Wage adjustment to shocks in Spain

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Introduction

The latest economic literature highlights the importance of labour market institutions in the economy's capacity to adjust to different macroeconomic shocks.[1] Among the numerous institutional arrangements that make up the labour market, wage determination mechanisms tend to play a prominent role when it comes to explaining how much of the adjustment ends up being pushed onto employment. In this respect, collective bargaining systems conducive to the adaptation of wages to cyclical fluctuations and shocks of various kinds smooth the changes in the level of employment. By contrast, systems with greater wage rigidity tend to generate more pronounced fluctuations in employment over the business cycle.

The high employment variability is one of the singular features of the cyclical behaviour of the Spanish economy. In the latest crisis, for example, the magnitude of the destruction of net employment in Spain was much larger than in other euro area countries in which the decline in GDP or the correction in the residential construction sector were comparable. However, this relatively larger response by employment in Spain, along with greater wage inertia, is not a phenomenon particular to this crisis episode, but rather reflects a historical pattern.[2] Behind this behaviour lie certain institutional characteristics of the Spanish labour market, such as the excessive difference in the degree of protection afforded to permanent and temporary contracts and the inability of the collective bargaining system to facilitate the adaptation of wages to the economic situation and to the circumstances of each firm.

From this perspective, this article addresses a specific aspect of the wage determination mechanism: the capacity of wages to respond to macroeconomic shocks and its determinants. With this aim, the following section provides evidence on the degree of response of wages to cyclical developments and inflation, as well as an estimation of the degree of wage rigidity in Spain, both in real and nominal terms, comparing it with the estimates available for other countries. The third section examines the relationship between the degree of wage flexibility and certain institutional characteristics of labour markets on the basis of the information available for four European countries (Spain, Belgium, Denmark and Portugal). Finally, Section 4 summarises the main conclusions.

Wage adjustment in response to shocks and international comparisons

Wage dynamics in Spain are characterised[3] by the fact that the impact of the cyclical position of the labour market on wage settlements is very small. As seen in Chart 1 (lower panel), there is barely any link between wage increases and the rate of unemployment. Further, Table 1 presents the results of a regression of collectively negotiated wage settlements on the rate of inflation, changes in regional unemployment and changes in industry productivity. Little connection is seen between wage settlements and the labour market situation, approximated by the rate of unemployment. In fact, only newly signed agreements show some sensitivity to the labour market situation, while no such negative relationship is seen between the rate

