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Wage moderation in Spain and in the euro area

Pilar Cuadrado and Federico Tagliati

Abstract

One of the most visible characteristics of the recent economic recovery is the moderation of wage growth in a good number of advanced economies. This article analyses quantitatively the contribution of several factors to changes in the wage growth rate in Spain and in the euro area during the current upturn. In both cases, the results show that the recent wage moderation is attributable to relatively high levels of labour market slack and low inflation expectations. For the euro area, another significant factor is low productivity growth, in contrast to other similar phases of the economic cycle. The analysis also reveals that, in the most recent period, it is important to take into account broader slack indicators than the unemployment rate, given that the high proportion of involuntary part-time and discouraged workers are exerting some downward pressure on wages.

Keywords: wage growth, unemployment, Phillips curve.

JEL codes: E24, E31, J3.

WAGE MODERATION IN SPAIN AND IN THE EURO AREA

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Introduction

The Phillips curve is the standard empirical framework used in the economic literature for analysing wage growth and its main determinants, at the aggregate level. Under this approach, the evolution of labour costs depends on the level of labour market slack (which is usually measured by means of the unemployment rate or the difference between it and the so-called structural unemployment rate or NAIRU), on agents' inflationary expectations and on the growth rate of labour productivity.

Some recent studies have provided evidence that the level of labour market slack might be determined not only by the unemployment rate[1], but by other variables indicative of the under-utilisation of the labour factor, which include the percentage of involuntary part-time workers and those not actively seeking employment, who are usually referred to as discouraged individuals. Further, the economic literature has shown that other structural factors, such as technological progress and globalisation, may have transformed labour-related needs, especially in the advanced economies, contributing also to wage moderation.

By estimating different specifications of the Phillips curve, this article analyses the extent to which structural factors and non-traditional slack indicators alike may have influenced recent wage developments in Spain and in the euro area as a whole. The results of the analysis show that, for Spain, low wage growth during the recent period of economic recovery has been largely due to labour market slack levels that are still relatively high and to low inflation expectations. Also, the countercyclical behaviour of labour productivity has been conducive to wage growth not standing even lower during the crisis. In the euro area, wage moderation is attributable, as in Spain, to relatively high unemployment rates and to low inflation, but also to productivity growth being below its average for the last 20 years.

Determinants of wage growth

According to economic theory, wage growth is related to several factors, cyclical and structural alike. In the expansionary phase of the economic cycle, firms need to create new vacancies to meet the greater demand for their products. Hence, firms must offer higher wages and better conditions to attract new workers or to retain their current staff. Conversely, the recessionary phase is characterised by higher levels of slack and by downward pressure on wages. Accordingly, there is generally a negative relationship between the wage inflation rate and the level of slack, which is known as the Phillips curve.

Another cyclical factor related to nominal wage growth is price developments. The inflation rate may exert upward pressure on wages so that there should be no deterioration in workers' purchasing power. The mechanism through which price increases translate into wage increases depends mainly on the expectations held about price developments in the negotiation of collective bargaining agreements.

Among the structural factors, the trend growth rate of productivity is key to wage developments. Faster growth in productivity may be determined, for instance, by the

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1 See IMF (2017), ECB (2017) and Banco de España (2017), for example.

spread of new technologies or by the enhanced human capital of workers. Thus, as worker productivity increases, firms' labour demand grows and that tends to generate upward pressure on wages.

Other structural factors this article analyses are technological change and globalisation. The rapid spread of new technologies in the first decade of the 21st century has prompted significant changes in the advanced economies' productive structure and labour market. For one thing, the decline in the relative price of capital vis-à-vis consumer goods is thought to have prompted a substitution of capital for the labour factor, especially in those sectors where productive processes are more susceptible to automation. If the possibility of substitutability between productive factors is high, a decline in the proportion of output that remunerates the labour factor may occur.[2] Alternatively, technological change may benefit those sectors in which new technologies are complementary to worker skills. At the aggregate level, the prevalence of one effect or another depends on the productive structure of each country.

As regards globalisation, several articles have found evidence that the greater openness of domestic product markets to foreign trade, and firms' participation in global value chains, have given rise – through increased competition and the delocalisation of specific productive activities – to declines in the demand for labour in certain productive sectors, with adverse effects on employment and wages in those sectors most exposed to this type of phenomenon.[3]

Recent wage developments and determinants

Chart 1 shows the year-on-year growth rate of wages, measured by compensation per employee, for the period from 1998 Q1 to 2017 Q2, both in Spain (see Chart 1.1) and in the euro area (Chart 1.2). It can be seen that while wage growth was more marked in Spain than in the euro area between 2003 and the first half of 2009, in Spain there were greater slowdowns during the global financial crisis than in the euro area, with even negative nominal wage growth rates observed in several quarters. The chart also includes the changes in cyclical slack in the labour market, measured through the unemployment rate. The unemployment rate increased markedly in Spain during the economic crisis, although there was a substantial decline as from 2013 Q3 (see Chart 1.1). The rise in unemployment in the euro area was more limited (see Chart 1.2), albeit with significant cross-country differences. In both cases, the reduction in the unemployment rate as from 2013 does not appear to have been accompanied by an increase in wage growth.

