Quarterly Report on the Euro Area

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Wage dynamics in the EMU

I. Wage dynamics in the EMU

This section takes stock of recent wage developments in the euro area given their importance for the well-functioning of the EMU. In the euro area, wage developments not only affect the allocation of resources and social cohesion, but also macro-economic adjustment. The latter is especially important in view of the remaining rebalancing challenges in the euro area. The section identifies several factors that may have caused sluggish wage growth in the euro area until recently, in spite of robust economic growth. It shows that remaining slack and low productivity growth can account for some of this slowdown in wage growth, but leave a significant amount unexplained. Adding backward- and forward-looking inflation measures improves the fit of the predicted values considerably. Other potential contributing factors to the observed wage dynamics are reviewed as well: broader measures of labour market slack, ongoing structural labour market changes, the downward trend in hours worked per employee, and the after-effects of downward nominal wage rigidities. The section shows that while wage developments mainly result from the interaction between market forces, policymakers have a number of instruments at hand to influence wage developments. These include public and minimum wages, the tax and benefit system, and the steering of collective bargaining in the private sector via tripartite agreements or by reviewing legal frameworks for negotiation in consultation with social partners. Structural reforms can also influence wage and labour cost developments, albeit in a more indirect way. Of particular importance are reforms that support productivity growth, e.g. by making labour markets more adaptable and improving allocative efficiency, and by investment in human capital and innovation. ([1])

I.1. Introduction

Wages play a key role in an economy. Sound wage behaviour can support economic resilience, by being a possible channel for macro-adjustment in the face of certain types of shocks. This is especially relevant in a currency union, where other channels for adjustment (such as exchange rate adjustment) can no longer be used. Relative wage differences across the economy can also signal where labour can be put to its most productive use, and hence where labour resources should be allocated. At the same time, wages are crucial determinants of household incomes, and hence of aggregate demand and (inclusive) growth.

The euro area is entering its sixth year of uninterrupted economic growth, and is expected to continue growing, albeit at slowing pace (from 2.4% in 2017 to 1.9% in 2020). ([2]) The output gap is estimated to have fully closed in 2018. These improvements are also observed in the labour market, which continues to recover at a rapid pace, with employment reaching pre-crisis levels in 2017 and unemployment rates gradually approaching

levels prior to the recession. According to the Commission's forecasts, unemployment will decline from 9.1% in 2017 to 7.5% by 2020.

Several studies have however observed that until recently, nominal wage growth ([3]) was not picking up as one would expect based on its historical relationship with standard indicators of economic activity and labour market slack. ([4])

Different reasons have been advanced by now to explain this, including low core inflation, "sticky" inflation expectations, a reduction in hours worked per employee, weak productivity developments, and structural labour market developments. In countries where un(der)employment remains high compared to pre-crisis levels, labour market slack continues to exert downward pressure on wage growth.

Subdued wage growth risks being a drag on private consumption, currently the main driver of growth. If wage growth is below consumer price inflation, real disposable incomes are eroded. Low wage growth in itself puts a break on inflation. Low price

inflation can also hamper rebalancing within the euro area by complicating real wage adjustment. These considerations have brought the issue of wage growth to the forefront of policy attention. In the context of the European Semester, the European Commission and the European Council have encouraged surplus countries to create conditions to promote higher real wage growth, while respecting the role of social partners. Faster real wage growth in the euro area as a whole is expected to help sustain domestic demand, reduce inequalities and ensure higher standards of living, thereby contributing to the realisation of the fair wage principle of the European Pillar of Social Rights.[5] Some observers have called for stronger coordination of (nominal) wage dynamics between euro area Member States. [6]

In this context, this section provides an overview of recent wage dynamics in the euro area, their link with economic slack and their implications for intra-euro area rebalancing. The section also looks into the set of instruments governments have at hand to influence wage setting.

