



EUROPEAN CENTRAL BANK

EUROSYSTEM

WAGE DYNAMICS
NETWORK

WORKING PAPER SERIES

NO 1102 / OCTOBER 2009

CB EZB EKT EKP

2009

WAGE-SETTING
BEHAVIOR IN
FRANCE

ADDITIONAL
EVIDENCE FROM
AN AD-HOC
SURVEY

by Jérémi Montornès
and Jacques-Bernard Sauner-Leroy



EUROPEAN CENTRAL BANK

EUROSYSTEM



WORKING PAPER SERIES

NO 1102 / OCTOBER 2009

WAGE DYNAMICS
NETWORK

WAGE-SETTING BEHAVIOR IN FRANCE

ADDITIONAL EVIDENCE FROM AN AD-HOC SURVEY¹

by Jérémi Montornès²
and Jacques-Bernard Sauner-Leroy³



In 2009 all ECB publications feature a motif taken from the €200 banknote.

This paper can be downloaded without charge from <http://www.ecb.europa.eu> or from the Social Science Research Network electronic library at http://ssrn.com/abstract_id=1485325.

¹ This paper reflects research conducted within the Eurosystem Wage Dynamics Network. This work has been carried out in close collaboration with Banque de France's branches. We are indebted to all participants to the WDN for very useful discussions and more particularly to Hervé Le Bihan, Patrick Sevestre and Erwan Gautier. We are also grateful to S. Tarrieu and S. Nakache for their wonderful research assistance. The usual disclaimer applies. The views expressed herein are those of the two authors and do not necessarily reflect those of the Banque de France, the European Central Bank or the Eurosystem.

² Corresponding author: Banque de France, 31, rue croix-des-petits-champs, 75 049 Paris Cedex 01, France; DGS-DSMF-SICOS, 46-2401 and DGEI-DEMS-SAMIC at the time this research was carried; Tel. 33 1 42 92 40 26; e-mail: jeremi.montornes@banque-france.fr

³ Banque de France, DGS-DESS-SIMQ, 43-1394, 31, rue croix-des-petits-champs, 75 049 Paris Cedex 01, France; e-mail: jacques-bernard.sauner-leroy@banque-france.fr

Wage Dynamics Network

This paper contains research conducted within the Wage Dynamics Network (WDN). The WDN is a research network consisting of economists from the European Central Bank (ECB) and the national central banks (NCBs) of the EU countries. The WDN aims at studying in depth the features and sources of wage and labour cost dynamics and their implications for monetary policy. The specific objectives of the network are: i) identifying the sources and features of wage and labour cost dynamics that are most relevant for monetary policy and ii) clarifying the relationship between wages, labour costs and prices both at the firm and macro-economic level.

The WDN is chaired by Frank Smets (ECB). Giuseppe Bertola (Università di Torino) and Julian Messina (Universitat de Girona) act as external consultants and Ana Lamo (ECB) as Secretary.

The refereeing process of this paper has been co-ordinated by a team composed of Gabriel Fagan (ECB, chairperson), Philip Vermeulen (ECB), Giuseppe Bertola, Julian Messina, Jan Babecký (CNB), Hervé Le Bihan (Banque de France) and Thomas Mathä (Banque centrale du Luxembourg).

The paper is released in order to make the results of WDN research generally available, in preliminary form, to encourage comments and suggestions prior to final publication. The views expressed in the paper are the author's own and do not necessarily reflect those of the ESCB.

© European Central Bank, 2009

Address

Kaiserstrasse 29
60311 Frankfurt am Main, Germany

Postal address

Postfach 16 03 19
60066 Frankfurt am Main, Germany

Telephone

+49 69 1344 0

Website

<http://www.ecb.europa.eu>

Fax

+49 69 1344 6000

All rights reserved.

Any reproduction, publication and reprint in the form of a different publication, whether printed or produced electronically, in whole or in part, is permitted only with the explicit written authorisation of the ECB or the author(s).

The views expressed in this paper do not necessarily reflect those of the European Central Bank.