One of the most frequent hypotheses for explaining this period of wage moderation suggests that the unemployment rate might only partly reflect the true level of cyclical slack in the labour market. Indeed, the presence of more flexible contractual arrangements that provide both for changes in hours worked and in the transition from inactivity to employment without passing through unemployment has been identified in the literature as a possible determinant of low wage growth.[4] The first two panels of Chart 2 illustrate the path of two alternative labour market slack indicators. On one hand there is the rate of involuntary part-time workers, i.e. part-time employees who work less than 30 hours per week and report that they would be prepared to work more hours. On the other, there is also the rate of discouraged individuals, measured by means of the ratio between those not actively seeking employment but who would be prepared to work immediately if they had a job offer and the group encompassing the labour force and the discouraged.
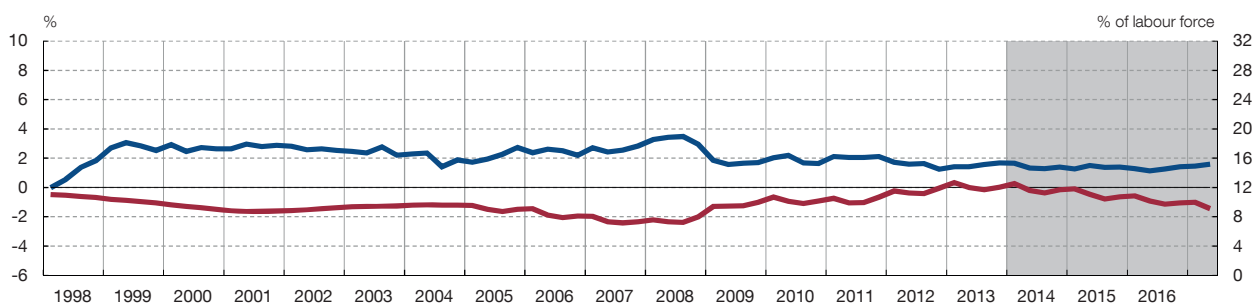
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2   See *Karabarbounis* and *Neiman* (2014).
3   See *Autor*, *Dorn* and *Hanson* (2013), and *Elsby*, *Hobijin* and *Sahin* (2013).
4   See European Commission (2015), IMF (2017) and Bulligan, Guglielminetti and Viviano (2017).

CHART 1

1 SPAIN
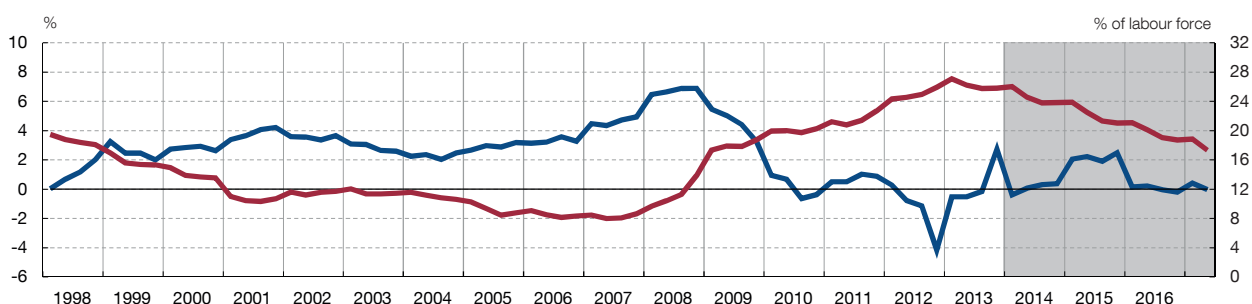
2 EURO AREA

—— COMPENSATION PER EMPLOYEE   —— UNEMPLOYMENT RATE (right-hand scale)

SOURCE: Eurostat.

⬇ Download

As can be seen, the rate of involuntary part-time employment has evolved in a similar fashion to the unemployment rate during the crisis. In the past 15 years the rate of involuntary part-time employees has grown rapidly in Spain, from a level close to 2% to around 8% of the labour force. The marked growth observable from 2008 might indicate that, during the financial crisis, at least a sizeable number of firms confronted the decline in activity by replacing a significant proportion of full-time workers with part-time employees, with the aim of reducing their labour costs. Conversely, in the euro area, the increase in the part-time employment rate was, on average, more gradual, albeit with significant differences from country to country. For example, while in Germany there were limited increases in involuntary part-time employment, the time series for Italy moved on a similar course to that of Spain both in terms of levels and trend.[5] The same qualitative observations may also be applied to the percentage of discouraged workers, which increased during the crisis and slowed as from 2013, both in Spain and in the euro area.

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5 Another significant aspect of the Spanish labour market has been the marked reduction in the rate of temporary employment during the crisis, i.e. the ratio of workers with temporary contracts to total employees, which is consistent with the fact that temporary workers were those who most saw their numbers adjusted during that period (see, for example, Bentolila et al., 2012). Spain is also notable for temporary employment levels far above the euro area average. Specifically, despite the recent reduction in its temporary employment rate, this continues to be about 10 pp higher than the euro area average. It is worth noting that the fall in the unemployment rate in Spain during the recovery has also been accompanied by an increase of almost 5 pp in the temporary employment rate. Indeed, the correlation between the rate of unemployment and the rate of temporary employment is -0.9 in Spain.

