Lessons of the *Wage Dynamics Network*

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Introduction

The European System of Central Banks (ESCB) sets up temporary networks bringing together researchers from the European Central Bank (ECB) and the national central banks (NCBs) to gain a better understanding of economic mechanisms. The *Wage Dynamics Network* (WDN), active from February 2006 to the end of 2009, was asked to identify the causes and characteristics of wage dynamics relevant to monetary policy and to clarify the link between wages, labour costs and prices at both micro- and macro-economic level. More specifically, the network aimed to answer the following questions: how are wages, labour costs and their components adjusted throughout the business cycle and in response to shocks? Are there any sectoral or regional differences? How often are wages adjusted? Is wage rigidity nominal or real, symmetrical or asymmetrical? What are the causes of wage or labour cost rigidity? How do adjustments to workers' wages affect marginal costs and business decisions on output and prices? How is wage and labour cost rigidity reflected in price rigidity and inflation persistence? What are the factors – such as wage-setting institutions, competition on product markets, and globalisation – which determine the scale and speed of the transmission of labour costs to output and prices?

To answer these questions, the WDN researchers were divided into four groups. The micro group conducted an econometric analysis of wage rigidity and the behaviour of firms on the basis of micro-economic data. The macro group introduced the concept of wage rigidity into macro-econometric models with frictional unemployment. The survey group polled more than 15,000 firms in sixteen European countries. Finally, the meta group coordinated the whole project and aimed to present general conclusions and economic policy recommendations. Altogether, more than 70 researchers, employees of the 25 European NCBs or the ECB and external consultants, took part in the WDN.

The researchers tapped many sources of information, some of which had never been analysed before. The usual macro-economic time series were used for the analyses and the application of macro-economic models. The researchers gathered institutional data specific to the various countries from the labour market specialists of the NCBs. In addition, they relied heavily on micro-economic or individual data obtained from employers or workers. Those data include the annual accounts of firms and their social balance sheets, if available, plus social security administrative data relating to each worker, and existing surveys such as the *Structure of Earnings Survey* (SES), which looks at the structure and breakdown of wages. These micro-economic data are only available for a small number of countries, and do not always permit a perfect international comparison. To supplement the available statistics, the WDN decided to conduct an *ad hoc* wage setting survey covering over 15,000 firms in the period 2007-2008. The largely harmonised results were published in time for sixteen European countries, including eleven euro area members. The questionnaire for Germany was not sufficiently similar to the common model to be used for comparative studies. In order to

assess the labour market's response to the economic and financial crisis, a new questionnaire was sent to the same sample of firms in ten countries during the summer of 2009, but not all replied. The composition of the sample used for the international analysis is presented in Annex 1.
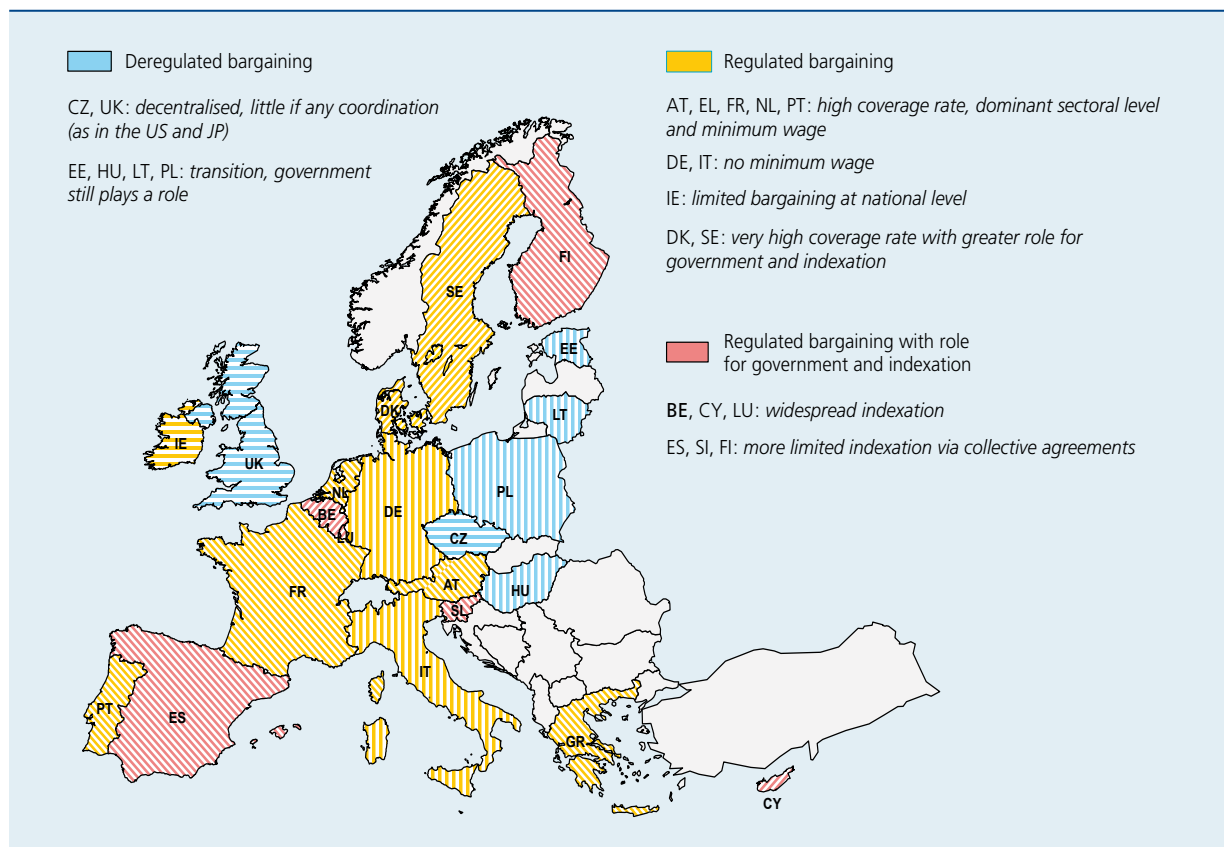
This article aims to give an overview of the main results of the WDN's work and the principal implications for monetary policy. It starts by examining the wage-setting institutions in Europe, and the structure of wages in a number of countries for which data are available, before analysing the network's main micro-economic findings: those relate to the frequency and timing of wage adjustments, the link between wages and prices, indexation mechanisms, wages of both new and experienced employees, and downward wage rigidity. It then examines the implications of these findings at macro-economic level and in terms of monetary policy. The last section focuses on the response of firms to shocks in general and to the crisis in particular. A conclusion follows.

1. Wage-setting institutions and the structure of wages

1.1 Wage-setting institutions

The countries which joined the economic and monetary union no longer have an independent monetary policy or a national exchange rate instrument, and their fiscal policy is subject to the stability pact rules. Consequently, many of the macro-economic adjustments have to be made via the labour market. Institutions play a key role in the way in which wages and employment respond to economic developments. They are therefore a vital feature of the network's conclusions. As an example, a number of the studies examined below highlight the importance of indexation mechanisms and collective agreements, whether concluded within the firm or at a higher level (sectoral, regional or national). The heterogeneous nature of the institutions is therefore a challenge for the common monetary policy, and that challenge will increase when new countries with a different institutional set-up join the monetary union.

CHART 1   HETEROGENEITY OF WAGE-SETTING INSTITUTIONS IN EUROPE

Deregulated bargaining

CZ, UK: *decentralised, little if any coordination (as in the US and JP)*

EE, HU, LT, PL: *transition, government still plays a role*

Regulated bargaining

AT, EL, FR, NL, PT: *high coverage rate, dominant sectoral level and minimum wage*

DE, IT: *no minimum wage*

IE: *limited bargaining at national level*

DK, SE: *very high coverage rate with greater role for government and indexation*

Regulated bargaining with role for government and indexation

BE, CY, LU: *widespread indexation*

ES, SI, FI: *more limited indexation via collective agreements*

Source : Du Caju et al. (2008).

The WDN sent out a questionnaire on the institutions to the national experts of all the participating European countries plus the United States and Japan. It aimed to gather information on the general institutional characteristics of wage setting in the countries concerned.

This information shows that Europe comprises a mosaic of wage-setting institutions (Du Caju et al., 2008). It is nevertheless possible to group together the countries with a comparable combination of institutions. The first group, which comprises the euro area countries which took part in the survey, has a system of regulated wage bargaining. In other words, the negotiations are subject to rules laid down by the government, by legislation, or by binding agreements. There are nonetheless some differences between the countries in this group. A central group consisting of Austria, France, Greece, the Netherlands and Portugal, applies extension mechanisms – collective agreements are extended to workers and/or firms not involved in the negotiations – and therefore has high coverage rates for the collective agreements, a wage-setting system dominated by the sectoral level and minimum wages. Several countries differ somewhat from this central group. Thus, in Germany and Italy, there is no national minimum wage. Ireland has little bargaining at national level. Denmark and Sweden have higher rates of union membership and coverage. In a sub-group of countries, the government plays a bigger role as a third party or intermediary facilitating the negotiations, and indexation is also more important. Yet there are some divergences within this sub-group. Belgium, Cyprus and Luxembourg apply a system of direct indexation, regulated at national level, while in Spain, Slovenia and Finland the more limited indexation forms the subject of collective agreements. A second group of countries features bargaining with few regulations. The core group here comprises the Czech Republic and the United Kingdom, where bargaining is decentralised and uncoordinated. [1] Since their transition to a market economy, Estonia, Hungary, Lithuania and Poland have introduced radical reforms, although the government still plays a role.

