DOCUMENT

DE TRAVAIL

N° 282

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May 2010

BANQUE DE FRANCE

EUROSYSTÈME

DIRECTION GÉNÉRALE DES ÉTUDES ET DES RELATIONS INTERNATIONALES

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Wage-setting Behavior in France: Additional Evidence from an Ad-hoc Survey[1]

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This draft: May 2010

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Abstract

We investigate the wage-setting behavior of French companies using an ad-hoc survey conducted specifically for this study. Our main results are the following. i) Wages are changed infrequently. The mean duration of wage contracts is one year. Wage changes occur at regular intervals during the year and are concentrated in January and July. ii) We find a lower degree of downward real wage rigidity and nominal wage rigidity in France compared to the European average. iii) About one third of companies have an internal policy to grant wage increases according to inflation. iv) When companies are faced with adverse shocks, only a partial response is transmitted into prices. Companies also adopt cost-cutting strategies. The wage of newly hired employees plays an important role in this adjustment.

Keywords: wage rigidity, wage-setting behavior, survey data

JEL Classifications: E24, J3

Résumé

Cet article caractérise empiriquement le comportement de fixation des salaires en France à partir d'une enquête conduite spécifiquement pour les besoins de l'étude. Les principaux résultats sont : i) Les salaires sont relativement rigides au sens où ils sont fixés pour une durée environ d'un an. ii) Il existe une saisonnalité dans la fixation des salaires : la plupart des changements de salaires sont observés en janvier et en juillet. iii) Environ un tiers des entreprises déclarent qu'elles pratiquent une indexation à l'inflation pour revaloriser les salaires. iv) Lorsque les entreprises font face à un choc d'offre, seule un partie est transmise aux prix. Les entreprises cherchent également à réduire leurs coûts. Le salaire des nouveaux entrants joue un rôle important dans cet ajustement.

Mots Clés : rigidités des salaires, formation des salaires, données d'enquête

Codes JEL : E24, J3

1 Introduction

The existence and the extent of wage rigidities have crucial implications for monetary policy analysis. First, a high degree of wage indexing (i.e. real rigidities) can generate a self-sustaining rise of inflation following a sectoral shock of inflation via second-round effects. Second, the extent of nominal rigidities affects the definition of the inflation target. The downward rigidity of nominal wages requires a certain level of inflation to allow real wages to adjust to changing conditions exerting a "grease effect" on the wheels of the labor market (see Tobin, 1972). More generally, wage rigidities imply real and persistent effects of monetary shocks on output (Christiano et al., 2005). Despite the importance of the issues at stake, there is still no consensus both on the theoretical mechanisms underlying wage rigidities and on the empirical assessment of the extent of wage rigidities.

The theoretical literature has identified different mechanisms of wage rigidities (see Cahuc and Zylberberg (2004) for a comprehensive presentation of wage formation models). A first branch focuses on the role of unions and bargaining power in generating rigid wages. In these models, the rent generated by the firm guarantees insiders' bargaining power in wage negotiations. In this context, the extent of rigidity is linked to the magnitude of unions' bargaining power. The second source of rigidity identified in the literature stems from the incentive for managers to pay their employees more than the market-clearing wage. The key assumption of these models is that high wages make workers more productive. Several versions of the 'efficient wages' hypothesis have been formulated including shirking, fairness, turnover and adverse selection mechanisms. All these models imply downward wage rigidity despite an excess of labor supply. However, empirical studies do not easily allow alternative models supporting the existence of wage stickiness to be distinguished. Econometric tests of various theories of wage rigidities fail because of the lack of variables especially designed for the purpose of the analysis. For instance, efficient-wage theories often rely on non-traditional variables for economists such as fairness, effort or reciprocity in labor relations. In addition, it is hard to discriminate empirically among theories according to their predictions since they all predict wage rigidity.

The empirics of wage rigidity focus rather on the extent of rigidity than on the causes of

downward rigidity. Most evidence produced on downward wage rigidity has been motivated by the debate on the appropriate inflation target for central banks (see Akerlof et al., 1996). Empirical studies typically adopt statistical models of wage change distribution rather than a structural model inspired by theory. Direct evidence of downward nominal wage rigidity comes from cross-sectional analysis of the wage changes distribution which almost always shows a spike at zero and a positive skew (Card and Hyslop, 1997, Lebow et al., 2003). However, this 'histogram-location' approach is subject to measurement errors. Altonji and Devereux (2000) provide econometric analysis by dealing explicitly with measurement errors and allowing individual heterogeneity. The International Wage Flexibility Project (IWFP) has recently provided a unified framework of analysis for 16 OECD countries. However, results on the extent of wage rigidities vary a lot according to the country (especially in Europe), the period under review (especially because of the influence of the inflation rate) and the data used.

A special line of research consists in exploiting qualitative surveys among firms' managers (see Blinder and Choi, 1990) collecting both additional evidence and perceived explanations of wage stickiness. Blinder' work has been replicated in the United States and has inspired similar research in other countries. Campbell and Kamlani (1997) highlighted the practise of efficiency wage as a factor of wage stickiness for the United States. Bewley (1999) also enhances the psychological factor of morale to explain downward wage rigidity. This contrasts with European countries. For instance, Franz and Pfeiffer (2006) highlight the role of implicit and explicit contracts in Germany. Agell and Bennmarker (2005), Zoega and Karlssonn (2005) also stress the importance of legislation on wage formation in Sweden and Iceland.

Previous works on wage rigidities in France were based on quantitative sources (Biscourp et al., 2005 and Heckel et al., 2008). By contrast, this study uses new qualitative information on wage setting in France based on an original survey conducted among two thousand firms of the market sector[4] representing approximately 500, 000 employees (see Appendix 1). The survey has been undertaken as part of the Wage Dynamics Network[5] (WDN). We extend the methodology

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[4] The WDN survey was conducted among a sample of companies usually interviewed for the purpose of the Banque de France's monthly Business Survey.

[5] The Wage Dynamics Network involves national central bank of 16 countries in Europe and has been coordinated by the Eurosystem.

proposed by Blinder in several ways. First, the WDN survey is based on a large and nationally representative sample. Second, it collects additional evidence on wage setting and information about the firms' economic and institutional environment that are seldom observed. In particular, data collected help in testing indicators of the strictness of wage setting institutions or perceived competition from the point of view of firms.

The contribution of this paper is empirical. First, we assess patterns of wage setting: the frequency and timing of wage changes, the duration of wage spells. Second, the WDN Survey gives insights into the relative importance of nominal versus real rigidities. We also attempt to establish some of the reasons for wage rigidity. However, the objective of the paper is broader. It analyses not just "wage rigidity" but also "adjustment" of firms in the presence of downward wage rigidity. The adjustment process relates to firms' responses to different kinds of adverse shocks including alternative means: change in prices, output, costs and profit margin.

The paper is organized as follows. Section 2 presents the survey. Section 3 reviews the main characteristics of the French wage setting procedures. Sections 4 examines the patterns of wage setting and section 5 investigates downward wage rigidity. Section 6 is devoted to reactions to shocks. Section 7 concludes.

2 Data description

The Wage Dynamics Network survey is a one-off survey that aims at investigating wage policies of human resource managers. The questionnaire refers to the main socio-occupational group within firm[6] (in each firm the main group accounts for 67.9 % of the employees on average). Thus, this survey strongly differs from traditional sources (administrative data or household survey) that collect individual records of wages. Typically, the survey aims at providing answers in a qualitative way to the following questions: How often do base wages change? Do they tend to take place in specific months of the year? Respondents were also asked to assess the relevance of prices, margins, output, or costs reductions in response to three unanticipated changes in their business environment: a slowdown in demand, an increase in the cost of an intermediate

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[6]This not includes individualized wage increases.

input (e.g. an oil price increase), and an increase in wages due to contracts bargained at the industry level (see Appendix 2 for the complete questionnaire).