The statement of purpose for the ECB Working Paper Series is available from the ECB website, <http://www.ecb.europa.eu/pub/scientific/wps/date/html/index.en.html>

ISSN 1725-2806 (online)

CONTENTS

Abstract	4
Non-technical summary	5
1 Introduction	7
2 Data description	9
3 Wage setting procedures in France: an overview	11
4 Patterns of wage setting	13
4.1 Frequency of wage changes	13
4.2 Wage spells duration	14
4.3 Timing of wage changes	15
5 Downward wage rigidity	16
5.1 Measuring downward nominal and real wage rigidity	17
5.2 Wage indexation	18
5.3 Perceived reasons for wage stickiness	18
6 Adjustment in the presence of wage rigidity	19
6.1 Responses to shocks	20
6.2 International comparison	22
6.3 Wages of new hires	23
7 Conclusion	24
References	25
Appendices	30
European Central Bank Working Paper Series	48

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 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: E3, D4, L11

Non-technical summary

This paper investigates the wage-setting behavior of French companies. The features and determinants of wage setting are crucial since they interact with inflation and they affect the monetary policy analysis.

There is a widespread theoretical and empirical literature on wage rigidities but it remains fragmented. 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. Following Blinder, this paper uses new qualitative information on wage setting in France based on an original survey conducted among two thousand firms of the market sector representing approximately 500, 000 employees. This survey has been undertaken as part of the Wage Dynamics Network (WDN) and was conducted among a sample of companies usually interviewed for the purpose of the Banque de France monthly Business Survey. The sectors covered by the sample represent approximately 69% of total GDP. A harmonised questionnaire was addressed simultaneously in 16 European countries.

We extend the approach 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 variables of the economic and institutional environment where firms operate 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 the patterns of wage setting: the frequency and timing of wage changes, the duration of wage spells. Second, the 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 responses to different kinds of adverse shocks including alternative means: change in prices, output, costs and profit margin.

Our main results are the following. Wages are changed infrequently. The mean duration of wage contracts is one year. Changes in wages occur at regular intervals during the year and are concentrated in January and in July. This indicates a time-dependent model of wage

changes. As in previous research we find evidence of the existence of downward wage rigidity. Our results suggest that the degree of 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. Moreover, about one third of companies have an internal wage-setting policy linking wages to inflation.

When companies 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 also adopt cost-cutting strategies. The WDN survey reports information about the flexibility resulting from bonuses, wages of the newly hired employees or early retirement. We carry out an econometric analysis based on a quadrivariate probit model. We model determinants of firms' reaction to adverse shock jointly to take into account the fact that decisions have been taken simultaneously. Our estimation results point out features of adjustment. The choice of strategies depends on the degree of competition prevailing on the market where the companies operate. It also depends on the firm's characteristics: firms with high labor share are more likely to adjust prices. Large firms in the service sector are less likely to adjust.

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 Benmarker (2005), Zoega and Karlsson (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 sector⁴ representing approximately 500, 000 employees (see Appendix 1). The survey has

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

been undertaken as part of the Wage Dynamics Network⁵ (WDN). We extend the methodology 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. Section 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 firm⁶ (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

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

⁶This not includes individualized wage increases.

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 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 countries⁸.

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

⁷In 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.

⁸Cross-countries studies exploiting the European harmonized sample are already available: Fabiani et al. (2008) examine linkings between wages and prices decisions, Babecky et al. (2008) assess downward nominal rigidities, Bertola et al. (2008) investigate the wages response to shocks, Galusak et al. (2008) 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 Laffèche, 2007).

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 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 level⁹. Furthermore, the government indirectly intervenes via extension mechanisms of collective agreements (at the request 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. (2007) 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

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

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 year¹⁰ (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 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 frequency¹¹. 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

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

¹¹In 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.

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]

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. (2008), 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-country 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. One¹³ 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., 2008). As argued by Messina et al. (2008), 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

¹²Results 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.

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

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.

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 law¹⁴, employment contracts in France do not have to automatically tie wages to a cost-of-living index with the exception of the minimum wage¹⁵. 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

¹⁴Article 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.

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. 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 mixed 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:

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

$$\begin{aligned} \text{reduce margin } y_2 &= \begin{cases} 1 & \text{if } Z\gamma + \varepsilon_2 > 0 \\ 0 & \text{otherwise} \end{cases} \\ \text{reduce output } y_3 &= \begin{cases} 1 & \text{if } W\theta + \varepsilon_3 > 0 \\ 0 & \text{otherwise} \end{cases} \\ \text{reduce costs } y_4 &= \begin{cases} 1 & \text{if } V\alpha + \varepsilon_4 > 0 \\ 0 & \text{otherwise} \end{cases} \end{aligned}$$

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 $j, k = 1, \dots, 4$. 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 $k = 1, \dots, 4$.