In most countries, the institutions have remained fairly stable over the past two decades, though collective agreements at firm level have gained in importance. They make it easier to align wages with the micro-economic situation.

[1] The United States and Japan are also in this group.

1.2 Wage structure

The Bank's WDN team used the Structure of Earnings Survey conducted by the Directorate General of Statistics and Economic Information (DGSEI) for the purpose of analysing wage differentials between sectors (Du Caju, Rycx and Tojerow, 2011). That survey is based on data relating to around 100,000 workers in Belgium. It revealed that wages vary according to the characteristics of the workers, their job and their employer, namely age, sex, education, occupation, seniority, type of contract, working time and size of firm. Thus, all other things being equal, the highest wages are paid to the oldest workers, men, the most highly skilled, workers in certain occupations (managers, etc.), the most senior workers, full-time workers, employees on permanent contracts and staff of large firms.

The study draws attention to the existence of significant pay differentials between sectors, even after allowing for the effects of the individual characteristics listed above. In fact, pay differentials between sectors are due partly to employment composition and to the characteristics of the jobs and the firms. Thus, some sectors (such as financial services) have a relatively high proportion of highly skilled workers or bigger firms. Adjusted pay differentials are calculated in order to neutralise the influence of these characteristics. The adjusted pay differentials are clearly less marked, although they are still significant overall. The sectors which pay the highest wages are traditionally the oil industry, the chemical industry, the energy sector and financial services. Lower wages are found in the textile and leather sectors, in retailing, and in the hotel and catering trade. The persistence of these pay differentials shows that non-competitive forces are at work on the labour market.

Rent sharing is one of the factors most frequently mentioned. Using the Belgian data, it is possible to include corporate profits (gross operating surplus per worker) in the analysis as well as the individual characteristics. The results show that the workers' individual wages are undeniably influenced by the profitability of the employer firm, even after adjustment for the influence of the other characteristics relating to the worker or the firm. The dispersion of the adjusted pay differentials in Belgium is about one-third lower if the firms' profits are taken into account. That is irrefutable evidence that a substantial proportion of the pay differentials between sectors is due to rent sharing.

Between 1999 and 2005 there was no sign of any upward or downward trend in the dispersion of pay differentials between sectors. Conversely, pay differentials between sectors are larger during an economic boom. Later we

CHART 2

DISPERSION OF PAY DIFFERENTIALS BETWEEN
SECTORS IN 2002

(standard deviation of differentials between sectoral wages
and the national average)
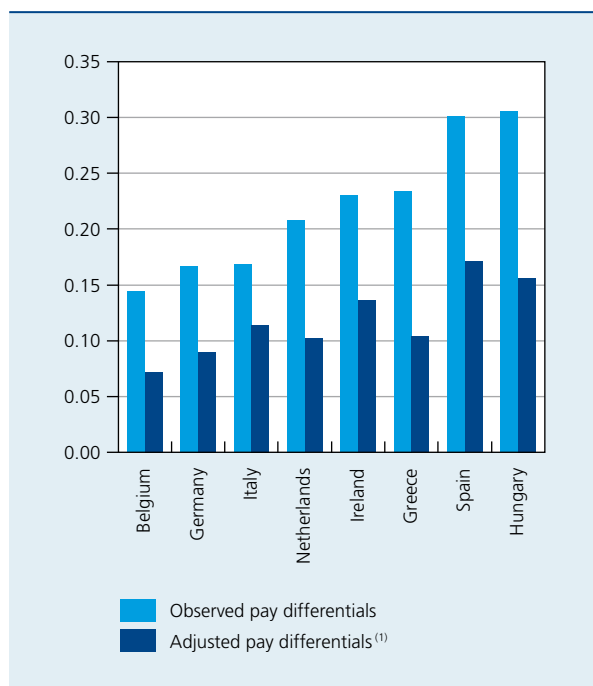
Source : Du Caju et al. (2010b).
(1) Adjusted for the influence of age, sex, education, occupation, seniority,
employment contract, working time and size of firm.

shall see that the existence of downward rigidity implies that wages are not adjusted downwards during periods of weak economic activity, whereas it is easier to increase them during favourable periods.

A more detailed analysis of the situation in Belgium showed that pay differentials between sectors were attributable partly to the competition which firms encounter on their main markets. Wages are lower in the sectors where competition is keenest, especially if the competitors are based in countries with relatively low income (Du Caju et al., 2010a).

For the purpose of making an international comparison, the WDN experts also have individual wage data from the *Structure of Earnings Survey* covering seven other countries, namely Germany, Greece, Hungary, Ireland, Italy, the Netherlands and Spain. Pay differentials between sectors were examined on the basis of that information (cf. Du Caju et al., 2010b).

The hierarchy of the sectors according to the level of wages paid is comparable in all the countries examined. The standard deviation of these (adjusted) pay differentials, which provides an indication of the dispersion

of wages between sectors, or pay inequality, looks relatively small in Belgium and Germany (2002 statistics). In contrast, it is fairly large in Hungary, Ireland and Spain, countries where wage setting is less coordinated.

Since the individual characteristics of the workers, their occupation or their employer, cannot explain the whole of the pay differentials between sectors, the researchers looked for variables specific to the sectors and linked to the level of wages. The pay differentials obtained for these eight countries were therefore combined with sectoral information relating to competition and performance. It appears that, after neutralisation of the influence of individual characteristics, wages are highest in sectors where competition is weakest – notably the energy sector – and those where firms achieve better results and are, in other words, more profitable, such as the oil industry. That finding confirms the existence of non-competitive forces at work on the labour market, implying that workers may be paid higher wages by firms which have market power.
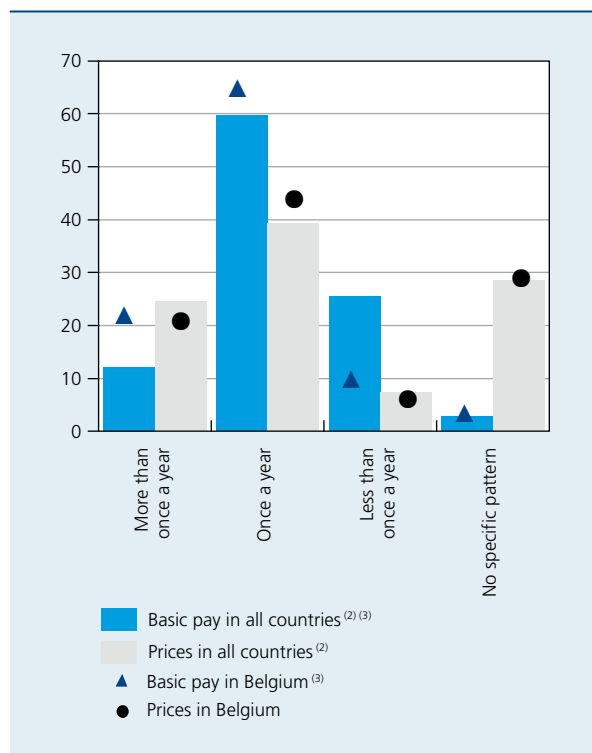
2. Wage and price adjustments

In order to analyse wage dynamics it is essential to obtain an idea of wage rigidity. Moreover, one of the conclusions of the ESCB's previous research network, namely the *Inflation Persistence Network* (IPN), was that sectors and products are decidedly heterogeneous in regard to price rigidity (Altissimo et al., 2006), one reason being the cost structure at the level of the sectors and firms. The IPN showed that prices were adjusted less frequently in sectors where labour costs represented a large percentage of the total cost, such as the service sector. These findings suggested the existence of a link between price and wage rigidity, and more particularly that the observed price rigidity reflected inertia in wage adjustments. The WDN therefore devoted much attention to analysing price and wage rigidity. It developed a number of measures for that purpose : this section discusses the frequency and timing of adjustments. The third section presents the criteria of nominal and real downward wage rigidity.

2.1 Frequency of wage and price adjustments

The frequency of wage and price adjustments is a criterion of rigidity/flexibility. We find that wages do not change frequently, generally only once a year (Druant et al., 2009). On average, of more than 15,000 European firms polled, 60 p.c. adjust wages annually. A quarter of firms do so less often, while 12 p.c. adjust wages more than once a year. Prices are adjusted more frequently : only 40 p.c. of firms make annual changes, and barely 7 p.c.

Basic pay in all countries[2][3]

Prices in all countries[2]

Basic pay in Belgium[3]

Prices in Belgium

Source : Druant et al. (2009).
(1) Results weighted on the basis of employment and scaled by omitting missing replies.
(2) AT, BE, CZ, EE, EL, ES, FR, HU, IE, IT, LT, NL, PL, PT, SI.
(3) Basic pay is equal to fixed salary excluding bonuses.

adjust prices even less often. In terms of implicit duration, that means that wages remain unchanged for 15 months on average, while the average interval between two successive price changes is 9.6 months.