1 INVOLUNTARY PART-TIME EMPLOYMENT

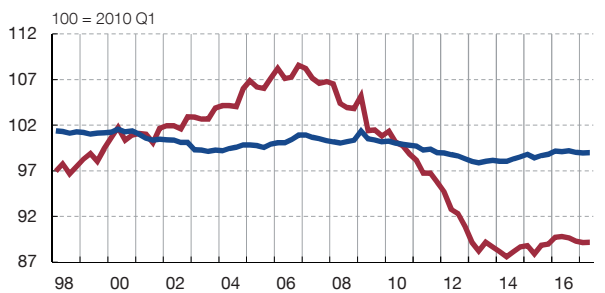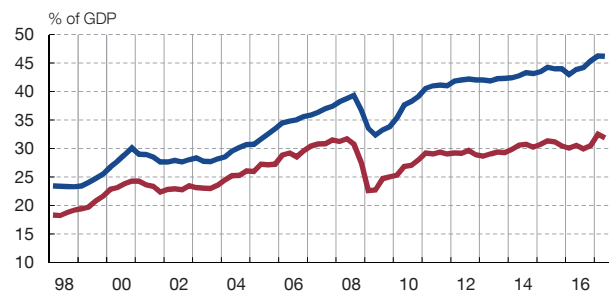% of labour force

2 DISCOURAGED
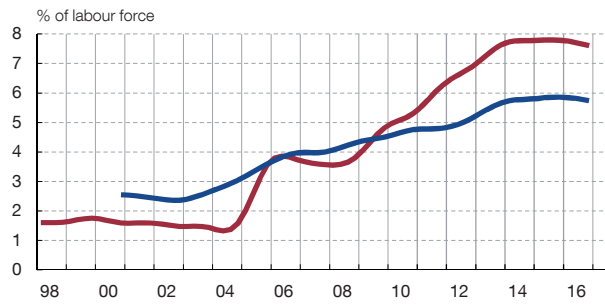
% of labour force and discouraged
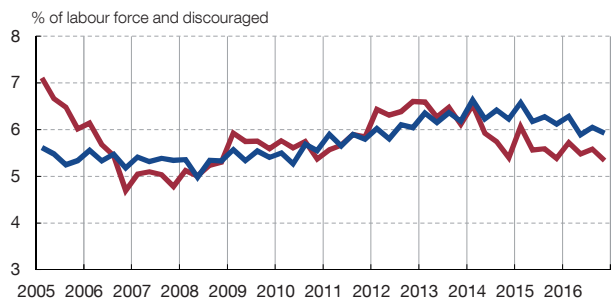
3 INFLATION EXPECTATIONS

%

4 PRODUCTIVITY GROWTH

%

5 RELATIVE PRICE OF CAPITAL

100 = 2010 Q1

6 IMPORTS

% of GDP

SPAIN ——— EURO AREA ———

FUENTE: Eurostat.

Download

Chart 2 also tracks inflation expectations in Spain (see Chart 2.3), which were constructed drawing on several composite indicators (see Álvarez and Sánchez, 2018). It can be seen how, in the post-crisis period, inflation expectations were lower than during the pre-crisis period and that such expectations have remained relatively moderate during the current recovery phase.[6]

Chart 2 further shows the time series of the trend of labour productivity growth (see Chart 2.4), the relative price of capital (Chart 2.5) and imports as a percentage of GDP (Chart 2.6). The

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6 The composite indicators are constructed taking the median of 15 expectations indicators, which cover the inflation predictions of economic analysts, consumers, firms and financial markets, for the current and the following year, along with 7 slack indicators, which cover the product markets and the labour factor. It has not been possible to construct the same inflation expectations measure for the euro area and, therefore, the chart only shows the time series for Spain.

first indicator, constructed as the trend component of the growth rate at two years of productivity per employee, evidences a strong countercyclical pattern in Spain owing to the existence of a composition effect, whereby lesser-skilled and less experienced workers are more exposed to leaving the workforce in periods of recession. On the contrary, euro area productivity growth slows over most of the period and picks up slowly as from 2010.

The relative price of capital, constructed as the ratio of the investment goods deflator to the consumption deflator, has been widely used in the literature as an indicator of technological change.[7] Technological progress incorporated into the production of investment goods (e.g. machinery, telecommunications, computers, etc.) makes for a reduction in their production cost and a consequent decline in their price relative to consumer goods. The relative price of capital moves on a positive course in Spain until 2007, declining markedly thereafter (see Chart 2.3). This course is largely given by the increase in the price of real estate assets pre-crisis and by their swift decline thereafter, despite the fact that the relative price of machinery and IT equipment has fallen throughout the period.[8] Yet this pattern is not observed in the euro area, where the relative price of capital has fallen gradually in the past 20 years. Imports move on a similar growing path in Spain and in the euro area, evidencing the progressive openness of the European economies to foreign trade (see Chart 2.4).