The use of 'stated-preference'[7] data to investigate companies' wage setting behavior has several advantages for our purpose. First, ad-hoc surveys allow to collect information on variables of interest that are seldom available such as perceived reasons of downward wage rigidity or response to shocks. Moreover, the survey is more likely to provide relevant information on how firms deal with laws or institutions than objective data (e.g. national indicators of bargaining coverage). Second, direct questioning may help for the econometric issue of identification of idiosyncratic shocks. By asking firms how they respond to shocks, there is no need to identify the shocks themselves. Finally, as both the sampling frame and the concept of wages are similar across countries participating in the WDN project, our data makes possible fully homogeneous comparisons between numerous European countries[8].

There are, of course, limitations to the data we use. This ad-hoc survey is cross-sectional by nature. The lack of time dimension does not allow us to test the sensitivity to the business cycle or to check whether wage setting behavior changes over time. Moreover, some questions might be misunderstood because they do not match the specific context of the firm. Furthermore, responses also have to be treated with caution because the person who filled in the questionnaire might not be aware of the entire wage-setting process especially in large firms (e.g. profit scheme). However, international comparisons (Druant et al., 2008) exhibit robust stylised facts across countries. Wage setting characteristics such as the frequency of wage change is shown not to be very different across European countries. Thus, WDN surveys represent a complementary

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[7]In numerous questions of the WDN survey (response to shocks, deviation from the on going wage, etc.), the respondent is asked to state which options he would choose. 'Stated-preference' data contrasts with 'revealed-preference' data that relates to people actual choices in real situations.

[8]Cross-countries studies exploiting the European harmonized sample are already available: Fabiani et al. (2009) examine linkings between wages and prices decisions, Babecky et al. (2009) assess downward nominal rigidities, Bertola et al. (2010) investigate the wages response to shocks, Galusak et al. (2010) focus on the issue of new hires wages. These studies are available at http://www.ecb.europa.eu/events/conferences/html/wage_dynamics_network.en.html. Similar surveys, using the WDN questionnaire, have also been conducted in Japan (see Ariga and Kamabayashi, 2008) and in Canada (see Amirault, Fenton and Laflèche, 2007).

data set and a useful crosscheck of the evidence obtained from quantitative sources.

Respondents were asked to provide information on the way they behave under "normal conditions and practises". Quantitative information relates to the previous accounting year. Thus, their responses depend, among other things, on the economic situation in France at the time the survey was conducted. It took place in an environment characterized by high unemployment and low inflation. The unemployment rate (7.9 %) has been on a downward trend since mid-2004 but it still remains higher than the European average. In 2007, the consumer price index grew at a rate of two percent, broadly stable compared to the preceding year. Economic growth in the first half of 2007 was in line with potential output. In addition, Table 1 gives a general picture of company characteristics in the sample. Hiring and firing are positively correlated across sectors and appear to be lower in the manufacturing sector and in larger companies. Also, companies hire employees mostly on fixed-term contracts or have recourse to temporary work. However, the number of these contracts remains limited (10 % of the national workforce). The vast majority (more than 90%) of contracts are permanent full-time ones. Due to the sample composition, manual workers are still over-represented and clerical under-represented compared to the entire workforce. Firms participating in the survey sell their products mainly in France, the manufacturing sector being the most open to international competition.

[TABLE 1: Company characteristics]

3 Wage setting procedures in France: an overview

In this section, we review the wage setting procedures to allow a better understanding of the empirical pattern of wage dynamics. Like in many countries in continental Europe, wage bargaining occurs at two levels. First, wages are defined by a multi-employer agreement (between employer associations and union or employee representatives). In addition, agreements might be improved by single-employer agreements at the company level[9]. Furthermore, the government indirectly intervenes via extension mechanisms of collective agreements (at the request

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[9]In France, escape clause exists since 2005 but they are rarely used by firms.

of employers or unions). The Auroux law (1982) also requires annual negotiations both at the company and the industry level.

At the industry level, employers have collectively to bargain wage rates when there are union representatives within the company. All companies are therefore not obligated to negotiate on wages but most are covered by an industry agreement. These agreements typically specify the wage scale for different tenure levels for a range of different job categories. At the bottom of the wage scale, the minimum wage, equally applies to every industry and thus constitutes a national wage floor. To ensure fair competition, industry level agreements may be extended to all companies belonging to the sector after a governmental decision.

At the company level, initiating annual negotiations is compulsory but the 'social partners' are not obliged to reach an agreement. A firm-level agreement almost always improves the situation of employees in relation to the industry level agreement in force. If negotiations fail (in 20% of cases), the existing pay structure remains applicable. Overall, 98 % of firms of the sample are covered by collective agreements (either negotiated at the company or the industry-level) although union membership is lower than 10% of the workforce. There can be significant differences of coverage between sectors, size and geographical areas.

[TABLE 2: Collective agreements]

Collective agreements might shape wage setting rules (see Section 4.3). Avouyi-Dovi et al. (2010) show that there is a strong seasonality in the wage bargaining rounds: 50 % of wage agreements are signed during the first month of the year. The duration of a collective agreement is typically 12 months. Occasionally, employers and employees' representatives find an agreement for a period of 24 months. Most agreements are strongly driven by developments in the price index. A majority of European countries share these characteristics (Du Caju et al., 2008).

However, agreements at industry level are not systematically binding and companies also have specific wage policies. Results taken from the survey indicate that wages are actually paid higher than negotiated wages in nearly half of the firms. These figures are broadly equivalent to those observed in Belgium for which this information is available (see Druant et al., 2008). The magnitude of the wage drift is also comparable with estimates on Spain based on a structural

model (see Palenzuela and Jimeno, 1996). According to the WDN survey data, effective wages exceed tariff wages by about 6.5% (see Table 2). The size of the gap shed light on the respective role of industry and firm negotiation. The wage drift tend to be higher in larger firms and in business services. This so-called 'wage drift' is likely to happen in heterogeneous sectors where sectoral bargained wages are low. Moreover, it can be in the interest of the firms to pay workers above the going rate set in the agreement. First, it might reflect pay policies by firm. One can argue it amplifies the effect of workers' characteristics on wages as assumed in efficient wage theories especially in business services. Second, it could also reflect unions' wage premium and rent sharing especially in large firms. Third, the gap between effective wages and tariff wages can be used to buffer possible and unwanted collective wage agreement since it allows employers to counterbalance increasing tariff wages. Then it can be interpreted as a short-term margin of flexibility for firms inside an industry coordinated wage bargaining system, noticeably for wages of newly hired employees. In this respect, a study panel data in Portugal also shows that the wage drift is contra-cyclical while wages are procyclical (Cardoso and Portugal, 2005).

4 Patterns of wage setting

In this section, we aim at characterising the empirical wage-setting rules. In this context, there are three elements of particular relevance: the frequency and the timing of wage changes and the duration of wage spells.

4.1 Frequency of wage changes

In the survey, firms had to indicate the number of times they change their wages in a given year. Wages are found to be relatively rigid in the sense they are changed every year. 74% of companies change wages once a year[10] (see Table 3). Nearly 20% of companies indicate they change the base wage more than once a year. The fraction of firms who do not change wages is negligible. These results are consistent with Biscourp et al. (2005) who obtain a frequency

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[10]Frequency is a synthetic variable based on three variables of the questionnaire: changes due to tenure, changes due to inflation and 'independent changes'.

of annual wage changes equal to 89%. Frequency of wage changes varies across sectors. For instance, wages change more frequently in the trade sector. Wage changes are less frequent in services than in manufacturing. In personal services, wage changes occur almost always once a year. Regarding size, the frequency is higher for large firms.

