (ed.), chapter 15, Elsevier., **1**, p. 1009-1050.
- [96]TAYLOR, J.B., 1980. Aggregate Dynamics and Staggered Contracts. *Journal of Political Economy*, **88**(1), p. 1-23.
- [97]TAYLOR, J.B., 1979. Staggered Wage Setting in a Macro Model. *The American Economic Review*, **69**(2), p. 108-113.
- [98]TOBIN, J., 1972. Inflation and Unemployment. *American Economic Review*, **62**(1), p. 1-18.
- [99]VARGAS, H., GONZALEZ, A., GONZALEZ, E., ROMERO, J.V. and ROJAS, L.E., 2009. Assessing Inflationary Pressures in Colombia. Banco de la Republica de Colombia.
- [100]WEISS, A., 1980. Job Queues and Layoffs in Labor Markets with Flexible Wages. *Journal of Political Economy*, **88**(3), p. 526-538.
- [101]WILSON, B.A., 1999. Wage Rigidity: A Look Inside the Firm. Board of Governors of the Federal Reserve System (U.S.), 22.
- [102]ZOEGA, G. and KARLSSON, T., 2006. Does Wage Compression Explain Rigid Money Wages? *Economics Letters*, **93**(1), p. 111-115.

# Appendix

## 10 Questionnaire

### Preliminary Remarks:

This survey intends to find out about your wage setting behavior.

It focuses on Regular employees (the ones with a formal contract) of manufacturing and services firms. However, towards the end of the survey there are questions that link Formal and Informal economies.

**REGULAR EMPLOYEES:** Employees with formal contracts, registered with Social Security and, or, EOBI, and mentioned in official documentation of the firm. However, for services only formal contract matter.

Some of the questions below pertain to the largest group of REGULAR employees in Q.2 whereas the others marked as GENERAL in brackets cover all the REGULAR work force.

State Bank of Pakistan guarantees that your answers will be treated with high degree of confidentiality and will only be used for research purposes. The information collected will be shared/used at the aggregate level rather than at the firm level.

**Q.1:** How many REGULAR employees on average worked in your company in 2009?

\_\_\_\_\_ (ONLY REGULAR/PERMENANT EMPLOYEES)

**Q.2:** What is the composition of employees in your company in the following categories? (Mark the largest group)

2.1 Office or service level employees (White Collar)	_____ %	or	_____ Nos.
2.2 Skilled workers (Blue Collar)	_____ %	or	_____ Nos.
2.3 Unskilled workers (Blue Collar)	_____ %	or	_____ Nos.
CHECK	1+2+3=100%		

**Q.3:** What is the average gross wage of main workers in Q.2 in your company?

- Up to Rs. 6000 1
- Rs.6001-10000 2
- Rs.10001-15000 3
- Rs. 15001-25000 4
- Rs. 25001-50000 5
- Rs. 50001 and above 6

**Q.4:** On average what is the proportion of basic salary in the total gross salary of the largest workers group in Q.2?

\_\_\_\_\_ %



Use Govt. example. If no basic, then 100% gross (example)

**Q.5:** What is the level of wages of the main class of workers in Q.2 relative to your competitors?

Higher than average	1
Average	2
Lower than average	3

**Q.6.1:** (General): Do your employees receive bonuses?

Yes	1
No	2 (Go to Q.7)

**Q.6.2:** (General): If YES what are they based on? (Circle all relevant options)

6.2.1 Performance	1
6.2.2 Profit	2
6.2.3 Turnover	3
6.2.4 Others (Please specify)	9

**Q.7:** (General): How important are the following in wage related decisions in your company:

	Very Important	Important	Of Minor Importance	Not Important
7.1 Owners of the company	1	2	3	4
7.2 Executive management of the parent company	1	2	3	4
7.3 Union e.g. CBA	1	2	3	4

**Q.8:** When are the wages of the main group of workers in Q.2 reviewed? (Circle one only)

- 8.1 Only after a certain period of time 1  
 8.2 Only after certain events (performance, profits etc) 2  
 8.3 After certain events as well as after certain time 3

**Q.9:** (General): Are the wages of all employees in your company revised at the same time?

- Yes 1  
 No 2

**Q.10:** On average, how frequently the wages of employees belonging to main occupation group in Q.2 typically change in your firm?