I.2. Wage developments in the euro area: Setting the scene

Nominal wage growth is picking up in the euro area. Wages are estimated to have grown at 1.6% in 2017, up from 1.1% in 2016 (Graph I.1). Going further, wage growth is expected to reach 2.3% in 2018 (including as a result of a pick-up in inflation) and then slow down again to 2.0% in 2019. [7]

At the individual country level, nominal wage growth has been positive but still moderate in most cases in recent years (Graph I.1). [8] Nominal wage developments remained particularly flat in those countries still characterised by high levels of unemployment, notably Greece, Spain, Italy, and Cyprus. Wage growth was even slightly negative in

Greece, Spain and Cyprus in 2016, but turned positive in 2017. In 2016, low wage growth (1% or below) was also observed in Belgium, France, and Luxembourg, which had experienced a deterioration of their external position and a loss of cost competitiveness during the crisis. In 2018, most euro area countries saw an acceleration of wage growth. Only in Greece, Spain, Finland, Cyprus, Portugal and Italy, nominal compensation growth is estimated to remain below 2% in 2018.

Graph I.1: **Nominal compensation per employee, 2016-18, annual % change**
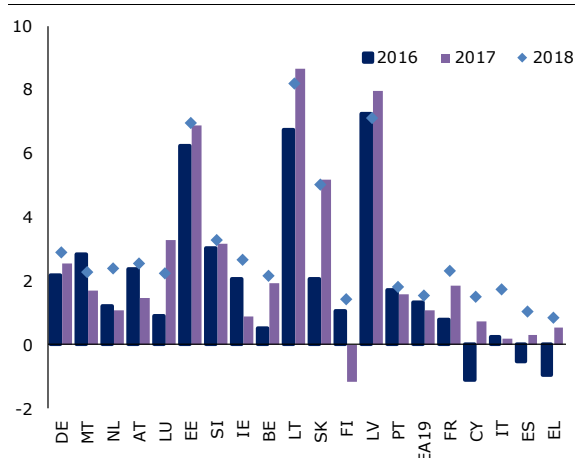
(1) Wages are measured by the indicator "Nominal compensation per employee", which is calculated as a total compensation of employees divided by total number of employees. The total compensation is defined as the total remuneration, in cash or in kind, payable by an employer to an employee in return for work done by the latter during the accounting period and it has two components: i) Wages and salaries payable in cash or in kind; and ii) Social contributions payable by employers. All data used are national accounts data. The indicators are based on national currency values. 2018 values are based on ECFIN's 2018 Autumn Forecast Aggregates are weighted averages. Countries are ranked in ascending order of the unemployment rate in 20167.
Source: European Commission, AMECO database.

Wages grew relatively slowly in Germany and the Netherlands, the two countries with the strongest current account surpluses in the euro area. In spite of declining unemployment, wage growth declined from 2.8% to 2.2% over the period 2014-2016 in Germany. In the Netherlands, nominal compensation grew at a relatively modest rate in 2016 and 2017 (at 1.2%), after negative observed growth in 2015. By 2018, wage growth is estimated to have accelerated in Germany and the Netherlands (to 2.9 and 2.4% respectively), but not to the extent that it compensates for the period of slow wage growth in previous years.

Wages grew faster in euro area Member States with the lowest wage levels, partially as a result of rapid

catching-up of GDP per capita to the average. Annual growth of nominal wages lingered between 6-9% in Estonia, Latvia and Lithuania in 2016 and 2017. In Slovakia wage growth saw a temporary drop in 2016, but recovered to a steady 5.2% in 2017. Also in 2018, these countries continue to observe steady wage growth.

At the same time, purchasing power has increased, as real wages rose in most euro area countries over the period 2015-17, in spite of the uptick in inflation. The increase in real consumption wages (i.e. wages adjusted for the change in consumer prices) helped sustain aggregate demand. Real consumption wages fell only in Spain and Greece—due to a decline in nominal wages—and in Italy, Belgium, and Finland where it was the result of consumer price inflation exceeding nominal wage growth.