[TABLE 3: Wage change frequency]

4.2 Wage spells duration

We also provide an approximation of the average implicit duration of wage contracts. The average implicit duration can be computed as the inverse of frequency[11]. This approach makes it possible to compute durations without using individual records and without treatment of censoring. In Table 4, the mean wage spell is expressed in months. Wages are considered as rigid as the duration between two changes is long. We also document low heterogeneity of wage spells across industry and company size. Overall, the average duration of a wage contract is found to be one year. These results have to be considered as proxies since they depend crucially on ad-hoc assumptions. Moreover, they differ from results obtained by Heckel et al. (2008) who find a mean duration of two quarters. However, the methodology differs: we provide implied average duration across firms whereas Heckel et al. (2008) compute direct duration across wage contracts. Moreover, our sources are not fully comparable. The WDN survey only captures "deliberate" changes whereas predetermination is a relevant feature of wage changes: i.e. the fact that contracts may include preset wage increases. In particular, while wage changes are implemented on average every two quarters, decisions on wage changes are actually less frequent.

[TABLE 4: Wage spells duration]

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[11]In the context of the WDN survey, answers define frequencies of wage changes (see Appendix 2). Most answers translate directly into durations (e.g. once a year translates into duration of one year). However, others answers define intervals. To translate intervals into a point, we assume that frequencies of wage changes are uniformly distributed across the interval (e.g. "less frequently than a year" is translated into 2 changes per year). Moreover, we also assume a truncation for indefinite intervals: "less frequently than once every two years" is bound to 0.4 change per year.

4.3 Timing of wage changes

We now investigate the dynamics of wage setting. A heuristic distinction is traditionally made between state-dependent and time-dependent wage setting rules. First, there is state-dependence wage setting when companies change wages as a result of a large change in economic conditions. A standard justification for this type of adjustment is the prevalence of adjustment costs (in the wage setting context it might be the cost of opening a negotiation). Thus, firms following state-dependence rules change wages in response to shocks. Second, time-dependence wage setting applies when companies change wages on a periodic basis. The time interval of the nominal contracts is often modelled e.g. by Taylor (1980) as fixed. Workers sign contracts that specify a fixed wage for several periods. The current generation of macro models also refers to Calvo-type contracts where the duration between two changes is random. Note that these state and time-dependent rules are not mutually exclusive. For instance, a mix of state-dependence and time-dependence is a common finding of price setting. Firms seem to change wages each year if their economic environment is stable but might renegotiate contracts in the presence of shocks (see Section 6). More generally, Olivei and Tenreyro (2008) show that real effects of monetary shocks depend on the timing of shocks. Using data from the U.S., Japan, Germany, U.K. and France, they argue that the quicker the transmission, the more synchronized wages change across firms.

[FIGURE 1: Timing of wage changes]

Figure 1 plots the timing of wage changes by month. We find a strong seasonal pattern of wage change decisions. Indeed, 58% of firms change base wages in January or in July. Overall, 78% of companies change wages in a particular month of the year. There is a clear synchronization in wage changes. However, it is difficult to determine whether this pattern provides evidence for state-dependence behavior (in response to the numerous price changes observed in January) or whether it reflects time-dependence due to institutional factors. The "January effect" might be due in large part to collective bargaining rounds which take place at the beginning of the year (see Section 3). The "July effect" also results from the minimum wage increase. Another way to assess time-dependency is to determine whether the probability of a

wage change is likely to be affected by the duration since the last wage change. Estimates of the wage change probability show it increases substantially at durations of 12 and 24 months, thus indicating that a fraction of companies change their wages each year or every two years (Gottschalk, 2005 for the U.S and see Heckel et al., 2008 for France).

5 Downward wage rigidity

In this section, we provide new evidence on the extent of downward wage rigidity. Standard measures of wage rigidities in the literature are based on year to year wage changes distributions of the same employees (see Kramarz, 2001 for a survey). Downward nominal wage rigidity (DNWR), that is resistance to cut nominal wages, is usually identified by the extent of the spike at zero on the histogram of wage changes (i.e. the number of individual wages that remains unchanged). Downward real wage rigidity (DWRW), that is resistance to cut real wages, is measured by the spike at the rate of inflation. Moreover asymmetries around zero are also considered as evidence of downward wage rigidity. However, the great majority of studies which intend to measure downward wage rigidity conclude that measurement errors are a serious problem (see e.g. Altonji and Devereux, 2000). The use of administrative datasets makes it difficult to properly identify base wage because of the inclusion of overtime hours and bonuses. If base wage levels are measured with errors, this leads to spurious wage changes that may wrongly be interpreted as wage flexibility. Furthermore, the use of household surveys may lead to an overestimation of wage rigidity since rounding effects bias wage change toward zero. Changes in working conditions (e.g. a shift from a full-time job to a part-time status or a shift from night work to day work) may also add noise to the data.

5.1 Measuring downward nominal and real wage rigidity

WDN surveys avoid these methodological pitfalls. We take advantage of the fact that human resources managers are directly questioned on their wage policies. We indeed measure deliberate wage changes that are indicated by respondents. Downward nominal wage rigidity is computed as the share of nominal wage freezes. The WDN survey does not include a direct proxy of

downward real wage rigidity. As Babecký et al. (2009), we define it as the proportion of firms linking wages to inflation. This includes firms that are constrained from adjusting real wages not only downward but also upward. Table 5 presents some summary statistics on the extent of DNWR and DRWR. We find real wage rigidity to be slightly higher than nominal wage rigidity in France (respectively 10.0% and 8.8%). Cross-county comparisons indicate a lower degree of rigidity in France than in the Euro Area where DRWR is found to be 20,3% and DNWR 9.3% (see Fagan et al., 2008). The same hierarchy is obtained with the use of the IWFP protocol (see Dickens et al., 2007)[12]. There are modest differences of the extent of wage rigidity across sectors in France. One[13] exception is real wage rigidity in the trade sector due to the high share of people paid to the minimum wage. However, there is a considerable variation across European countries in the extent of downward wage rigidity (see Fagan et al., 2009). As argued by Messina et al. (2009), this suggests that labor market institutions rather than technology are a source of heterogeneity of wage rigidity among European countries.

[TABLE 5: Downward nominal and real rigidities]

WDN survey data also show that base wage cuts do occur: 2.5 % of companies say they have used base wage cuts at least once in the past five years. Wage cuts are more frequent in the manufacturing sector. The data confirm the existence of downward adjustments in extreme cases. Managers are more likely to cut wages if the firm faces extreme financial difficulties or if jobs are at stake. Moreover, according to respondents these wage cuts affect 70% of employees within a company but not all. This contrasts with Bewley (1999) who argued that reductions are made in order to preserve the pay differentials required by the pay structure.

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[12] Results of the WDN and IWFP are not comparable because the unit (firms vs. employees) and the type of data (cross-section vs. panel) are different.

[13] Because of the low response rate, results in the personal services sector are not statistically different from others sectors.

5.2 Wage indexation

Wage indexation directly affects downward wage rigidity. The degree of indexation is embedded in the labor market institutions. According to the law[14], employment contracts in France do not have to automatically tie wages to a cost-of-living index with the exception of the minimum wage[15]. According to Koubi and Lhommeau (2006), the spillover effect of the minimum wage increase is on average 30% at the bottom of the wage scale with a high dispersion across sectors. The existence of a minimum wage implies that real wages become more rigid as inflation rate goes to zero.

The WDN survey provide information on both formal indexation at the minimum wage and informal practice of indexation (for instance at each round of collective bargaining). Results show that about one third of companies say they practise informal indexing. 22.4% of firms say they adopt backward-looking behavior and index their wages to past inflation (see Table 6). 9.3% of firms adjust wages on expected inflation. However, the survey was conducted in an environment of inflation close to 2%. It therefore does not reflect any change in behavior associated with rising inflation. In the presence of inflationary pressures, wage pressures could be intensified which in turn could increase the degree of wage indexation to inflation.

[TABLE 6: Wage indexation]

5.3 Perceived reasons for wage stickiness

We also assess potential reasons for wage rigidity. Evidence on this issue is rather scarce and dispersed. Direct information can be obtained from the WDN survey. It contains a question which directly addresses the reasons for wage stickiness (see Appendix 2). Possible answers to this question include a list of statements addressed in simple terms based on sources of rigidities arising from institutional restrictions, insurance provision, relative wages (when taking wage decisions firms take into account wage rates set in other firms) and efficiency wage hypothesis.