In Belgium, prices are adjusted at a frequency similar to the average for all firms polled, but wages are adjusted more often. In fact, the average frequency is 12.6 months for wages in Belgium while the interval between two price adjustments is 9.9 months. The higher frequency of wage adjustments in Belgium is due to the indexation system, namely the fact that wages are automatically linked to the movement in the health index. Indexation is a key factor leading to regular wage adjustments, but – as will become apparent later – it is not an sign of wage flexibility; rather the reverse. That also points to defects in the use of adjustment frequency measures. Other rigidity/flexibility criteria will be discussed later in the article.

Apart from indexation, other labour market institutions explain some of the differences between countries in terms of wage adjustment frequency. Wages are adjusted

more often in firms concluding a collective wage agreement at the level of the firm; conversely, a high coverage rate for collective wage agreements (taking all levels together) and strict employment protection legislation (or EPL) produce the opposite effect. These factors lie behind the considerable heterogeneity between countries in regard to wage adjustments. It is nevertheless noteworthy that no major differences are apparent between the group of euro area countries and the group of countries not belonging to that area, despite the substantial differences between those groups of countries in terms of labour market institutions.

2.2 Timing of wage and price adjustments

Apart from data on adjustment frequencies, the WDN supplies information on the way in which prices and wages react to new circumstances. Thus, it analysed the timing of wage and price adjustments, and more particularly their concentration in certain months. The literature on the subject distinguishes between time-dependent strategies and state-dependent strategies. If the method of setting prices and wages is time-dependent, the adjustment moment is exogenous: it does not depend on the economic situation. If the method of setting prices and wages is state-dependent, then economic conditions do determine the timing of the adjustment. It is important for monetary policy to know which of these strategies lies behind the wage or price policy of firms. In a state-dependent context, prices and wages will react immediately to shocks which are (sufficiently) large, whereas in a time-dependent context firms will still wait until the predetermined time, even in the event of major shocks, and will therefore display more rigid behaviour.

The WDN study provides clear indications that wage adjustments are time-dependent (Druant et al., 2009): 53 p.c. of firms adjust wages in a specific month, while 34 p.c. do so in the case of price adjustments. These time-dependent wage adjustments are more common in euro area countries, where this is the strategy adopted by 61 p.c. of firms. The same percentage was recorded for Belgium (Druant et al., 2008). That finding reflects the great importance of collective wage agreements in the euro area.

Almost 30 p.c. of time-dependent wage adjustments are made in January, and that January-effect is found in all countries. Moreover, price and wage adjustments are synchronised to some extent: in both cases, there is a peak in January. A quarter of Belgian firms adjust wages during that month. In some countries, firms also mention another month in which wage adjustments are concentrated, such

as July in Belgium (12 p.c.) and in France (26 p.c.). This pattern of wage adjustments is attributable to the fact that collective wage agreements generally take effect at the same time, and to wage indexation. For instance, in France minimum wages are indexed in July, triggering the adjustment of other wages. In Belgium, the wages of almost 60 p.c. of workers are indexed at fixed intervals. The commonest frequency is one year – which accounts for the January peak – but half-yearly indexation is also common – hence another peak in July – and so is quarterly indexation, producing additional smaller peaks in April and October.

2.3 Link between wage and price adjustments

In analysing the link between wages and prices, the WDN did not only examine the timing of the adjustments but also considered whether wages are reflected in prices, and whether that is significant.

The survey contained a question on firms' response to a widespread and unexpected increase in labour costs. Almost 60 p.c. of firms would react to such a shock by increasing prices (ECB, 2009). A similar proportion of firms would cut their costs, while a smaller percentage would reduce their margins or cut production. Belgian firms' behaviour is largely in line with these findings: cost reduction is the commonest strategy (67 p.c.), even though 60 p.c. of participants mention price adjustments (Druant et al., 2008). As is the case, on average, for all countries, half of the Belgian firms polled reduce their margins, whereas barely one-tenth cut production.

It is mainly in firms where labour costs represent a high percentage of total costs that wages have a big impact on prices. The factors which moderate the transmission

TABLE 1   REACTION TO A PERMANENT RISE
IN LABOUR COSTS[1]

(firms replying "important" or "very important",
as a percentage of the total)

	All countries[2]	Belgium
Reduce costs	59.0	66.9
Increase prices	59.2	62.2
Reduce margins	49.8	50.0
Cut production	22.5	11.5

Sources: Druant et al. (2008), ECB (2009).
(1) Results weighted on the basis of employment and scaled by omitting the missing replies.
(2) AT, BE, CZ, EE, EL, ES, FR, HU, IE, IT, LT, NL, PL, PT, SI.

are fierce competition, a high percentage of exports, and the firm's size. Firms facing stiff competition or obtaining a large proportion of their turnover from exports, and therefore active on a competitive foreign market, are less inclined to adjust prices if a shock affects their labour costs. In fact, both a price cut or a price rise could be detrimental to their profitability, the first on account of the pressure which it would place on profit margins, and the second in view of the fall in turnover. Firms with a large workforce have other ways of adapting, e.g. by cutting the volume of labour or reducing costs other than labour costs.

The evidence obtained from the survey results are more difficult to reproduce on the basis of a micro-economic analysis. The elasticity of prices and wages seems to be fairly low, and the transmission of intermediate input prices outstrips that of wages.

2.4 Indexation of wages in line with inflation

Examination of the link between wages and prices automatically raises the question of the extent to which inflation determines wages. The definition of the concept of wage indexation, and hence how to measure it, was hotly debated by the network, because the absence of any formal wage indexation mechanism does not mean that wage policy takes no account of inflation.

Two studies conducted by the WDN, namely the survey on wage setting by firms (Druant et al., 2009) and the survey of the institutional characteristics of wage bargaining mechanisms (Du Caju et al., 2008), make this clear.

The survey contained a question asking whether the firms have a wage policy whereby inflation determines adjustments to basic pay. There could be either a formal automatic link or a policy which takes informal account of the rise in consumer prices.

An automatic link is fairly unusual in Europe. It operates in Belgium, where it is applied by 98 p.c. of firms, and in Luxembourg, Spain and Cyprus. [1] In the other countries, whether or not they belong to the euro area, inflation is generally taken into account informally during wage bargaining. On average, the internal wage policy of one-third of firms consists in adjusting basic wages in line with inflation. That is true for both the group of countries in the euro area and those outside it.

(1) Cyprus is not included in the table because the survey was conducted later and the data are not entirely comparable.

TABLE 2 FIRMS WHICH PURSUE A POLICY OF ADJUSTING BASIC PAY IN LINE WITH INFLATION[1]

(percentage of the total number of firms)

	Automatic link	No formal rule, but inflation is taken into account	Total[2]
All countries[3]	17.5	19.9	36.3
Euro area countries[4]	20.8	16.0	35.7
Belgium, Luxembourg and Spain	66.6	11.5	78.1
Other countries	8.2	17.1	23.9
Countries outside the euro area[5]	8.7	30.0	38.1

Source: Druant et al. (2009).
(1) Results weighted on the basis of employment and scaled by omitting missing replies. Basic pay is equal to fixed salary without bonuses.
(2) As some firms use various methods of adjustment in line with inflation, the total does not necessarily equal the sum of the two methods.
(3) AT, BE, CZ, EE, EL, ES, FR, HU, IE, IT, LT, LU, NL, PL, PT, SI.
(4) AT, BE, EL, ES, FR, IE, IT, LU, NL, PT, SI.
(5) CZ, EE, HU, LT, PL.

That percentage may underestimate the influence of price movements on wage setting. The results of the study of the institutional characteristics of wage bargaining mechanisms in fact show that inflation plays a key role in wage bargaining in all the countries considered. Productivity, competitiveness, taxation and parafiscal levies are also explicitly mentioned, though to a lesser extent.

3. Nominal and real downward rigidity

The above results concerning the frequency of adjustments to prices and nominal wages suggest that, in the short term, price rigidity combined with nominal wage rigidity leads to real wage rigidity. Given the importance of wage rigidity for the dynamics of employment and inflation, and for monetary policy, the WDN conducted supplementary studies. These provided alternative measures of wage rigidity and an analysis of its causes.

3.1 Wage rigidity affects existing employees ...

The first WDN survey of firms, conducted in 2007, reveals strong resistance to reductions in the wages of existing employees (Babecký et al., 2009a). The resistance to wage reductions may be reflected in a wage freeze. In fact, only 2.6 p.c. of firms introduced wage cuts in the five years preceding the survey, and 9 p.c. of firms applied a nominal wage freeze.

The survey also asked firms what causes them not to reduce wages when the economic situation requires (Babecký et al., 2009c). It seems that the main reasons are the potential impact on the workers' morale, their effort, and hence their productivity, and fears that some of them may leave the firm. Almost nine out of ten firms consider these factors to be important or very important. The same factors recur in similar surveys conducted in the United States (Bewley, 1999). These findings leave little scope for structural reforms designed to increase downward wage flexibility. Yet it should be noted that, in European countries, a third reason mentioned by firms concerns institutional restrictions resulting from collective agreements or the existence of specific wage regulations. For example, in Portugal the law prohibits reductions in nominal wages.

