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Shocks and wage adjustments

How did European companies react to the demand shock during the European sovereign debt crisis? This article attempts to answer this question using two recent studies based on company survey data from 25 European Union countries over the 2010-13 period. The main results of these studies are that firms face downward nominal base wage rigidities, which increase lay-offs when firms have to adjust to a negative demand shock. Moreover, firms preferably use non-base wage components whenever possible, which highlights their role as a shock absorber during this period. The lockdown adopted in almost all European countries due to the Covid-19 pandemic triggered both a demand shock and a supply shock. Consequently, the relationship between employment and wages may be different to what we observed in 2013 for a demand shock.

Clémence Berson
Microeconomic and Structural Analysis Directorate
External Trade And Structural Policies Division

JEL codes
J23, J30,
J32

5%
share of European firms having reduced base wages over the 2010-13 period

74%
share of European firms that use non-base wage components

7%
average share of non-base wage in total pay

Share of firms having frozen wages over the period 2010-13 (%)
(%)
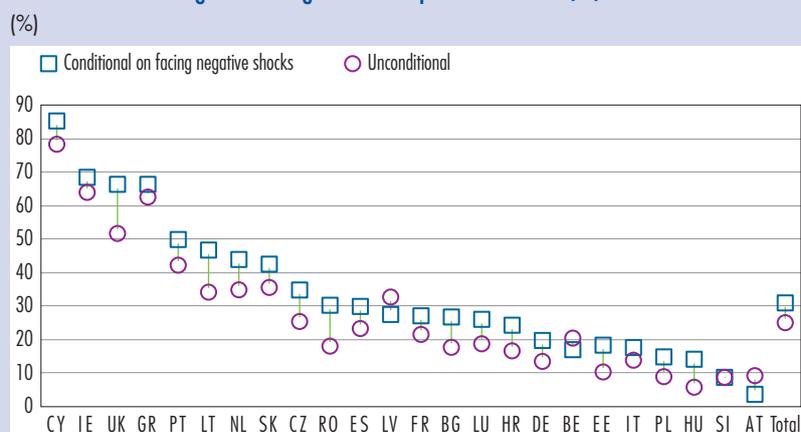
□ Conditional on facing negative shocks　　○ Unconditional

Source: WDN3, Babecký et al. (2019)
Note: The data are weighted to reflect overall employment in the country.

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1. Labour cost adjustments and shocks

Micro-level data on wage variations and survey-based evidence on wage setting have shown that, even in the face of large negative shocks, not only are workers reluctant to accept cuts in their nominal wages, but firms also seem to be unwilling to carry out such cuts. Indeed, it would lower employees' motivation, reduce productivity and increase resignations (see, for example, Stiglitz, 1974, Solow, 1979, or more recently Du Caju et al., 2015, who use the data from the first wave of the survey discussed in this Bulletin). The degree of downward nominal wage rigidities (DNWR) determines, among other factors, the speed, nature, and cost of firms' response to economic shocks. However, the relevance of DNWR depends on the levers at firms' disposal, apart from the base wage, to adjust labour costs when needed. In this regard, firms use different combinations of remuneration and incentive schemes. If base or bargained wages typically feature downward rigidity, firms can also adjust other forms of remuneration — which may be less important or less visible to workers than base wages — to achieve desired adjustments in total labour costs. Reducing employment is also a possible recourse for reducing costs, particularly in the case of DNWR.

A dataset that is particularly well suited to these topics can be drawn from a survey of firms from 25 European Union countries as part of the third wave of the Wage Dynamics Network (WDN). This is a Eurosystem research network set up in 2006 and reactivated in 2013 with the main purpose of assessing labour market adjustments over the 2010-13 period (see Box). Over this period, EU members experienced a sovereign debt crisis, which affected countries in very diverse ways, all the more so as this crisis followed the Great Recession of 2008.