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[14]Article L112-2, Code monétaire et financier

[15] The minimum wage is adjusted each July by a automatic indexation on the cost of living and half from increased purchasing power of average wage worker. Moreover companies have incentive to increase wages at the bottom of the wage scale in order to maintain wage hierarchy.

Four versions of the efficiency wage theory are detailed: the first one holds that high wages reduce labor turnover. A second efficiency-wage theory holds that the average quality of a firm's work force depends on the wage it pays its employees. The third and fourth versions of efficiency-wage theory hold that high wages increase workers' effort and (respectively) reciprocity. Company responses have been converted into numerical scores ranging from 1 to 4 using the same coding scheme as that proposed by Blinder et al. (1998) in their study of price rigidity. Above 2.5, the score is considered as reasonably strong and an average above 3.0 as very strong. Table 7 ranks theories by mean scores.

[TABLE 7: Rating of theories explaining wage stickiness]

Data suggest that both the fairness and the shirking version of the efficiency wage hypothesis are supported. Overall, companies are reluctant to adjust wages. The survey results also indicate that lower wages would not be an incentive and this could lead to lower the productivity by employees. The main reasons for the deviations from the going rate appear to be employer-related, even in firms in which all workers are covered by collective agreements. We emphasize mechanisms of wage rigidity at the establishment-level. When faced with shocks, firms use alternative ways to adjust.

6   Adjustment in the presence of wage rigidity

In the presence of downward of rigidity, the WDN survey provides information on firm's adjustment. Respondents were asked to assess the relevance of the following adjustments margins: an increase in prices, a reduction in profit margins, a reduction in output and a reduction in costs. By asking firms how they respond to shocks, there is no need to identify the shocks themselves. The WDN survey questions specify three hypothetical shock scenarios: a slowdown in demand, an increase in intermediate costs (e.g. an oil price increase) and a permanent rise in wages (for instance due to contracts bargained at the industry level). All these three shocks are considered as unexpected and common to all firms. We provide evidence on how firms react to shocks and distinguish different margins of adjustment.

6.1 Responses to shocks

Table 8 shows that companies use different strategies when faced with shocks combining price adjustment and cost minimization. The chosen margins of adjustments differ according to the type of shock. Companies reduce costs primarily when they are facing with a demand shock and increase prices when faced with supply shocks. Cost reduction is an important strategy for approximately 75 % of the respondents after a demand shock. On the contrary, price adjustment is an important strategy for around 55% of the respondents after a supply shock. However, we do not find any sign of the potential price vs. quantity adjustment dichotomy (see Andersen and Toulemonde, 2004).

[TABLE 8: Economic shocks and margins of adjustment]

We try to determine which factors increase the probability to change price, margin, output and cost. Three kinds of explanations are considered: the degree of market competition, the type of collective agreements and the technology of the firm. We use a measure of perceived competition at the firm level. Both firm-level and industry-level collective agreements are considered. Labor intensity identifies the technology of the firm. A set of control variables captures features of the firm's strategies: industry dummies to control for differences in technology, geographical area, composition of the work force. We model determinants of firms' reaction to adverse shock jointly. We use a quadrivariate probit model to take into account the fact that decisions have been taken simultaneously. To allow for the possibility that choices are related to unobserved factors, errors terms are correlated. The equations for this model have the following form:

$$\text{increase price} \quad y_1 = \begin{cases} 1 & \text{if } X\beta + \varepsilon_1 > 0 \\ 0 & \text{otherwise} \end{cases}$$

$$\text{reduce margin} \quad y_2 = \begin{cases} 1 & \text{if } Z\gamma + \varepsilon_2 > 0 \\ 0 & \text{otherwise} \end{cases}$$

$$\text{reduce output} \quad y_3 = \begin{cases} 1 & \text{if } W\theta + \varepsilon_3 > 0 \\ 0 & \text{otherwise} \end{cases}$$

$$
\text{reduce costs} \quad y_4 = \begin{cases} 1 & \text{if } V\alpha + \varepsilon_4 > 0 \\ 0 & \text{otherwise} \end{cases}
$$

We assume that the error terms are distributed as a quadrivariate normal distribution $(\varepsilon_1, \varepsilon_2, \varepsilon_3, \varepsilon_4) \rightarrow N_4(0, \Sigma)$, where Σ has values of 1 on the leading diagonal and correlations $\rho_{jk} = \rho_{kj}$ as off-diagonal elements. The log-likelihood function of the model is:

$$
l = \sum_i^n \log \Phi_4(\mu_i, \Omega)
$$

$\Phi_4(\mu_i, \Omega)$ is the quadrivariate normal cdf where $\mu_i = (q_1 X\beta, q_2 Z\gamma, q_3 W\theta, q_4 V\alpha)$; Ω has elements $\Omega_{jj} = 1$ and $\Omega_{jk} = q_j q_k \rho_{jk}$ for $j, k = 1, ..., 4$. The 'signs' variables ($q_k = 2y_k - 1$) being equal to 1 and -1 depending on whether the observed binary outcome equals 1 or 0 for $k = 1, ..., 4$.

The likelihood function requires evaluation of quadrivariate normal distribution. For high dimension of the multivariate normal distribution, simulation-based methods are required. Here, we use simulated ML based on the 'GHK' simulator. The GHK simulator exploits the fact that a multivariate normal distribution can be expressed as the product of sequential condititioned univariate normal distributions. The simulated probabilities are plugged into the likelihood at each iteration of the maximisation. Table 9 reports multivariate probit estimations. The first column gives the likelihood of the respective reaction after a demand shock, the second and third columns refer to the response after an increase in the cost of an intermediate input or the labor cost.

[TABLE 9: Multivariate probit estimates]

The nature of the response might depend on the characteristics of the firm (size, sector, area) and the conditions external to the firm (wage bargaining system, competition and technology). The intensity of competition amplifies company responses. Our empirical results show that stronger competition is associated with more intensive adjustment in the aftermath of shocks. Price increases (decreases) after supply (demand) shocks are less (more) likely when competition

in the product market is strong. Higher labour cost share lowers the likelihood of price increases after a shock. Since a higher labour share implies that marginal costs are more sensitive to labour costs, prices are more likely to be raised in response to a general wage increase. This is also consistent with the results on price determinants within the Inflation Persistence Network (see Loupias and Ricart, 2006, Loupias and Sevestre, 2009). Our results also suggest that collective bargaining at sectoral level does not have a significant impact on the probability that firms will adjust. There is a clear sectoral effect indicating that compared to the manufacturing sector, firms operating in the market services sector are less likely to adjust. We also find that large firms are less likely to adjust. However, there might be a strong interaction of demand shocks and the degree of competition. Competition makes prices react more to demand changes than to costs changes. Finally, the error terms are found to be significantly correlated.

6.2 International comparison

An important question is whether the difference in response to shocks across countries might be explained by the differences between job market institutions. In a study involving the twelve European countries participating in the WDN survey, Bertola et al. (2010) find evidence of important institutional influences on company-level responses to all types of shocks. Collective pay agreements bargained outside the firm increase the probability that firms cut costs by laying off workers, while employment protection legislation increases the likelihood that firms reduce wages. The effect of collective agreement is more prevalent when we use the European dataset (due to heterogeneity) than in a single country case (see above). Across Euro area countries, more stringent employment protection is associated with a lower probability of employment reduction in response to a shock. Countries with rather stringent employment protection, which is the case of France, tend to smooth permanent employment adjustment, while increasing the responsiveness of hours adjustment and (less clearly) of temporary employment.