Over the longer term, while real wage growth has been broad-based, it has not always kept pace with productivity growth. Cumulative growth in real compensation since 2000 amounts to 10% on average in the euro area (around 0.6% annually) (Graph I.2). The strongest growth was observed in countries starting from the lowest wage levels (Latvia, Lithuania, Estonia), where purchasing power roughly doubled over the considered period, partially as a result of rapid catching-up of GDP per capita to the EU average. Real wage growth in line with productivity supports sustained firm profitability and sustainable job creation, growth, and underpins increases in living standards.[9] On average in the euro area, real wage growth was slightly weaker than productivity growth over the period 2000-17 resulting in a slight decline in real unit labour costs of 1.7 ppt (Graph I.2). The largest gaps were observed in Ireland and Portugal. [10] A smaller gap is noted in Spain, Malta, Cyprus and Germany.

Even if inflation remained weak, the inflation component was the main contributor to wage growth in the EA. Growth of real wages has been trailing marginally behind productivity growth since 2012; and this is expected to remain the case over

the forecast period (with the exception of 2018). Hence, while nominal unit labour cost growth is estimated to have accelerated to 1.6% in 2018 (up from 0.7% in 2017) as a result of a pick-up in inflation; real unit labour costs are predicted to continue on their gradual decline in the euro area.

Graph I.2: **Cumulative growth in real compensation and real unit labour costs, 2000-17**
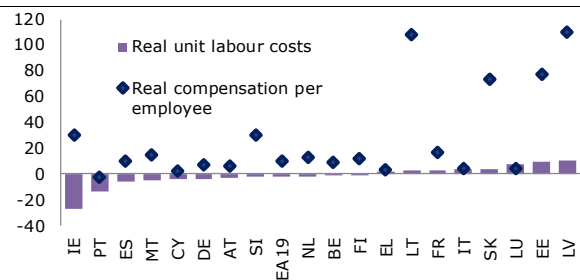
(1) Real compensation is measured as nominal compensation, deflated with private consumption prices. Real unit labour costs are defined as the ratio of real compensation per employee over GDP per worker (in this case, both deflated with the GDP price deflator).
Source: European Commission, AMECO database

The largest real unit labour cost reductions over 2015-17 were observed in Ireland, Cyprus, Malta and Finland. In contrast, real wage growth exceeded productivity growth significantly in the Baltic States, Slovakia, and Luxembourg, resulting in positive real unit labour cost growth.

I.3. Wage responsiveness to labour market slack

I.3.1. Stylised facts of subdued wage growth

Wage growth tends to reflect labour market conditions, as depicted by the Phillips curve. The Phillips curve relation predicts that wage growth will be higher in tight labour markets, and lower in the presence of substantial labour market slack. [11] A steeper Phillips curve reflects a stronger relationship between wages and labour market slack, in other words, that wage growth is more reactive to cyclical fluctuations in unemployment; conversely, a flatter curve implies a weaker response.

In 2016 and 2017, wage growth in the euro area remained almost one ppt below what would be expected based on its historical relationship with

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[9] Note that real unit labour costs are also a (rough) measure of the labour income share (labour income as a share of GDP), which has a positive relationship with aggregate demand to the extent that the marginal propensity to consume out of labour income is higher than the marginal propensity to consume out of capital income.

[10] The Irish case is particular as its real GDP grew by more than 25% in 2015 as a result of revisions in calculation methods.

[11] Phillips, A. W. (1958). The Relationship between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957. Economica, 25, 283-299.

unemployment, as shown by simple cross-time scatter plots (Graph I.3). The aggregate picture hides considerable heterogeneity across countries (Graph I.4). (¹²) Still, in virtually all countries, wage growth in 2016 and 2017 was slower than or equal to what would be expected on the basis of its historical relationship with unemployment. Countries in which wage growth remained furthest below the historical relationship are Belgium, Spain, and Finland.