Indeed, due to the financial crisis, the GDP of European Union members dropped by 4.3% in 2009, with significant differences across countries. While the Baltic countries lost nearly 15% of their GDP, Poland saw an increase of 2.8% and France posted a decrease of only 2.9%. This decline in economic activity resulted in a sharp rise in unemployment, from 7% to roughly 10%, in the euro area. However, the consequences for the labour markets also differed according to the magnitude of the

The Wage Dynamics Network survey

The Wage Dynamics Network (WDN) is a research network made up of 25 European central banks and the European Central Bank. Set up in 2006 to study wage developments in Europe, the network was reactivated in 2013 to assess labour market adjustments over the 2010-13 period and firms' response to labour market reforms in EU Member States during this period. To this end, in 2014, the network launched an ad hoc survey of firms, which is a follow-up of the survey developed during phase one of the network. At that time, the WDN's research goal was to:

- identify the sources and features of wage and labour cost dynamics that are most relevant for monetary policy;

- clarify the relationship between wages, labour costs and prices at both the firm and the macroeconomic level.

Data was collected between end-2014 and mid-2015. Although the national surveys were organised and carried out by each national central bank separately, the questionnaire and the target population of firms were very similar across countries. The WDN members worked together to develop a "core questionnaire".

The WDN3 survey provides a unique cross-country dataset of labour market adjustment practices and wage and price-setting mechanisms of firms with exceptional value in terms of both geographical and sectoral coverage. The data facilitate assessment of recent labour market adjustments to different shocks, such as change in demand, customers' ability to pay and credit availability. Izquierdo et al. (2017) describe the dataset and several research papers draw on this survey. In particular, Babecky et al. (2019) and Marotzke et al. (2020) focus on wage rigidity and non-base wage adaptability.

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shock and countries' institutions. In Germany, where GDP fell by almost 6% in 2009, unemployment decreased by 1 percentage point, partly due to the collective bargaining system and wage moderation implemented since the 2000s (see notably Dustmann et al., 2014). By contrast, GDP in Spain decreased by less than 4%, but unemployment rose by around 10 percentage points. In order to tackle the 2008 recession, European governments first used primarily cyclical measures. As the downturn persisted due to the sovereign debt crisis, governments took more structural measures regarding employment protection, unemployment insurance, wage-setting systems and working time (see the COE reports, 2015; Izquierdo et al., 2017).

While the 2008 shock was significant, the current economic crisis due to the lockdown implemented to avoid the Covid-19 pandemic will have a much larger impact. According to ECB forecasts, GDP in the European Union is expected to fall by 7.4% in 2020,

which is almost twice the magnitude of the fall in 2009. Another difference in the current crisis is that we have simultaneously seen a supply shock and a demand shock, which may imply different behaviours among firms and workers than during the previous crisis.

Firms were not all affected by the sovereign debt crisis in the same way. The WDN dataset highlights these differences by collecting information on the shocks, negative or positive, experienced by firms. The survey looks at different types of shocks, in particular demand shocks, credit or financial shocks, and customers' ability to pay. Chart 1 shows the share of firms facing negative shocks by country for each type of shock. The share of firms facing a demand shock or a decrease in their customers' ability to pay is relatively similar in most EU countries. A lower share of firms faced a credit constraint. Babecký et al. (2019) and Marotzke et al. (2020) use these shocks to observe how affected firms adjust labour costs according to the different margins

C1 Share of firms facing negative demand, customers' ability to pay and credit shocks over the 2010-13 period
(%)
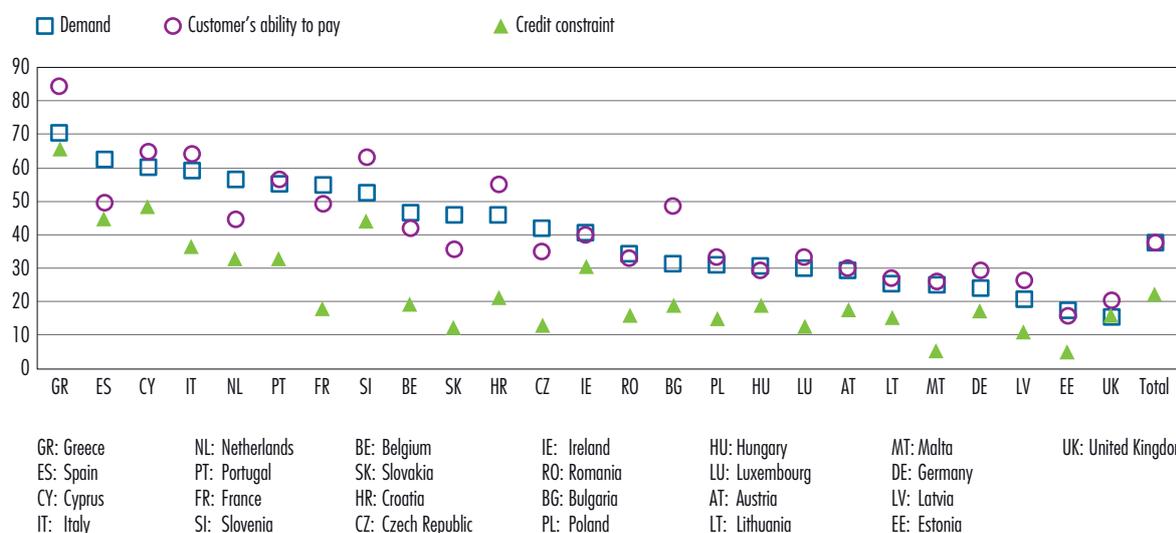
GR: Greece	NL: Netherlands	BE: Belgium
ES: Spain	PT: Portugal	SK: Slovakia
CY: Cyprus	FR: France	HR: Croatia
IT: Italy	SI: Slovenia	CZ: Czech Republic