6.3 Wages of new hires

In the presence of downward wage rigidity firms have other ways to adjust labor costs. Surveyed firms were asked whether they have ever used other adjustment mechanisms to reduce labor

cost. These mechanisms include the hiring of new employees at a lower wage level than ongoing wages, slowing down the rate at which promotions are filled or reducing bonuses and non-pay benefits. Evidence in the literature on wages of new hires show procyclicality of real wages (more than job stayers) in the US (see Beaudry and DiNardo, 1991) ; this is true both for workers moving from job to job and for those moving from unemployment to job (see Bils, 1985). In the UK, Germany and Italy, there is no evidence that wages of movers are more pro-cyclical than wages of stayers (see Peng and Siebert, 2007). On the contrary, Carneiro et al. (2008) find a significant wage cyclicality of new hires taking into account firm and employees unobserved heterogeneity in Portugal. Evidence is scarce on this issue in France. Traditional interpretation of wage movers stress a cyclical composition effect of jobs: during recessions firms hire more skilled workers than during booms. It also relies on inter-industry wage differentials. If these sectors are cyclically sensitive, workers can switch into high-paying jobs during booms. More recent interpretation insists on a 'cyclical within firm' effect according to which is wages of new hires are more flexible than wages of existing employees (see Pissarides, 2009). The WDN survey provides direct evidence on the main occupational group within firm.

In response to idiosyncratic shocks, half of the companies say that new employees are hired with lower wages. However, *under normal circumstances*, wages of new hires are determined largely by pay scale. In this context, deviations from the going rate are not very common. The survey also shows that the wages of new hires remain determined by the pay scale within companies. Recruiter tries to understand how new hires fit into the wage scale given their training experience, skills and job. As pointed by Bewley (1999), pay scales allow to guarantee fairness among employees (as suggested in Section 5).

7 Conclusion

Using a source of a qualitative nature, this study highlights several characteristics of wage setting in France. First, a vast majority of companies change wages each year. Changes in wages occur at regular intervals during the year and are concentrated in January and in July. The timing of negotiation and the degree of synchronisation of wage changes indeed matters for

the transmission of monetary policy.

As in previous researches, we find evidence of the existence of downward wage rigidity. Our results suggest that downward real wage rigidity is slightly higher than nominal wage rigidity in France but lower than the European average. Among explanations advocated in the literature for wage rigidity, both the fairness and the effort version of the efficiency wage hypothesis are important considerations for French firms.

About one third of companies have an internal wage-setting policy linking wages to inflation. When companies are faced with adverse shocks, they use mixed strategies combining prices adjustment and costs minimization. Only a partial response to economic shocks is transmitted into prices. Companies generally adopt cost-cutting strategies. In the presence of downward base wage rigidity, companies use different strategies such as reductions in bonuses or wages of new hires and early retirement schemes. The choice of strategies depends on the firms' characteristics. Large firms in the service sector are less likely to adjust. The wage of new hires also plays an important role in this adjustment.

A number of questions for future work remain open. First, do these results remain unchanged in a context of rising inflation? Another key question is to know how asymmetry of shocks matters as the questionnaire focuses on adverse shocks.

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Appendix 1: Description of the survey

The WDN survey that was carried out during the fall of 2007 is an ad-hoc survey. The questionnaire cover among other topics wage changes, adjustment to shocks, and adjustment to inflation.

Scope of the survey

The WDN survey was conducted among a sample of companies usually interviewed for the purpose of the Banque de France monthly Business Survey. It was carried out in close collaboration with the Banque de France's branches. The survey covers companies with at least 5 employees and whose economic activity belong to the sectors C to K of the classification of activities of the European Community (manufacturing, trade, hotels and restaurants, market services) in France. The sectors covered by the sample represent approximately 69% of total GDP. The survey focuses on employees and excludes apprentices and trainees. The sample does not include the civil servants and self-employed. A harmonized survey was conducted simultaneously in 16 European countries. Some specific questions were added to the core questionnaire concerning wage drift and in order to take into account some institutional specificities.

The data collected relate to the year 2007. The questionnaire focuses, unless otherwise stated, on the base wage excluding overtime pay and bonuses. Questions relative to the firms' wage policy are mostly qualitative. The survey also collects information about the firm, on the flows of entries and exits of employees within firms. Companies were mainly interviewed by mail and electronic mail but also by face to face or telephone interviews.

Survey methodology

The basic statistical unit is the firm. Groups are not interviewed as such, the results are not consolidated. 6645 firms were interviewed. The questionnaire was mainly filled by business managers (CEO, CFO or human resource manager). The response rate is around 31% that is lower than conventional firm surveys or business surveys but usual for that kind of ad-hoc surveys. There is also little evidence of sample selection bias. Detail of response rate by sector, size and geographical area are presented in Table A.

[TABLE A The sample]

The descriptive results are weighted. For a given firm, weights indicate the number of workers in relation to the total population, taking into account the firm's size and sector. The weight is defined as the sum of all employees in the stratum divided by the number of firms in that stratum. The sample is divided into 20 strata according to the sector and the number of employees. The weights were derived from FIBEN database. The sample weights take no account of the classification of the employees according to the occupational status.

Appendix 2 : Questionnaire

BANQUE DE FRANCE

EUROSYSTÈME

SURVEY ON WAGE AND PRICE FORMATION

This survey is aimed at collecting information on wage and price setting in your firm. It is part of a Eurosystem project, involving the Central banks of the euro area and of other EU countries. Broadly the same questionnaire is submitted to a sample of firms in each of these countries.

Your cooperation is extremely valuable, but your participation is totally on a voluntary basis and your eventual refusal to participate will not have any implication.

The information collected through the questionnaire will be used exclusively for research purposes and it will never be disseminated outside the Eurosystem; only aggregate figures, based on the answers by all firms included in the sample, will be published and eventually disseminated to other organization.

1

Wage setting and wage changes

This part collects information on wage setting practices, on the frequency and timing of wage changes.
It also focuses on how the wages of new workers are set relative to existing workers.
Unless specifically indicated, answers should refer to "normal conditions and practices".

1 – How were your firm's employees distributed across the following occupational groups in the reference period ?
For the definition of employee and of occupational groups, see the attached appendix.

Low skilled blue collars/Production	____%
High skilled blue collars/Technical	____%
Low skilled white collars/Clerical	____%
High skilled white collars/Professional	____%
TOTAL (= 100%)	100 %

2 – Does your firm apply a collective contract signed outside the firm (at the national, regional, sectoral or occupational level)?

No,	▫
Yes	▫

3 – If yes in 2, at which level are negociated collective agreement?

Firm	▫
Industry	▫

4 –What is the scope of the industry agreement?

National	▫
Regional	▫

5 – If yes in 2, is there a difference between wage paid to employees and negociated wage in the collective agreement ?

Yes	▫
No	▫

6 – If yes in 3b, what is the difference between wage paid in the firm an negociated wage at industry level ?

____ %

7 – If yes in 2, what percentage of your total wage bill in the "reference period" was related to individual or company performance related bonuses or benefits ?

____ %

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

Definition of base wage: direct remuneration excluding bonuses (regular wage and salary, commissions, piecework payments)

No	▫ → GO TO 8
Yes	▫

9 – If yes in 6, please choose among the options below, the one that reflects best such a policy.

Wage changes are <u>automatically linked</u> to:

- past inflation	▫
- expected inflation	▫

Wage changes <u>take into account</u>, without a formal rule:

- past inflation	▫
- expected inflation	▫

10 – How frequently is the base wage of the main occupational group in your firm (as defined in question 1) typically changed in your firm?

	more than once a year	once a year	once every two years	less frequently than once every two years	never / don't know
Wage changes apart from tenure and inflation	□	□	□	□	□
Wage changes due to tenure	□	□	□	□	□
Wage changes due to inflation	□	□	□	□	□

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

No   □
Yes: Jan. □   Feb. □   Mar. □   Apr. □   May □   June □   July □   Aug. □   Sept. □   Oct. □   Nov. □   Dec. □

12 – Considering the main occupational group in your firm (as identified in question 1), please indicate among the following options what is the most relevant factor in determining the entry wage of newly hired employees

Collective wage agreement (at any level)	□
Wage of similar employees in the firm	□
Wage of similar workers outside the firm	□
Availability of similar workers in the labour market	□
Other	□

Downward wage rigidity and the adjustment to shocks

This part **addresses the issue of the presence of (eventual) obstacles to downward wage adjustments and the reaction of firms to different shocks.**

13 – Over the last five years, has the base wage of some workers in your firm ever been frozen ?