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 conditioned 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, 2008). 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. (2008) 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 cyclicity 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 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 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.

References

- [1] Andersen, T. M. and Toulemonde, E., (2004), "Adapting Prices or Quantities in the Presence of Adjustment Costs?," *Journal of Money, Credit and Banking*, Blackwell Publishing, vol. 36(2), p. 177-96, April.
- [2] Agell J., and Benmarker H., (2005), "Wage incentives and wage rigidity: a representative view from within", *Labour Economics*, vol 14, nr 3, p 347-369.
- [3] Akerlof, G. A., Dickens W. T., and Perry G. L., (1996), "The Macroeconomics of Low Inflation," *Brookings Papers on Economic Activity*, pp. 1-76.
- [4] Altonji P. and Devereux P.(2000), "Is There Nominal Wage Rigidity? Evidence from Panel Data.", *Research in Labor Economics*, Vol 19, Elsevier Science Inc. : 383-431.
- [5] Amirault, D., P. Fenton and T. Laffèche (2007), "A Canadian Wage Setting Survey", slides
- [6] Ariga, K. and R. Kambayashi (2008), "Pricing Strategy and Wage-Employment. Adjustments in Japan: A Preliminary Analysis", slides.
- [7] Avouyi-Dovi S., Fougère D. and Gautier E. (2007), "Collective bargaining and firm-level agreements in France : how do they affect wage dynamics", Mimeo, Banque de France.
- [8] Babecký J., Du Caju Ph., Kosma D., Lawless M., Messina J. and Rõõm T. (2008), "Downward Wage Rigidity and Alternative Margins of Adjustment. Survey Evidence from 15 EU Countries", Mimeo, European Central Bank.
- [9] Beaudry P. and DiNardo, J. E. (1991), "Implicit Contracts and the Movement of Wages over the Business Cycle," *Journal of Political Economy*, August 1991.
- [10] Bertola G., Dabusinskas A., Hoerberichts M., Izquierdo M, Kwapil C., Montornès J. and Radowski D. (2008), "Wage and employment response to shocks: Evidence from the WDN Survey", Mimeo, European Central Bank.
- [11] Bewley, T. F., (1999) *Why Wages Don't Fall During A Recession*, Cambridge, Mass.: Harvard University Press.

- [12] Bilal M. J., 1985. "Real Wages over the Business Cycle: Evidence from Panel Data," *Journal of Political Economy*, University of Chicago Press, vol. 93(4), pages 666-89, August.
- [13] Bircou P., Dessy O. and Fourcade N. (2005), *Les salaires sont-ils rigides? Le cas de la France à la fin des années 1990* », *Economie and Statistique*, 386.
- [14] Blinder A., and Choi Don H., (1990), "A Shred of Evidence on Theories of Wage Stickiness", *The Quarterly Journal of Economics*, 105, 1003–15.
- [15] Blinder, A., Canetti E., Lebow D. and Rudd J. (1998), *Asking about prices: a new approach to understand price stickiness*", New York, Russel Sage Foundation.
- [16] Cahuc, P. and Zylberberg A., (2004), *Labour economics*, MIT Press, 872 p.
- [17] Campbell, C. M., and . Kamlani, K. S (1997), "The Reasons for Wage Rigidity: Evidence from a Survey of Firms," *The Quarterly Journal of Economics*, 3, 759 -89.
- [18] Card, D., and D. Hyslop, (1997), "Does Inflation "Grease the Wheels of the Labor Market"?", " in: Christina D. Romer and David H. Romer, eds., *Reducing Inflation : Motivation and Strategy*, Chicago: The University of Chicago Press, , p. 71-114.
- [19] Cardoso A. R. and Portugal P. (2005), "Contractual Wages and the Wage Cushion under Different Bargaining Settings", *Journal of Labor economics*, Volume 23, Issue 4
- [20] Carneiro A. and Portugal P. (2008), "Workers' Flows and Real Wage Cyclicalilty", Mimeo, European Central Bank.
- [21] Christiano L. J., M. Eichenbaum, and C. Evans (2005), "Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy", *Journal of Political Economy*, 113(1), 1-45.
- [22] Dickens, W., L. Goette, E.L. Goshen, S. Holden, J. Messina, M.E. Schweitzer, J.Turunen, and M. Ward (2007), *How Wages Change: Micro Evidence from the International Wage Flexibility Project*", *Journal of Economic Perspectives*, 21(2), 195–214.