Empirical analysis and statistical information used

For Spain, the empirical analysis of the determinants of wage growth has been conducted through the estimation of the following Phillips curve for the period 1998-2017:

$$\pi_t^w = \alpha_0 + \alpha_1 \text{slack}_t + \alpha_2 \pi_{t-4}^P + \alpha_3 \text{gprod}_t + \alpha_4 X_t + \varepsilon_t \qquad [1]$$

where π_t^w is the wage inflation rate, calculated on the basis of quarterly national accounts data as the year-on-year growth rate of compensation per employee; slack_t is a labour market slack indicator which, depending on the model specification, has been measured either traditionally through the seasonally adjusted unemployment rate, or additionally resorting to non-conventional indicators. Among the latter, first, an indicator has been constructed taking into account involuntary part-time employment, for which purpose the unemployment rate and the involuntary part-time employment rate are added, using information from the Spanish Labour Force Survey. Second, an additional indicator has been constructed in which discouraged individuals are considered in addition to involuntary part-time workers.[9]

The inflation expectations[10], π_{t-4}^P, have been included by means of a composite indicator[11] with a lag of four quarters; gprod_t is the growth rate at two years of the trend component of productivity per employee; and ε_t is a statistical error[12, 13]. Lastly, according to the

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7 See *Karabarbounis* and *Neiman* (2014).

8 The fixed investment goods deflator, which has been used to construct the relative price of capital, includes both the changes in property prices and those in the price of equipment and machinery. The results presented are robust to the use of measures that reflect exclusively the changes in the price of investment in equipment.

9 Defined as those unemployed not actively seeking employment because they think they will not find a job. The denominator of this indicator also includes discouraged individuals.

10 Different lags have been tested for this indicator with similar results, although the fourth lag proves more significant.

11 See Álvarez and Sánchez (2018).

12 The productivity trend has been extracted using a Hodrick-Prescott filter. The inclusion of productivity growth in the estimation of the Phillips curve can be found, for example, in *Ball and* Moffitt (2001), *Dew-Becker* and *Gordon* (2005) and IMF (2017).

13 The wage inflation rate has been measured as the year-on-year growth rate of compensation per employee. However, the robustness of the empirical results to using the year-on-year growth rate in compensation per hour worked has been verified.

TABLE 1

	First model	Second model	Third model	Fourth model	Fifth model
Dependent variable					
π^w_t					
Unemployment rate	-0.268***			-0.239***	-0.286***
	(0.059)			(0.058)	(0.065)
Slack (unemployment and involuntary part-time employment)		-0.217***			
		(0.055)			
Slack (unemployment, involuntary part-time employment and discouraged, U6)			-0.226***		
			(0.057)		
Inflation expectations (composite indicator of inflationary pressure) (b)	0.830***	0.715**	0.724**	1.124***	0.711**
	(0.230)	(0.277)	(0.272)	(0.239)	(0.257)
Productivity growth	0.730**	0.850**	0.957**	1.148**	0.700**
	(0.257)	(0.333)	(0.354)	(0.376)	(0.259)
Technological change (growth of the relative price of capital)				0.257	
				(0.159)	
Foreign trade (change in imports, as a % of GDP)					-0.080
					(0.049)
Constant	3.663***	3.958**	4.895**	2.135*	4.362**
	(1.060)	(1.267)	(1.455)	(1.160)	(1.272)
Number of observations (c)	70	68	68	70	70
R.2	0.665	0.640	0.646	0.683	0.677

SOURCES: Eurostat and Banco de España.

a   The standard errors are shown in brackets. The asterisks *, ** and *** denote significance with confidence levels of 90%, 95% and 99%, respectively.
b   Constructed from the median of 15 expectations indicators, encompassing forecasts among professionals, consumers, firms and financial markets, and from 7 indicators of slack covering the product and labour markets. See Álvarez, Sánchez (2018).
c   Relating to the period from 2000 Q1 to 2017 Q2.

specification of the model, X_t may include the annual change in the relative price of capital and the degree of openness of foreign trade, measured as the biannual change in the ratio of imports to GDP.[14]

The estimation of the Phillips curve for the group of euro area countries follows a similar empirical strategy, but with the difference that panel data have been used for the 19 countries.[15] Unlike Spain, inflation expectations are included drawing on the year-on-year rate of inflation with a lag of one period, since expectations indicators for all the euro area countries are not available.

Results

Table 1 shows the results of the estimation of five different Phillips curve models for Spain. The first column includes the results of the baseline model, and the unemployment rate, productivity and inflation expectations can be seen to have influenced wage growth in the direction suggested by economic theory. Specifically, a 1p p increase in the unemployment rate would be associated with a reduction of about 0.3 pp in wage growth. In the case of trend productivity, a 1 pp increase would correspond to wage growth of 0.7 pp. Further, as might

14   As explained in the previous section, the relative price of capital is defined as the ratio of the fixed investment goods deflator to the consumption deflator, based on National Accounts data.
15   The specification of the Phillips curve for the euro area includes country fixed effects, although the coefficients of the different variables are not country-specific.

be expected, the coefficient of price inflation expectations is positive and significant, there being a close relationship between both variables, with a coefficient close to 0.8.

The following two columns of Table 1 show the results obtained on including other factors that are used to measure different aspects of the level of labour market slack and which may not be properly captured by the unemployment rate. In particular, the slack variable defined as the sum of the unemployment rate and the involuntary part-time rate, in the second column; and, in the third column, the indicator that encompasses, moreover, the group of discouraged individuals. Both measures show a significant relationship to wages throughout the period analysed.

