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Survey on Wage and Price Formation of Czech Firms

Jan Babecký, Kamil Dybczak and Kamil Galuščák [*]

Abstract

Using an ad-hoc survey at the firm level, we investigate the determinants of wage and price-setting practices in Czech firms, the presence and sources of wage rigidity, and reactions of firms to hypothetical shocks. Although the evidence of downward wage rigidity is not widespread, we find particular relevance of efficiency wage models for wage rigidity, while implicit contract theory is relevant in firms employing mainly high-skilled labour. The survey further suggests that prices are less rigid than wages, while the link between wage and price changes is weak. As a response to unanticipated shocks such as a demand drop, an increase in the cost of an intermediate input or a wage increase, firms mainly reduce costs by reducing non-labour costs and temporary employment.

Nontechnical Summary

Based on a survey of firms, we investigate the determinants of wage and price-setting practices, the presence and sources of wage rigidity, and the reaction of firms to hypothetical shocks.

We find that almost two thirds of firms adapt wage changes to inflation, out of which more than half reflect past inflation. The evidence suggests that prices are more often changed than wages, i.e. prices are less rigid than wages, while a third of firms claim there is no defined pattern for price changes. Although the experience of downward wage rigidity is not widespread, the survey evidence points particularly to the efficiency wage theory to explain wage rigidity. Contract theories on the other hand receive less support, being more relevant in firms employing mainly high-skilled labour.

Reasons for wage rigidity from our survey of Czech firms can be compared with similar results obtained for Germany (Franz and Pfeiffer, 2006) and the USA (Campbell and Kamlani, 1997). While the efficiency wage explanation for wage rigidity (the effect of a wage cut on workers' effort) is more relevant in the Czech Republic than in Germany and the USA, the implicit contract theory is less relevant than in the other two countries. The contract theory induced by the presence of collective agreements is more relevant than in the USA, but receives less attention than in Germany.

Furthermore, more than half of Czech firms state that base wage changes are concentrated in a particular month. Wage changes are most common in January. As in the case of wage adjustments, firms often revise prices in January. At the same time, more than 50 per cent of firms declare that there is no link between price and wage changes, while about 25 per cent admit that there is a link but no particular pattern. Our finding of January changes in wages and prices contributes to the discussion of the role of monetary policy and its effects. As argued by Olivei and Tenreyro (2007), during the periods of wage setting (e.g. a month or so before the actual wage changes) monetary policy has, inter alia, a smaller impact on the real economy compared to the alternative periods of more rigid wages. In what follows, Czech monetary policy might be less effective at the end of the calendar year, when wages are largely negotiated.

As a response to unanticipated shocks such as a slowdown in demand, an increase in the cost of an intermediate input and a permanent increase in wages, firms mainly reduce other costs, while they are less likely to react by adjusting margins, output or prices. Other costs are reduced mainly through cutting non-labour costs and the number of temporary workers, while firms would be less likely to react by reducing the number of permanent workers and eliminating bonuses.

1. Introduction

Labour markets are characterised by different types of frictions stemming from various sources, such as a high degree of regulation, specific institutions and skill mismatch. As a result, the real-life operation of the labour market seems to be far from the textbook models of a competitive labour market. Consequently, the price of labour does not adjust immediately in response to labour market conditions. Thus, wages often fall too little even when unemployment is high. As a result, even in a recession, workers' displacements and a reduction in the number of hours worked tend to be more prevalent than wage cuts.

Various frameworks have been proposed to explain the rationale behind labour market frictions. For instance, Campbell and Kamlani (1997) stress the role of alternative factors such as morale, fairness in pay and adverse selection in quits as being crucial when analysing labour market development. Unfortunately, testing the empirical relevance of labour market theories and models which incorporate these factors is rather problematic, since commonly accessible statistics on wages and employment do not reveal the motives of employers and employees behind their decisions. Thus, several economists, such as Bewley (1995), Campbell and Kamlani (1997) and Franz and Pfeiffer (2006), in a quest to understand labour market specifics better, decided to interview company decision makers directly.

In general, the outcomes of individual surveys support the predictions of alternative theories and models. The five most common frameworks of wage rigidity are (i) contract theory; (ii) implicit contract theory; (iii) efficiency wage theory; (iv) the fair wage-effort hypothesis; and (v) insider-outsider theory – see Campbell and Kamlani (1997) for an overview and discussion of these alternative theories. In a nutshell, *contract theories* explain wage rigidity as being due to an agreement (a contract) between a firm and its workers: the contract can be either explicit (induced by a collective agreement) or implicit. *Efficiency wage theory* (and the various forms thereof) assumes that the worker's productivity ("worker's efficiency") is proportional to the wage received[1]. Therefore, firms are reluctant to cut wages since a higher wage rate is believed to increase the workers' effort. Next, according to the *fair wage-effort hypothesis*, the workers' effort depends on their perception of how high their actual wage is with respect to the perceived 'fair wage'. Finally, the *insider-outsider theory* focuses on two classes of workers: insiders (actual workers) and outsiders (applicants), each of the groups being characterised by a different wage rate that the firm is willing to pay.

Different authors find support for different theories depending on the countries' particularities, such as national institutions and legislation. In addition, different types of economic activity, unlike the size of the firm or diverse levels of employees' skills, significantly affect the development of wages. For example, Bewley (1995) and Campbell and Kamlani (1997), when analysing US firms, find strong support for the efficiency wage theory (the adverse selection and morale arguments), suggesting that employers are aware that a potential pay cut would adversely affect employees' effort and that the best employees would quit the firm. In addition, Campbell and Kamlani (1997) suggest that there is a stronger effect of wages on effort for less skilled and blue-collar workers. In Sweden, Agell and Lundborg (1995) find that wages do not fall even

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[1] The shirking model, the gift-exchange model, the adverse selection model and the turnover model belong to the class of efficiency wage theories.

during a recession, because workers are concerned about fairness and relative wages ("fair wage-effort hypothesis"). Furthermore, Agell and Bennmarker (2003) claim that wage rigidity in Sweden is influenced by institutional as well as other factors such as morale and fairness. Zoega and Karlsson (2005) suggest that the reasons for downward nominal wage rigidity in Iceland are mainly related to the heterogeneity of workers; limited support is found for the efficiency wage theory and the implicit contract theory. Franz and Pfeiffer (2006), studying the German labour market, uncover strong evidence in support of labour union contracts effects ("contract theory"), implicit contract theory and efficiency wage theory (a turnover model thereof). In the Czech Republic, Galuščák and Münich (2005) refer to a shirking version of the efficiency wage model (Shapiro and Stiglitz, 1984) to explain cyclical variations in estimates of the wage curve, i.e. the relationship between regional unemployment and the regional level of wages. Although it is not possible to differentiate between the above-mentioned theories of wage stickiness when using aggregate data, analysis at the macroeconomic level is still informative for inferring about the overall degree of rigidity. Application of alternative methods such as the Phillips curve, the time-varying Phillips curve and cointegration to the macroeconomic series over 1995–2004 reveals significant wage rigidities prevailing on the Czech labour market (Babecký, 2008). A similar finding of limited wage flexibility is obtained when using the structural vector-error correction framework to investigate fluctuations in nominal and real wages for the period 1996–2007 (Babecký and Dybczak, 2008).

In addition to exploring wage-setting practices, economists often conduct surveys to explore the price-setting behaviour of firms. The seminal work by Blinder (1991) examines the empirical relevance of different theories of price stickiness, such as cost-based pricing theory, explicit contract theory, implicit contract theory and menu-costs theory, in the case of US firms. Similar surveys were conducted, for example, by Hall *et al*. (2000) in the UK and Amirault *et al*. (2006) in Canada. In Europe, price-setting studies have recently been conducted in the context of the Eurosystem Inflation Persistence Network (IPN) during 2003–2004.[2] The results seem to be robust across countries, suggesting the strongest support for the explicit and implicit contract theories. In other words, prices are not often adjusted by firms because consumers prefer stable nominal prices. However, what remains unexplained by the IPN is the role of wages and wage rigidities in price setting.

In the case of the Czech Republic, price-setting behaviour and price rigidity was analysed by Rottová *et al*. (2008). They find prices react only sluggishly to shocks to the economy. The main factor behind sticky prices seems to be explicit contracts. When setting prices, firms take into consideration both past and expected developments. Prices are monitored regularly, but changed less frequently. Due to strong competition, firms adjust other costs rather than prices.

Following the literature, we study in depth the features and sources of wage and price dynamics in the Czech Republic. Regarding the theories of wage rigidity, we find particular relevance of efficiency wage models, while implicit contract theory is relevant in firms employing mainly high-skilled labour. This finding is similar to that by Campbell and Kamlani (1997) reported for the United States. In addition, compared to the above-mentioned studies, the outcomes from our

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[2] For details, see http://www.ecb.int/home/html/researcher_ipn.en.html. A summary of the IPN findings is reported in Altissimo, Ehrmann and Smets (2006). See also Fabiani *et al*. (2005) for an overview and cross-country assessment of the results. A comparison of price stickiness in the euro area and the US is presented in Dhyne *et al*. (2006).

survey are not limited to wage rigidity analysis or to price-setting behaviour. The questions address both labour cost and price developments. With the help of the survey we collected valuable information on wage and price formation which is not available in the generally accessible data. Such information can be used for analytical and forecasting purposes, including calibration of parameters of economic models. Consequently, we identify relevant implications of wage and price dynamics for monetary policy. Concerning the development of prices, our findings of price rigidities appear to be in line with Rottová *et al.* (2008).

The paper is organised as follows. Following a brief overview of the macroeconomic and institutional situation, Section 2 describes the questionnaire and the realisation of the survey. Section 3 presents the results organised along three lines: wage setting, price setting and the link to wage setting, and downward wage rigidity and the adjustment to shocks. The last section concludes.

2. Data

2.1 Macroeconomic and Institutional Background

Prior to discussing the survey, which largely concerns firms' responses to the situation in 2006, we briefly outline basic stylised facts on the macroeconomic situation during 2000– 2007 in order to assess how the reference period chosen may affect the results. As illustrated in Table 1, the year 2006 does not represent an 'exceptional' episode. Except for higher-than-average economic growth, inflation (overall and measured by producer prices), nominal wage growth, labour productivity and the unemployment rate remained within the 2000–2007 range.