- [23] Druant M., Fabiani S., Kezdi G., Lamo A., Martins F. and Sabbatini R. (2008), "How are firms' wages and prices linked: survey evidence in Europe?", Mimeo, European Central Bank.
- [24] Druant M., Du Caju Ph. and Delhez Ph.(2008), "Results of the Bank's survey of wage-setting in Belgian firms", Monthly Bulletin september 2008, National Bank of Belgium.
- [25] Du Caju Ph., Gautier E., Momferatou D., and Ward-Warmedinger M. (2008), Institutional features of wage bargaining in 22 EU countries, the US and Japan", Working paper n°974, European Central Bank.
- [26] Fagan G., Krause M., Lamo, A. Le Bihan H.. and Smets F. (2008), "Progress report of the Wage Dynamics Network", Mimeo, European Central Bank.
- [27] Fehr E. and Goette L.(2005), "Robustness and real consequences of nominal wage rigidity", Journal of Monetary Economics, 52 (4), 779-804.
- [28] Franz, W. and Pfeiffer F. (2006), Reasons for Wage Rigidity in Germany, LABOUR - Review of Labour Economics and Industrial Relations, 20 (2), 255-284.
- [29] Galuscak K., Murphy A., Nicolitsas D., Smets F., Strzelecki P. and Vodopivec M., (2008), The determination of wages of newly hired employees: Survey evidence on internal versus external factors", Mimeo, European Central Bank.
- [30] Gottschalk P. (2005), "Downward Nominal Wage Flexibility: Real or Measurement Error?" The Review of Economics and Statistics, 87(3), 556-568.
- [31] Heckel T., Le Bihan H., and Montornès J., (2008), Sticky Wages. Evidence from Quarterly Microeconomic Data", Note d'Etude and de Recherche, N° 208 Banque de France.
- [32] Kramarz F., (2001), 'Rigid Wages: What Have we Learnt from Microeconometric Studies', in Advances in Macroeconomic Theory, J. Drèze ed., 194-216, Oxford University Press, Oxford, UK.

- [33] Koubi M. and Lhommeau B. (2006), « La revalorisation du smic et ses effets de diffusion dans l'échelle des salaires sur la période 2000-2005 », Dares, Premiers synthèses.
- [34] Lebow D.E., Saks R. E. and Wilson B.A., (2003), "Downward Nominal Wage Rigidity : Evidence from the Employment Cost Index" – Advances in Macroeconomics – Vol. 3, Issue 1, Article 2.
- [35] Loupias C. and Ricart R. (2006), Price setting in France: new evidence from survey data", Revue d'Economie Politique, Vol. 116, N^o. 4, p. 541-554.
- [36] Loupias C. and Sevestre P. (2008), Costs, demand and producer price changes, Mimeo, Banque de France.
- [37] Messina J., Du Caju P., Duarte C., Izquierdo M. and Hansen N. (2008), "The Causes and Consequences of Nominal and Real Wage Rigidity: a Sectoral Approach" Mimeo, European Central Bank.
- [38] Olivei G. and Tenreyro S., (2008), "Wage Setting Patterns and Monetary Policy: International Evidence", mimeo, LSE
- [39] Palenzuela D. R. and Jimeno J. F. (1996), « Wage drift in collective bargaining at the firm level », Annales d'économie et de statistique, N^o 41/42
- [40] Pissarides, C. A. (2009), "The Unemployment Volatility Puzzle: Is Wage Stickiness the Answer?," *Econometrica*, 2009, vol. 77, issue 5, pages 1339-1369
- [41] Peng F. and Siebert W.S. (2007), "Real Wage Cyclicity in Germany and the UK: New Results Using Panel Data", IZA Discussion Papers 2688, Institute for the Study of Labor (IZA).
- [42] Taylor, J. B., (1980), "Aggregate Dynamics and Staggered Contracts", *Journal of Political Economy*, vol. 88 (1), pp. 1-23.
- [43] Tobin, J., (1972), "Inflation and Unemployment", *American Economic Review* 62, p.1-18.