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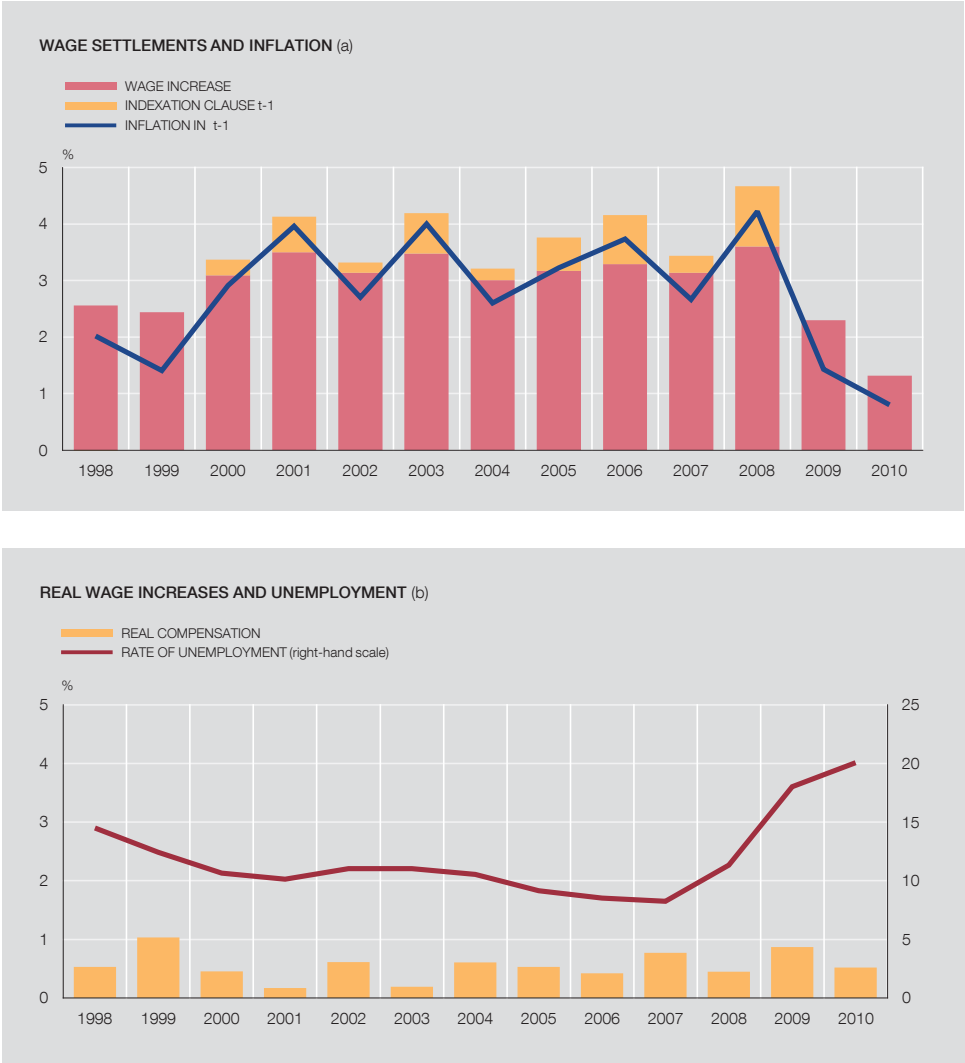
1. See, for example, Álvarez et al. (2006). **2.** See, for example, the evidence presented in Estrada et al. (2009). **3.** See Bentolila et al. (2010) for a recent analysis of the cyclical insensitivity of wages in Spain and the high degree of indexation.

WAGES AND CYCLICAL CONDITIONS CHART 1



SOURCES: Instituto Nacional de Estadística, Ministerio de Trabajo e Inmigración and Banco de España.

a. Inflation and the indexation clause correspond to the previous period (t-1), while the wage increase relates to the reference period (t).
b. Real remuneration is obtained as the sum of the wage increase in period t and the indexation clause of period t-1, less inflation in period t-1.

of unemployment and wages in the case of revised agreements.[4, 5] Also, the relationship between wage settlements and industry productivity is very low.

At the same time, the degree of indexation in collective bargaining is seen to be very high. As the upper panel of Chart 1 shows, there is a very close relationship between wage settlements and past inflation, which in terms of compensation per employee is strengthened by the impact of indexation clauses. In fact, the percentage of workers covered by indexation clauses averaged 69% over the period 2001-08. On data that are still preliminary, this proportion fell to 64% in 2009 and then to 46% in 2010. Also, since these clauses are not symmetric, in periods of declining inflation real wage increases often occur. The results of Table 1 support this evi-

4. It should be noted that only one third of agreements with economic effects are negotiated in the same year, since most agreements are for more than one year, and therefore can be expected to be less sensitive to contemporaneous cyclical factors. **5.** Controlling for the nature of the agreement (newly signed or revised previously signed multi-year agreements), the level at which it is negotiated (firm or higher level) and the sector of the firms it affects.

IMPACT OF INFLATION AND CYCLICAL CONDITIONS ON WAGE SETTLEMENTS (a) TABLE 1

Dependent variable: wage settlements

EXPLANATORY VARIABLES	REVISED AGREEMENTS		NEWLY SIGNED AGREEMENTS	
	Coefficient	t-statistic	Coefficient	t-statistic
Positive inflation deviation in t-1	0.94	108.6	1.13	148.9
Negative inflation deviation in t-1	-0.19	-3.0	-0.35	-4.6
Change in unemployment rate in t-1	0.01	1.4	-0.24	-34.3
Change in sector productivity in t-1	0.004	1.6	0.003	1.1
Constant	2.66	30.8	2.38	29.6
Observations	37,256		52,570	
Adjusted determination coefficient	0.29		0.33	

SOURCE: Bentolila et al. (2010).

a. The regressions include dummy variables for sector of activity (two digits of the 1993 Spanish National Classification of Economic Activities), level of bargaining and presence of indexation clause

dence, since they show that positive deviations in inflation are passed through to wage increases with a coefficient of nearly 1, while this pass-through does not take place when inflation falls below the 2% reference rate.