Table 1: Key Macroeconomic Indicators

	2000	2001	2002	2003	2004	2005	**2006**	2007
Real GDP growth, %	3.7	2.5	1.9	3.6	4.5	6.3	**6.8**	6.6
Inflation, %	3.9	4.7	1.8	0.1	2.8	1.9	**2.5**	2.8
Producer prices, %	5.1	3.0	-0.5	-0.3	5.6	3.1	**1.4**	4.1
Nominal wage growth, %	6.4	8.7	7.3	6.6	6.6	5.3	**6.5**	7.3
Labour productivity, %	3.6	2.5	1.9	3.6	4.1	5.2	**5.1**	4.7
Unemployment rate (ILO), %	.	.	.	7.8	8.3	7.9	**7.1**	5.3

Note: Year-on-year changes in %, unemployment rate in % of active population.
Source: Czech Statistical Office.

The survey explores the link between wage and price formation at the firm level. Considering macroeconomic data, Figure 1 and Figure 2 show the dynamics of growth rates of gross wages and producer prices in industry (excluding construction) at monthly frequency, defined on a yearly and monthly basis respectively. Apparently, there is no significant correlation between the two series. While the correlation coefficient is 0.24 for yearly growth rates, it equals -0.02 and is insignificant for monthly growth rates.

Figure 1: Wages and Producer Prices in Industry, year-on-year changes (%)
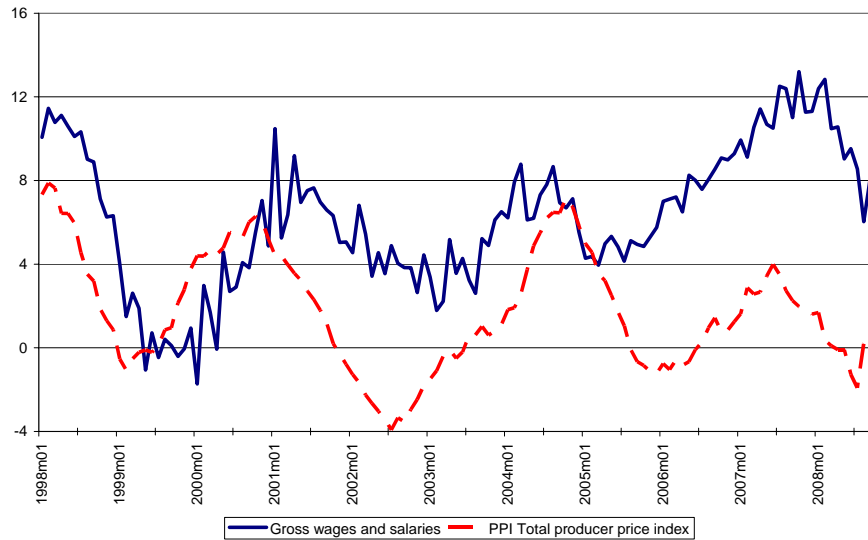
Source: Eurostat, seasonally adjusted data.
Note: Correl(wage change, PPI change) = 0.24 (p-value=0.006).

Figure 2: Wages and Producer Prices in Industry, month-on-month changes (%)
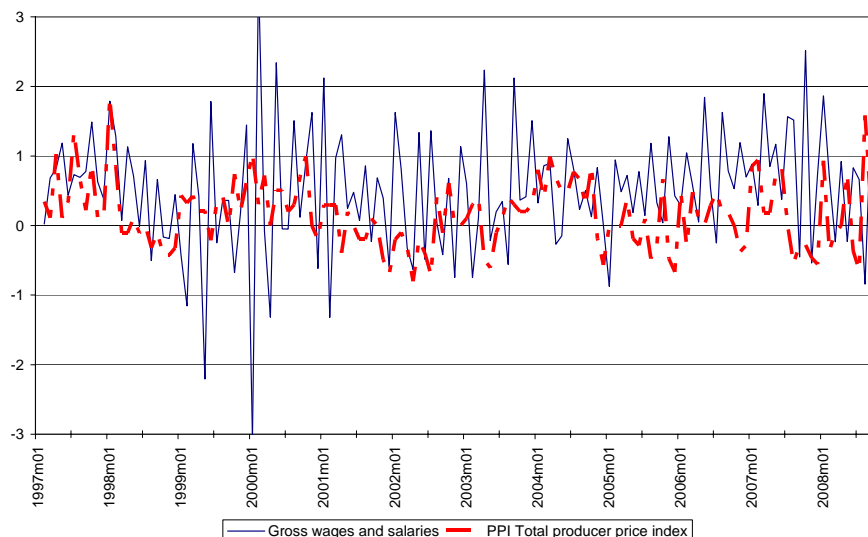
Source: Eurostat, seasonally adjusted data.
Note: Correl(wage change, PPI change) = -0.02 (p-value=0.84).

The institutional environment has a fundamental influence on the labour market. Based on information from 23 European countries, the US and Japan on wage-bargaining institutions collected using a standardised questionnaire in 2006, Du Caju *et al.* (2008) find that the Czech Republic is among the countries with highly decentralised wage bargaining (alongside Estonia, Hungary, Japan, Lithuania, Poland, the UK and the US). While there is a binding national minimum wage, indexation of wages to prices is not applied in the Czech Republic.[3]

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[3] The CNB's Analyses of the Czech Republic's Economic Alignment with the Euro Area (Hájková, 2005, 2006, 2007, 2008) provide a brief overview of the Czech Republic's institutions compared to those in Austria, Germany, Hungary, Poland, Portugal and Slovenia. This yearly document is aimed at assessing the potential impact of euro adoption on the Czech economy. The flexibility of the labour market is gauged using the collective bargaining coverage, the minimum wage, employment protection and work-incentive indicators.

2.2 Questionnaire Description

The harmonised survey questionnaire is an outcome of a coordinated effort within the ECB Wage Dynamics Network working group. The questionnaire was developed by economists from national central banks, statisticians and external advisers to the ECB. The questionnaires have been used in all euro area and other European countries.[4] This paper describes national results from the Czech questionnaire.[5]

The questionnaire is divided into four main parts. The first part focuses on wage-setting practices and on the frequency and timing of wage changes. It also collects information on how the wages of new workers are set relative to those of existing workers. First, firms were invited to indicate how their employees were distributed across occupational groups at the end of 2006.[6] The answer to this question determines the main occupational group to which some questions refer. The next question asks if a firm applies a collective wage agreement and to what extent it applies bonuses and benefits in worker remuneration. In the questionnaire it is important to distinguish these flexible wage components, which are usually linked to an individual's performance, and the base wage, as subsequent questions are related to changes in base wages. For example, the next question asks if a firm has a policy that adapts changes in base wages to inflation, and, if so, if there is a formal automatic rule for wage changes and whether base wage changes are linked to past or expected inflation. Firms were also invited to report how often they change the base wages of employees belonging to the main occupational group and whether base wage changes are concentrated in any particular month or months.

The last three questions in the first part of the questionnaire are devoted to factors which affect wage setting of new employees. In particular, firms were invited to indicate whether a collective pay agreement, the wage of similar employees in the firm, the wage of similar workers outside the firm, the availability of workers in the labour market, or other reasons are the most relevant in determining the entry wage of newly hired employees who belong to the main occupational group in the firm. Firms were also asked to report if they would pay newly hired employees a significantly lower wage than the wage of similarly qualified employees already in the firm if there is an abundance in the labour market, or a significantly higher wage if there is a shortage in the labour market. If the answer is negative, firms indicate the main reason for not differentiating the entry wages to labour market conditions.

The second part of the questionnaire addresses the issue of the presence of potential obstacles to downward wage adjustments and the reaction of firms to different unanticipated shocks. Firms indicate if base wages of some employees in the firm have been cut or frozen during the last five years and, if so, describe the main reason for reducing or freezing the wage.[7] Firms also select the factors that go against base wage cuts (labour regulation or collective agreements, negative impact on employee effort or morale, negative impacts on the firm's reputation, etc.). On the other hand, firms are also asked if any of the specified strategies have been used to reduce labour costs, such

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[4] The countries involved in the survey are: Austria, Belgium, the Czech Republic, Estonia, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, the Netherlands, Portugal, Spain, Poland and Slovenia.

[5] For the results in cross-country comparison, see Druant *et al.* (2008), Babecký *et al.* (2008), Galuščák *et al.* (2008) and Bertola *et al.* (2008).

[6] The reference period to which questions refer is 2006 or the end of 2006.

[7] The base wage is frozen if it remains unchanged in nominal terms, while it is considered cut if it decreases in nominal terms.

as the reduction or elimination of bonus payments or non-pay benefits, redundancy or reorganisation, outsourcing, etc. Firms also indicate whether it has become easier over the last decade to adjust wages to reduce labour costs, and, if so, what was the most important factor. The remaining six questions in this part ask hypothetical questions of how firms adjust prices, margins, output, wages, employment and non-labour costs in response to unanticipated shocks such as a slowdown in demand, an increase in the cost of an intermediate input (e.g. an oil price increase) and a permanent increase in wages.[8]

The third part of the questionnaire collects information on price-setting practices and the frequency of price changes. The answers refer to the main product or service that generated the highest fraction of the firm's revenue in 2006. First, firms were asked to report what share of revenue in 2006 was due to sales in domestic and foreign markets and how the price of the main product is determined in the main market (domestic or foreign). Firms were then asked to indicate to what extent they experience price competition and how likely they are to react to price cuts in the market.

The last three questions in this part are related to price changes. Firms were invited to report how often they typically change prices of the main product and whether price changes are concentrated in any particular month or months. It is also important to learn how wage-setting practices translate into price-setting behaviour. Therefore, the last question asks how the timing of price changes is related to the timing of wage changes.

The aim of the last part of the questionnaire is to collect firm-specific characteristics, since different wage and price-setting practices are expected to be specific for diverse categories of firms. This part also asks questions on the structure of employees in terms of the type of work contract, firm age and worker tenure in the firm, and questions on worker turnover and labour intensity, i.e. what percentage of the firm's total costs were due to labour costs in 2006.[9] The last question asks how the firm's revenue in 2006 compares to the previous year. The whole questionnaire is presented in Table A1 in the Appendix.