The results of the follow-up survey indicate that the percentage of firms cutting wages increased only slightly, from 2.6 to 3.2 p.c., during the economic and financial

CHART 4 FIRMS REPORTING A BASIC PAY CUT OR PAY FREEZE[1]

(percentages of the total number of firms[2])
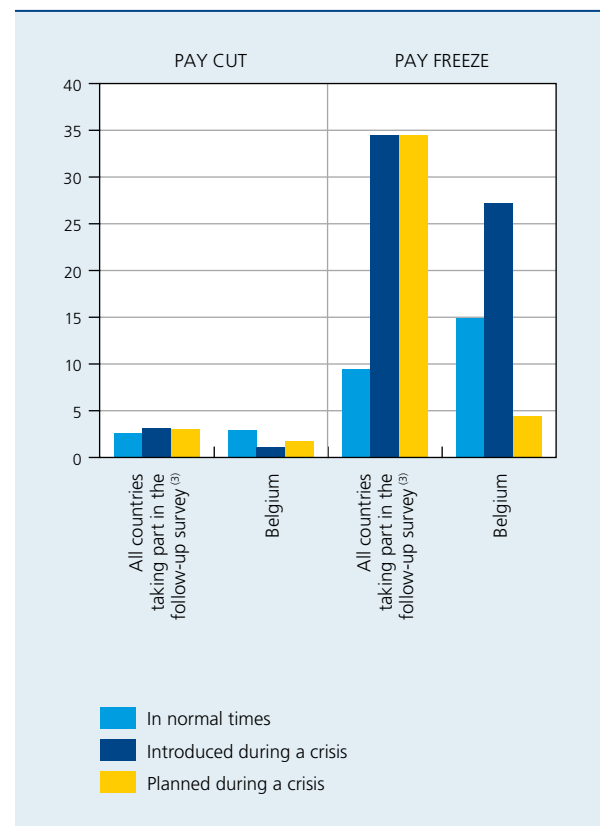
Sources: WDN, NBB.
(1) Results weighted on the basis of employment and scaled by omitting missing replies. Basic pay is equal to fixed salary without bonuses.
(2) The same sample of firms was used for both surveys.
(3) AT, BE, CZ, EE, ES, FR, IT, LU, NL, PL.

crisis. That is borne out by the macro-economic statistics, which indicate that there was little change in nominal wages. In contrast, the percentage of firms stating that they had imposed a wage freeze went up from 9 to 35 p.c. Moreover, 35 p.c. of firms stated that they intended to freeze wages in the future. These trends are also evident in Belgium although the increase in the wage freeze is weaker there. The percentage of Belgian firms reporting a wage freeze was almost twice as high during a crisis (27 p.c.), compared to a normal situation (15 p.c.), whereas the figure tripled for countries as a whole. In contrast to other countries, only a small percentage of Belgian firms stated that they intended to freeze wages in the future.

3.2 … but also new recruits

Economic theory clearly states that corporate profit optimisation depends on the marginal cost, which in turn depends on the newly recruited worker. Moreover, most research work on this subject has shown that, in normal times and in the absence of any specific measures[1], labour adjustments tend to be made more by varying employment than by changing the number of hours worked per person. In this context, wages of new recruits become one of the determinants for hiring staff. Lastly, since incumbent workers' wages have a strong downward rigidity, those of newly recruited workers could play a major role in wage flexibility. However, macro-economic estimates indicate that wage rigidity in the case of new recruits is broadly similar to that for existing employees. Estimates based on micro-economic wage data do not so far allow an unequivocal conclusion, and cover only a small number of countries[2].

The WDN survey examined the strategies which firms use to cut their labour costs, and the factors determining the wages of new recruits. It emerges that if firms can take on cheaper workers to replace employees leaving voluntarily or retiring, that is mainly because of a labour force composition effect, e.g. where older employees are replaced by younger staff. This strategy is common in Belgium, as it is in France and Italy, combined with the use of early retirement. It is more often adopted by large firms and those facing strong competition (Babecký et al., 2009b).

Conversely, in the majority of cases, new recruits are paid according to the same pay scale as the firm's existing employees with the same level of experience, or in accordance with collective agreements.[3] In fact, fewer than 15 p.c. of firms in the euro area and 36 p.c. of firms in countries outside the euro area would pay new recruits less than the wages of existing employees with a comparable level of experience (Galuscak et al., 2010).

The main reason,[4] mentioned by over 80 p.c. of firms, for not deviating from their internal pay scale when taking on new staff concerns considerations of fairness and the potential negative impact of such a move on the employees' morale and effort.

3.3 Heterogeneity of downward wage rigidity

The above findings reveal some resistance to nominal wage reductions. However, a distinction must be made between nominal and real wage rigidity. One of the factors restricting the scope for varying real wages concerns wage indexation: in the absence of indexation, nominal wage rigidity leads to real wages being adjusted in the opposite direction from prices.

Two types of measures were used to assess the degree of downward wage rigidity. The first is based on individual wage data (Du Caju et al., 2007, 2009; and Messina et al., 2009). It defines downward nominal wage rigidity (DNWR) as the percentage of workers whose nominal wages do not decline, whereas they would have been reduced in the absence of rigidity. This constraint leads to the freezing of many workers' nominal wages. Downward real wage rigidity (DRWR) is defined as the percentage of workers whose wages at least keep pace with the reference inflation rate, whereas they would have been reduced in the absence of rigidity.

The second measure of wage rigidity is based on the results of the survey of firms (Babecký et al., 2009a). Downward nominal wage rigidity is measured by the percentage of firms which froze wages during the five years preceding the survey. Real wage rigidity is measured by the percentage of firms reporting a significant link between wage adjustments and inflation. There is a positive correlation between the measures based on the survey and those based on individual wage data, although they are difficult to compare.

Overall, the results indicate that the dominant type of wage rigidity in Europe is real rigidity. On average, 17 p.c. of firms are subject to DRWR, compared to 10 p.c. for DNWR. The euro area countries exhibit greater real rigidity

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(1) The specific working time reduction measures taken during the economic recession are discussed in section 5.2.
(2) Two WDN studies examine these questions (Carneiro et al., 2009; and Carlsson et al., 2009). In Portugal, the results show that the wages of new recruits are twice as sensitive to the national unemployment rate as the wages of existing workers. However, in Portugal as in Sweden, the reaction of wages to productivity is similar, albeit slightly stronger, in the case of new recruits.
(3) In Belgium, 52 p.c. of firms state that the wages of new recruits are set according to the wages of workers at the same level in the firm, and 34 p.c. according to sectoral collective agreements.
(4) On the basis of the survey results for a small number of countries: Germany, Estonia, Greece, Hungary, Italy, Poland, the Czech Republic and Slovenia.

TABLE 3   HETEROGENEITY OF DOWNWARD WAGE RIGIDITY

	DRWR [1]			DNWR [2]		
	Minimum	Average	Maximum	Minimum	Average	Maximum
All countries [3]	1.7 (IT)	17.1	98.2 (BE)	2.4 (ES)	9.6	26.5 (CZ)
Euro area countries [4]	1.7 (IT)	20.6	98.2 (BE)	2.4 (ES)	8.1	23.2 (NL)
Countries outside the euro area [5]	4.4 (EE)	8.5	23.5 (SI)	2.9 (SI)	13.4	26.5 (CZ)
p.m. Belgium		*98.2*			*11.8*	

Source : Babecky et al. (2009a).
(1) DRWR : percentage of firms where the link between wage adjustments and inflation is significant.
(2) DNWR : percentage of firms freezing wages in the past five years.
(3) AT, BE, CZ, EE, EL, ES, FR, HU, IE, IT, LT, NL, PL, PT, SI.
(4) AT, BE, EL, ES, FR, IE, IT, NL, PT, SI.
(5) CZ, EE, HU, LT, PL.

(DRWR) than nominal rigidity (DNWR). Conversely, countries not belonging to the euro area see more DNWR than DRWR.

Real wage rigidity is linked to indexation mechanisms, be they formal mechanisms like those in Belgium, or informal links whereby inflation is taken into account in wage bargaining. Nominal wage rigidity can be attributed to the influence of collective bargaining, plus employment protection. One explanation for this correlation is that workers are less inclined to accept pay concessions when the redundancy situation is more favourable to them, i.e. if there is little fear of job losses.

Overall, the results show that the type of wage rigidity varies significantly, even within the euro area. Nominal rigidity prevails in Austria, Germany, Greece, Italy, the Netherlands and Portugal, whereas real rigidity dominates in Belgium, Finland, Luxembourg Spain and Sweden. Other countries feature a mix of real and nominal rigidity. The heterogeneity of downward wage rigidity between euro area countries has considerable implications for the impact of the common monetary policy on national economies, as will be explained in the next section.