IE: Ireland	HU: Hungary	MT: Malta	UK: United Kingdom
RO: Romania	LU: Luxembourg	DE: Germany
BG: Bulgaria	AT: Austria	LV: Latvia
PL: Poland	LT: Lithuania	EE: Estonia

Source: WDN3, Babecký et al. (2019).
Note: The data are weighted to reflect overall employment in the country.

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T1 Labour cost adjustments over the 2010-13 period for Germany, Spain, France, Italy and the full sample

(%)

	employment	base wage	non-base wage	Conditional on having faced a negative shock		
				employment	base wage	non-base wage
European Union	30.5	5.3	13.0	39.2	7.5	18.2
Germany	22.9	3.0	4.3	31.5	4.7	6.7
Spain	44.9	7.5	23.7	52.7	8.1	28.4
France	26.8	1.9	12.1	32.2	2.4	13.8
Italy	47.1	5.9	19.9	52	6.9	22.4

Sources: WDN3, author's calculations and Babecký et al. (2019).
Note: The shocks considered are a change in demand, customers' ability to pay and access to external finance. The data are weighted to reflect overall employment in the country.

for employment, base wages and non-base wages. Contrary to studies using administrative or tax data, this survey contains information on the shocks actually experienced by firms. Table 1 summarises labour cost adjustments over the 2010-13 period for the EU and the four larger countries of the euro area, across the total sample of firms and those that faced a negative shock. In general, firms cut back their labour costs more when they face a negative shock.

2. Downward nominal wage rigidities

Based on these descriptive statistics, Marotzke et al. (2020) explore the impact of wage adjustment on employment and focus on the role of downward nominal wage rigidity. Chart 2 ranks EU countries according to the share of firms that froze base wages over the 2010-13 period. This ranking broadly mimics that related to the share of firms experiencing negative shocks (Chart 1). The authors estimate the probability of increasing, freezing or decreasing base wages depending on positive and negative shocks. The findings support the presence of nominal wage rigidities in Europe: wage responses to demand developments are asymmetric with a weaker downward response. A fall in demand significantly increases the probability that base wages will remain unchanged, whereas one might expect these decreases in demand to reduce wages. As the distribution of changes

C2 Share of firms having frozen wages over the 2010-13 period

(%)

☐ Conditional on facing negative shocks   ○ Unconditional on facing negative shocks