The wage inertia described above has been especially apparent during the recent economic crisis. In 2007 and 2008 negotiated wage rates grew, driven by, among other factors, adjustments to reflect the previous years' inflation deviations, causing wages to rise while demand was falling. Subsequently, the adjustment of wages in 2009 almost exclusively reflected the sharp fall in inflation, despite the deterioration in the labour market. Only in 2010, with a two year lag from the start of the crisis, did more genuine wage moderation occur, under the agreement signed by the social agents for the period 2010-12, in a propitious lower inflation environment. However, the activation at the beginning of 2011 of the indexation clause led to an average wage increase of 2% in the 2010 collective agreements.

The results of the Survey of Wage Formation in Firms conducted in 2008 on a sample of Spanish firms by the Banco de España in collaboration with the Wage Dynamics Network lead to the same conclusion. The survey questions included one asking firms for information on how they achieve cost reductions when faced with a negative shock. The results show that, in general, the different shocks lead firms to reduce temporary employment, especially in the case of a fall in demand, with more than half of the respondents declaring that this was the main way of reducing costs (see Table 2). In contrast, adjustment of the wage component, both its most stable factor and the variable one, is relatively infrequent. In the case of shocks affecting intermediate costs or wages, firms also tend to significantly reduce other types of non-labour costs. The survey update conducted during the crisis confirms these results (see Table 3).

Overall, in comparison with other European countries these results show that temporary employment is used more frequently in Spain as the main way of adjusting to shocks, while wages (including their fixed and variable components) are more isolated from firms' adjustment needs (see Table 3). This difference is undoubtedly related to the greater importance of temporary employment, the greater protection of permanent employment and the high degree of wage rigidity in the Spanish economy.

CHANNELS FOR COST ADJUSTMENT IN RESPONSE TO DIFFERENT SHOCKS TABLE 2

	TYPE OF SHOCK		
Percentage of firms	Decline in demand	Increase in cost of	Increase in wage costs
Reduction in basic wage	4.8	7.2	8.9
Reduction in variable wage component	5.8	5.6	11.8
Reduction in permanent employment	11.7	4.5	7.6
Reduction in temporary employment	57.5	26.0	27.6
Reduction in hours worked per employee	5.6	4.3	4.6
Reduction in non-wage costs	14.6	52.3	39.7

SOURCE: Survey of Wage Formation in Firms, conducted by the Banco de España

The high inertia and inflexibility of the Spanish wage bargaining model may be illustrated more formally by estimating the degree of downward wage rigidity following the methodology used by the so-called International Wage Flexibility Project (IWFP).[6] This methodology, which is explained in detail in Dickens and Goette (2006), estimates this variable on the basis of a comparison between the observed distribution of changes in individual wages and a theoretical/notional distribution which seeks to replicate the existence of complete flexibility in the wage determination process. To construct this notional distribution it is assumed that in the situation of complete flexibility the wage changes from one year to the next are distributed symmetrically.[7] Subsequently, the distribution of observed wage changes is estimated. In comparison with the notional distribution, the presence of rigidities would mean that, in response to a negative shock to productivity or a reduction in the firm's demand, the wage changes of a larger number of workers would be concentrated around zero (which is known as "nominal rigidity") or around the expected value for inflation (which is called "real rigidity").