	Quarterly	Bi-annually	Annually	Once every two years	Never
10.1 Wage changes due to inflation	1	2	3	4	5
10.2 Wage changes due to tenure	1	2	3	4	5
10.3 Wage changes other than tenure and/ or inflation(Example productivity, profit. high turnover)	1	2	3	4	5

**Q.11:** (General): Under normal circumstances, in which months are wages usually revised? (You can circle more than one month if you need to do so.)

January	1	May	5	September	9
February	2	June	6	October	10
March	3	July	7	November	11
April	4	August	8	December	12
				There is no fixed time	13

**Q.12.1:** (General): Is there any sort of indexation between inflation and wage revisions?

- Complete 1
- Partial 2
- None 3 (Go to Q.12.3)

**Q. 12.2:** (General): If the above answer is (1. Complete) or (2. Partial) then how are wages indexed to Inflation?

(Please circle one option)

- Past Inflation 1
- Expected Inflation 2
- If a combination of above then specify the respective percentages: 3

- a. Past Inflation \_\_\_\_\_% 3.1
  - b. Expected Inflation \_\_\_\_\_% 3.2
- (Sum should be 100%)

**Q. 12.3:** (General): If the answer to Q.12.1 is NONE, by how much, on average, were the wages revised in 2009?

- Increase by more than 20 percent 1
- Increase by 16-20 percent 2
- Increase by 11-15 percent 3
- Increase by 6-10 percent 4
- Increase by up to 5 percent 5
- Remained the same 6
- Decreased by up to 5 percent 7
- Decreased by 6-10 percent 8
- Others, Please Specify \_\_\_\_\_ 9

**Q. 13:** (General): How does your company plan to revise wages in the next 12 months?

- Raise wages 1
- Reduce wages 2
- No change 3

**Q. 14:** (General): How important are the following for decisions making purposes in wage revisions?

	Very Important	Important	Of Minor Importance	Not Important
.1) Change in turnover	1	2	3	4
.2) Change in prices of your product/services	1	2	3	4
.3) Change in worker efficiency	1	2	3	4
.4) Change in profits	1	2	3	4
.5) Changes in wages of competitive companies	1	2	3	4
.6) Changes in wages in the informal sector	1	2	3	4
.7) Change in inflation	1	2	3	4
.8) Company policy	1	2	3	4
.9) Main Period of the year when Contracts Expire and are up for Renewal	1	2	3	4
.10) Change in Public Sector Wages	1	2	3	4
11) Union Pressures	1	2	3	4
12) Demand and supply of labour	1	2	3	4
13) Impact of change in Minimum Wage Level on the wages of all employees	1	2	3	4

**Q.15:** (General): How quickly do the following influence your wage revisions Upward?

	Within 1 Month	Within 3 Months	Within 6 Months	Within 9 Months	Within 1 Year	No Change
1) Change in turnover	1	2	3	4	5	6
2) Change in prices of your product/services	1	2	3	4	5	6
3) Change in worker efficiency	1	2	3	4	5	6
4) Change in profits	1	2	3	4	5	6
5) Changes in wages of competitive companies	1	2	3	4	5	6
6) High inflation level	1	2	3	4	5	6
7) Low in inflation level	1	2	3	4	5	6
8) Rise in Demand for Labour	1	2	3	4	5	6

9) Fall in Supply of Labour	1	2	3	4	5	6
10) Increase in wages in the informal sector	1	2	3	4	5	6
11) Increase in wages in the Public sector	1	2	3	4	5	6
12) Impact of change in Minimum Wage Level on the wages of all employees	1	2	3	4	5	6

**Q16:** (General): Over the last 5 years have the wages of employees in your company ever been cut/reduced?

- Yes                    1 (Go to Q.17)  
 No                      2 (Skip Q.17)

**Q. 17:** (General): How quickly do the following influence your wage revisions Downward?

	Within 1 Month	Within 3 Months	Within 6 Months	Within 9 Months	Within 1 Year	No Change
1) Decrease in turnover	1	2	3	4	5	6
2) Decrease in prices of your product/services	1	2	3	4	5	6
3) Decrease in worker efficiency	1	2	3	4	5	6
4) Decrease in profits	1	2	3	4	5	6
5) Decrease in wages of competitive companies	1	2	3	4	5	6
6) Fall in Demand for Labour	1	2	3	4	5	6
7) Rise in Supply of Labour	1	2	3	4	5	6