Different reasons contribute to explaining the observed subdued wage growth. These reasons include low core inflation, weak productivity developments, "sticky" inflation expectations, a reduction in hours worked per employee, and, especially in countries where labour resources remain underutilised, the effect of remaining "slack" in the labour market and pent-up wage deflation. (¹³)

Graph I.3: **Phillips curve for EA19 2000-18**
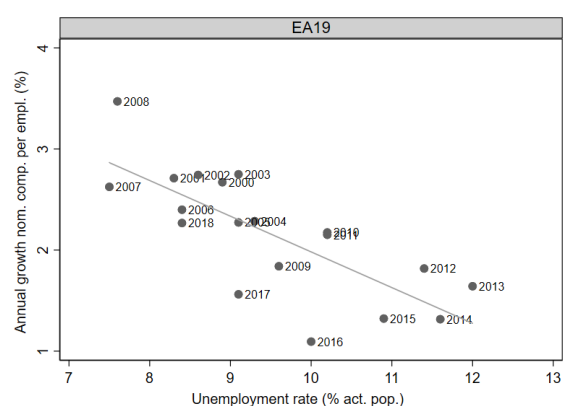
Source: European Commission, AMECO database

In what follows, these arguments will be reviewed in more detail. While the analysis focuses on the euro area, the findings are likely to apply to non-euro area countries as well. Many of the results

presented are drawn from early research, and further monitoring and analysis is needed to corroborate their robustness. Results are also likely to differ depending on the perspective that is taken, i.e. whether the euro area is considered on aggregate, or whether analysis zooms in on individual countries.

I.3.2. Traditional measures of slack, productivity and inflation

European Commission analysis focusing on the euro area confirms the important role of standard measures of slack in explaining wage growth but also that these measures are insufficient to explain recent developments. A regression which only includes the output gap, a traditional slack indicator, captures observed wage growth reasonably well for much of the sample period (Graph I.5, line PV1). (¹⁴) However, it fails to explain why the rapid narrowing of the output gap since 2014 has not been matched by higher growth in compensation per employee in 2015-2017. Using other measures of economic slack, such as the unemployment gap, leads to similar results.

Low productivity growth is weighing on wage growth. Productivity growth, typically an important driver of wage growth, has been sluggish in recent years. Whereas real productivity per person employed over the period 2004-2007 grew on average by 1.3% a year in the euro area, this slowed down during the crisis to around 0.3% over the period 2008-2012; to recover to 0.7% on average over the period 2013-2017. The shortfall of investment is likely to have reduced productivity growth during the crisis.

More recently, the structure of employment creation may have contributed to low productivity developments, as job creation has been particularly strong in lower-productivity sectors. (¹⁵) On the other hand, a decline in labour productivity growth has already been observed since the mid-1990s in the euro area. (¹⁶)

(¹²) In some countries such as AT and SK, no negative relationship between unemployment and wage inflation is observed at all. This phenomenon has been noted earlier, e.g. by Bhattarai, K. (2016) Unemployment-inflation trade-offs in OECD countries. *Economic Modelling*, 58: 93-103.

(¹³) This implies that wages are growing slower during the recovery because they were unable to decline considerably during the crisis (to the value consistent with high unemployment) as a result of downward nominal wage rigidities (Yellen, 2014; Daly and Hobijn, 2015). See Yellen, J. (2014), "Labour Market Dynamics and Monetary Policy"; speech at the Federal Reserve Bank of Kansas City Economic Symposium, Jackson Hole, Wyoming; Daly, M.C., Hobijn, B. (2015) Why is Wage Growth so Slow? FRBSF Economic Letter 2015-01, Federal Reserve Bank of San Francisco.

(¹⁴) For more details on the underlying regression model, see Box II.1.

(¹⁵) ECB (2015) What is behind the recent rebound in euro area employment? Economic Bulletin, Issue 8, December 2015.

(¹⁶) Gomez-Salvador, R., Musso, A., Stocker, M., Turunen, J. (2006) Labour productivity developments in the euro area. ECB Occasional Paper No. 53, October 2006; Andrews, D., Criscuolo, C., Gal, P. (2017) The best vs the rest: the global productivity slowdown hides an increasing performance gap across firms. VoxEU, 27 March 2017.