2.3 Realisation of the Survey and Data Processing

We organised a pilot survey in spring 2007, receiving 29 out of the 35 distributed questionnaires. The results from the pilot survey and the comments on the questions helped us to improve the formulation of the questions in the final survey.

For the survey, we generated a targeted sample of firms as a stratified random sample from the Czech Statistical Office business register, which we restricted to firms in the business sector with 20 or more employees in the following industries: manufacturing, construction, wholesale and retail trade, hotels and restaurants, transport, and real estate and business activities. We define strata in 19 industry groups and 3 size categories: small firms with 20 to 49 employees, medium-

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[8] Prices refer to the main product or service, defined as the one that generated the highest fraction of revenue in the reference period (2006). Employment and wages refer to the main occupational group in the firm.

[9] Total costs are all operating expenses, while labour costs are defined as wages, salaries, bonuses, social contributions, training, tax contributions, contributions to pension funds, etc. Labour costs are often grouped as direct remuneration (direct pay for time worked and bonuses), other direct costs (payments in kind, payment in capital and remuneration for non-working days) and indirect costs (social security contributions, vocational training and miscellaneous taxes).

sized firms with 50 to 199 employees, and large firms with 200 or more employees. Within each stratum we drew randomly 4% of small firms, 8% of medium-sized firms and 35% of large firms. The targeted sample size is 1,591 firms.[10]

The survey was launched through seven regional branches of the CNB in autumn 2007.[11] Letters with instructions and the questionnaire were sent by mail through CNB branches. Firms were asked to download the questionnaire prepared in Excel from the CNB website and submit it electronically. In the case of non-contact, firms in the targeted sample were replaced.[12]

The received questionnaires were processed automatically using Excel programming. The final response rate is 25% and the realised sample size is 399 firms (Table 2). In order to increase the representativeness across strata, we merge the original 19 industry groups into 11. Using the data on the number of questionnaires across 11 industries and 3 size classes, we construct weights correcting for unequal probability of selection of firms into the targeted sample, non-response and average firm size.[13] In this way the weights allow us to calculate sample averages representing all workers in the population of firms. Given that N_h is the population of firms in each stratum h, n^*_h is the number of firms in the targeted sample within each stratum, n_h is the number of firms in the realised sample in each stratum and $\overline{l_h}$ is the average firm size in the realised sample, the weights are defined as

$$w_l = \left(\frac{N_h}{n^*_h}\right)\left(\frac{n^*_h}{n_h}\right)\overline{l_h}.$$ (1)

While the first term on the right-hand side of (1) corrects for unequal sampling probability, the second term adjusts for non-response. The last term corrects for employment, assuming that the average size of the firms in a particular stratum in the realised sample is equal to the average firm size in the same stratum in the population of firms.[14]

We use the employment-based weights defined in (1) in weighted summary statistics. The statistics are thus made to represent total employment in the population of firms in the selected industries of the business sector with 20 or more employees.[15] Notice that when we describe wage

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[10] The random sample contained 115 firms which regularly cooperate with the CNB on its business survey. We increased the number of cooperating firms in our sample to 269 by replacing the firms in the sample based on size category and 4-digit NACE classification (the full list of cooperating firms contains 340 firms). While we aimed at increasing the expected response rate by including firms already cooperating with the CNB, we believe the sample is still random. Comparing the two groups of 269-115=154 firms, the replacing firms are larger and older than the replaced firms (average size of 594 employees as compared to 383 employees; average year of establishment of the firm of 1991.6 as compared to 1994.1). On the other hand, there are no statistically significant differences in terms of labour productivity, profit per employee and average wage.

[11] Although the survey was realised through CNB regional branches, region was not a sampling criterion. We define strata across industries and firm size categories.

[12] Non-contact was about 0 to 3% across CNB branches.

[13] The main reasons for non-response were as follows: too busy (either own activity or overloaded with other surveys required by the Czech Statistical Office), voluntary survey, foreign owner of the firm refused, confidential information, while some firms did not reply.

[14] We use this approximation as the exact firm size is not reported in the Czech Statistical Office business register.

[15] Even after applying weights the sample slightly overrepresents large firms. The total weighted employment in the sample is 2,293,000 workers at the end of 2006. According to the Czech Statistical Office, the total employment in the same industries and size category was 2,080,000 workers in the fourth quarter of 2006.

and price-setting practices, the unit is not a firm but an employee. More importance is thus assigned to larger firms.[16]

Table 2: Sample Size and Response Rate

Industry group	NACE	Realised sample				Response rate (%)			
		Small firms	Medium-sized firms	Large firms	Total	Small firms	Medium-sized firms	Large firms	Total
1	15,16	3	4	9	16	18.8	15.4	20.0	18.4
2	17,18,19,20,21,22	4	13	22	39	13.8	33.3	44.9	33.3
3	24,25,26	3	10	29	42	14.3	24.4	42.6	32.3
4	27,28	5	13	18	36	15.2	28.3	29.0	25.5
5	29,30,31,32,33	6	14	46	66	18.2	21.5	38.7	30.4
6	34,35,36,37	3	6	22	31	20.0	23.1	34.4	29.5
7	45	7	12	14	33	11.3	23.1	42.4	22.4
8	50,51,52	13	18	21	52	12.1	20.7	27.3	19.2
9	55,60,61,62,63,64	4	11	19	34	9.8	26.2	31.1	23.6
10	70,71,72,73	5	6	8	19	16.1	19.4	38.1	22.9
11	74	7	9	15	31	17.9	18.4	24.6	20.8
	Total	60	116	223	399	14.1	23.0	33.8	25.1

Note: Industry groups: 1 Manufacture of food products, beverages and tobacco; 2 Manufacture of textiles, leather, wood, paper, publishing; 3 Manufacture of chemicals, rubber, plastic, other mineral products; 4 Manufacture of metals and fabricated metal products; 5 Manufacture of machinery, electrical and optical equipment.; 6 Manufacture of transport equipment, other manufacturing; 7 Construction; 8 Trade; 9 Hotels and restaurants, transport; 10 Real estate, renting; 11 Other business activities.
Small firms (20–49 employees), medium-sized firms (50–199 employees), large firms (200 or more employees).

3. Results

3.1 Wage Setting and Wage Changes

This subsection focuses on the information provided by firms on their wage-setting practices and on the frequency and timing of wage changes. It also collects information on how wages of new workers are set relative to those of existing workers. In addition to providing weighted statistics, we explore the determinants of particular answers using probit regression estimates. Explanatory variables include firm size, sector, a dummy variable denoting that high skilled workers are the dominant occupational group in the firm[17], a dummy indicating the presence of a collective agreement signed at any level[18] and the share of bonuses in total wage bill. Additional control

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[16] Unweighted statistics are provided in Table A1 in the Appendix.

[17] High-skilled workers include technical and professional workers, i.e. workers normally with secondary or tertiary education. On the other hand, low-skilled workers comprise production and clerical workers. We also denote as low-skilled the category of other employees, as it includes service workers and shop and market sales workers as an example.

[18] The coverage of employees by collective wage agreements is an important determinant of wage setting. The information provided in the survey shows that 54% of employees are covered by a collective wage agreement signed either at the firm or at a higher level. This result is higher than previous estimates of the degree of collective wage agreement, but in line with other estimates produced recently. While OECD (2004) reports 25%

variables used in our regressions are: the share of sales on the foreign market, the share of labour cost in total costs, dummy variables for severe or strong competition, gross flows and whether the firm is less than 5 years old, and dummies denoting whether revenue is the same, higher or much higher than in the previous year.

The development of individual workers' wages is affected by a number of factors, ranging from individual and firm characteristics to the evolution of aggregate economic variables. In some countries, wage indexation is defined by law and wages are regularly upgraded in line with inflation or productivity growth. Statutory indexation is not officially applied in the Czech Republic, although 60% of firms confirm that inflation is reflected in their base wage changes (Table 3). Using a probit model we try to find factors affecting the probability that a firm takes into account the development of the aggregate price level in wage changes. The results in column (1) in Table 5 suggest that the probability that a firm has a policy of adapting changes in base wages to inflation is 17 percentage points lower in business services. Other sectors as well as the size of the firm do not seem to significantly affect the probability of inflation being reflected during a base wage adjustment process. The existence of any type of collective agreement is significant and positive, amounting to a 26 percentage point change in the probability. This suggests that collective agreements take into account the real value of wages of individual workers. On the other hand, the share of bonuses in total labour costs reduces the probability by 40 percentage points, indicating that firms using flexible wage components tend to adapt wages to inflation to a lesser extent. One can deduce that once bonuses are generous enough there is no additional need to adjust base wages periodically to inflation.

Among the firms which have a policy of adapting changes in base wages to inflation, 56% link wages to past inflation, while 44% take into account expected inflation (Table 3). Column 2 of Table 5 below indicates that expected inflation is less likely to be reflected in the construction, trade and service sectors, and also in firms with higher worker turnover. On the other hand, a positive effect of collective agreements indicates that collective agreements are designed in a way to take into consideration the expected development of the aggregate price level. Finally, expected inflation is also more likely to be reflected in base wage changes in firms with a higher share of labour costs.

The next question asks how often the base wage is typically changed. Figure 3 suggests that about a quarter of firms never adjust wages to inflation or do not know, half of firms change wages due to inflation once a year, while 6% of firms change base wages according to inflation more often than yearly. On the other hand, 17% of firms change wages less frequently than once a year. Column 3 in Table 5 reports marginal effects of probit estimates for the probability that a firm changes wages due to inflation once a year or more often. The estimates are positive and significant for medium-sized and large firms, for firms in construction and for firms with a dominant high-skilled occupational group of workers. In all these cases, the frequency of wage changes due to inflation is significantly higher. On the other hand, firms with a higher proportion of benefits and bonuses in worker remuneration and with higher worker turnover change wages less often.

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as a lower bound estimate of coverage in 2000, recent estimates from individual data on firms and employees show that the coverage was 53% in the business sector with 10 or more employees in 2007 (Trexima, 2008).

More than half of firms (56%) state that base wage changes are concentrated in a particular month (Table 3). Probit estimates reported in column 4 in Table 5 suggest that wage changes are more likely to be concentrated in a specific month in large firms and in firms applying a collective wage agreement. Conversely, the probability is lower for firms with lower worker turnover. As follows from Figure 3, wage changes are most common in January (54% of firms) and April (20% of firms).