This article presents estimates for Spain based on information supplied by the *Muestra Continua de Vidas Laborales* (Continuous Survey of Working Life, MCVL).[8] This survey is restricted to workers of the General Social Security Regime who work full time and have been in the same firm for at least two years, in order to calculate wage changes free from the impact of changes in employment. This fact affects the interpretation of the results obtained, insofar as it means that what is being estimated is the degree of rigidity of the wages of workers who remain in their jobs.[9]

To illustrate the estimation method used, Chart 2 shows the distribution of wage changes observed in a particular year (2008) and compares it with the notional distribution. As can be

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6. The IWFP is a study by more than forty researchers of the effects of inflation on wage determination and on the nature, size, causes and consequences of wage rigidity. It uses individual data on wages for more than 16 countries. **7.** Following a Weibull distribution with two tails centred on the median wage change. This distribution is used because wage changes tend to be more concentrated around the median and, at the same time, to have extreme values with a higher probability than would be observed in a normal distribution. Dickens et al. (2007) present evidence to show that this distribution reflects the wage changes observed in different countries particularly well. **8.** Specifically, the 2008 wave is used, which contains information on a sample of 4% of all workers who had some type of relationship with the Social Security system that year and their previous labour history, and the period of analysis of the degree of wage rigidity is extended to the period 1996-2008. The MCVL also provides information on some personal characteristics (sex, age and contribution group; the latter may be considered a proxy for the level of education) and the work they perform (sector of activity, firm size, type of contract and wage). In particular, it provides the monthly and annual social security contribution base of each worker, which includes practically all wage items and, therefore, may be considered a good measure of the total wage paid by firms, at least for all those workers with wages below the maximum contribution base. As a result, all those workers with the maximum contribution base have been eliminated from the sample, since wage changes estimated on the basis of such data are determined entirely by the annual changes in the contribution bases. Around 10-15% of all workers have the maximum base in each year of the sample. **9.** Accordingly, firms are not considered to be able to use other means of adjusting their labour costs, such as employment or hours worked per employee.

CHANNELS FOR COST ADJUSTMENT IN RESPONSE TO THE CRISIS IN DIFFERENT COUNTRIES TABLE 3

Percentage of firms

REDUCTION IN:	AUSTRIA		BELGIUM		CZECH REPUBLIC		ESTONIA		SPAIN	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
Basic wage	0.0	0.4	0.3	3.4	0.0	3.9	0.5	15.7	4.8	1.1
Variable wage component	10.9	15.8	10.3	16.7	18.6	24.3	17.3	23.9	5.8	5.9
Permanent employment	11.0	11.2	29.3	35.7	19.0	42.7	17.2	24.4	11.7	25.8
Temporary employment	6.5	10.1	29.0	45.6	27.0	34.2	15.7	3.3	57.5	42.4
Hours worked per employee	20.4	34.2	5.1	32.5	3.5	10.8	4.9	9.1	5.6	5.7
Other non-wage costs	51.2	28.2	26.0	40.6	41.5	52.8	44.5	23.6	14.6	19.2
	FRANCE		ITALY		NETHERLANDS		POLAND			
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)		
Basic wage	0.0	0.1	1.0	1.3	0.3	1.2	3.5	2.2		
Variable wage component	7.5	9.9	9.3	8.8	3.0	4.6	8.0	17.0		
Permanent employment	10.9	17.1	16.0	17.1	3.2	8.4	31.4	15.3		
Temporary employment	28.4	33.9	28.9	20.8	37.7	40.1	8.7	10.0		
Hours worked per employee	10.0	12.4	9.8	18.2	2.1	5.8	5.2	6.4		
Other non-wage costs	43.2	26.2	35.0	33.8	5.2	6.4	43.3	47.0		

SOURCES: Wage Dynamics Network.

a. Original survey.
b. Survey update during the crisis.