- [44] Zoega G. and Karlsson T. (2005), "Does wage compression explain rigid money wages?"
Economics Letters Volume 93, Issue 1, October 2006, p. 111-115.

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



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.

Questionnaire.....

Page 2 to 7

Methodology.....

Page 8

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 negotiated 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 negotiated wage in the collective agreement ?

Yes

No

6 – If yes in 3b, what is the difference between wage paid in the firm an negotiated 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 automatically linked to:

- past inflation

- expected inflation

Wage changes take into account, 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?

	<i>more than once a year</i>	<i>once a year</i>	<i>once every two years</i>	<i>less frequently than once every two years</i>	<i>never / don't know</i>
Wage changes apart from tenure and inflation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wage changes due to tenure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wage changes due to inflation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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)	<input type="checkbox"/>
Wage of similar employees in the firm	<input type="checkbox"/>
Wage of similar workers outside the firm	<input type="checkbox"/>
Availability of similar workers in the labour market	<input type="checkbox"/>
Other	<input type="checkbox"/>

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	<input type="checkbox"/>
Other costs increased	<input type="checkbox"/>
Jobs were at risk	<input type="checkbox"/>
It was imposed by legislation or higher level collective agreement	<input type="checkbox"/>

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

(please tick a box for each line)

	<i>not relevant</i>	<i>of little relevance</i>	<i>relevant</i>	<i>very relevant</i>	<i>don't know</i>
It is impeded by labour regulation/collective agreements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It would have a negative impact on employees' efforts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It would have a negative impact on employees' morale	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It would have a negative impact on the firm's reputation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It would mean the best employees would leave the firm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3

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

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)	<input type="checkbox"/>
Used early retirement to replace high wage employees by entrants with lower wages	<input type="checkbox"/>
Reduced or eliminated bonus payments	<input type="checkbox"/>
Reduced or eliminated non pay benefits	<input type="checkbox"/>
Slowed or frozen rate at which promotions are filled	<input type="checkbox"/>

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

(please tick a box for each line)

	<i>not relevant</i>	<i>of little relevance</i>	<i>relevant</i>	<i>very relevant</i>	<i>don't know</i>
Increase prices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce margins	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce output	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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	<input type="checkbox"/>
Reduce flexible wage components (for example bonuses, benefits, etc.)	<input type="checkbox"/>
Reduce the number of regular employees	<input type="checkbox"/>
Reduce the number of temporary employees / other type of workers	<input type="checkbox"/>
Adjust the number of hours worked per employee	<input type="checkbox"/>
Reduce non-labour costs	<input type="checkbox"/>

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)

	<i>not relevant</i>	<i>of little relevance</i>	<i>relevant</i>	<i>very relevant</i>	<i>don't know</i>
Increase prices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce margins	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce output	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce other costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

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)

	<i>not relevant</i>	<i>of little relevance</i>	<i>relevant</i>	<i>very relevant</i>	<i>don't know</i>
Increase prices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce margins	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce output	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce other costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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 draftspeople; 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	Export share	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 drift = "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
By sector				
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
By size				
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 - Adjustment 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