The penultimate and last columns of Table 1 separately add to the baseline model the two previously mentioned structural factors, i.e. the changes in the relative price of capital and in the influence of imports. Regarding the first factor, the relative price of capital can be seen to not be statistically associated with the wage inflation rate. As to the influence on the global market, the estimated coefficient for the change in imports proved negative, although it is not statistically significant.[16]

These estimates allow for an analysis of the impact that each determinant has had on wage growth over time.[17] Beginning with the basic model (see Chart 3), it is seen that the unemployment rate was the main factor which, gradually, exerted downward pressure on wage growth during the crisis (between 2008 and 2012). From 2014, against the background of the progressive economic recovery, the unemployment rate continued to exert a negative effect on wages, albeit decreasingly so. Inflationary expectations are also important for explaining wage developments and, in particular, a substantial increase is discernible in their contribution in the quarters following the recovery, characterised by particularly low inflationary expectations. As regards productivity, during the crisis years their contribution was positive and moved on a growing path, which offset, at least in part, the impact of high unemployment.[18]

Chart 3 also tracks, for the different models, the residuals, i.e. that portion of wage growth not explained by the variables included in the model. Generally, the residuals are seen to be small, meaning the model is capable of explaining wage developments reasonably well. However, two periods of negative residuals stand out. Specifically, from 2000 to 2007, which might be related to the strong inflow of foreign workers who possibly had lower wage bargaining power. Also, between 2010 and 2012, two labour reforms were approved which, along with the inter-confederal agreements for collective bargaining, are estimated to have been conducive to a greater degree of wage moderation, in accordance with this analysis.[19]
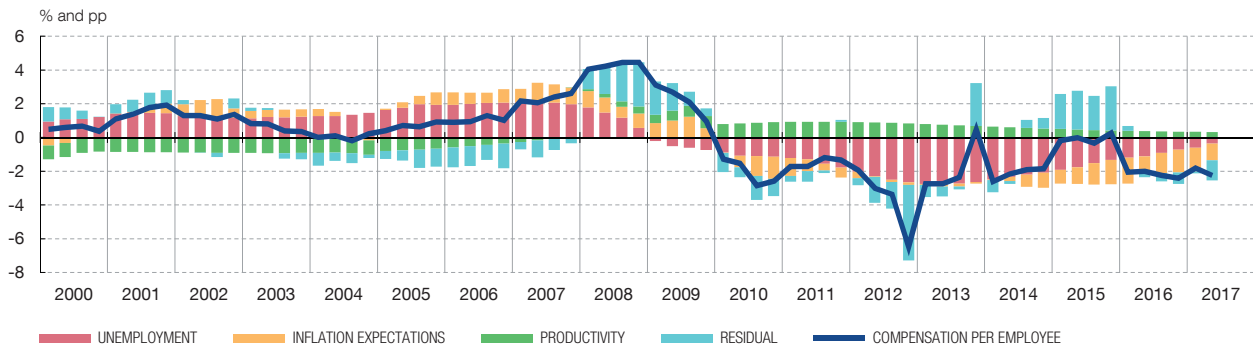
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16 However, the sign is indicative of some sensitivity of wages to demand shocks on the part of foreign competition. Significantly, this relationship might merit further research at the sectoral level given that the effect of external demand shocks on wages is probably heterogeneous between sectors depending on their level of exposure to such shocks, and that the relationship at the aggregate level estimated here would represent an "average" effect across the different sectors.

17 The contributions have been calculated as the deviations in wage growth with respect to the average growth rate in the period under analysis.
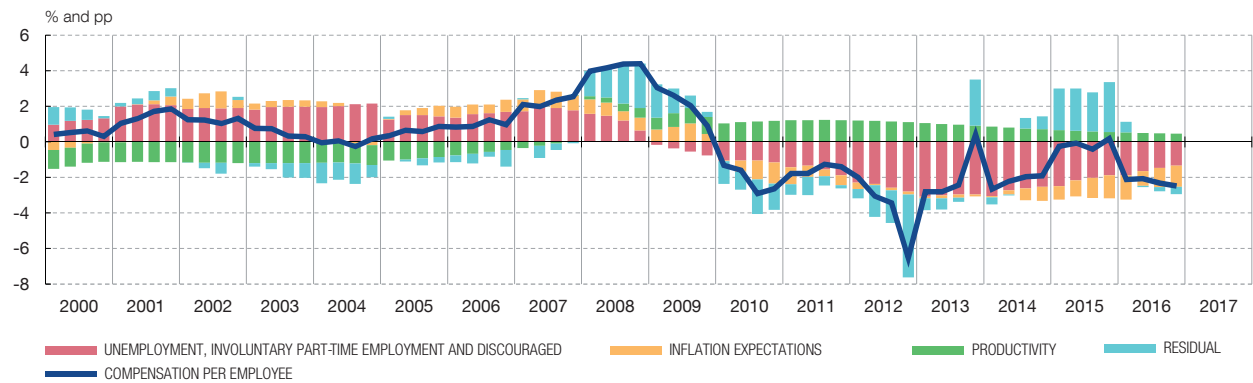
18 This confirms the countercyclical profile which, traditionally, has characterised productivity in Spain and which is due to the particular characteristics of the Spanish labour market, with intense use, at times of adjustment, of temporary employment and of less experienced or lesser-skilled workers.