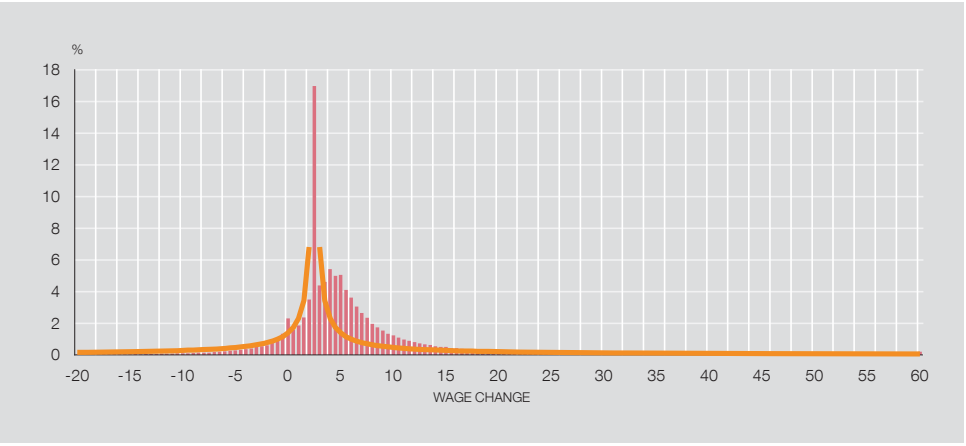
seen, the distribution of wage changes that actually occurred in 2008 is not symmetric and, in comparison with the notional distribution, wage cuts are less frequent, while wage increases above the median of the distribution are more frequent. Apart from this asymmetry, there are two peaks to be seen in the distribution: the first one (at around zero) reflects the frequency of wage freezes, while the second, higher one (at around 3%), illustrates the greater frequency of wage increases at around the forecast rate of inflation[10] or, in other words, of cases in which the constancy of wages is ensured in real terms.

The results of the estimation for the period 1996-2008 are shown in the upper panel of Chart 3. The estimate of the degree of real wage rigidity in Spain is seen to be much higher than that of nominal rigidity. Throughout the period, a relatively stable proportion of workers (between 30% and 40%) who in a theoretical framework of complete flexibility would have received wage increases below inflation, maintained the level of their wages in real terms. On average during the period 1996-2008 this proportion was 33.7% of the total sample of workers. Meanwhile, it is estimated that around 16% of workers who in the notional scenario would have received a wage cut actually experienced no change in their wage. In this case, the proportion seems to follow a declining trend over the period, since it reached 21% between 1996 and 2000 and 13% on average between 2000 and 2008.

In terms of international comparisons, and applying this methodology, Spain is among those countries that have a high degree of real wage rigidity, but simultaneously among those for which nominal rigidity is less important. However, the latter result may, in principle, contrast with the findings of the Survey of Wage Formation in Firms mentioned above.[11] In the case of

10. This concentration of wage changes around the forecast inflation rate is also observed for other periods. **11.** In the case of the survey, the firms were asked whether they had reduced or frozen wages during the last five years. Although the results may be affected by the business cycle, since this period was characterised by strong economic growth in Spain, the responses show a high degree of both nominal and real wage rigidity: 97.5% declared that they had not reduced or frozen nominal wages, and the proportion that declared that they had frozen wages was very small (2.4%).

DISTRIBUTION OF WAGE CHANGES IN 2008 IN SPAIN (a) CHART 2



SOURCES: Muestra Continúa de Vidas Laborales and Banco de España.

a. The bars correspond to the distribution of wage changes and the line represents the estimation of a Weibull distribution with two tails centred on the average wage change.

real wage rigidity, Chart 3 compares the estimates available for other countries within the IWFP framework [Dickens et al. (2009)] and it can be seen that those for Spain are in the upper middle range, close to countries such as Belgium, France, Sweden and Finland, which have a higher degree of rigidity in real terms. In general, these countries are characterised by a high degree of wage indexation, given, for example, the fact that indexation clauses apply to the majority of workers in Belgium and the indexation of the minimum wage in France. In the case of Spain, as indicated above, this result is not surprising, given the fundamental role of inflation, both past and projected, and the low degree of cyclical sensitivity in the wage formation process.[12]