Table 3: Relation of Wages to Inflation and the Frequency of Wage Changes (weighted means)

Wage changes are related to inflation	0.60
Wage changes are linked to past inflation	0.56
Wage changes are linked to expected inflation	0.44
Wage changes are concentrated in a particular month	0.56

Figure 3: Frequency of Wage Changes
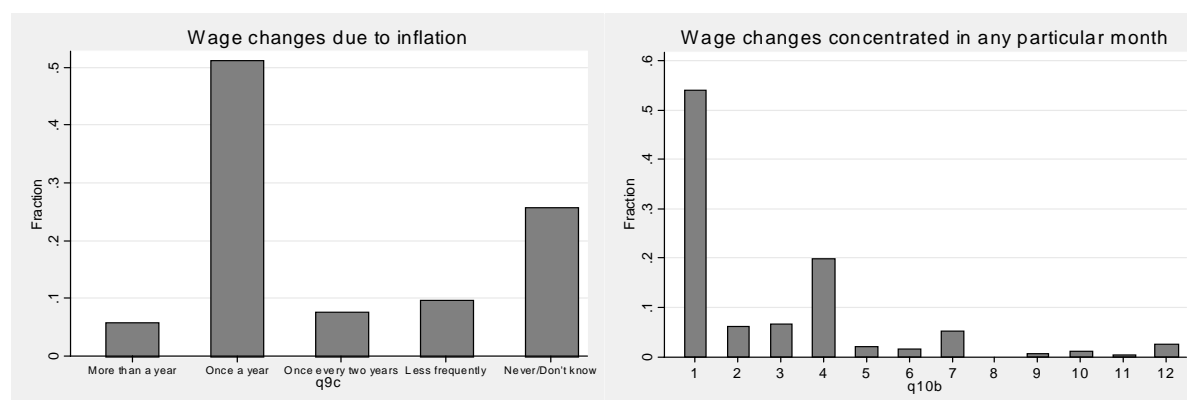
Wages of newly hired workers can be determined by various factors. As Table 4 suggests, the majority of the respondents (67%) recognise the wage of similar employees in the firm to be the most relevant factor in determining the entry wage of newly hired employees, while 18% of firms mention the impact of a collective pay agreement. Other options, such as the wage of similar workers outside the firm and the availability of workers with similar characteristics in the labour market, are less likely to be relevant to entry wage determination. Fairness considerations play the most significant role in determining entry wages of newly hired employees, while external labour market conditions have a minor role.

The next two questions ask hypothetically if a firm would pay to new entrants a significantly lower wage than that of similar (in terms of experience and qualification) employees already in the firm if there is an abundance of workers in the labour market and a significantly higher wage in a labour shortage. The results reveal asymmetry in the responses, indicating the presence of downward wage rigidity. In particular, 16% of firms would offer a higher wage in a labour shortage, while only 10% of firms would pay a lower wage in a labour abundance (Table 4). Probit estimates of the probability of paying a lower or higher wage are reported in columns 5 and 6 in Table 5. Firms are more likely to pay a lower wage in a labour abundance in services and less likely to do so in firms applying a collective wage agreement. This suggests that a collective wage agreement is a significant reason for downward wage rigidity in setting new wages. On the other hand, factors affecting the probability that a firm pays a higher wage in a labour shortage are all insignificant.

As other results in Table 4 suggest, the most common reason for not paying a lower wage in a labour abundance is a negative effect on the work effort of new employees (42%), while 31% of firms report that it would be perceived as unfair and give the firm a bad reputation and 23% of firms admit that it is not allowed by labour regulations or collective pay agreements. On the other hand, the most common reasons for not paying a higher wage in a labour shortage are fairness considerations (34%) and possible negative effects on the work effort of the employees already in the firm (31%). To sum up, fairness considerations and a negative effect on workers' effort are the most frequent reasons for not deviating entry wages from the wages of existing employees due to external labour market conditions. In addition, labour regulations or collective wage agreements prevent firms from paying a lower entry wage in a labour abundance.

Table 4: Determinants of Entry Wages of Newly Hired Employees (weighted means)

The most relevant factor in determining the entry wage	
Wage of similar employees in the firm	0.67
Collective pay agreement (signed at any level)	0.18
Availability of workers with similar characteristics	0.09
Wage of similar workers outside the firm	0.04
Other reasons	0.02
Do you offer a lower wage in a labour abundance?	
Yes	0.10
No, it would have a negative effect on the work effort of the new employees	0.42
No, it would be perceived as unfair and earn the firm a bad reputation	0.31
No, it is not allowed by labour regulations or collective pay agreements	0.23
No, the unions would contest such action	0.00
No, other reasons	0.01
Do you offer a higher wage in a labour shortage?	
Yes	0.16
No, it would be perceived as unfair by existing employees	0.34
No, it would have a negative effect on the work effort of the employees in the firm	0.31
No, it is not allowed by labour regulations or collective pay agreements	0.16
No, it would generate pressure for wage increases from existing employees	0.12
No, other reasons	0.02

Table 5: Wage Setting and Wage Changes (probit estimates)

	(1)	(2)	(3)	(4)	(5)	(6)
Medium-sized	-0.034	0.0396	**0.133***	0.0777	0.0259	0.107
	[0.0854]	[0.137]	[0.0711]	[0.0891]	[0.0447]	[0.0791]
Large	-0.0832	0.176	**0.215***	**0.156***	-0.00299	0.0785
	[0.0862]	[0.127]	[0.0946]	[0.0919]	[0.0411]	[0.0660]
Construction	0.106	**-0.211***	**0.202***	0.0179	0.0521	0.016
	[0.102]	[0.121]	[0.0380]	[0.111]	[0.0785]	[0.0829]
Trade	-0.011	**-0.457***	-0.0561	-0.136	0.0128	0.0306
	[0.0931]	[0.0545]	[0.0897]	[0.0998]	[0.0494]	[0.0730]
Services	**-0.167***	**-0.258***	0.0237	-0.0274	**0.112***	0.0589
	[0.0886]	[0.109]	[0.0850]	[0.0969]	[0.0657]	[0.0680]
High-skilled dominant	0.0412	0.0275	**0.130***	0.000335	-0.0288	0.131
	[0.104]	[0.179]	[0.0601]	[0.116]	[0.0345]	[0.0891]
Collective agreement	**0.257***	**0.218***	0.102	**0.275***	**-0.106***	0.018
	[0.0585]	[0.0831]	[0.0653]	[0.0610]	[0.0354]	[0.0447]
Share of bonuses in total wage bill	**-0.397***	0.164	**-0.639***	-0.31	0.165	0.142
	[0.223]	[0.356]	[0.236]	[0.246]	[0.116]	[0.142]
Share of sales on foreign markets	0.0695	-0.0365	0.15	0.0838	0.0498	0.0711
	[0.0980]	[0.131]	[0.0916]	[0.103]	[0.0475]	[0.0651]
Severe or strong competition	-0.0279	-0.146	0.183	-0.0421	0.024	0.0165
	[0.106]	[0.156]	[0.134]	[0.118]	[0.0387]	[0.0703]
Gross flows	-0.0575	**-0.281***	**-0.129***	**-0.180***	0.0082	-0.0759
	[0.0538]	[0.128]	[0.0643]	[0.0737]	[0.0348]	[0.0467]
New firm	-0.073	0.152	0.116	-0.15	0.0307	0.0435
	[0.106]	[0.164]	[0.0848]	[0.114]	[0.0576]	[0.0765]
Share of labour costs in total costs	0.171	**0.545***	0.298	-0.034	-0.0667	-0.0487
	[0.157]	[0.272]	[0.183]	[0.160]	[0.0751]	[0.102]
Observations	349	187	226	343	348	346
Adjusted r2	0.0841	0.167	0.193	0.141	0.131	0.0467

Note: Marginal effects reported, *** significant at 1%, ** at 5%, * at 10%. Robust standard errors in brackets.

Controlled for revenue the same/higher/much higher than in the previous year (not reported).

(1) Firm has a policy that adapts wage changes to inflation.
(2) Wage changes are linked to expected inflation.
(3) Wage changes due to inflation once a year or more often.
(4) Wage changes are concentrated in particular months.
(5) Firm pays a significantly lower wage to newly hired employees if there is an abundance in the labour market.
(6) Firm pays a significantly higher wage to newly hired employees if there is a shortage in the labour market.

3.2 Price Setting, Price Changes and the Link to Wage Changes

This subsection delivers information on price setting and the frequency of price changes, and also examines the link between price and wage changes.[19] When setting prices, 38% of firms follow the lead of their main competitors (Table 6). Column 1 in Table 7 indicates that prices follow main competitors in firms facing severe or strong competition and in firms employing mainly high-skilled labour, while a lower effect is surprisingly found for firms established recently. Other

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[19] If a firm produces or sells more than a single good or service, the answers refer to the main product or service defined as the one that generated the highest fraction of the firm's revenue in 2006.

data in Table 6 suggest that 37% of firms claim that the price is set fully according to costs plus a completely self-determined profit margin, while 14% of firms assert that the price of their main product is regulated or set by the parent firm. Finally, in 11% of cases the price is set by main customers.

If the firm's main competitor decreases its prices, the majority of firms (77%) would probably or very probably react in the same direction, i.e. they would reduce their prices as well. This confirms that prices are mostly determined on a competitive basis. Probit estimates shown in column 2 in Table 7 suggest that the probability of decreasing the price of the main product when the main competitor does so is significantly higher in trade, in firms facing stronger competition, and in firms with a higher share of bonuses and a higher worker turnover. On the other hand, the probability of decreasing prices is lower in construction and in labour intensive firms.

Figure 4 suggests that a third of firms (33%) claim there is no defined pattern for price changes. Probit estimates in column 3 in Table 7 suggest that the probability that there is a pattern for adjusting prices is higher in firms applying a collective agreement and in firms generating a significant part of their revenues on foreign markets. Conversely, there is less likely to be a defined pattern to how often prices are changed in firms in construction and services.

The frequency of price changes shows that the price of the firm's main product is typically changed at least once a month for 10% of firms, while 13% of firms adjust the price quarterly or half-yearly (Figure 4). The majority of firms (36%) change prices on a yearly basis and only 9% do so less frequently. As we have already mentioned, 33% of firms report that there is no defined pattern for price changes. Probit estimates presented in column 4 in Table 7 indicate that the probability of adjusting prices more often than yearly increases in the case of firms in construction and trade.