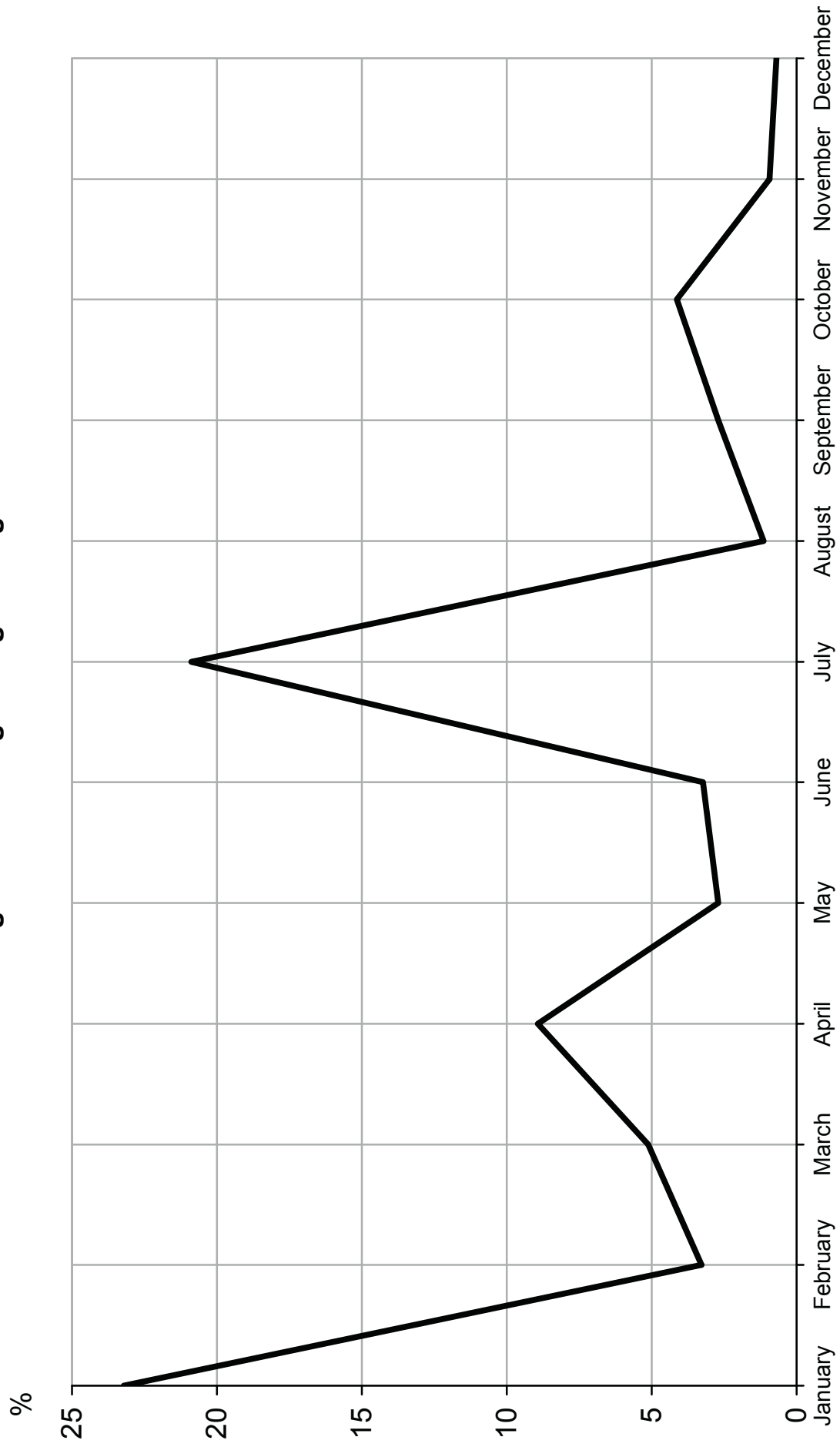
Table 9 - Adjustment in response to a shock
(multivariate probit estimates)

		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



European Central Bank Working Paper Series

For a complete list of Working Papers published by the ECB, please visit the ECB's website (<http://www.ecb.europa.eu>).