Definition of freeze in base wage:

- No   □
- Yes (indicate for what percentage of your employees)   _____%

14 – Over the last five years, has the base wage of some workers in your firm ever been cut ?

Definition of cut in base wage:

- No   □
- Yes (indicate for what percentage of your employees)   _____%

15 – If yes in either 14 or 15, what was the main reason why the base wage was cut or frozen?

(choose only one option, the most important reason)

Profitability and/or sales went down	□
Other costs increased	□
Jobs were at risk	□
It was imposed by legislation or higher level collective agreement	□

16 – How relevant are the following reasons in preventing base wage cuts?

(please tick a box for each line)

	not relevant	of little relevance	relevant	very relevant	don't know
It is impeded by labour regulation/collective agreements	□	□	□	□	□
It would have a negative impact on employees' efforts	□	□	□	□	□
It would have a negative impact on employees' morale	□	□	□	□	□
It would have a negative impact on the firm's reputation	□	□	□	□	□
It would mean the best employees would leave the firm	□	□	□	□	□

It would imply high costs of hiring and training new employees	▫	▫	▫	▫	▫
It would create difficulties in attracting new workers	▫	▫	▫	▫	▫
Workers dislike unpredictable reductions in income	▫	▫	▫	▫	▫
Employees are concerned with how their wage compares to that of similar workers in other firms in the same market	▫	▫	▫	▫	▫

17 -- Have you used any of the following strategies to reduce labour costs? (select all that apply)

Recruited new employees{with roughly the same skills and experience} at lower wage level than those who left (e.g due to voluntary quits and retirement)	▫
Used early retirement to replace high wage employees by entrants with lower wages	▫
Reduced or eliminated bonus payments	▫
Reduced or eliminated non pay benefits	▫
Slowed or frozen rate at which promotions are filled	▫

18 – How does your firm react to an unanticipated slowdown in demand ?

(please tick a box for each line)

	not relevant	of little relevance	relevant	very relevant	don't know
Increase prices	▫	▫	▫	▫	▫
Reduce margins	▫	▫	▫	▫	▫
Reduce output	▫	▫	▫	▫	▫
Reduce costs	▫	▫	▫	▫	▫

19 – 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:

(indicate only the most important factor)

Reduce base wages	▫
Reduce flexible wage components (for example bonuses, benefits, etc.)	▫
Reduce the number of regular employees	▫
Reduce the number of temporary employees / other type of workers	▫
Adjust the number of hours worked per employee	▫
Reduce non-labour costs	▫

20 – How does your firm react to an unanticipated increase in the cost of an intermediate input (e.g. an oil price increase) affecting all firms in the market?

(please tick a box for each line)

	not relevant	of little relevance	relevant	very relevant	don't know
Increase prices	▫	▫	▫	▫	▫
Reduce margins	▫	▫	▫	▫	▫
Reduce output	▫	▫	▫	▫	▫
Reduce other costs	▫	▫	▫	▫	▫

21 – 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: (indicate only the most important factor)

Reduce base wages	▫
Reduce flexible wage components (for example bonuses, benefits, etc)	▫
Reduce the number of regular employees	▫
Reduce the number of temporary employees / other type of workers	▫
Adjust the number of hours worked per employee	▫
Reduce other non-labour costs	▫

22 – How does your firm react to an unanticipated permanent increase in wages (e.g. due to the renewal of the national contract) affecting all firms in the market? (please tick a box for each line)

	not relevant	of little relevance	relevant	very relevant	don't know
Increase prices	□	□	□	□	□
Reduce margins	□	□	□	□	□
Reduce output	□	□	□	□	□
Reduce other costs	□	□	□	□	□

23 – 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:

(indicate only the most important factor)

Reduce flexible wage components (for example bonuses, benefits, etc)	□
Reduce the number of regular employees	□
Reduce the number of temporary employees / other type of workers	□
Adjust the number of hours worked per employee	□
Reduce other non-labour costs	□

Price setting and price changes

This part collects some information on price setting and the frequency of price changes.

The price should refer to the firm's "main product or service", defined as the one that generated the highest fraction of the firm's revenue in the "reference year".

24 – What share of the revenue generated by your firm's main product in the reference period was due to sales on:

Domestic market	____%
Foreign markets	____%
Total (= 100%)	100 %

25 – How is the price of your firm's main product set on its main market ?

(please select only one of the options below)

There is not an autonomous price setting policy because:

- the price is regulated, or it is set by a parent company / group	□
- the price is set by the main customer(s)	□
The price is set following the main competitors	□
The price is set fully according to costs and a completely self-determined profit margin	□
Other	

26 To what extent does your firm experience price competition for its main product?

(please select only one of the options below)

Severe competition	□
Strong competition	□
Weak competition	□
No competition	□
Don't know / no answer	□

27 – 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 select only one of the options below)

Very likely	□
Likely	□
Not likely	□
Not at all	□
It doesn't apply	□

28 – Under normal circumstances, how often is the price of the firm's main product generally changed?

(please select only one of the options below, the one that applies most closely to your firm)

More than once a year:
- daily   □
- weekly   □
- monthly   □
- quarterly   □
- half-yearly   □
Once a year   □
Once every two years   □
Less frequently than once every two years   □
There is not a defined pattern   □

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

No   □
Yes: Jan. □   Feb. □   Mar. □   Apr. □   May □   June □   July □   Aug. □   Sept. □   Oct. □   Nov. □   Dec. □

30 – How does the timing of these price changes relate to that of wage changes?

(please select only one of the options below)

Decisions are taken simultaneously   □
Price changes tend to follow wage changes   □
Wage changes tend to follow price changes   □
There is a link but no particular pattern
There is no link between the two

Information about the firm

31 – How many workers (including employees and other types of workers) did your firm have at the end of the reference period?
PERMANENT PART-TIME: employees who have no set termination date and work less than legal duration required in the collective agreement
TEMPORARY: employees who have a set termination date or a specific period of employment.

Number of employees   _____

Of which: (fill in one of the two columns, as you prefer: levels or %)	Percentages	Number
permanent full-time	_____ %	_____
permanent part-time	_____ %	_____
temporary	_____ %	_____
TOTAL (= 100%)	100 %	

Number of other types of workers (e.g. people employed by agencies, consultants, apprenticeships, students, etc.)   Number _____

32 – How many employees left the firm in the reference period?

(refer to all types of employees: temporary and permanent, see definition above)

_____

33 – How many employees joined the firm in the reference period?

(refer to all types of employees: temporary and permanent, see definition above)

_____

34 – What percentage of your firm's total costs were due to labour costs in the reference period ?

Definition of labour costs: wages, salaries,bonuses, social contributions, training, tax contributions, contributions to pension funds

_____ %

35 – How was your firm's revenue in the reference period compared to the previous year?

Much lower	□
Lower	□
Approximately the same	□
Higher	□
Much higher	□

Thank you very much for having completed the questionnaire!

Methodology of the survey

Some questions require quantitative answers (the number of employees hired, the sales by geographic area, etc.). These elements are very important because they are conditioning the analysis of the responses of other questions.

The information must be accurate but this must not be an obstacle for the respondents. Some results are requested as a percentage. For these questions, the total is filled to 100% in order to check the consistency of responses. When the data are not readily available, a proxy is agreed.

The answers to the questionnaire should reflect the behaviour of the firm during the last two or three years without take into account a particular event.