CY: Cyprus	PT: Portugal	CZ: Czech Republic	FR: France	DE: Germany	PL: Poland
IE: Ireland	LT: Lithuania	RO: Romania	BG: Bulgaria	BE: Belgium	HU: Hungary
UK: United Kingdom	NL: Netherlands	ES: Spain	LU: Luxembourg	EE: Estonia	SI: Slovenia
GR: Greece	SK: Slovakia	LV: Latvia	HR: Croatia	IT: Italy	AT: Austria
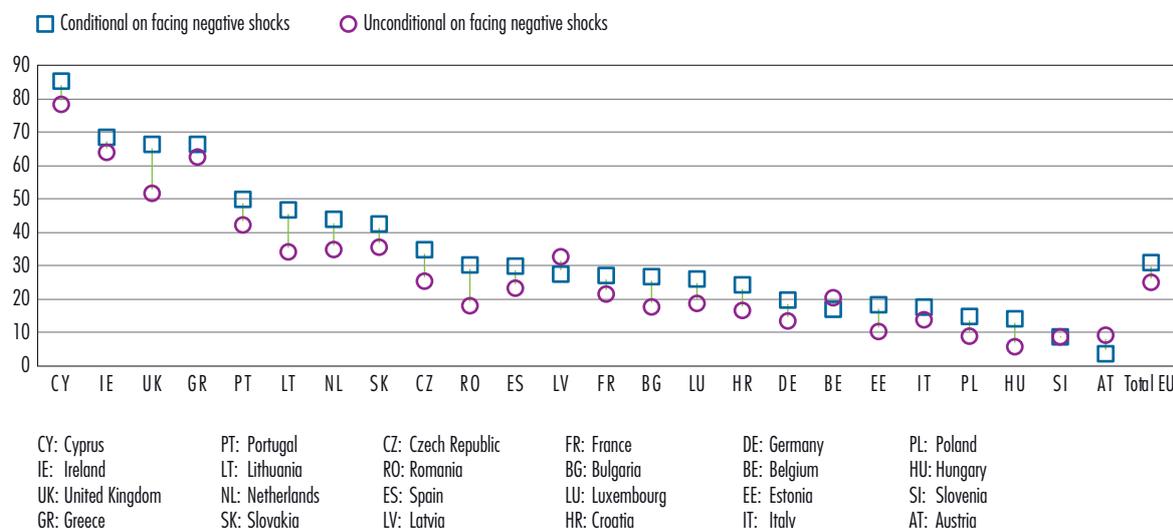
Source: WDN3, author's calculations.
Note: The data are weighted to reflect overall employment in the country.

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T2 Relationship between base wage cuts and employment for firms facing constraints

Wage equation	Base wages		
	Decrease	Unchanged	Increase
Strong demand shock	0.04***	0.03***	-0.07***
	(0.01)	(0.00)	(0.01)
Negative shock:			
Finance	*0.03****	*0.02****	*-0.05****
	(0.01)	*(0.00)*	*(0.01)*
Customers	*0.01***	*0.01***	*-0.02***
	(0.01)	*(0.00)*	*(0.01)*
Supplies	*0.00*	*0.00*	*-0.01*
	(0.01)	*(0.00)*	*(0.01)*
Collective pay agreement [a]	-0.03***	-0.02***	0.05***
	(0.01)	(0.00)	(0.01)
Employment equation	**Employment**		
	Decrease	Unchanged	Increase
Base wages:			
Decrease	*-0.18****	*-0.06****	*0.24****
	(0.01)	*(0.01)*	*(0.02)*
Unchanged (reference)			
Increase	*0.31****	*-0.08****	*-0.23****
	(0.01)	*(0.00)*	*(0.01)*
Strong demand shock	0.15***	-0.03***	-0.12***
	(0.01)	(0.00)	(0.01)
Negative shocks:			
Finance	*0.03****	*-0.01****	*-0.03****
	(0.01)	*(0.00)*	*(0.01)*
Customers	*0.01*	*-0.00*	*-0.01*
	(0.01)	*(0.00)*	*(0.01)*
Suppliers	*0.02**	*-0.00**	*-0.02**
	(0.01)	*(0.00)*	*(0.01)*
Observations	6,746		

a Share of workers covered – instrument variable
Source: WDN3, Marotzke et al. (2020)
Notes: The marginal effect for indicator variables is measured by the discrete change from the base level. For instance, the estimated probability of a decrease in employment given a decline in base wages is 18.4 percentage points lower than when base wages are unchanged. Firm size, sector and country dummies included. Standard errors in brackets; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
See other controls in Marotzke et al. (2020).
Scope: only firms with a negative demand shock.

in wages starts to bunch around unchanged base wages when demand falls, this is further evidence of DNWR. By contrast, an increase in demand is associated with a lower probability of base wages staying unchanged. However, this study focuses on the consequences of DNWR and in particular on the impact on employment.