19% of firms declare that price changes are concentrated in a particular month or months (Table 6). Probit estimates in column 5 in Table 7 suggest that in medium-sized and large firms the probability of revising the price in a particular month is higher. Price changes are also concentrated in a typical month or months in exporting firms. On the other hand, time-dependent price changes are less likely to be observed in construction and in labour intensive firms. While firms in construction are more likely to change prices more often than yearly, the price changes are not concentrated in any particular month.

As in the case of wage adjustments, firms usually revise prices at the beginning of each year – in January (51% of firms, see Figure 4). Contrary to wages, some firms also change prices in December (11% of firms). Notice that these seasonal effects are not observed in the macroeconomic (seasonally adjusted) series reported in Figure 1 and Figure 2.

The next question investigates the link between price and wage changes (Table 6). Even though there seem to be some similarities in the patterns of wage and price changes, more than half of firms declare that there is no link between price and wage changes (59%), and 27% of firms claim there is a link but no particular pattern. On the other hand, 5% of firms decide about prices and wages simultaneously, while even fewer firms claim that price changes tend to follow wage changes or vice versa. Probit estimates reported in the last column of Table 7 indicate that a link between the timing of price and wage changes is more likely to be observed in labour intensive firms, while the link is less likely to be reported in trade and in recently established firms.

Concerning the relationship between price and wage setting, 15% of firms report that both price and wage changes are concentrated in a typical month or months. However, 42% of those firms still declare that there is no explicit link between price and wage changes. A link but no pattern is recorded by 21% of firms, while 24% of those firms change prices and wages simultaneously. To sum up, the evidence suggests that the relationship between wage and price changes is weak. This result also corresponds to the observed insignificant correlation between wage and price changes at the macroeconomic level (see Figure 1 and Figure 2).

Table 6: Price Setting, Price Changes and the Link to Wage Changes (weighted means)

How is the price of the main product set in its main market?	
Price is set following main competitors	0.38
Price is set according to costs plus profit margin	0.37
Price is regulated or set by parent company	0.14
Price is set by main customers	0.11
Other	0.01
Likely or very likely to decrease prices if the main competitor decreases its prices	0.77
Price changes concentrated in a particular month	0.19
How is the timing of price changes related to wage changes?	
There is no link	0.59
There is a link but no particular pattern	0.27
Decisions are taken simultaneously	0.05
Price changes tend to follow wage changes	0.04
Wage changes tend to follow price changes	0.04
Don't know	0.01

Figure 4: Frequency of Price Changes
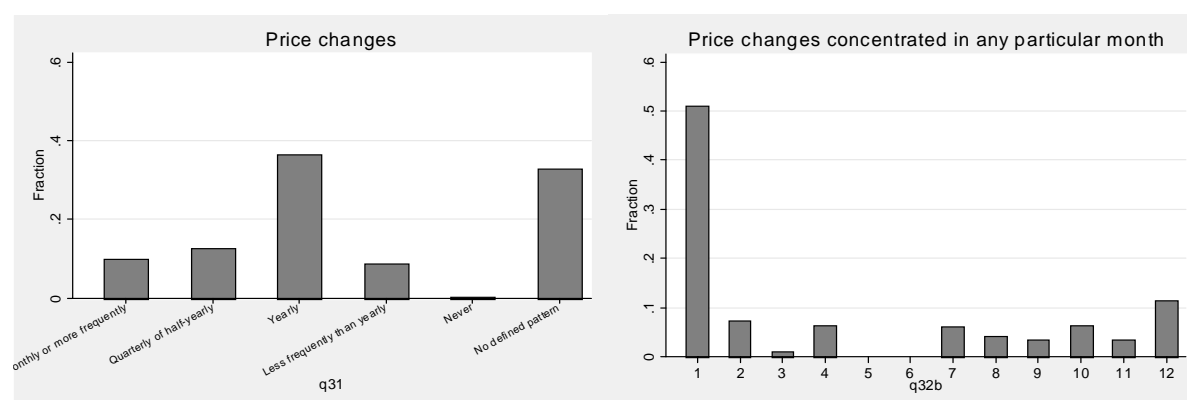
Table 7: Price Setting and Price Changes (probit estimates)

	(1)	(2)	(3)	(4)	(5)	(6)
Medium-sized	0.066	0.033	-0.0436	0.116	**0.179***	0.0803
	[0.0872]	[0.0656]	[0.0797]	[0.127]	[0.0993]	[0.0894]
Large	0.127	0.0809	0.00971	0.0307	**0.206***	0.0318
	[0.0831]	[0.0700]	[0.0808]	[0.114]	[0.0764]	[0.0900]
Construction	-0.074	**-0.142**	**-0.253***	**0.371***	**-0.155***	0.00342
	[0.0939]	[0.116]	[0.113]	[0.157]	[0.0454]	[0.111]
Trade	0.0935	**0.141***	0.0936	**0.540***	0.000828	**-0.164***
	[0.0950]	[0.0524]	[0.0738]	[0.0937]	[0.0724]	[0.0845]
Services	0.0642	-0.116	**-0.166***	-0.14	0.0686	0.0729
	[0.0887]	[0.0850]	[0.0894]	[0.107]	[0.0773]	[0.0895]
High-skilled dominant	**0.221***	0.05	0.102	0.0212	0.0976	0.0478
	[0.110]	[0.0708]	[0.0810]	[0.148]	[0.100]	[0.117]
Collective agreement	0.0674	-0.032	**0.139***	0.0685	0.0622	0.0325
	[0.0589]	[0.0505]	[0.0581]	[0.0727]	[0.0444]	[0.0615]
Share of bonuses in total wage bill	0.224	**0.419***	-0.065	0.194	-0.128	0.304
	[0.225]	[0.184]	[0.218]	[0.278]	[0.164]	[0.226]
Share of sales on foreign markets	-0.126	-0.0493	**0.239***	0.0538	**0.118***	-0.0372
	[0.0921]	[0.0810]	[0.0907]	[0.113]	[0.0706]	[0.0954]
Severe or strong competition	**0.286***	**0.396***	0.0999	0.0862	0.000562	0.155
	[0.0636]	[0.145]	[0.112]	[0.131]	[0.0771]	[0.0979]
Gross flows	-0.088	**0.164***	0.0611	0.0732	-0.00954	-0.0102
	[0.0747]	[0.0606]	[0.0507]	[0.0646]	[0.0480]	[0.0605]
New firm	**-0.190***	0.0386	0.0543	-0.109	-0.0612	**-0.294***
	[0.0834]	[0.0785]	[0.0979]	[0.103]	[0.0627]	[0.0699]
Share of labour costs in total costs	-0.267*	**-0.245***	0.00229	-0.286	**-0.230***	**0.369***
	[0.148]	[0.130]	[0.152]	[0.198]	[0.125]	[0.164]
Observations	349	319	348	241	346	341
Adjusted r2	0.0839	0.124	0.111	0.182	0.105	0.068

Note: Marginal effects reported, *** significant at 1%, ** at 5%, * at 10%. Robust standard errors in brackets.
  Controlled for revenue the same/higher/much higher than in the previous year (not reported).
  (1) The price is set following the main competitors.
  (2) Very likely or likely to decrease own price if the main competitor decreases its prices.
  (3) There is a defined pattern to how often the price of the main product is typically changed.
  (4) The price of the main product is typically changed more often than yearly.
  (5) Price changes are concentrated in a particular month or months.
  (6) There is a link in the timing of price and wage changes.

3.3 Downward Wage Rigidity and the Adjustment to Shocks

This subsection addresses the issue of the presence of potential obstacles to downward wage adjustments. It also asks hypothetical questions with the objective of inferring about the reaction of firms to unanticipated shocks such as a slowdown in demand, an increase in the cost of an intermediate input (e.g. an oil price increase) and a permanent increase in wages.

About 27% of the firms state that the base wage of some employees has been frozen at some point over the last five years (Table 8). A smaller percentage of firms (8%) indicate that the base wage of some employees has been cut at some point in the last five years. When identifying the main

reasons for freezing or reducing the base wage, the firms mainly stress the role of profitability or sales (46%) and unsatisfactory level of workers performance (30%).

Although the majority of firms do not implement wage freezes and cuts, firms were asked to indicate the relevance of specific reasons for preventing base wage cuts. It turns out that the firms are aware that in the presence of a wage cut the most productive employees might leave the firm. Almost all firms (97%) find this argument to be relevant or very relevant. Not only might the best workers quit a firm; if a significant number of employees quit, the cost of hiring and training new workers subsequently increases; 89% of the firms are afraid of this possibility and consider it to be relevant or very relevant. Indeed, hiring and training costs would rise, but in addition it would be more difficult to attract new workers; 84% of firms support this argument. While 87% of firms claim that wage cuts would reduce employees' efforts, resulting in less output or poorer service, 84% of firms expect that a wage cut would have a negative impact on employees' morale. The evidence in the survey thus points particularly to the efficiency wage theory to explain wage rigidity. Contract theories, on the other hand, receive less attention in explaining the reasons for wage rigidity. In particular, only 58% of firms do not cut wages because such an action is prevented by labour regulation or collective agreements. Finally, about 49% of firms emphasise that workers dislike unpredictable reductions in income. Therefore, workers and firms reach an implicit understanding that wages will neither fall in recessions nor rise in expansions.

Table 9 reports probit estimates capturing the main determinants of wage rigidity. As columns 1 and 2 suggest, the efficiency wage explanation for wage rigidity is more common in firms using a higher share of bonuses in worker remuneration and in firms with a higher worker turnover. Another theory explaining wage rigidity, the implicit contract theory, describes that risk-neutral firms insure risk-averse employees against fluctuations in their marginal productivity by keeping wages stable. Probit estimates in column 3 of Table 9 suggest that the implicit contract theory is more significant in construction and in firms employing mainly high-skilled labour, while it is less significant in trade. To sum up, the results from the survey provide evidence particularly for the efficiency wage theory, while implicit contract explanations of wage rigidity are relevant in firms employing mainly high-skilled workers.