Almost all the questions refer to the **base wage** or the **main product**: The base wage means wage excluding bonuses and benefits in kind. The main product is a product which represents the largest share of the turnover.

QUESTION 1 –

EMPLOYEES: people with a contract of employment (paid employees who work on-site; paid employees who work off-site such as customer service representatives or telecommuters; salesmen and similar employees). **Exclude** freelance workers, home or out workers, and casual workers who do not have a contract of employment.

OCCUPATIONAL CATEGORIES:
Production: non-supervisory staff in production or maintenance positions that require no vocational /trades accreditation or the equivalent in on-the-job training (assemblers, packers, sorters, pilers, machine operators, transportation equipment operators (drivers), warehousemen, and cleaning staff).
Technical: employees whose duties would normally require a community college certificate /diploma or the equivalent and who are not primarily involved in the marketing /sales of a product or service (technologists, lab technicians, registered nursing assistants, audio-visual technicians; ECE-trained caregivers; technology trainers; legal secretaries and draftspersons; computer programmers and operators).
Clerical: non-supervisory staff providing clerical or administrative services (secretaries, office equipment operators, filing clerks, account clerks, receptionists, desk clerks, mail and distribution clerks, bill collectors and claims adjusters)
Professionals: employees whose duties would normally require at least an undergraduate university degree or the equivalent (medical doctors, lawyers, accountants, architects, engineers, economists, science professionals, psychologists, sociologists, registered nurses, marketing and market research professionals, nurse-practitioners and teaching professionals; computing professionals whose duties would normally require a minimum of an undergraduate degree in computer science).
Other: if you have a large number of employees who do not correspond to any of the above categories, please write in their occupation(s) in the space provided.

QUESTION 34 –
permanent full-time employees: those who have no set termination date working (x/30/35?) or more hours per week.
permanent part-time employees: those who have no set termination date working less than (x/30/35?) hours per week.
Temporary employees: those who have a set termination date or a specific period of employment.

QUESTION 40 –
Labour costs: wages, salaries,bonuses, social contributions, training, tax contributions, contributions to pension funds.

Appendix 3 : Tables and Figure

Table 1 - Company characteristics (percentages)

	Labor Cost Share	Main socio occupational group				Types of Workers			Export share	Labor mobility	
		Production	Technical	Clerical	Professional	Full time	Part-time	Temporary		Entry	Exit
Total	39.0	47.8	22.3	10.7	19.2	85.7	8.6	5.7	16.2	15.5	16.7
By sector											
Manufacturing	28.2	58.3	15.9	12.7	13.1	92.2	3.9	3.9	27.2	10.8	10.1
Trade	19.6	46.0	25.3	15.5	13.2	92.1	4.3	3.6	3.9	17.7	16.3
Business services	49.6	39.7	26.6	8.6	25.1	79.5	13.2	7.3	7.8	18.9	21.8
Personal services	57.6	6.4	74.5	6.2	12.9	82.6	6.7	10.7	0.0	55.4	63.3

Table 2 - Collective agreements (percentages)

	Collective agreement Firms	Firm-specific wage policy	Wage drift*
Total	97.9	46.0	6.5
By sector			
Manufacturing	98.5	50.5	5.7
Trade	99.2	47.7	4.7
Business services	97.3	43.1	7.4
Personal services	98.4	1.6	1.0
By size			
0-19 employees	96.4	28.8	5.6
20-49 employees	96.7	43.1	5.3
50-199 employees	98.7	42.0	5.4
>200 employees	98.1	50.6	7.1

*Wage dift = "effective" wage -
"bargained" wage (in level)

Table 3 - Frequency of wage changes (percentages)

	More frequently than once a year	Yearly	Less frequently than once a year	Never
Total	19.5	74.3	5.2	1.1
Manufacturing	23.7	71.8	3.9	0.6
Trade	28.4	53.6	12.1	5.8
Business services	15.6	77.4	5.8	1.2
Personal services	0.0	93.5	6.5	0.0
0-19 employees	12.8	66.0	17.9	3.3
20-49 employees	13.6	76.7	8.8	0.9
50-199 employees	20.3	72.2	6.3	1.2
>200 employees	21.5	75.6	2.1	0.7

Table 4 - Duration of wage spells (months)

	Mean Duration	Number of observations
Total	11.9	2 029
Manufacturing	11.3	1 295
Trade	13.7	63
Market services	12.2	653
Non-market services	13.0	18
0-19 employees	14.7	281
20-49 employees	12.7	396
50-199 employees	12.0	764
>200 employees	11.2	588

Table 5   - Downward nominal and real wage rigidity (percentages)

	DNRW	DRWR
Total	8.8	10.0
Manufacturing	9.4	9.6
Trade	9.3	20.4
Business services	8.3	9.9
Personal services	8.3	1.2

Table 6 - Wage indexation (percentages)

	Link to past inflation	Link to expected inflation	Wage indexation
Total	22.4	9.3	31.7
Manufacturing	27.0	11.2	38.2
Trade	28.9	2.3	31.2
Business services	18.5	8.4	26.8
Personal services	1.6	1.6	3.2

Table 7 - Ranking of theories explaining wage stickiness (mean scores)

	France	Europe*
Shirking	3.3	3.1
Gift-exchange	3.3	3.0
Explicit contract	3.1	2.9
Adverse selection	3.1	3.3
Negative signal	2.7	2.8
Reputation	2.5	2.6
Relative wages	2.2	2.6
Turnover	2.1	2.8
Implicit contract	1.6	2.4

* Excluding Germany and Greece

Table 8 - Adjustement strategies (percentages)

Adjustment strategy	After a cost-push shock Percent	After a wage shock Percent	After a demand shock Percent
Price/Costs	20.4	1.0	3.2
Increase price	14.1	17.3	0.3
Price/Margin/Costs	12.4	0.3	12.7
Margin/Costs	10.5	0.4	8.9
Reduce costs	10.3	0.3	15.0
Price/Margin	4.7	5.6	4.4
Reduce margin	4.4	5.1	2.2
Price/Margin/Output/Costs	2.1	2.2	9.1
Margin/Output/Costs	1.9	0.9	5.5
Price/Output/Costs	1.5	1.6	2.2
Output/Costs	1.2	1.2	18.5
Price/Output	0.3	15.3	0.2
Price/Margin/Output	0.3	12.2	2.0
Reduce Output	0.2	10.6	3.3
Margin/Output	0.1	9.9	1.3
None	15.7	16.2	11.2

Table 9 - Adjustment in response to a shock
(multivariate probit estimates)