19 Conversely, a period of wage growth higher than may be explained by fundamentals was seen between 2007 and 2009. That reflects the high inertia of collective bargaining agreements, which made it difficult to adapt the conditions of such agreements to the changes stemming from the onset of the economic crisis. The composition effects on wages also played a relevant role in this period, raising average wages as a result of high job destruction with lower-than-average wages. Galán and Puente (2014) estimate this effect, showing an increase in real wages at the start of the crisis, despite the strong deterioration in the labour market.
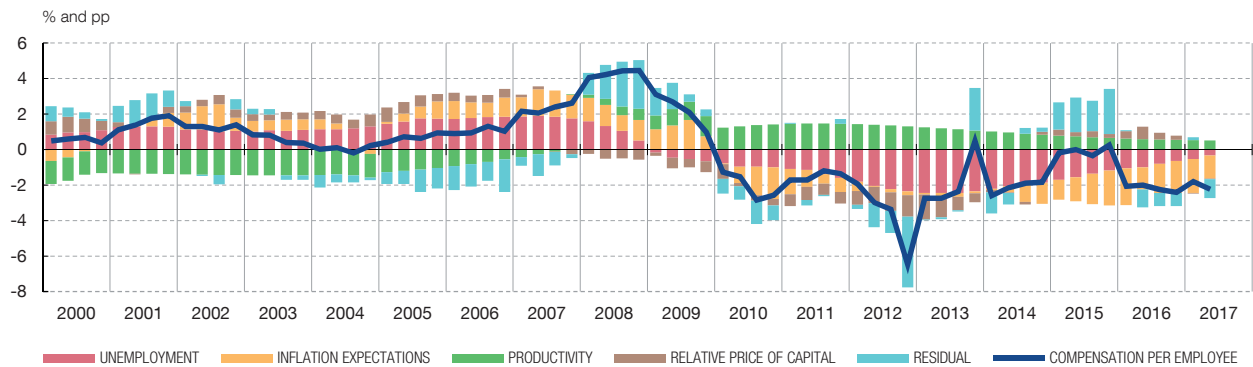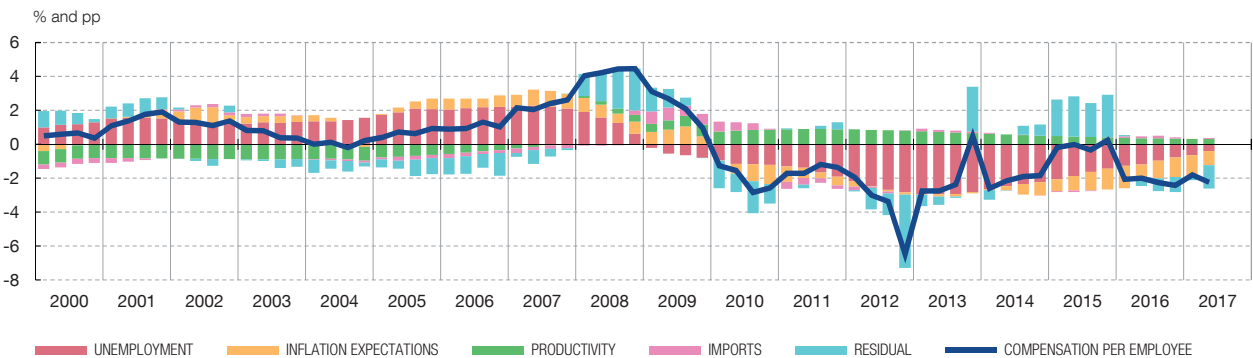
1 BASIC MODEL

% and pp

UNEMPLOYMENT   INFLATION EXPECTATIONS   PRODUCTIVITY   RESIDUAL   COMPENSATION PER EMPLOYEE

2 MODEL WITH INVOLUNTARY PART-TIME EMPLOYMENT AND DISCOURAGED

% and pp

UNEMPLOYMENT, INVOLUNTARY PART-TIME EMPLOYMENT AND DISCOURAGED   INFLATION EXPECTATIONS   PRODUCTIVITY   RESIDUAL
COMPENSATION PER EMPLOYEE

3 MODEL WITH TECHNOLOGICAL CHANGE

% and pp

UNEMPLOYMENT   INFLATION EXPECTATIONS   PRODUCTIVITY   RELATIVE PRICE OF CAPITAL   RESIDUAL   COMPENSATION PER EMPLOYEE

4 MODEL WITH FOREIGN TRADE

% and pp

UNEMPLOYMENT   INFLATION EXPECTATIONS   PRODUCTIVITY   IMPORTS   RESIDUAL   COMPENSATION PER EMPLOYEE

SOURCES: Eurostat and Banco de España.