4. Lessons of New-Keynesian models and macro-economic implications

4.1 Presentation of the model

Smets and Wouters (2003, 2007) constructed and estimated a New-Keynesian reference model which combines nominal and real frictions in order to faithfully reproduce the dynamics of seven basic macro-economic series : GDP, consumption, investment, wages, inflation, key interest rate and employment. However, in regard to the WDN's aim, this model suffers from an over-simplistic representation of the labour market. It is a market without friction, and with only voluntary unemployment. De Walque et al. (2010a) developed a variant of this model by combining the model of Smets and Wouters with a labour market featuring frictional unemployment. In this model, firms and workers negotiate nominal wages. However, the wages of existing employees are not renegotiated in each period ; there is only a degree of probability that such negotiations will take place. Similarly, newly recruited workers may either be paid at the wage prevailing in the firm which takes them on, or negotiate their wages with the firm under the prevailing macro-economic conditions. Wages which are not formally negotiated are partially indexed to past inflation. The aggregate real wage is the arithmetical mean of wages in the economy, or in accordance with the above description :

$$w_t = \frac{n_{t-1}}{n_t}(1-\rho)\left[\left(1-\xi_w^o\right) \quad +\xi_w^o w_{t-1}\frac{\pi_{t-1}^\gamma \bar{\pi}^{1-\gamma}}{\pi_t}\right]$$
$$+ \frac{m_t}{n_t}\left[\left(1-\xi_w^n\right)w_t^* +\xi_w^n w_{t-1}\frac{\pi_{t-1}^\gamma \bar{\pi}^{1-\gamma}}{\pi_t}\right] \quad (1)$$

where
– w_t is the aggregate real wage at time t
– n_t is the number of employees and m_t is the number of new recruits
– ρ is the separation rate, [1] assumed to be constant during the year

(1) The separation rate is the average over the estimation period of the flow of persons from an employment situation to an unemployment situation, as a ratio of the number of workers.

- w_t^* is the negotiated wage at time t
- ξ_w^o is the probability that an existing employee's wage will not be renegotiated
- ξ_w^n is the probability that a new recruit's wage will not be negotiated
- π_t is price inflation at time t and $\bar{\pi}$ is long-term price inflation
- γ is the degree of indexation of wages not renegotiated in line with past inflation

Estimation of this model's parameters (de Walque et al., 2010b) for quarterly aggregate data[1] on the euro area yields values in line with the micro-economic studies and surveys conducted by the WDN and described above. Thus:

- each quarter, 36.6 p.c. of wages are renegotiated: that figure implies that negotiated pay reviews take place on average every 4.4 quarters. That is comparable to the 15 month period calculated on the basis of the survey;[2]
- a similar percentage of new employees (37 p.c.) negotiate their wages, which means that if new employees are given the opportunity to negotiate their wages, that is purely because the firm taking them on engages in wage bargaining with all its employees. This confirms that the wages of new recruits are determined by the wages currently prevailing in the firm which takes them on;
- the degree to which non renegotiated wages are indexed to inflation is 0.364, which means that the 36.4 p.c. of firms/workers who do not engage in wage bargaining, nominal wages are adjusted in line with the inflation recorded in the preceding period. That percentage is totally in accordance with the survey findings, which indicated that 36.3 p.c. of firms adjust wages in line with inflation.

4.2 Lessons of the model

As explained at the beginning of section 3 and very clearly illustrated by Knell (2010) with the aid of a theoretical model, real wage rigidity is the outcome of the combination of nominal rigidities on the market in goods and services and on the employment market. Two opposing examples can be used to illustrate this. If wages are renegotiated in each period, they are perfectly flexible and are adjusted to recorded inflation so that real and

nominal wages coincide. If prices are freely adjusted in each period, relative prices are constant in the model so that the concept of inflation disappears, and nominal and real values coincide.

The New-Keynesian Phillips curve formalizes the latter reasoning:

$$\hat{\pi}_t = \beta \cdot E_t \hat{\pi}_{t+1} + \kappa \cdot \hat{x}_t \qquad (2)$$

where
- $\hat{\pi}$ is the deviation of inflation from stationary equilibrium
- β is a discount rate
- E is the expectations operator
- κ is a parameter dependent on the probability of price adjustments
- $\hat{x}$ is the marginal cost expressed as the deviation from the stationary equilibrium

Since wages are an essential component of production costs, it is immediately evident that inflation persistence is attributable partly to nominal price rigidity (κ) and partly to the more or less smooth profile of the reaction of the marginal cost $\hat{x}_t$ to an unexpected shock.

However, the marginal cost, i.e. the cost of producing one additional unit, does not depend on the aggregate labour cost but on the cost of the unit of labour to be taken on in order to make that additional unit. This means that the main explanatory factor for the marginal cost is the wage of the newly recruited workers.

Chart 5 shows for three variables (inflation, real wages and working hours) the percentage change compared to the equilibrium situation following an unexpected 1 percentage point cut in the central bank's key interest rate. The reaction calculated for the estimated model is shown in pale blue, while – for comparison – an economy which is identical to the first except for the degree of flexibility in the wages of new recruits is shown in dark blue. The chart shows these reactions after 1, 2 and 3 years. It is perfectly clear that, although the new recruits represent only a small percentage of the wage bill, the fact that their wages are fixed according to macro-economic conditions (dark blue) or according to the remuneration prevailing in the firm which takes them on (light blue) implies a crucial difference in terms of the volatility of inflation and of real aggregate wages. In the first case (dark blue), new recruits take advantage of the favourable macro-economic conditions generated by the cut in the key interest rate to negotiate higher wages. That has a direct impact on the marginal cost $\hat{x}_t$ and hence on inflation. That inflation is taken into account by the existing workers who have the opportunity to renegotiate their wages. Since the

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proportion of those workers is estimated at around one-third, this has a major impact on aggregate real wages. So in this case, inflation and real wages react strongly but not very persistently. The opposite occurs if new recruits do not negotiate their wages and instead receive wages which were negotiated in the past. It should be noted that the parameter ξ_w^n – probability that the wages of a new recruit will not be negotiated – is essential to reproduce the observed rigidity of real wages and the observed inflation persistence. Conversely, its effect on the volatility of the real sector of the economy is far less significant, as is evident from the smaller difference in the reaction of working hours between the two scenarios.

The indexation of wages to inflation is generally viewed as a key element in real wage rigidity since it prevents inflation from affecting the real remuneration of labour. The effect of indexation can again be seen with the aid of the New-Keynesian model described above. Chart 6 presents the reaction of the same three variables as before to a 1 p.c. fall in productivity[1] if the degree of indexation is as estimated, namely 36.4 p.c. For comparison, an economy in which wages are 100 p.c. indexed to past inflation is shown in dark blue.

(1) This example can be interpreted as an unexpected rise in the costs of intermediate goods required for production (energy, commodities, etc.).

For all types of shocks (supply, demand, monetary policy, etc.) full wage indexation increases both the volatility of inflation and its persistence, by generating what are known as second round effects: the transmission of inflation to wages via indexation affects the marginal cost, which drives up inflation via the New-Keynesian Phillips curve (see equation (2)). For the type of shock considered here, namely a fall in productivity, a shock to which prices and wages react in opposing directions, the strong reaction of inflation caused by stronger indexation prevents the decline of real wages and therefore increases real wage rigidity. By preventing real wages from being adjusted downwards, indexation transfers the adjustment of the economy to its real component, namely employment and working hours.