Using an instrumental strategy, estimation results also show that a base wage reduction significantly lowers the probability of a decrease in employment at the firm level when demand falls (Table 2). The authors thereby point to a negative effect of downward wage rigidities on employment at the firm level.

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3. Non-base wage as shock absorber

As nominal base wages are relatively rigid, Babecký et al. (2019) examine the role of non-base wage components as a channel of labour cost adjustment for firms facing adverse economic shocks over the 2010-13 period. First, they analyse the relationship between wage rigidities and the use of non-base wage component adjustment. Then, they focus on the different responses of base wages and non-base wages to shocks. Descriptive statistics show that bonuses and other performance-related benefits (i.e., non-base wage components) were an important adjustment mechanism used by firms over the 2010-13 period. Around 75% of firms used this tool to modulate remuneration and motivate their employees in 2013. The reported average share of non-base wage components stands at 7%, which is somewhat lower than the figure obtained for 2007 in the context of a similar survey. The smaller share of non-base wage components in the total wage bill may reflect slower economic growth in 2013 relative to the pre-crisis period (2002–07). It also suggests the greater role played by these payments in firms' labour cost flexibility, as reflected in a higher share of firms using non-base wages as part of their remuneration mechanisms. There is significant heterogeneity in the use of non-base wage reductions by sector and size for firms negatively affected by the economic conditions. The financial sector and large companies are particularly responsive. Unsurprisingly, Table 1 shows that the share of firms that cut non-base wage components over the 2010-13 period (13%) is larger than the share that cut base wages (5%).

Table 3 summarises the estimates of the likelihood of reducing non-base wage components. The estimation results also indicate that non-base wage components played a role as shock absorbers during the 2010-13 period, even when controlling for the context and particular features of the firm. Under DNWR, measured here by the freezing of base wages, firms are more likely to cut non-base wages in order to adjust labour costs. Shocks are associated with a larger reduction in non-base wage components. While firms hit by negative demand shocks are more likely to reduce both base wages and non-base wage components, the increase in the probability of reducing non-base wages is higher than

that of reducing base wages. Similarly, other negative shocks consistently generate negative effects on wages. Evidence also suggests that non-base wage components react more frequently in the case of negative shocks, and these reactions are stronger for non-base wage components than for base wages. Finally, one can conclude from the comparison of marginal effects that downward rigidity is stronger for base wages than for non-base wage components.

T3 Relationship between cuts in non-base wage components and base wage rigidity
Customers' ability to pay shock

Reduction in non-base wage components	(1)	(2)	(3)
Base wage rigidity			
Base wage freeze	0.12***	0.09***	0.08***
	(0.01)	(0.01)	(0.02)
Shocks			
Demand shock		0.11***	0.11***
		(0.01)	(0.01)
Finance shock		0.06***	0.06***
		(0.01)	(0.01)
Customers' ability to pay shock		0.03***	0.02**
		(0.01)	(0.01)
Availability of supplies shock		0.03***	0.03***
		(0.01)	(0.01)
Shocks			
Base wage freezes & demand shock			-0.02
			(0.02)
Base wage freezes & finance shock			0.04***
			(0.01)
Base wage freezes & customer pay shock			-0.01
			(0.01)
Base wage freezes & availability of supplies shock			-0.01*
			(0.01)
Observations	19,234	18,582	18,582

Key: Freezing base wages is correlated with a 12-point higher probability of reducing non-base wage components.
Source: WDN3, Babecký et al. (2019).
Note: Marginal effects reported. Probit estimation. The dependent variable is equal to one if the firm reduces non-base wage components. Standard errors in brackets; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The estimation is controlled for sectors, firm size, labour cost share, share of manual workers, workers' tenure, multi-establishments and country fixed effects.

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To summarise, Marotzke et al. (2020) and Babecký et al. (2019) highlight the presence of downward nominal base wage rigidities in EU countries during the 2010-13 post-crisis period. In a downturn, these rigidities have a negative impact on employment. However, firms also use other labour cost adjustments when they face a shock, such as bonuses and other performance-related benefits. The current economic crisis due to the Covid-19 pandemic is a more complex crisis and involves both supply and demand shocks. Employment and wages should therefore react in a different manner to that observed during the sovereign debt crisis.

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