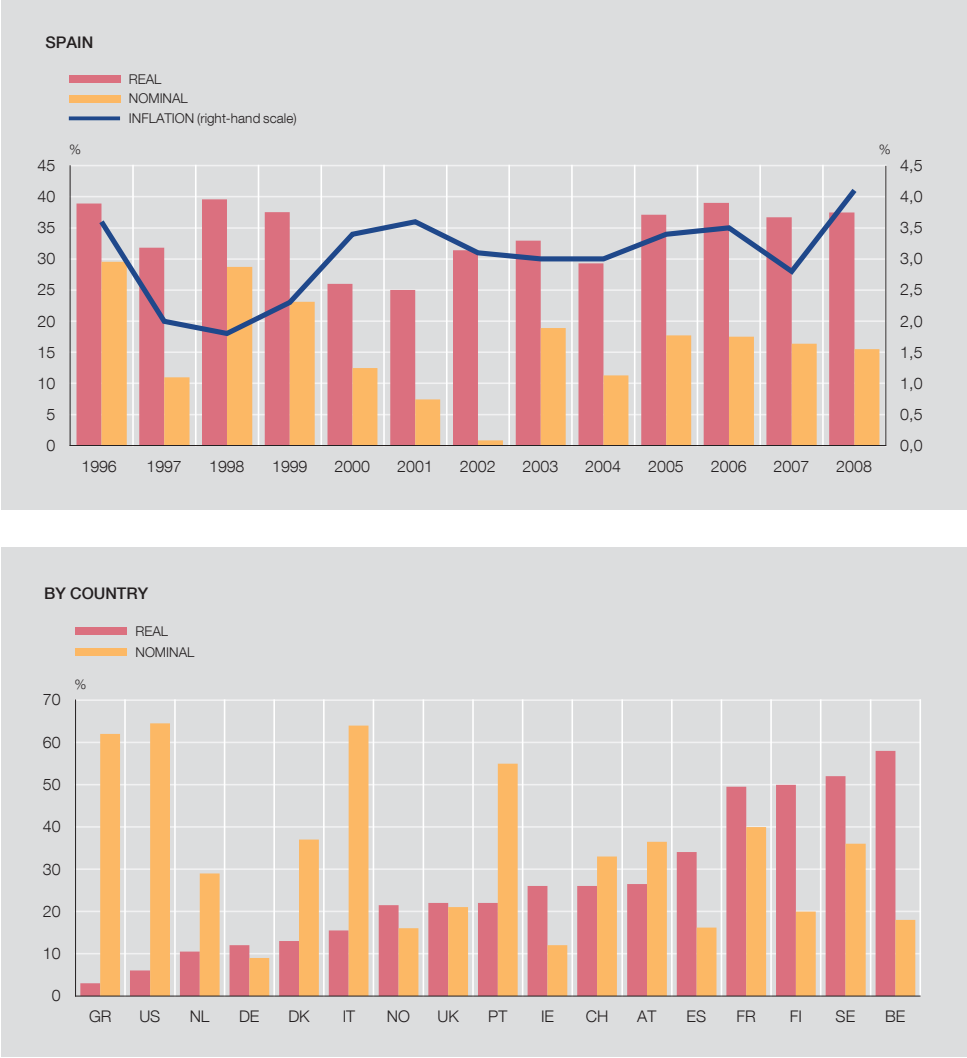
Estimates have been made for specific groups of workers in order to analyse whether differences can be observed that would allow the lack of flexibility to be associated with other characteristics of the wage formation process. Table 4 presents these estimates for different skill levels,[13] age groups, contract types, firm sizes and sectors of activity.

In terms of the characteristics of the workers, wage rigidity is seen to be greater for the higher skilled workers of the firm. The results are similar when rigidity is computed in nominal terms, but one sees less variation between the different groups of workers.[14] By age groups, one sees a negative relationship between age and the degree of wage rigidity, both in real and nominal terms[15]. Also, one sees a higher degree of rigidity, both real and nominal, among

12. The same conclusion regarding the high degree of real wage rigidity in Spain is also drawn from the Survey of Wage Formation in Firms. Around 55% of the Spanish firms surveyed responded that they apply automatic mechanisms to adjust wages for inflation, as against 17% on average in the other countries in which the survey was conducted. **13.** Approximated by the Social Security contributor groups. **14.** This positive relationship between wage rigidity and skill level is consistent with different wage formation models, such as, for example, efficiency wage models, which predict that it is more difficult for firms to adjust the wages of higher skilled workers, since their productivity is more difficult to observe than that of lower skilled workers. At the same time, different models of labour turnover also tend to predict greater wage rigidity among higher skilled workers, since firms have a greater interest in retaining such workers. Finally, insider-outsider wage bargaining models, which take into account the greater bargaining power of higher skilled workers, are also consistent with these results. **15.** In principle, the wage efficiency and insider-outsider models mentioned above would tend to predict greater wage rigidity for the intermediate age group, in accordance with their combination of training and work experience. The findings for Spain, as well as for Belgium [see Du Caju et al. (2008)], which show higher wage rigidity for young workers, would be consistent, however, with models in which firms do not wish to lower the wages of those workers who are most likely to leave the firm (in this case, young workers) to avoid the costs associated with labour turnover.