Other factors relating to labour market institutions play a role in determining real wage rigidity. Thus, when negotiating wages, firms and workers take account of factors which are influenced by the business cycle (labour market tensions, expected inflation, etc.) but also of reserve wages, i.e. the level of wages below which an unemployed person will not accept a job, that remains unchanged overall. Therefore, replacement incomes which are generous in both value and duration increase the workers' reserve wages and limit the change in wages throughout the cycle. Similarly, if the workers have little bargaining power, they will be less able to take advantage of cyclical improvements in the macro-economic situation,
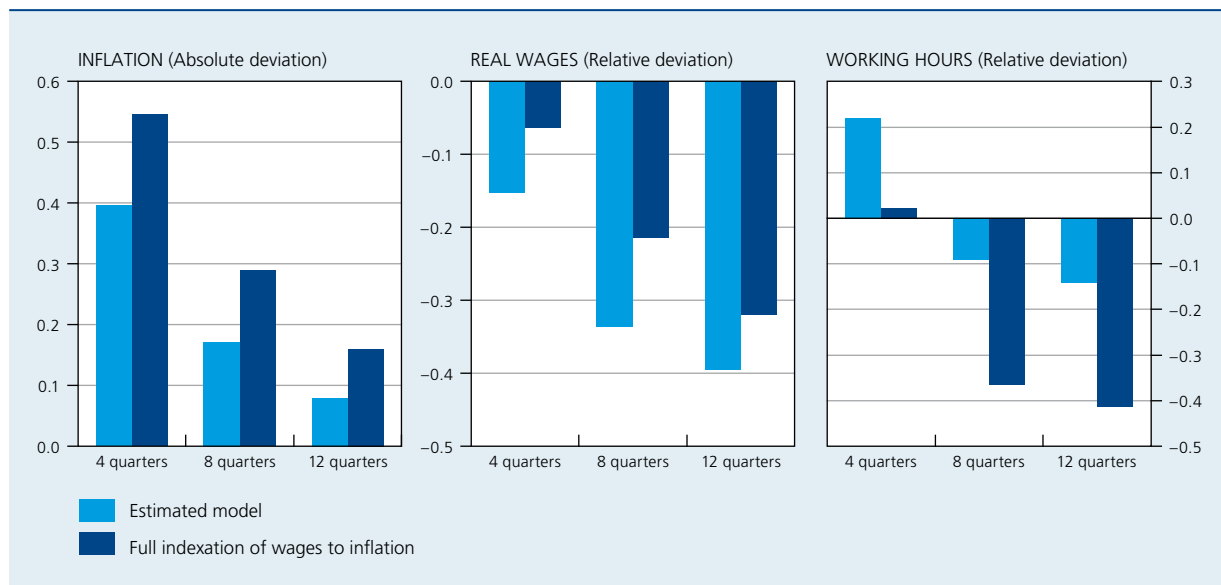
CHART 5 **REACTION TO AN UNEXPECTED 1 PERCENTAGE POINT CUT IN THE CENTRAL BANK'S KEY INTEREST RATE**
(percentage deviation from equilibrium)
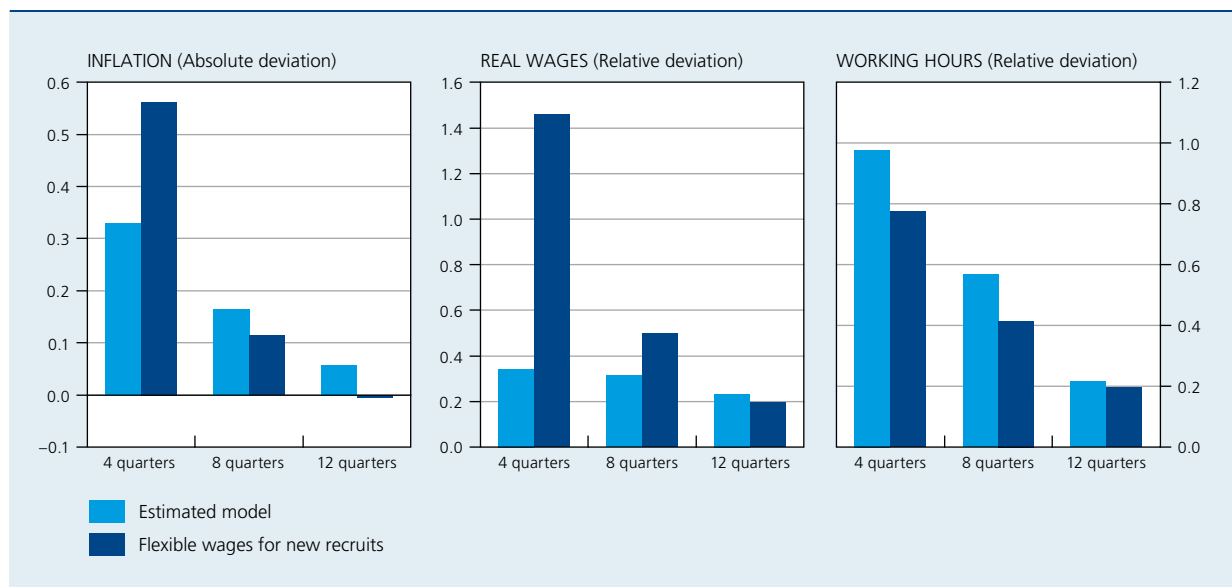
Source : NBB, based on de Walque et al. (2010b).

CHART 6   REACTION TO AN UNEXPECTED 1 P.C. FALL IN PRODUCTIVITY
(percentage deviation from equilibrium)

INFLATION (Absolute deviation)   REAL WAGES (Relative deviation)   WORKING HOURS (Relative deviation)

Estimated model

Full indexation of wages to inflation

Source : NBB, based on de Walque et al. (2010b).

further limiting the pro-cyclicality of wages. The level of worker protection may also influence wage rigidity. By strengthening the workers' bargaining power in times of weak economic activity, it makes them less inclined to accept wage concessions.

4.3 Macro-economic implications

As illustrated by chart 6, real wage rigidity greatly increases the volatility of working hours and heightens inflation persistence. It complicates the conduct of monetary policy by emphasising the choice between employment and price stability. By generating persistent inflation expectations, real wage rigidity increases the cost of fighting inflation in the event of price shocks. That makes it all the more important to ensure firm anchoring of inflation expectations. Moreover, as the ECB's sole objective is price stability, real wage rigidity underlines the need to adopt a medium-term view of that objective in order to avoid excessive volatility of interest rates and of real activity.

Chart 6 illustrates very clearly that in an economy where real wages display strong downward rigidity – e.g. as a result of strong wage indexation in line with inflation – prices react more strongly to a productivity shock. Consequently, in a monetary union, countries with institutions which engender more real

wage rigidity will suffer from a persistent decline in competitiveness in the event of a common shock. That loss of competitiveness will then have an even bigger impact on the real economy in those countries (Fahr and Smets, 2009).

Economists have long argued that price inflation should be slightly positive rather than strictly zero. That is due to the downward rigidity of nominal wages. The purpose of this modest inflation is to greese the wheels of the economy by allowing real wages to be adjusted downwards in the event of a shock, even though nominal wages are rigid. That argument becomes irrelevant in the face of real downward wage rigidity. Clearly, the greater the downward rigidity of real wages, the lower the optimum inflation rate. Fagan and Messina (2009) calculated the optimum inflation rate for economies calibrated in order to represent the labour market characteristics of certain countries. For the United States, the optimum rate was calculated at between 2 p.c. and 5 p.c. according to the data used. Owing to the stronger nominal price rigidity and the significant downward real wage rigidity, the optimum inflation rate for the euro area as a whole is lower than in the United States, at just under 2 p.c., in line with the ECB's inflation target. If the euro area's labour market had the same characteristics as that of Belgium or Finland, that optimum rate would fall to 0 p.c.

5. Reaction to adverse economic shocks

It is clear from the foregoing that the wages of both existing employees and new recruits undergo only minor downward adjustment if the need arises, and that this has serious implications in terms of employment. The WDN examined the reaction of firms to adverse economic shocks, an analysis topic which became particularly relevant at the time of the economic and financial crisis, when declining turnover was the principal feature.

5.1 Reaction in normal times

5.1.1 Adjusting wages as opposed to employment

The 2007 survey focused in particular on the way in which each firm reacted to three types of adverse shocks: a decline in demand for its products/services, a rise in the cost of intermediate inputs, and a generalised increase in

CHART 7   **COST-CUTTING STRATEGIES** [1]
(percentage of the total number of firms)

Source : Dhyne and Druant (2010).
Results weighted on the basis of employment and scaled by omitting the missing replies.
(1) AT, BE, CZ, EE, EL, ES, FR, HU, IE, IT, LT, NL, PL, PT, SI.
(2) AT, BE, EL, ES, FR, IE, IT, NL, PT, SI.
(3) From 5 to 19 employees.
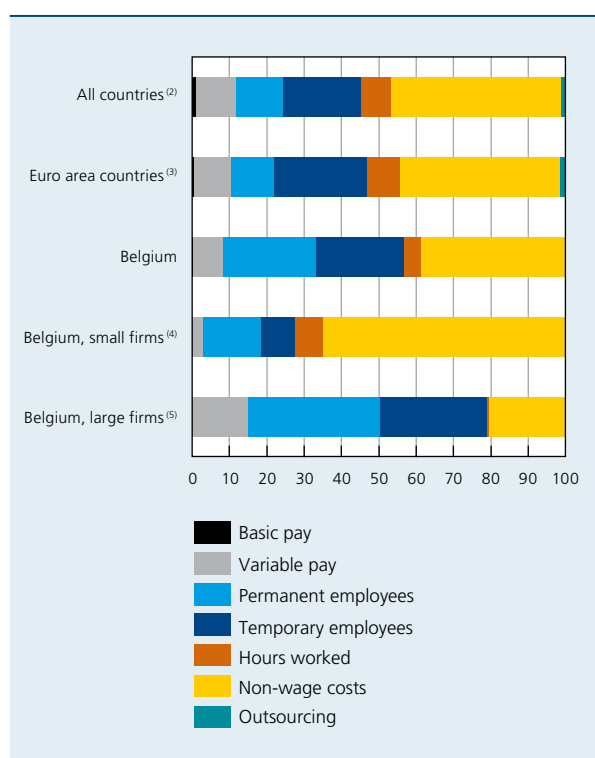(4) 200 or more employees.

labour costs. In these three cases, firms usually adopt a strategy of cutting costs. Taking the average for the three shocks, almost 70 p.c. of firms consider that strategy to be important or very important. Almost 60 p.c. would adjust prices, whereas cutting margins or output was said to be less important.

Firms which adjust their costs in response to a shock were also asked to specify the strategy used. On average for the three shocks, 45 p.c. of the 15,000 firms polled cut their non-wage costs. 33% of firms reduce their workforce (both permanent and temporary staff). In accordance with the downward wage rigidity described above, they rarely cut wages, either basic pay or the variable pay component. Barely 10 p.c. of firms cut working time.

In Belgium, firms also respond to shocks mainly by cutting their costs. That applies to 72 p.c. of them. However, they do so primarily by reducing the number of permanent and temporary workers (50 p.c. of firms) and - to a lesser extent than the average for all countries – by cutting non-wage costs (39 p.c. of firms). Wage adjustments and reductions in working time are also used less frequently. There are clear differences according to the size of the firm's workforce. Thus, there is a marked positive correlation between firm size and the adoption of an employment adjustment policy: the bigger the firm, the greater the staff reduction. Conversely, the link between firm size and changes in non-wage costs is negative. Large firms in fact have more scope than small ones for cutting their workforce in the face of problems. That is probably why small firms are more likely to resort to cutting working time. Adjustment of the variable pay component is the approach most commonly used in firms which pay more bonuses, on average, namely large firms.