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	First model	Second model	Third model	Fourth model	Fifth model
Dependent variable					
π^w_t					
Unemployment rate	-0.373***			-0.377***	-0.373***
	(0.022)			(0.024)	(0.022)
Slack (unemployment and involuntary part-time employment)		-0.248***			
		(0.015)			
Slack (unemployment, involuntary part-time employment and discouraged, U6)			-0.207***		
			(0.014)		
Inflation expectations (past inflation)	0.138**	0.098**	0.136**	0.132**	0.122**
	(0.049)	(0.048)	(0.050)	(0.050)	(0.054)
Productivity growth	0.449***	0.406***	0.327***	0.448***	0.447***
	(0.057)	(0.058)	(0.060)	(0.057)	(0.057)
Technological change (growth of the relative price of capital)				-0.019	
				(0.142)	
Foreign trade (change in imports, as a % of GDP)					0.017
					(0.015)
Constant	3.098***	3.183***	4.568***	3.130***	3.085***
	(0.218)	(0.203)	(0.287)	(0.232)	(0.216)
Number of observations (b)	1,481	1,333	1,316	1,481	1,481
R.2	0.433	0.426	0.394	0.433	0.434

SOURCES: Eurostat and Banco de España.

a   The standard errors are shown in brackets. The asterisks *, ** and *** denote significance with confidence levels of 90%, 95% and 99%, respectively.
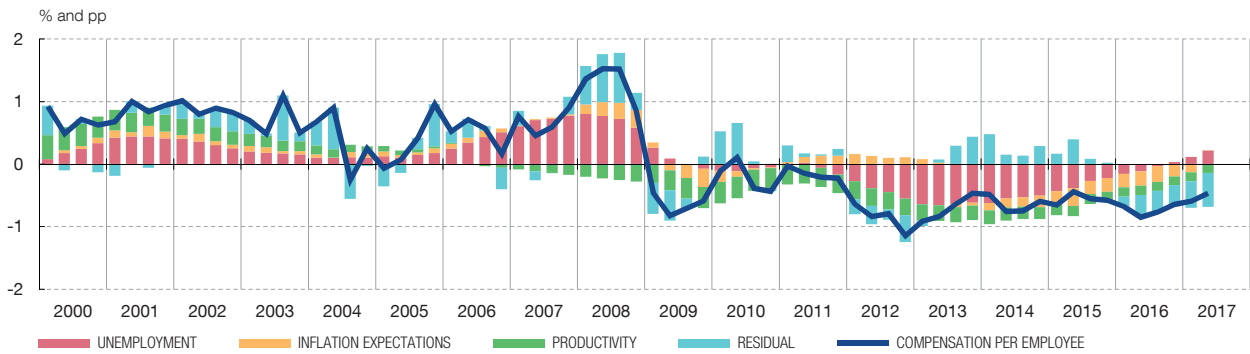b   Relating to the period from 1997 Q1 to 2017 Q2.

As to the current period of recovery dating back to 2014, it can be seen that, in 2016 and in the first two quarters of 2017, the growth of compensation per employee was, on average, almost 2 pp below the average for the period. This wage moderation is essentially attributable to the setting of low inflation expectations and to the high degree of slack still characterising the Spanish labour market. However, the negative residuals observed since 2016 Q2 would indicate that wage growth were lower than expected, by 0.4 pp on average. These recent negative residuals practically disappear (see Chart 3.2) when the additional measures of slack are taken into account, suggesting that these factors (involuntary part-time employment and discouraged individuals) played a significant role when it comes to explaining the low wage growth in the most recent period.