		Demand shock		Cost shock		Labor cost shock	
		Coeff.	Rob. std.	Coeff.	Rob. std.	Coeff.	Rob. std.
Price adjustment equation							
(price decrease for demand shock)	Fierce competition	ref.		ref.		ref.	
(price increase for supply shock)	Strong competition	-0,33 ***	0,12	0,29 **	0,12	0,35 ***	0,12
	Weak competition	-1,09 ***	0,13	0,47 ***	0,13	0,58 ***	0,13
	No competition	-1,67 ***	0,25	0,21	0,21	0,00	0,21
	Collective agreement, industry level	0,35	0,30	-0,18	0,39	-0,23	0,39
	Collective agreement, firm level	-0,11	0,08	-0,04	0,09	-0,16 *	0,09
	Labor intensity	-0,43 *	0,24	-0,38	0,25	0,51 **	0,26
	Manufacturing	ref.		ref.		ref.	
	Trade	-0,36	0,26	0,00	0,00	0,18	0,24
	Business services	0,07	0,12	-0,01 **	0,00	0,28 **	0,12
	Personal services	-0,04 ***	0,00	-0,66 ***	0,24	0,73	0,65
Margin adjustment equation							
	Fierce competition	ref.		ref.		ref.	
	Strong competition	-0,25 **	0,12	-0,11	0,12	-0,24 **	0,12
	Weak competition	-0,70 ***	0,13	-0,58 ***	0,12	-0,74 ***	0,13
	No competition	-1,20 ***	0,22	-0,57 ***	0,22	-1,04 ***	0,23
	Collective agreement, industry level	0,23	0,33	-0,57	0,36	-0,30	0,35
	Collective agreement, firm level	-0,08	0,08	0,03	0,08	-0,06	0,09
	Labor intensity	0,23	0,24	0,37	0,24	0,30	0,25
	Manufacturing	ref.		ref.		ref.	
	Trade	0,17	0,25	-0,03	0,24	0,05	0,24
	Business services	0,01	0,12	-0,17	0,12	-0,23 *	0,12
	Personal services	-0,04 ***	0,00	-0,05 ***	0,00	-0,05 ***	0,01
Output adjustment equation							
	Fierce competition	ref.		ref.		ref.	
	Strong competition	0,10	0,12	-0,20	0,15	0,07	0,13
	Weak competition	0,29 **	0,13	-0,06	0,15	-0,07	0,13
	No competition	0,63 ***	0,20	-0,68 **	0,35	-0,25	0,22
	Collective agreement, industry level	0,05	0,33	-0,19	0,43	0,97 **	0,41
	Collective agreement, firm level	0,05	0,09	-0,11	0,10	0,05	0,09
	Labor intensity	-0,30	0,24	0,51 *	0,30	-0,46 *	0,25
	Manufacturing	ref.		ref.		ref.	
	Trade	-0,06	0,29	0,19	0,31	0,34	0,29
	Business services	-0,41 ***	0,12	-0,27 *	0,15	-0,41 ***	0,12
	Personal services	0,04 ***	0,00	-0,04 ***	0,00	0,00	0,59
Cost adjustment equation							
	Fierce competition	ref.		ref.		ref.	
	Strong competition	0,05	0,13	0,09	0,13	-0,20	0,14
	Weak competition	0,11	0,14	-0,04	0,13	-0,06	0,15
	No competition	-0,08	0,22	-0,34	0,21	0,01	0,27
	Collective agreement, industry level	0,48	0,32	0,33	0,35	-0,57	0,42
	Collective agreement, firm level	0,04	0,09	0,01	0,09	-0,02	0,11
	Labor intensity	-0,39	0,26	-0,15	0,25	-0,43	0,31
	Manufacturing	ref.		ref.		ref.	
	Trade	0,13	0,29	0,26	0,29	-0,18	0,33
	Business services	0,19 ***	0,12	-0,28 ***	0,12	-0,33 **	0,15
	Personal services	0,37 ***	0,27	0,66 ***	0,27	-0,04 ***	0,00
	Not reported : sector size area dummies, constant, export share						
	Observations	1309		1352		1116	
	Log-likelihood	-2951		-3002		-2487	
	rho21	0,47 ***	0,03	-0,12 ***	0,04	-0,08 **	0,04
	rho31	-0,13 ***	0,04	-0,01	0,05	0,00	0,04
	rho41	-0,06	0,04	0,01	0,04	0,10 ***	0,05
	rho32	-0,12 ***	0,04	0,21 ***	0,05	0,17 ***	0,04
	rho42	-0,01	0,04	0,11 ***	0,04	0,06	0,05
	rho43	0,11 ***	0,04	0,14 ***	0,04	0,16 ***	0,05

Table A - The sample

	Firms in the initial sample	Respondents	Response rate	Employees
Sector				
Manufacturing	3 816	1 295	33.9	374 612
Trade	262	63	24.0	4 976
Market services	2 394	653	27.3	116 771
Non-market services	73	18	24.7	975
Size				
0-19 employees	1 257	281	22.4	2 500
20-49 employees	1 236	396	32.0	11 510
50-199 employees	2 192	764	34.9	71 908
>200 employees	1 860	588	31.6	411 416
Geographical area				
Paris area	772	178	23.1	69 824
North East	1 795	589	32.8	135 436
North West	1 428	431	30.2	104 949
South East	1 529	454	29.7	97 644
South West	1 021	377	36.9	89 481
Total	6 545	2 029	31.0	497 334

Figure 1 - Timing of wage changes
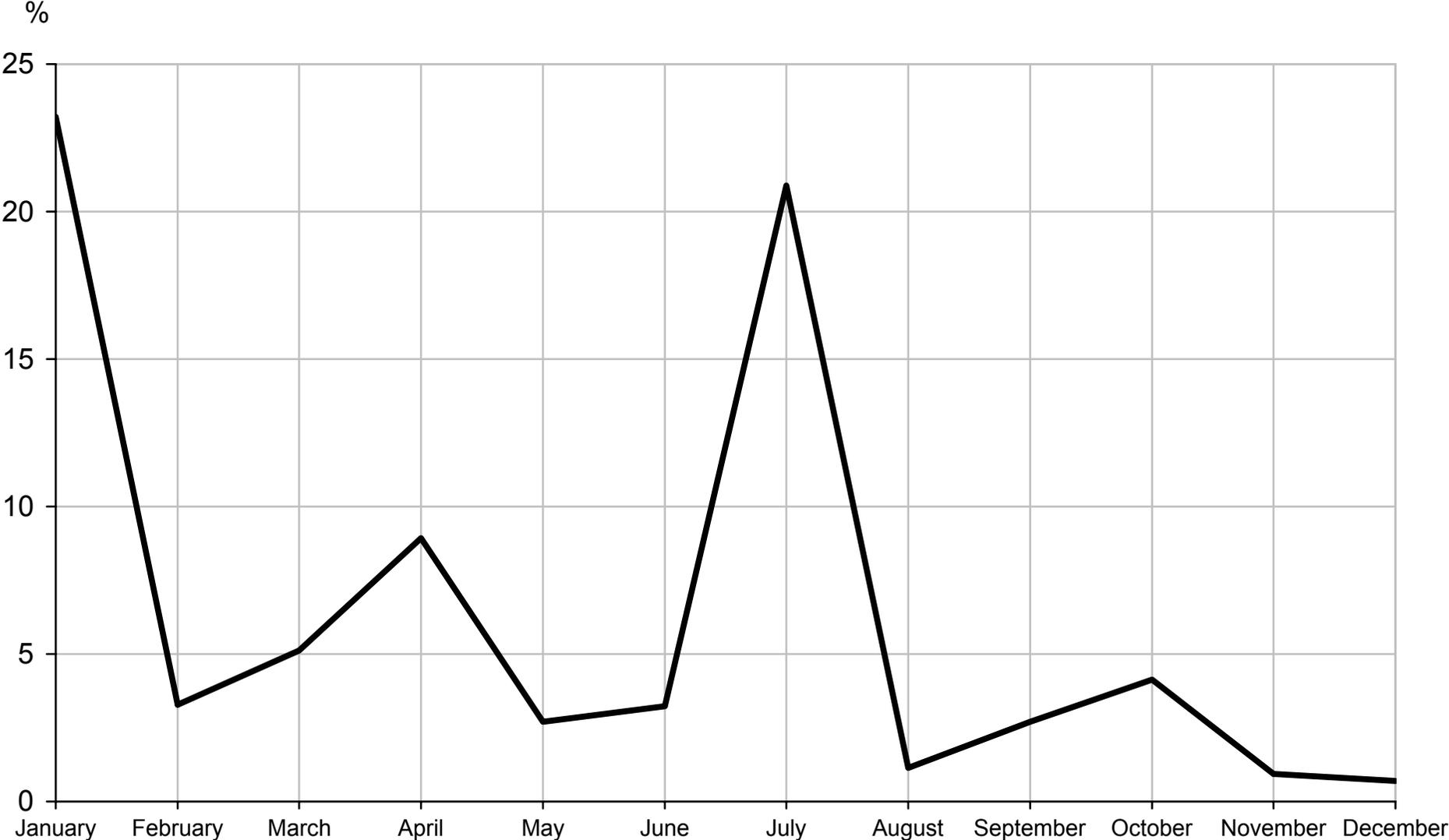
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