Table 10 compares reasons for wage rigidity in the Czech Republic (our survey) with similar results obtained for the Euro area average, Germany (Franz and Pfeiffer, 2006) and the USA (Campbell and Kamlani, 1997). While the efficiency wage explanation for wage rigidity (the effect of a wage cut on workers' effort) is more relevant in the Czech Republic and the Euro area aggregate than in Germany and the USA, the implicit contract theory is less relevant than in the other two countries. The contract theory induced by the presence of collective agreements in the Czech Republic is not surprisingly more relevant than in the USA, but receives less attention than in Germany and in particular in the Euro area aggregate.

Firms also indicate which strategies have been used to reduce labour costs (Table 8). Redundancy or reorganisation is relevant for 39% of firms, 32% of firms admit that reduction or elimination of bonus payments was used as a strategy to reduce labour costs, while 27% reduced labour costs through outsourcing. Other factors were less relevant, while 36% of firms state that so far they have not reduced labour costs. In addition, only 5% of firms report that it has become easier over the last decade to adjust wages to reduce labour costs. Among those firms the most common

reasons are more intense competition (54%), more workers available on the market (23%) and less powerful trade unions in collective bargaining (16%).

Table 8: Downward Wage Rigidity (weighted means)

Has the base wage been frozen in the last five years?	0.27
Has the base wage been cut in the last five years?	0.08
The most important reason for freezing or cutting the base wage	
Profitability and/or sales went down	0.46
Because worker performance was not satisfactory	0.30
Other costs increased	0.10
It was imposed by legislation or a higher level collective agreement	0.03
Jobs were at risk	0.02
Other reasons	0.11
The following reasons are relevant or very relevant in preventing base wage cuts	
In the presence of a wage cut the most productive employees might leave the firm	0.97
A wage cut would increase the number of employees who quit, increasing the cost of hiring and training new workers	0.89
It would reduce employees' efforts, resulting in less output or poorer service	0.87
It would create difficulties in attracting new workers	0.84
It would have a negative impact on employees' morale	0.84
Employees compare their wage to that of similarly qualified workers in other firms in the same market	0.79
It would damage the firm's reputation as an employer, making it more difficult to hire workers in the future	0.71
Labour regulation/collective agreements prevent wages from being cut	0.58
Workers dislike unpredictable reductions in income. Therefore, workers and firms reach an implicit understanding that wages will neither fall in recessions nor rise in expansions	0.49
Strategies used to reduce labour costs	
Redundancy or reorganisation	0.39
Reduction or elimination of bonus payments	0.32
Outsourcing	0.27
Change in shift assignments	0.11
Use of early retirement to replace high wage employees by entrants with lower wages	0.09
Recruitment of new employees (with similar skills and experience) at lower wages than those who have left (e.g. due to voluntary quits and retirement)	0.09
Reduction or elimination of non-pay benefits	0.08
Slowdown or freeze of the rate at which promotions are filled	0.02
Other strategies	0.02
So far we have not reduced labour costs	0.36
Has it become easier over the last decade to adjust wages to reduce labour costs?	0.05
Yes, competition has become more intense	0.54
Yes, more workers are available on the market	0.23
Yes, trade unions have less power in collective bargaining	0.16
Yes, production is outsourced in markets where labour is cheaper	0.07
Yes, employment protection has become less tight	0.00
Yes, price inflation and inflation expectations are lower and more stable	0.00

Table 9: Downward Wage Rigidity (probit estimates)

	(1)	(2)	(3)
Medium-sized	0.0399	0.0442	-0.0038
	[0.0480]	[0.0506]	[0.0908]
Large	0.0387	0.00998	0.00969
	[0.0524]	[0.0555]	[0.0904]
Construction	-0.177	-0.0164	**0.228****
	[0.108]	[0.0758]	[0.106]
Trade	-0.0463	-0.0219	**-0.207****
	[0.0678]	[0.0677]	[0.0919]
Services	-0.0727	-0.0288	0.143
	[0.0668]	[0.0635]	[0.0897]
High-skilled dominant	0.0509	0.0446	**0.211****
	[0.0495]	[0.0515]	[0.106]
Collective agreement	-0.0416	-0.0388	-0.0648
	[0.0355]	[0.0384]	[0.0646]
Share of bonuses in total wage bill	**0.357****	**0.306***	-0.0455
	[0.145]	[0.157]	[0.242]
Share of sales on foreign markets	-0.0375	0.0978	0.0342
	[0.0582]	[0.0682]	[0.0998]
Severe or strong competition	0.0448	-0.0006	-0.0886
	[0.0816]	[0.0686]	[0.114]
Gross flows	**0.0890****	**0.114****	0.0726
	[0.0440]	[0.0487]	[0.0596]
New firm	-0.031	0.0201	-0.0826
	[0.0767]	[0.0683]	[0.109]
Share of labour costs in total costs	0.0321	0.00369	0.00527
	[0.104]	[0.107]	[0.172]
Observations	336	336	317
Adjusted r2	0.0549	0.0536	0.0638

Note: Marginal effects reported, *** significant at 1%, ** at 5%, * at 10%. Robust standard errors in brackets.

   Controlled for revenue the same/higher/much higher than in the previous year (not reported).

   The following factors are relevant or very relevant in preventing base wage cuts:

  (1) It would reduce employees' efforts, resulting in less output or poorer service.

  (2) It would have a negative impact on employees' morale.

  (3) Workers dislike unpredictable reductions in income. Therefore, workers and firms reach an implicit understanding that wages will neither fall in recessions nor rise in expansions.

Table 10: Reasons for Wage Rigidity in the Czech Republic, Euro Area, Germany and the USA (average scores)

Statements	Category	Czech Rep.	EA[a]	Germany[b]	USA[c]
A cut in wages would reduce employees' efforts, resulting in less output or poorer service	Overall	3.20	3.29		
	Highly skilled			2.82	2.77
	Skilled			2.90	2.99
	Less skilled			2.83	2.88
Labour regulation or collective agreements prevent wages from being cut	Overall	2.51	3.30		
	Highly skilled			2.40	1.35
	Skilled			2.94	2.40
	Less skilled			3.18	2.05
Workers dislike unpredictable reductions in income. Therefore, workers and firms reach an implicit understanding that wages will neither fall in recessions nor rise in expansions	Overall	2.42	2.43		
	Highly skilled			2.63	2.59
	Skilled			2.92	2.79
	Less skilled			2.93	2.60

Note: Average scores: 1 not relevant, 2 of little relevance, 3 relevant, 4 very relevant.
   [a] Euro area average: calculated across Austria, Belgium, France, Ireland, Italy, Netherlands, Portugal and Slovenia
   [b] From Franz and Pfeiffer (2006, Table 3)
   [c] From Campbell and Kamlani (1997, Table 4)

The next six questions investigate how firms adjust prices, margins, output and other costs, including wages, employment and other non-labour costs, to unanticipated shocks: a slowdown in demand, an increase in the cost of an intermediate input (e.g. an oil price increase) and a permanent increase in wages affecting all firms in the market. If the reduction of costs is relevant, firms are further asked to indicate the main channel through which other costs are reduced.

When facing a slowdown in demand, 84% of firms would react by reducing other costs, 59% would reduce margins, 53% would reduce prices and 52% would reduce output (Table 11). As the remaining columns in Table 11 suggest, reduction of other costs is also the most relevant reaction to the increased cost of an intermediate input[20] or increased wages. On the other hand, reductions of output and margins are less common when facing the two shocks rather than a drop in demand. Moreover, the cost shock is more likely to be reflected in price changes than a slowdown in demand or wage shock.

Table 12 suggests that firms which reduce costs due to a demand drop also reduce prices, while prices are not changed jointly with reducing costs when facing a cost or wage shock. Due to cost shocks some firms reduce costs jointly with output, while as a response to an increase in wages some firms change costs, output and margins jointly.

The results in Table 13 indicate that a reduction of non-labour costs is the most relevant channel through which a cut of other costs is achieved when facing any of the three types of shocks. Due to slowdown of demand, 41% of firms reduce non-labour costs, 27% of firms reduce the number of temporary or other types of workers and 18% of firms reduce the number of permanent employees, while 16% of firms reduce flexible wage components. Reduction of the number of temporary or permanent workers and elimination of bonuses are also used to reduce other costs

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[20] For example an oil price increase affecting all firms in the economy.

when facing the other two types of shocks. On the other hand, no firm would reduce base wages as a response to an unanticipated drop in demand or to an increase in the cost of an intermediate input. Few firms would adjust the number of hours worked per employee when facing any of the three types of shocks.

Table 11: Strategies when a Firm Faces an Unanticipated Shock (weighted means)

	Slowdown in demand	Increase in the cost of an intermediate input (oil price increase)	Permanent increase in wages affecting all firms
Reduce prices	0.53	x	x
Increase prices	x	0.69	0.55
Reduce margins	0.59	0.54	0.49
Reduce output	0.52	0.16	0.14
Reduce other costs	0.84	0.78	0.81

Note: The proportion of firms denoting the factor as relevant or very relevant.

Table 12: Correlation of Strategies when a Firm Faces an Unanticipated Shock

	Reduce margins	Reduce output	Reduce costs
Slowdown in demand			
Reduce prices	**0.52*****	**-0.13****	**0.14*****
Reduce margins		**-0.10***	0.06
Reduce output			0.08
Increase in the cost of an intermediate input			
Increase prices	-0.02	0.04	-0.39
Reduce margins		0.09	0.01
Reduce output			**0.09***
Permanent increase in wages			
Increase prices	0.05	0.09	-0.03
Reduce margins		**0.19*****	**0.10***
Reduce output			**0.09***

Note: Pairwise correlation coefficients. *** significant at 1%, ** at 5%, * at 10%.

Table 13: Main Channel through which Reduction of Costs is Achieved (weighted means)

	Slowdown in demand	Increase in the cost of an intermediate input (oil price increase)	Permanent increase in wages affecting all firms
Reduce base wages	0.00	0.00	x
Reduce flexible wage components (for example bonuses, benefits, etc.)	0.16	0.09	0.13
Reduce the number of permanent employees	0.18	0.11	0.14
Reduce the number of temporary employees / other type of workers	0.27	0.16	0.21
Adjust the number of hours worked per employee	0.04	0.03	0.02
Reduce non-labour costs	0.41	0.65	0.54

4. Conclusions

Using an ad-hoc survey at the firm level, we find that 60% of firms adapt wage changes to inflation, more so if there is a collective agreement, but less so in business services and in firms which use flexible wage components to greater extent. This suggests that firms with a higher share of bonuses in worker remuneration are less likely to adjust base wages to inflation.