A more detailed analysis (Dhyne and Druant, 2010) shows that the difference between Belgium's reaction and that of the other countries is significant and can be attributed to various factors, most of which constitute wage rigidities. More particularly, this concerns the fact that wages are largely set at a level higher than the firm (98.3 p.c. in Belgium, compared to 65.8 p.c. for all countries), the high coverage rate of collective wage agreements (89.1 p.c. against 60 p.c.), and the fact that almost all wages are inflation-linked (98.2 p.c. against 36.3 p.c.). Other factors which may explain the greater use of the employment channel in Belgium are the slightly higher share of labour (37.5 p.c. against 35 p.c.), the small share of the variable pay component in total labour costs (7.7 p.c. against 12.6 p.c.), the large proportion of the workforce consisting of low-skilled manual workers (49.6 p.c. against 41.2 p.c.), a category of workers who are generally cheaper to make redundant, and the relatively flexible

dismissal laws (1.7 on a scale ranging from 0 to 4; compared to 2.5).

Other factors tend to safeguard employment in Belgium. Thus, the proportion of small firms (employing fewer than 50 workers) comes to 67 p.c., compared to 49.1 p.c. for all countries. As stated earlier, small firms in fact have less scope for cutting their workforce when problems arise. Moreover, small business owners may be unwilling to make staff redundant owing to the close working relationships with their staff. They look for other solutions, such as cutting non-wage costs, while waiting for things to improve. [1] Furthermore, the process of wage-setting in Belgium comprises mechanisms which make wages less rigid, thus protecting jobs. The wage cushion – the amount which firms pay on top of the sectoral pay scales (72.7 p.c. of them) – gives them some scope for adjusting actual wages in line with economic conditions, if necessary.

The results of the Belgian survey are borne out by a quantitative assessment based on individual remuneration data and data on firms for the period 1997-2001.

The growth of the wage bill of each firm was broken down into four components: (1) increase in wages of existing workers, (2) wage differential between new recruits and workers leaving the firm, (3) increase in the total number

of days worked by existing employees, and (4) difference between days worked by new recruits and by workers leaving. The last two components together represent the growth of employment measured in terms of the number of days worked.

The analysis shows that, on average, both wage increases (3.7 p.c. – 1.4 p.c. = 2.3 p.c.) and fluctuations in employment (0.7 p.c. + 2.4 p.c. = 3.1 p.c.) account for changes in the wage bill (+5.4 p.c.). [2] For firms whose wage bill increased, the rise was due more to increases in employment than to changes in wages. Where the wage bill declines, employment bears the brunt of the adjustment. The elements in this breakdown in fact reveal that contractions in the wage bill are due to reductions in employment despite the nominal wage increases of existing workers; the contribution of the wages of new recruits remains negative. It should be noted that in the case of both reductions and increases in the wage bill, the nominal wages of existing workers rose by at least 3 p.c., on average. This reflects such factors as increases due to indexation, as well as real negotiated increases.

(1) The results shown are only valid if the shock is insufficient to drive firms into bankruptcy. Since this is a one-off survey, it is not possible to control for the bankruptcies, which affect proportionately more small firms, being generally more sensitive to the business cycle.
(2) On average, new recruits are paid about 15 p.c. less than existing workers. That difference is due, in particular, to the fact that firms do not usually grant holiday pay in the year in which the worker is taken on.

TABLE 4   WHICH FACTORS EXPLAIN THE INTENSIVE USE OF THE EMPLOYMENT CHANNEL IN BELGIUM? [1]

(percentage of the total number of firms, unless otherwise stated)

	All countries [2]	Euro area countries [3]	Belgium
Factors leading to a strong contraction of employment			
Collective wage agreements concluded at a level higher than the firm (+)	65.8	87.6	98.3
Coverage rate of collective wage agreements (+)	60.0	77.3	89.1
Linking of wages to inflation (+)	36.3	30.7	98.2
Share of labour in total costs (+)	35.0	35.6	37.5
Variable pay component (–)	12.6	12.1	7.7
Proportion of low-skilled manual workers in the workforce (+)	41.2	39.7	49.6
Protection of permanent employees against individual dismissal [4] (–)	2.5	2.5	1.7
Factors safeguarding employment			
Proportion of small firms (< 50 employees) (+)	49.1	49.5	67.0
Wage cushion (+)	n.	n.	72.7

Source: Dhyne and Druant (2010).
(1) Results weighted on the basis of employment and scaled by omitting the missing replies.
(2) AT, BE, CZ, EE, EL, ES, FR, HU, IE, IT, LT, NL, PL, PT, SI.
(3) AT, BE, EL, ES, FR, IE, IT, NL, PT, SI.
(4) Average of values between 0 and 4, corresponding to a rising degree of protection.

TABLE 5   GROWTH OF THE WAGE BILL OF FIRMS IN BELGIUM: EXPLANATORY FACTORS

(Belgian firms with over 50 employees, 1997-2001)

	Growth of the wage bill (in percentage)	Contribution to the growth of the wage bill (points of percentage)			
		increase in wages of existing workers	wage differential between new recruits and workers leaving the firm	change in the total number of days worked by existing workers	difference between days worked by new recruits and by workers leaving
Average	5.4	3.7	−1.4	0.7	2.4
Firms whose wage bill increases	7.9	3.8	−1.4	1.5	4.0
Firms whose wage bill decreases	−3.8	3.1	−1.5	−2.1	−3.2

Source: Fuss (2009).

5.1.2 Permanent versus temporary staff

The greater use of the employment channel in Belgium in response to adverse economic shocks concerns both permanent and temporary staff. In regard to the former, Belgium is in second place in the ranking of the 14 countries considered. In regard to the reduction of temporary staff, Belgium is in fourth place. This means that, unlike in many other countries such as Spain, France and the Netherlands, in the event of an economic shock there is no trade-off between a marked fall in the number of temporary employment contracts and a limited contraction of permanent employment.

More detailed analysis (Dhyne and Druant, 2010) shows that a large percentage of temporary workers in the total workforce increases the risk of a reduction in temporary employment while safeguarding permanent jobs. Temporary staff therefore act as a buffer in periods of adversity. Nonetheless, the proportion of temporary workers in Belgium (8.7 p.c.) is below the average (13.3 p.c.). Moreover, the legislation on temporary employment is stricter in Belgium (2.6 on a scale ranging from 0 to 4, compared to 2.2). The key role of temporary employment as a shock absorber can be explained partly by the low costs entailed in recruiting and dismissing temporary workers, namely 0.8 p.c. of the average costs associated with permanent staff (Dhyne and Mahy, 2009). In addition, temporary work is very widespread, particularly in large firms. While the proportion of temporary workers in total employment is low, almost 20 p.c. of firms in Belgium employ temporary workers.

It should be noted that, in Belgium, strict regulations on temporary employment and a high level of protection against collective dismissal (4.1 against 3.2) are accompanied by relatively flexible legislation on individual dismissal (1.7 against 2.5). In consequence, as stated earlier, over half of redundancies concern permanent staff, compared to an average of one-third for all countries examined.

5.1.3 Adjustment of real wages in line with productivity in Belgium

Another measure of wage rigidity is based on the elasticity of real wages in relation to productivity. In the absence of friction on the various markets, both the labour market and the product markets, that elasticity should be equal to one, which means that changes in productivity are reflected pro rata in changes in real wages. Two studies (Fuss and Wintr, 2009, for Belgium and Kilponen and Turunen, 2009, for Finland) compare how wages react to circumstances specific to the firm as opposed to circumstances affecting the entire sector. This reveals that the elasticity of real wages in relation to the firm's productivity is extremely low in Belgium (0.02). It should be noted that an equally low level is found for the other European countries (France, Italy, Portugal, Finland, Sweden and Hungary[1]) for which comparable studies exist.

Conversely, the elasticity of real wages in relation to sectoral productivity is much greater (0.41) in Belgium, just as it is in Sweden. The analysis for Belgium suggests that this is due (partly) to the role played by collective bargaining at sectoral level. For one thing, the measure of the reaction of real wages to negotiated wage increases during the year is positive (0.26). In the long term, negotiated wage increases are almost entirely reflected in average real wages of firms.[2] Also, the index of negotiated increases is correlated with productivity changes at sectoral level, with long-term elasticity at 0.47.

(1) See the respective articles by Biscourp et al. (2005), Guiso et al. (2005), Cardoso and Portela (2005), Kilponen and Turunen (2009), Carlsson et al. (2009), Katay (2008). Hungary alone has a higher elasticity (between 005 and 0.11), as a result of a more flexible labour market, far more decentralised wage bargaining and a very low coverage rate for collective bargaining.
(2) The study by López-Novella and Sissoko (2009), based on total individual wages in the private sector in Belgium, also indicates that the elasticity of wages to negotiated increases is very close to one.