- 1066 “Universal banks and corporate control: evidence from the global syndicated loan market” by M. A. Ferreira and P. Matos, July 2009.
- 1067 “The dynamic effects of shocks to wages and prices in the United States and the euro area” by R. Duarte and C. R. Marques, July 2009.
- 1068 “Asset price misalignments and the role of money and credit” by D. Gerdesmeier, H.-E. Reimers and B. Roffia, July 2009.
- 1069 “Housing finance and monetary policy” by A. Calza, T. Monacelli and L. Stracca, July 2009.
- 1070 “Monetary policy committees: meetings and outcomes” by J. M. Berk and B. K. Bierut, July 2009.
- 1071 “Booms and busts in housing markets: determinants and implications” by L. Agnello and L. Schuknecht, July 2009.
- 1072 “How important are common factors in driving non-fuel commodity prices? A dynamic factor analysis” by I. Vansteenkiste, July 2009.
- 1073 “Can non-linear real shocks explain the persistence of PPP exchange rate disequilibria?” by T. Peltonen, M. Sager and A. Popescu, July 2009.
- 1074 “Wages are flexible, aren't they? Evidence from monthly micro wage data” by P. Lünneemann and L. Wintr, July 2009.
- 1075 “Bank risk and monetary policy” by Y. Altunbas, L. Gambacorta and D. Marqués-Ibáñez, July 2009.
- 1076 “Optimal monetary policy in a New Keynesian model with habits in consumption” by C. Leith, I. Moldovan and R. Rossi, July 2009.
- 1077 “The reception of public signals in financial markets – what if central bank communication becomes stale?” by M. Ehrmann and D. Sondermann, August 2009.
- 1078 “On the real effects of private equity investment: evidence from new business creation” by A. Popov and P. Roosenboom, August 2009.
- 1079 “EMU and European government bond market integration” by P. Abad and H. Chuliá, and M. Gómez-Puig, August 2009.
- 1080 “Productivity and job flows: heterogeneity of new hires and continuing jobs in the business cycle” by J. Kilponen and J. Vanhala, August 2009.
- 1081 “Liquidity premia in German government bonds” by J. W. Ejsing and J. Sihvonen, August 2009.
- 1082 “Disagreement among forecasters in G7 countries” by J. Dovern, U. Fritsche and J. Slacalek, August 2009.
- 1083 “Evaluating microfoundations for aggregate price rigidities: evidence from matched firm-level data on product prices and unit labor cost” by M. Carlsson and O. Nordström Skans, August 2009.
- 1084 “How are firms' wages and prices linked: survey evidence in Europe” by M. Druant, S. Fabiani, G. Kezdi, A. Lamo, F. Martins and R. Sabbatini, August 2009.

- I085 “An empirical study on the decoupling movements between corporate bond and CDS spreads” by I. Alexopoulou, M. Andersson and O. M. Georgescu, August 2009.
- I086 “Euro area money demand: empirical evidence on the role of equity and labour markets” by G. J. de Bondt, September 2009.
- I087 “Modelling global trade flows: results from a GVAR model” by M. Bussière, A. Chudik and G. Sestieri, September 2009.
- I088 “Inflation perceptions and expectations in the euro area: the role of news” by C. Badarinta and M. Buchmann, September 2009.
- I089 “The effects of monetary policy on unemployment dynamics under model uncertainty: evidence from the US and the euro area” by C. Altavilla and M. Ciccarelli, September 2009.
- I090 “New Keynesian versus old Keynesian government spending multipliers” by J. F. Cogan, T. Cwik, J. B. Taylor and V. Wieland, September 2009.
- I091 “Money talks” by M. Hoerova, C. Monnet and T. Temzelides, September 2009.
- I092 “Inflation and output volatility under asymmetric incomplete information” by G. Carboni and M. Ellison, September 2009.
- I093 “Determinants of government bond spreads in new EU countries” by I. Alexopoulou, I. Bunda and A. Ferrando, September 2009.
- I094 “Signals from housing and lending booms” by I. Bunda and M. Ca’Zorzi, September 2009.
- I095 “Memories of high inflation” by M. Ehrmann and P. Tzamourani, September 2009.
- I096 “The determinants of bank capital structure” by R. Gropp and F. Heider, September 2009.
- I097 “Monetary and fiscal policy aspects of indirect tax changes in a monetary union” by A. Lipińska and L. von Thadden, October 2009.
- I098 “Gauging the effectiveness of quantitative forward guidance: evidence from three inflation targeters” by M. Andersson and B. Hofmann, October 2009.
- I099 “Public and private sector wages interactions in a general equilibrium model” by G. Fernández de Córdoba, J.J. Pérez and J. L. Torres, October 2009.
- I100 “Weak and strong cross section dependence and estimation of large panels” by A. Chudik, M. Hashem Pesaran and E. Tosetti, October 2009.
- I101 “Fiscal variables and bond spreads – evidence from Eastern European countries and Turkey” by C. Nickel, P. C. Rother and J. C. Rülke, October 2009.
- I102 “Wage-setting behaviour in France: additional evidence from an ad-hoc survey” by J. Montornés and J.-B. Sauner-Leroy, October 2009.