Individual wages are more likely to reflect past than expected inflation. In particular, among the firms adapting base wage changes to inflation, 56% of firms link wages to past inflation, while 44% of firms link wages to expected inflation. Firms applying a collective agreement and with a higher share of labour costs put more emphasis on expected inflation, while firms in construction, trade and services and firms with a higher worker turnover account for past inflation when changing base wages.

A half of firms change wages due to inflation once a year, while only 6% of firms change base wages according to inflation more often than yearly. The frequency of base wage changes due to inflation is significantly higher for medium-sized and large firms, for firms in construction and for firms with a dominant high-skilled occupational group. On the other hand, the frequency of wage changes due to inflation is lower the more the firm uses bonuses in worker remuneration and in firms with a higher worker turnover. While 56% of firms change base wages in a typical month or months, large firms and firms applying a collective wage agreement are more likely to do so. More than half of firms change wages in January, while 20% of firms change base wages in April.

Wages of newly hired employees mostly do not deviate from wages of similarly skilled workers in the firm. In particular, 67% of firms refer to wages of similar workers in the firm and 18% to collective agreements as the most important factor in determining wages of newly hired employees. On the other hand, external labour market conditions play only a minor role in determining entry wages. The presence of rigidity in setting wages of newly hired employees is also indicated in asymmetry of the responses on the determinants of entry wages when facing opposite labour market conditions. While 16% of firms would offer a higher wage when facing difficulties in hiring workers due to a shortage on the labour market, 10% of firms only would offer a lower wage when facing a labour market abundance. Fairness considerations and a negative effect on workers' effort are frequently cited reasons for not deviating entry wages from wages of existing employees, while collective agreements prevent firms from offering a lower wage in a labour abundance.

The survey also asks questions on price setting, price changes and the relationship between price and wage changes. Prices are in most cases determined competitively. While 38% of firms set prices following their main competitors, more probably in firms facing severe or strong competition and in firms employing mainly high-skilled labour, 77% of firms would decrease prices if their main competitor decreased its prices. This is more likely in trade, in firms with a lower share of labour costs, a higher share of bonuses in the total wage bill as well as higher gross flows, and, importantly, in firms facing a higher degree of competition.

The survey results further indicate that a third of firms claim there is no defined pattern for price changes. On the contrary, a regular scheme for changing prices is associated with the presence of

collective agreements. The probability of adjusting prices regularly also increases when a firm generates a higher proportion of its revenues from sales in foreign markets.

The survey evidence suggests that prices are less sticky than wages, as base wages are typically changed in 6% of firms more often than yearly, while prices are changed in 23% of firms with the same frequency. Firms in construction and trade adjust prices more often. Price changes are more likely to be concentrated in any particular month in medium-sized and large firms and in exporting firms, while firms in construction and with a higher share of labour costs are less likely to concentrate price changes. Similarly to wage changes, prices are often changed in January. More than half of firms declare that there is no link between price and wage changes, while a quarter of firms admit there is a link but no particular pattern. A rather weak link between wage and price changes is also revealed when looking at firms which concentrate both wage and price changes in a particular month or months.

Our finding of January changes in wages and prices contributes to the discussion of the role of monetary policy and its effects. For example, departing from the anecdotal evidence that in the Unites States wage changes occur predominantly during the first quarter of each year, Olivei and Tenreyro (2007) show that during these periods of massive wage revisions (e.g. a month or so before the actual wage changes) monetary policy has, inter alia, a *smaller impact* on the real economy compared to the alternative periods of more rigid wages. By applying these results to the Czech case, one might argue that Czech monetary policy could be less effective at the end of the calendar year, when wages are largely negotiated. Further insight for policymakers in relation to our finding of a January spike in prices follows from Borys and Horváth (2008), who report that contractionary Czech monetary policy has a negative effect on output and on the level of prices, with about a four-quarter delay.

The survey investigates the presence and sources of wage rigidity by asking questions on the firm's experience with wage rigidity and the reasons for cutting or freezing wages. In particular, while 8% of firms have some experience with wage cuts, base wages in 27% of firms have been frozen in the last five years, mostly due to a drop in profitability or sales, or unsatisfactory worker performance. The most common reasons preventing base wage cuts are increased worker quits and difficulties in hiring new workers and a negative impact on employees' effort and morale, while a collective agreement or implicit understanding that wages neither fall in recessions nor rise in expansions receives relatively less attention. The survey evidence thus indicates a widespread relevance of efficiency wage theory in explaining wage rigidity by a negative impact on productivity through reduced effort or morale. This is more relevant in firms with a higher share of bonuses in the total wage bill and in firms with a higher worker turnover. Another theoretical model for wage rigidity is the implicit contract theory, explaining that firms keep wages stable to avoid fluctuations in wages in the course of the business cycle. While this is relevant for half of firms, it is significantly more relevant in firms employing mainly high-skilled workers. Comparing our results with those reported for the United States and Germany, efficiency wage explanations for wage rigidity are more relevant in the Czech Republic, while implicit contract theory receives less attention than in Germany and the United States.

Firms indicate that redundancy or reorganisation, reduction of bonus payments and outsourcing have been the main strategies used to reduce labour costs in the last five years. On the other hand,

5% of firms report that it has become easier to adjust wages to reduce labour costs in the last decade, mainly due to increased competition.

The survey also explores the reactions of firms to hypothetical unanticipated shocks such as a slowdown in demand, an increase in the cost of an intermediate input (e.g. an oil price increase) and a permanent increase in wages affecting all firms in the market. In all cases, firms mainly reduce other costs, while they are less likely to react by adjusting margins, output or prices. Nevertheless, the adjustment of margins and output is a more likely response due to a demand drop than due to increased costs of an intermediate input or increased wages. On the other hand, prices are more likely to be changed when facing a cost shock than due to a wage shock or a demand drop. Other costs are reduced mainly through cutting non-labour costs and the number of temporary workers, while firms are less likely to react by reducing the number of permanent workers and eliminating bonuses. On the other hand, few firms would adjust the number of hours worked per employee when facing any of the three types of shocks, while no firm would reduce base wages when facing a slowdown in demand or an increase in the cost of an intermediate input.

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Appendix

Table A1: Unweighted Summary Statistics

Variable	N	Mean	Standard Deviation
NACE classification			
Manufacturing (NACE 15 to 22, 24 to 37)	399	0.58	
Construction (NACE 45)	399	0.08	
Trade (NACE 50 to 52)	399	0.13	
Services (NACE 55 to 64, 70 to 74)	399	0.21	
Size of the firm			
Small (20 to 49 employees)	399	0.16	
Medium-sized (50 to 199 employees)	399	0.30	
Large (200 or more employees)	399	0.54	

Section 1: Wage setting and wage changes

1 How were your firm's employees distributed across the following occupational groups at the end of 2006 (in %)?

	N	Mean	Std. Dev.
Production	395	57.7	28.9
Technical	395	12.3	13.2
Clerical	395	10.1	11.5
Professional	395	9.9	15.3
Other (service workers and shop and market sales workers, etc.)	395	10.0	20.9

2 Does your firm apply a collective pay agreement bargained and signed outside the firm?

	N	Mean	
No, such an agreement does not exist	393	0.77	
No, such an agreement exists, but does not set wages	393	0.05	
Yes, we apply such an agreement which sets wages	393	0.18	

3 Notwithstanding your answer to question 2, does your firm apply a collective pay agreement (which sets wages) signed at the firm level?

	N	Mean	
Yes	396	0.51	
No	396	0.49	

4 If "yes" in questions 2 or 3, what percentage of your firm's employees are covered by a collective pay agreement (at any level)?

	N	Mean	Std. Dev.
	206	93.9	16.6

5 What percentage of your total wage bill in 2006 was related to individual or company performance related bonuses or benefits?

	N	Mean	Std. Dev.
	382	20.0	12.3

6 Does your firm have a policy that adapts changes in base wages to inflation?

	N	Mean	
Yes	398	0.59	
No	398	0.41	

7 If "yes" in question 6, please select the options that best reflect the policy followed:

	N	Mean	
Wage changes are <u>automatically linked</u> to:			
- past inflation	233	0.11	
- expected inflation	233	0.09	
Although there is no formal rule, wage changes <u>take into account</u>:			
- past inflation	232	0.50	
- expected inflation	232	0.40	

8 What is the principle of remuneration for the main occupational group (as defined in question 1)? Please choose a single option.

	N	Mean	
Hourly base wage	396	0.42	
Piece-rate base wage	396	0.19	
Monthly base wage (or other period-specific wage)	396	0.37	
Other	396	0.02	

9 How frequently is the base wage of an employee belonging to the main occupational group in your firm (as defined in question 1) typically changed in your firm?

(1=more than once a year, 2=once a year, 3=once every two years, 4=less frequently than once every two years, 5=never/don't know)

	N	Mean	Std. Dev.
Wage changes apart from tenure and/or inflation	351	2.87	1.20
Wage changes due to tenure	311	3.65	1.29
Wage changes due to inflation	340	2.97	1.36

10 Under normal circumstances, are base wage changes concentrated in any particular month / months?

No		389	0.46
Yes:	January	389	0.31
	February	389	0.04
	March	389	0.05
	April	389	0.12
	May	389	0.02
	June	389	0.01
	July	389	0.04
	August	389	0.00
	September	389	0.01
	October	389	0.01
	November	389	0.01
	December	389	0.01

11 Considering the main occupational group in your firm (as identified in question 1), please indicate among the following options which is the most relevant factor in determining the entry wage of newly hired employees: (Please choose a single option.)

Collective pay agreement (signed at any level)	396	0.16
Wage of similar employees in the firm	396	0.69
Wage of similar workers outside the firm	396	0.04
Availability of workers with similar characteristics in the labour market	396	0.09
Other reasons	396	0.02

12 If there is an abundance in the labour market of workers you need to hire, do you pay newly hired employees a significantly lower wage than that of similar (in terms of experience and qualification) employees already in the firm?