With regard to the results obtained for the set of euro area countries, Table 2 shows the estimation of the same specifications of the Phillips curve using data for the 19 countries[20], while Chart 4 displays the results of the decomposition of the Phillips curve during the 2000-2017 period. The results are similar to those obtained for Spain. In particular, it is estimated that a 1 pp increase in the unemployment rate would be associated with a reduction of about 0.4 pp in wage growth, somewhat higher than that observed in Spain, whereas a 1 pp increase in the productivity rate would correspond to an increase in wage growth of 0.4 pp.[21] Among
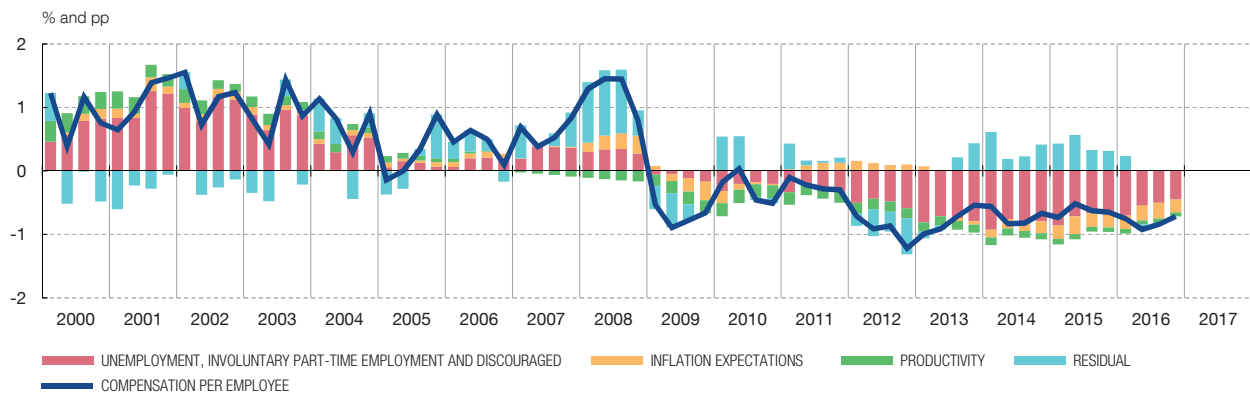
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20   With the caveat that, in this case, inflation expectations are captured by the year-on-year inflation rate of the previous quarter, since a better fit is attained thereby, and that country fixed effects have been included.
21   In this case, inflation expectations are captured via past inflation, whose coefficient is of a smaller scale than in the Spanish case, probably reflecting the differences in the definition of this variable.
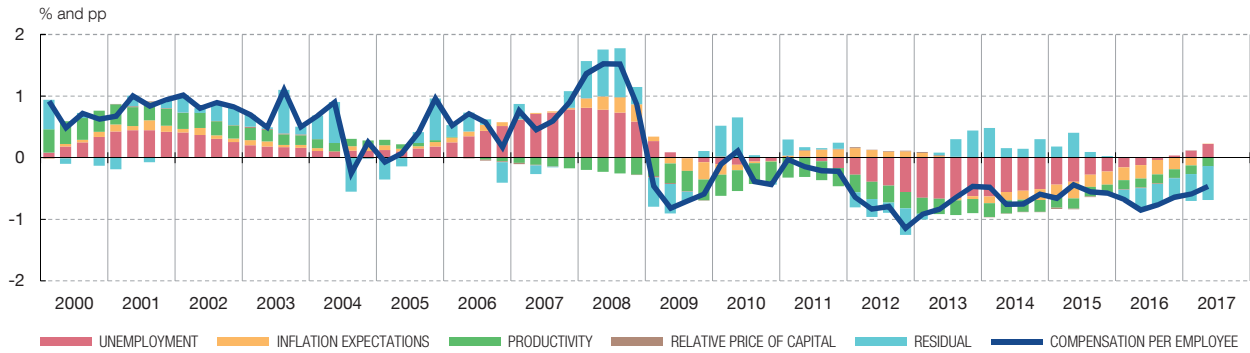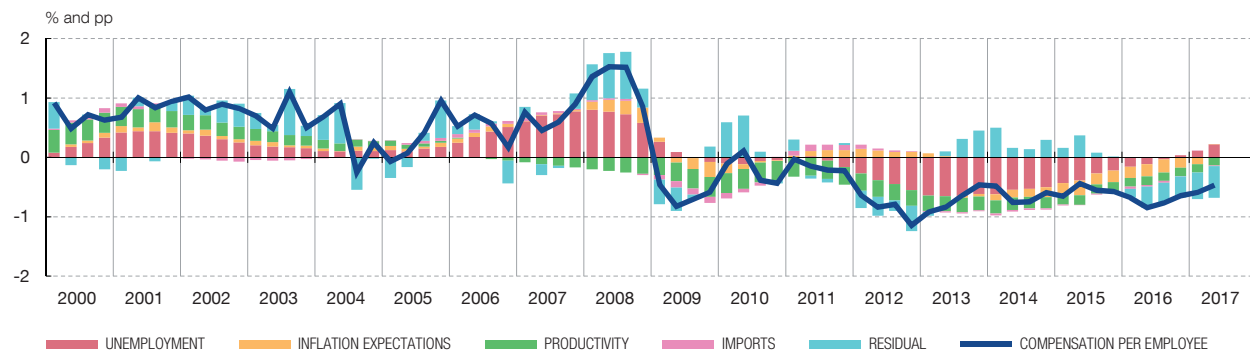
EURO AREA: DECOMPOSITITON OF PHILLIPS CURVE ACCORDING TO MODELS
Deviations from average for the period

CHART 4

1 BASIC MODEL

% and pp

| UNEMPLOYMENT | INFLATION EXPECTATIONS | PRODUCTIVITY | RESIDUAL | COMPENSATION PER EMPLOYEE |

2 MODEL WITH INVOLUNTARY PART-TIME EMPLOYMENT AND DISCOURAGED

% and pp

| UNEMPLOYMENT, INVOLUNTARY PART-TIME EMPLOYMENT AND DISCOURAGED | INFLATION EXPECTATIONS | PRODUCTIVITY | RESIDUAL |
| COMPENSATION PER EMPLOYEE |

3 MODEL WITH TECHNOLOGICAL CHANGE

% and pp

| UNEMPLOYMENT | INFLATION EXPECTATIONS | PRODUCTIVITY | RELATIVE PRICE OF CAPITAL | RESIDUAL | COMPENSATION PER EMPLOYEE |

4 MODEL WITH FOREIGN TRADE

% and pp

| UNEMPLOYMENT | INFLATION EXPECTATIONS | PRODUCTIVITY | IMPORTS | RESIDUAL | COMPENSATION PER EMPLOYEE |

SOURCES: Eurostat and Banco de España.

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the structural factors, it can be highlighted that both the relative price of capital and the incidence of imports have a minor effect, which is not statistically significant.[22]

The decomposition exercise shown in Chart 4 reveals that the low wage growth observed in the euro area as from 2010 is mainly due to high levels of labour market slack, to low inflation and to productivity growing below the average for the period. Nevertheless, negative residuals are observed which would denote wage growth below that explained by its traditional determinants. As for Spain, these residuals tend to disappear in the most recent period when the extended measure of slack in the labour market is included in the model.

9.10.2018.

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22 The coefficients associated with the unemployment rate, with past inflation and with productivity growth that have been estimated for the euro area are similar in size to those in other papers in the literature that use a broader set of countries (IMF, 2017). However, the same studies show a positive relationship between the relative price of capital and wage growth.