DEGREE OF WAGE RIGIDITY
Percentage of workers (a)

CHART 3



SOURCES: Muestra Continúa de Vidas Laborales, International Wage Flexibility Project and Banco de España.

a. Percentage of workers whose wage is unchanged (in nominal or real terms), when in the absence of wage rigidity (nominal or real) it would have been cut.

workers with permanent contracts[16]. By firm size, the results obtained are not particularly conclusive, which is also the case when the analysis is made by sector of activity, where the differences are not large either.

Some determinants of the degree of wage rigidity. A cross-country comparative analysis[17]

As seen in Chart 3, the heterogeneity observed across countries in the extent to which wages respond to macroeconomic shocks is high. Institutional differences (in particular, in wage bargaining mechanisms) may, therefore, be a fundamental factor in explaining these differences. In order to analyse which labour institutions may be most closely associated with wage rigidities, Messina et al. (2010) consider disaggregated data for 13 branches of activity and four countries (Spain, Belgium, Denmark and Portugal). This paper shows that the differences between countries

16. However, it should be pointed out that the group of temporary workers for which greater wage flexibility is estimated is a small and very specific group of such employees, since the estimation method requires that they stay at the firm for at least two consecutive years. **17.** This section briefly summarises the main results of Messina et al. (2010) published as Banco de España Documento de Trabajo No 1022.

WAGE RIGIDITY ESTIMATIONS (a)

TABLE 4

		REAL	NOMINAL
BY GROUPS OF WORKERS:			
OCCUPATION	Skilled non-manual	45.0	18.4
	Unskilled non-manual	35.5	16.0
	Skilled manual	34.5	15.8
	Unskilled manual	26.7	15.9
AGE GROUP	16-29	42.1	21.1
	30-44	34.1	15.9
	45-64	30.0	12.5
BY CHARACTERISTICS OF EMPLOYMENT:			
TYPE OF CONTRACT	Temporary	21.4	9.3
	Permanent	34.2	16.4
SIZE OF FIRM	< 20 workers	27.6	19.5
	20-200 workers	34.9	15.4
	> 200 workers	32.5	15.1
SECTOR OF ACTIVITY	Industry	36.9	14.3
	Construction	35.4	18.8
	Market services	31.4	17.9

SOURCES: Muestra Continua de Vidas Laborales and Banco de España.

a. Percentage of workers whose wage is unchanged (in nominal or real terms), when in the absence of wage rigidity (nominal or real) it would have been cut.

in the degree of wage rigidity are much larger than those observed between branches of activity, despite the high level of sectoral disaggregation used. However, the variation across the sectors of one single country, equally affected by the national labour institutions, may also give a clue to some of the structural determinants of the degree of wage rigidity

First, in terms of the characteristics of the workers, the analysis of the four countries mentioned shows no clear association between labour rigidity and the distribution of employment at the sectoral level by sex, age group or firm size. However, one does observe, in line with the results discussed above, that wage rigidity is greater in those sectors with a larger proportion of highly skilled workers.

Also, the results show a negative relationship between the degree of real wage rigidity and the presence of firm-level agreements. In the four countries analysed, the most common level of bargaining is the sectoral level and the results suggest that, in those branches of activity in which agreements at a more decentralised level play a greater role, wages are ultimately more flexible. Some studies [Cardoso and Portugal (2005), for example] show that in some of these countries firm-level bargaining ultimately leads to larger wage increases than those negotiated at the sectoral level, but this positive difference also offers greater flexibility to firms to adjust their wages in response to negative shocks.