Yes	397	0.10
No, because (please choose a single option, the most important reason):		
It would be perceived as unfair and earn the firm bad reputation	397	0.34
It would have a negative effect on the work effort of the new employees	397	0.40
It is not allowed by labour regulation or collective pay agreement	397	0.24
Unions would contest such action	397	0.01
Other reasons	397	0.01

13 If there is a shortage in the labour market of workers you need to hire and attracting new workers is difficult, do you give newly hired employees a significantly higher wage than that of similarly qualified employees already in the firm?

Yes	396	0.15
No, because (please choose a single option, the most important reason):		
It would be perceived as unfair by existing employees	396	0.34
It would have a negative effect on work effort of the employees in the firm	396	0.32
It is not allowed by labour regulation or collective pay agreement	396	0.16
It would generate pressure for wage increases by existing employees	396	0.13
Other reasons	396	0.02

Section 2: Downward wage rigidity and the adjustment to shocks

14 Over the last five years, has the base wage of some employees in your firm ever been frozen?

No	398	0.74	
Yes (indicate for what percentage of employees)	397	12.7	29.1

15 Over the last five years, has the base wage of some employees in your firm ever been cut?

No	397	0.92	
Yes (indicate for what percentage of employees)	397	1.5	10.8

16 If "yes" in either question 14 or 15, what was the main reason for freezing/reducing the base wage? (Please choose a single option, the most important reason.)

Profitability and/or sales went down	111	0.47
Other costs increased	111	0.11
Jobs were at risk	111	0.03
It was imposed by legislation or a higher level collective agreement	111	0.02
Because worker performance was not satisfactory	111	0.29
Other reasons	111	0.11

17 How relevant is each one of the following reasons in preventing base wage cuts? (Please tick an option for each line.)

(1=not relevant, 2=of little relevance, 3=relevant, 4=very relevant, 5=don't know)

Labour regulation/collective agreements prevent wages from being cut	385	2.57	1.24
It would reduce employees' efforts, resulting in less output or poorer service	384	3.23	0.76
It would have a negative impact on employees' morale	384	3.22	0.75

It would damage the firm's reputation as an employer, making it more difficult to hire workers in the future	383	2.98	0.89
In presence of a wage cut the most productive employees might leave the firm	382	3.65	0.63
A wage cut would increase the number of employees who quit, increasing the cost of hiring and training new workers	382	3.30	0.75
It would create difficulties in attracting new workers	381	3.14	0.78
Workers dislike unpredictable reductions in income. Therefore, workers and firms reach an implicit understanding that wages will neither fall in recessions nor rise in expansions	381	2.60	1.14
Employees compare their wage to that of similarly qualified workers in other firms in the same market	382	3.03	0.86

18 Has any of the following strategies ever been used in your firm to reduce labour costs? (Please choose as many options as apply to your firm.)

Reduction or elimination of bonus payments	392	0.32
Reduction or elimination of non-pay benefits	392	0.08
Change in shift assignments	392	0.11
Slowdown or freeze of the rate at which promotions are filled	392	0.02
Recruitment of new employees (with similar skills and experience) at lower wage than those who left (e.g. due to voluntary quits and retirement)	392	0.09
Use of early retirement to replace high wage employees by entrants with lower wages	392	0.09
Redundancy or reorganisation	392	0.38
Outsourcing	392	0.26
Other strategies	392	0.02
So far we have not reduced labour costs	392	0.37

19 Has it become easier over the last decade to adjust wages to reduce labour costs?

Yes	394	0.04
No	394	0.72
Don't know	394	0.24

20 If "yes", why? Please choose a single option, the most important reason.

Competition has become more intense	16	0.44
More workers are available on the market	16	0.31
Trade unions have less power in collective bargaining	16	0.19
Employment protection has become less tight	16	0
Production is outsourced in markets where labour is cheaper	16	0.06
Price inflation and inflation expectations are lower and more stable	16	0

21 How relevant are each one of the following strategies when your firm faces an unanticipated slowdown in demand? (Please tick an option for each line.)

(1=not relevant, 2=of little relevance, 3=relevant, 4=very relevant, 5=don't know)

Reduce prices	368	2.47	0.94
Reduce margins	361	2.62	0.92
Reduce output	361	2.57	1.06
Reduce costs	377	3.21	0.84

22 If the reduction of costs is of any relevance in your answer to question 21, please indicate the main channel through which this goal is achieved: (Please choose a single option, the most important factor.)

Reduce base wages	358	0
Reduce flexible wage components (for example bonuses, benefits, etc.)	358	0.16
Reduce the number of permanent employees	358	0.18
Reduce the number of temporary employees / other type of workers	357	0.27
Adjust the number of hours worked per employee	358	0.04
Reduce non-labour costs	358	0.41

23 How relevant are each one of the following strategies when your firm faces an unanticipated increase in the cost of an intermediate input (e.g. an oil price increase) affecting all firms in the market? (Please tick an option for each line.)

(1=not relevant, 2=of little relevance, 3=relevant, 4=very relevant, 5=don't know)

Increase prices	378	2.72	0.84
Reduce margins	357	2.53	0.81
Reduce output	350	1.71	0.85
Reduce other costs	368	3.05	0.84

24 If the reduction of other costs is of any relevance in your answer to question 23, please indicate the main channel through which this goal is achieved: (Please choose a single option, the most important factor.)

Reduce base wages	344	0
Reduce flexible wage components (for example bonuses, benefits, etc)	344	0.09
Reduce the number of permanent employees	344	0.12
Reduce the number of temporary employees / other type of workers	344	0.17

Adjust the number of hours worked per employee	344	0.03
Reduce other non-labour costs	343	0.65

25 How relevant are each one of the following strategies when your firm faces an unanticipated permanent increase in wages (e.g. due to the renewal of the national contract) affecting all firms in the market? (Please tick an option for each line.)

(1=not relevant, 2=of little relevance, 3=relevant, 4=very relevant, 5=don't know)

Increase prices	367	2.51	0.84
Reduce margins	353	2.42	0.85
Reduce output	349	1.68	0.78
Reduce other costs	372	3.03	0.78

26 If the reduction of other costs is of any relevance in your answer to question 25, please indicate the main channel through which this goal is achieved: (Please choose a single option, the most important factor.)

Reduce flexible wage components (for example bonuses, benefits, etc)	353	0.13
Reduce the number of permanent employees	353	0.15
Reduce the number of temporary employees / other type of workers	353	0.22
Adjust the number of hours worked per employee	351	0.02
Reduce non-labour costs	353	0.52

Section 3: Price setting and price changes

27 What share of the revenue generated by your firm's main product in 2006 was due to sales in (in %):

Domestic market	394	64.5	36.6
Foreign markets	394	35.5	36.6

28 How is the price of your firm's main product set in its main market (as defined in question 27)? (Please choose a single option.)

There is no autonomous price-setting policy because:		
- the price is regulated, or is set by a parent company / group	393	0.13
- the price is set by the main customer(s)	393	0.10
The price is set following the main competitors	393	0.37
The price is set fully according to costs and a completely self-determined profit margin	393	0.40
Other	393	0.01

29 To what extent does your firm experience price competition for its main product? (Please choose a single option.)

Severe competition	396	0.34
Strong competition	396	0.56
Weak competition	396	0.06
No competition	396	0.01
Don't know / no answer	396	0.02

30 Suppose that the main competitor for your firm's main product decreases its prices; how likely is your firm to react by decreasing its own price? (Please choose a single option.)

Very likely	394	0.23
Likely	394	0.48
Not likely	394	0.18
Not at all	394	0.01
It doesn't apply	394	0.10

31 Under normal circumstances, how often is the price of the firm's main product typically changed? (Please choose a single option, the one that best describes the situation in your firm.)

More than once a year:		
- daily	395	0.01
- weekly	395	0.02
- monthly	395	0.07
- quarterly	395	0.06
- half-yearly	395	0.07
Once a year	395	0.38
Once every two years	395	0.03
Less frequently than once every two years	395	0.04
Never	395	0.00
There is not a defined pattern	395	0.31

32 Under normal circumstances, are these price changes concentrated in any particular month / months?

No	389	0.80
Yes: January	389	0.13

February	389	0.02	
March	389	0.02	
April	389	0.03	
May	389	0.01	
June	389	0.01	
July	389	0.03	
August	389	0.02	
September	389	0.02	
October	389	0.03	
November	389	0.02	
December	389	0.03	

33 How does the timing of these price changes relate to that of wage changes? (Please choose a single option.)

There is no link between the two	388	0.59	
There is a link but no particular pattern	388	0.26	
Decisions are taken simultaneously	388	0.05	
Price changes tend to follow wage changes	388	0.04	
Wage changes tend to follow price changes	388	0.04	
Don't know	388	0.01	

Section 4: Information about the firm

34 How many workers (including employees and other types of workers) did your firm have at the end of 2006?

Number of employees:	399	407.8	740.4
of which: permanent full-time (in % of total employees)	397	85.1	18.5
permanent part-time (in % of total employees)	396	4.4	11.9
temporary (in % of total employees)	396	10.5	14.6
Other types of workers in % of total employees (e.g. people employed by agencies, freelance, consultants, apprenticeships, students, other casual workers, etc.)	260	17.7	57.2

35 How many employees left the firm during 2006? (In % of all types of employees: temporary and permanent, see definition in question 34.)

	396	23.1	26.6

36 How many employees joined the firm during 2006? (In % of all types of employees: temporary and permanent, see definition in question 34.)

	394	24.4	24.7

37 How were your firm's employees distributed across the following age classes at the end of 2006 (in %)?

Less than 25 years old	395	10.3	10.0
25-54 years old	395	73.4	14.0
55-65 years old	395	14.9	11.0
More than 65 years old	395	1.4	3.4

38 How were your firm's permanent employees distributed according to tenure at the end of 2006 (in %)?

Less than 1 year	396	15.5	14.5
Between 1 and 5 years	396	34.7	21.1
More than 5 years	396	49.8	25.9

39 What was the first year of operation of your firm?

	394	1991.9	5.7

40 What percentage of your firm's total costs was due to labour costs in 2006?

	384	29.5	19.4

41 How was your firm's revenue in 2006 compared to the previous year?

Much lower	395	0.02	
Lower	395	0.10	
Approximately the same	395	0.26	
Higher	395	0.51	
Much higher	395	0.11	

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