**Q. 18:** (General): How important are the following in preventing wage cuts?

	Very Important	Of Minor	Not	
	Important	Importance	Important	
1) Collective agreements prevent wages from being cut	1	2	3	4
2) It would reduce employees' effort, resulting in less output or poorer service because outside opportunities appear more attractive	1	2	3	4
3) It would have a negative impact on employees' morale and loyalty to the firm	1	2	3	4
4) In the presence of wage cut, the most productive employees may quit the firm	1	2	3	4
5) It would create difficulties in attracting new workers	1	2	3	4
6) A wage cut would increase the number of employees who quit; increasing the cost of hiring and training new workers	1	2	3	4
7) Workers dislike unpredictable reductions in income. Therefore, workers and firm reach an implicit understanding that wages neither fall in recessions nor rise in expansions	1	2	3	4
8) Employees compare their wages to that of similarly qualified workers in other firms in the same market	1	2	3	4
9) Fear of non-cooperation by existing employees prevents average wage reduction	1	2	3	4

**Q. 19:** (General): Has any of the following strategies ever been used in your firm to reduce labor costs? (Please circle all options applicable to your firm.)

19.1 Reduction or elimination of bonuses.	1
19.2 Reduction or elimination of non-pay benefits.	2
19.3 Adjustment of hours worked per employee.	3
19.4 Slowdown or freezing of promotions.	4
19.5 Recruitment of new workers at lower wage in place of those who left/retired.	5
19.6 Use of early termination of contracts/early retirement policies to reduce the number of REGULAR employees.	6
19.7 Reduce the number of temporary employees.	7
19.8 None	8

**Q. 20.1:** (General): If your sales turnover increases next month, which of the following strategies will you use?

(Please circle all options applicable to your firm.)

- |  |   |
|--|---|
| 20.1.1 Hire new REGULAR employees                | 1 |
| 20.1.2 Hire new TEMPORARY employees              | 2 |
| 20.1.3 Re-organize work and/or use overtime work | 3 |
| 20.1.4 No change                                 | 4 |

**Q. 20.2:** (General): If your sales turnover falls next month, which of the following strategies will you use?

(Please circle all options applicable to your firm.)

- |   |   |
|---|---|
| 20.2.1 Reduce REGULAR employees                         | 1 |
| 20.2.2 Reduce TEMPORARY employees                       | 2 |
| 20.2.3 Re-organize work and/or stop using overtime work | 3 |
| 20.2.4 No change  | 4 |

**Q. 26:** (General): Let us assume two people with equal skills, education and experience apply for the same position. The first applicant accepts the offered wage, the other demands a higher wage. Would you assume that the person demanding a higher wage is more talented and would work more efficiently?

- |     |   |
|-----|---|
| Yes | 1 |
| No  | 2 |

**Q. 28:** (General): Do you employ REGULAR workers who, before joining your company, worked in the informal sector?

- |     |   |
|-----|---|
| Yes | 1 |
| No  | 2 |

## 11 Post Stratification

In the case of the manufacturing sector, the observations are adjusted using the procedure in Kwapil et al. (2005) and Martins (2005) where data points were re-weighted by sub-sector of economic activity and firm size in that

$$w_h = \frac{\frac{P_h}{S_h}}{\frac{P}{S}}$$

where,  $w_h$ ,  $P_h$ ,  $P$ ,  $S_h$  and  $S$  denote the weight of the  $h$ th stratum, the number of employees in the population in stratum  $h$ , the total number of employees in the population, the number of employees in the firms interviewed in stratum  $h$  and the total number of employees in all the responding firms respectively.

Post-stratification is more complex for the services sector because the SECP database does not include information on employment. However, we had information of authorized paid-up capital from SECP database which can be used as a proxy for firm size. We therefore split firms in services sector on the basis of authorized paid-up capital as small, medium and large firms according to less than Rs.15000000, Rs.15000000-50000000 and greater than Rs.50000000 respectively.<sup>34</sup> The responses for the services sector in this paper are therefore reported by post stratification using the following weights

$$w_h = \frac{\frac{C_h}{o_h}}{\frac{C}{o}}$$

where  $w_h$ ,  $C_h$ ,  $C$ ,  $o_h$  and  $o$  denote  $h$ th stratum weight, the paid-up capital of the firm in the population in stratum  $h$ , the total paid-up capital of firms in the population frame, the paid-up capital of the firms interviewed in stratum  $h$  and the total paid-up capital of the firms in the sample.

---

<sup>34</sup> This categorization has correlation coefficient of 0.5 with classification of employment for the observed sample.