In the case of Spain, it should be recalled that collective bargaining takes place predominantly at the sectoral level, within each province, which implies an intermediate level of centralisation, while the employment conditions of only around 10% of workers are negotiated at the firm level (see Table 5). The empirical evidence for Spain indicates moreover that the intermediate level of bargaining (provincial sectoral level) produces settlements that are generally higher than those agreed at a more centralised level (national sector level) or at a more decentralised level (firm). As seen in Table 5, both the initially agreed wage increase and the impact of the indexation clause were lower in virtually

COLLECTIVE BARGAINING AGREEMENTS

TABLE 5

LEVEL OF BARGAINING	2003	2004	2005	2006	2007	2008	2009 (a)	2010 (a)
	NEGOTIATED WAGE INCREASE As a percentage							
TOTAL	3.48	3.01	3.17	3.29	3.14	3.60	2.28	1.32
Firm	2.70	2.61	2.94	2.92	2.70	3.09	2.20	1.09
Other level	3.58	3.06	3.19	3.34	3.20	3.65	2.29	1.34
Percentage of workers affected by firm-level agreements	10.75	9.95	10.78	11.01	10.87	10.15	9.72	6.97
	REVISED WAGE INCREASE As a percentage							
TOTAL	3.68	3.60	4.04	3.59	4.21	3.60	2.26	2.09
Firm	2.94	3.14	3.61	3.15	3.57	3.09	2.20	1.55
Other level	3.77	3.65	4.09	3.65	4.28	3.65	2.27	2.13
	INDEXATION CLAUSE In percentage points							
TOTAL	0.20	0.59	0.87	0.30	1.06	0.00	-0.02	0.77
Firm	0.24	0.53	0.67	0.23	0.87	0.00	0.00	0.46
Other level	0.19	0.59	0.90	0.31	1.09	0.00	-0.02	0.79

SOURCE: Ministerio de Trabajo e Inmigración.

a. Provisional data, on information to January 2011; in particular, the 2010 data may change in the coming months.

every year of the period 2003-10 in the case of firm agreements than in that of agreements at other levels. As a result, the revised wage increase (which includes the impact of the wage indexation clause) under firm agreements was lower than under agreements negotiated at other levels.[18]

Meanwhile, the importance of variable payments in total labour costs slightly reduces the degree of wage rigidity, both in real and nominal terms. In this respect, the results show that these variable payments are no substitute for greater flexibility in the basic wage, and it is precisely in those sectors in which they are most important that one tends also to find a lower degree of wage rigidity. Finally, although the results are less conclusive, using a measure of competition in the product market one finds that greater competition is associated with lower wage rigidity in nominal terms, possibly reflecting the impact of competition on the profits and the wage formation mechanism.

Conclusions

This article presents estimates of the extent to which wages respond to macroeconomic shocks using a methodology that means they can be compared with those available for other countries. The main results show that wage rigidity in Spain is high in real terms and similar to that found in certain other European countries in which the degree of wage indexation is high. This result is consistent with the basic characteristics of the collective bargaining system in Spain, which assign a dominant role to inflation among the determinants of wage increases and a minimal role to firm-level bargaining. As seen, this generates a high degree of wage inertia that hampers the necessary adjustment of wages to the specific conditions of each firm and the cyclical position of the economy.

Wage developments during the economic crisis have been indicative of the difficulties involved in restoring competitiveness to the economy without sharp increases in unemployment.

18. Izquierdo, Moral and Urtasun (2003) present similar evidence for the 1990s, even when the impact of a broad set of characteristics of the collective agreements is controlled for.

Indeed, if these patterns of wage determination are maintained in the current economic circumstances, marked by a rise in inflation that should be temporary, since it largely arises from the impact of certain tax increases and the rise in the oil price, then inflation will remain at higher rates, with the consequent loss of competitiveness and reduction in employment and activity in the Spanish economy.

The recent reform of the labour market will help reduce the degree of wage rigidity in the Spanish economy. The introduction of new possibilities for decentralising collective bargaining must be exploited in order to increase wage flexibility and thereby reduce the excessive volatility of employment in the Spanish economy. The reform of collective bargaining, planned for the first quarter of this year, is bound to play a fundamental role in overcoming the labour market inefficiencies that have recurrently manifested themselves in very large increases in unemployment.

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