There are various possible explanations for this result. First, it can be interpreted as a sign of wage rigidity. In that connection, it can be said that the Belgian study indicates positive elasticity of employment in relation to the firm's productivity, in accordance with the theories predicting greater employment volatility in the case of real wage rigidity. Second, labour market tensions may be a significant factor. As highlighted by the survey results, one of the reasons which firms give for not reducing wages is the fear that their workers may leave and move to other firms. That is typically the case when the pay cut concerns an isolated firm, but is not a factor, or significantly less so, if all firms in the sector jointly decide to adjust wages. Collective bargaining offers a framework for consultation and coordination in regard to decisions on wages.
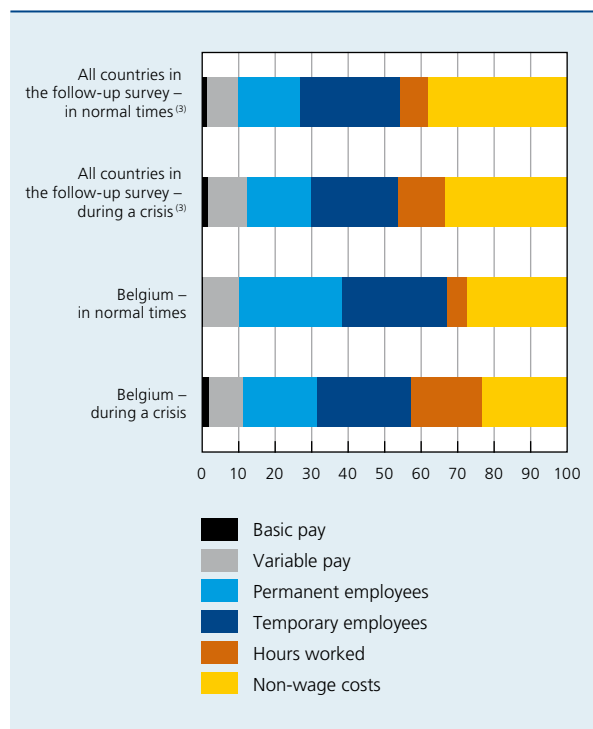
5.2 Reaction during the economic and financial crisis

The follow-up survey conducted in the midst of the economic crisis examined whether the reaction of firms to the fall in their turnover was fundamentally different from that seen in normal times. In fact, the original survey had only considered the theoretical reaction to a hypothetical shock. As to the cost-cutting strategies, it should be noted that the firms participating in the follow-up survey no longer confined themselves to ticking a single option. They used several strategies simultaneously, and in each case they took stronger action than they had anticipated when responding to the original survey. The firms therefore reacted differently from the way in which they had anticipated in the case of a purely hypothetical situation. To permit a comparison of the results in normal times and those in a crisis, the latter were converted to the same scale so that the total of the strategies is equal to 100 p.c. The results need to be interpreted with due caution : it is advisable to focus on the trends apparent before and after the crisis, rather than the exact percentages.

As already stated in section 3.1, these results confirm that the firms which took part in both surveys make hardly any adjustments to basic pay, either in normal circumstances or in a crisis. The variable pay components made only a very small contribution to the adjustment process.

The decision to cut the number of hours worked is very noticeable : during the crisis, the share of this reaction in the total strategies adopted by all countries increased from 8 to 13 p.c. In Belgium, it increased fourfold, from 5 to 20 p.c. Ways of reducing the number of hours worked included limiting or abolishing overtime and making greater use of the time-credit system. However, in Belgium this reduction was achieved mainly by the system

CHART 8 COST-CUTTING STRATEGIES IN NORMAL TIMES AND IN A CRISIS[1]

(percentage of the total number of firms)[2]

Legend:
- Basic pay
- Variable pay
- Permanent employees
- Temporary employees
- Hours worked
- Non-wage costs

Sources : WDN, BNB.
(1) Results weighted on the basis of employment and scaled by omitting the missing replies.
(2) The same sample of firms was used for both surveys.
(3) AT, BE, CZ, EE, ES, FR, IT, LU, NL, PL.

of temporary lay-offs. Under that system, the major part of the labour costs associated with surplus workers is no longer borne by the firm, whereas the workers concerned retain a contractual link with their employer, who can redeploy his staff as soon as business picks up. The already existing system of temporary lay-offs was extended in reaction to the crisis. Similar systems were introduced or extended in other countries, entailing a decrease in hours worked.

During the crisis, employment also contracted strongly in the case of permanent employees, and even more so for temporary staff. The latter act as a buffer, absorbing cyclical fluctuations. Nevertheless, a smaller number of firms than in the original survey replied that they had used the employment channel : 41 compared to 44 p.c. for all countries, and 46 compared to 57 p.c. for Belgium. It is also evident that the gap between Belgium and the average of the countries examined declined sharply from 13 to 5 percentage points. These results suggest that the reaction to the crisis had not ended at the time of the survey. Once the reduction in hours worked has reached its limit, the staff will probably be cut further, since – in

principle – temporary lay-offs can only absorb brief periods of falling demand.

In response to the crisis, firms also made substantial savings on their non-wage costs. That applies mainly to small firms which have less scope for reducing their workforce. The Belgian survey examined the expense items on which firms make the biggest cuts: vehicle fleet, maintenance, travel and representation expenses, advertising and sponsorship.

Conclusion

Between 2006 and 2009 over 70 economists from 25 NCBs and the ECB together with external consultants analysed the dynamics of wages in Europe via the *Wage Dynamics Network*. The results contain a number of relevant findings, including for Belgium. In this respect, it is noticeable that the findings of the macro- and microeconomic studies and the surveys are very coherent, and that increases their credibility.

The wage structure and the wage-setting institutions are relatively stable but differ from one country to another. However, the countries can be divided into groups sharing a set of institutional characteristics. The Belgian institutions are comparable overall to those of most euro area countries, except that the indexation of wages plays a much greater role. There are significant, persistent wage differentials between sectors which can only be partly explained by composition effects (the fact that wages depend on the characteristics of the workers, their type of occupation and their employer), and which suggest that it is mainly in the less competitive sectors that firms share with their workers part of the rent which they obtain from their dominant position by paying higher wages.

Wage rigidity was examined from various angles. First, it seems that wages are revised less frequently than prices, and often at fixed intervals rather than in response to changes in the economic environment. Second, firms are highly reluctant to reduce wages, and that may lead to a pay freeze. This was particularly apparent during the recent economic crisis. Third, when firms suffer negative shocks, wages play only a marginal role in cost adjustment. That finding was borne out during the recent crisis.

Finally, downward adjustments rarely affect basic pay, even in the case of new recruits, but instead apply mainly to the variable component.

In regard to wage rigidity, it is important to distinguish between nominal and real rigidity. The former permits some scope for adjusting real wages via price inflation. That relative scope disappears if the rigidity is real. The emergence of real wage rigidity is encouraged by such factors as the degree of employment protection, the level of replacement incomes, the centralisation of wage bargaining, the indexation of wages in line with price inflation and the lack of competition on the market in goods. The greater the downward real rigidity of wages, the more firms respond by adjusting their workforce in the face of negative shocks. To do that they not only cut the number of regular staff but also use the scope for adjustment offered by temporary staff and reductions in working time. This last option was used particularly during the recent crisis, with government support. The euro area has downward real wage rigidity rather than nominal wage rigidity. That is particularly true in Belgium, the main reason being the system of automatic wage indexation.

On the basis of the results of the WDN research, it is possible to formulate a number of monetary policy implications. First, real wage rigidity makes it more complicated to conduct monetary policy in that it leads to larger fluctuations in output and employment, and makes inflation more persistent. Next, the optimum inflation rate is lower the greater the downward real rigidity of wages. That implies a rather low inflation target for the euro area in general, in line with the ECB's inflation target of just under 2 p.c., but that is still too high for Belgium. Finally, the research also shows that in a monetary union the countries with greater real wage rigidity suffer a loss of competitiveness in the event of adverse productivity shocks. In general, wage-setting institutions play a key role in the way in which firms and economies react to shocks. The institutional differences between euro area countries are therefore a challenge for monetary policy, a problem which will grow with each enlargement of the euro area. All this highlights the need for labour market reforms with a view to harmonisation and greater flexibility. However, those reforms must be conducted in the overall context, striking a careful balance between the optimum allocation of resources and social protection.

Annex

COMPOSITION OF THE WDN SURVEY SAMPLE USED FOR THE INTERNATIONAL ANALYSIS

	Number of firms in the original survey (2007-2008)	Percentages	Number of firms in the survey conducted during the crisis [1] (2009)	Percentages
Euro area				
Austria	548	3.57	336	6.15
Belgium	1,420	9.22	992	18.16
Spain	1,769	11.49	962	17.61
France	2,011	13.06	818	14.97
Greece	401	2.60	–	–
Ireland	848	5.51	–	–
Italy	952	6.18	676	12.37
Luxembourg	456	2.96	299	5.47
Netherlands	1,068	6.94	670	12.26
Portugal	1,320	8.57	–	–
Slovenia	650	4.22	–	–
Non euro area				
Czech Republic	399	2.59	241	4.41
Estonia	366	2.38	163	2.98
Hungary	1,959	12.72	–	–
Lithuania	333	2.16	–	–
Poland	896	5.82	307	5.62
Total	**15,397**	**100.00**	**5,464**	**100.00**

Sources: WDN, NBB.
(1) Firms participating in the follow-up survey during the crisis represent part of the sample participating in the original survey.

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