Graph I.4: **Phillips curves for individual euro area countries (2000-18)**
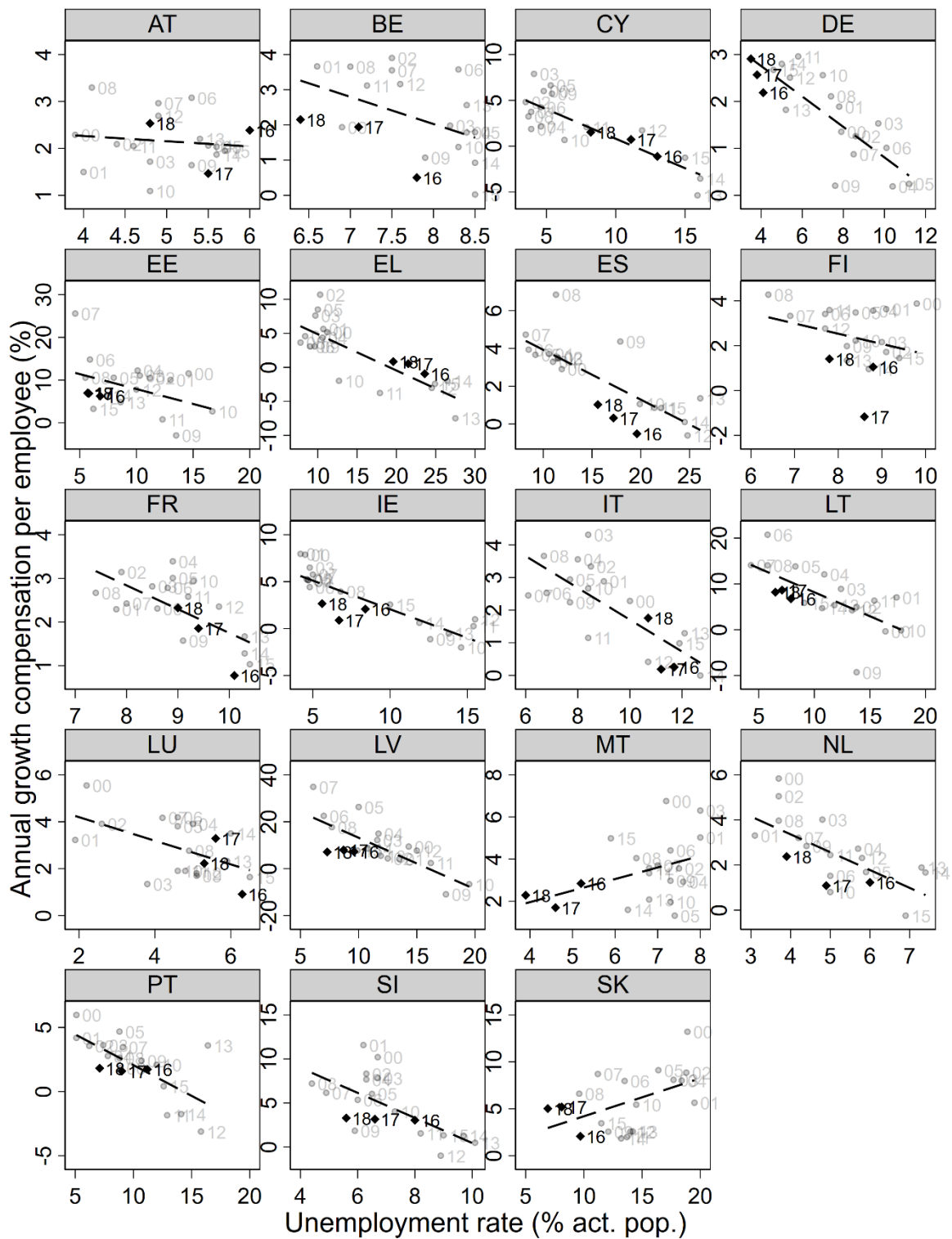
Source: European Commission, AMECO database

Adding productivity growth on top of the output gap as an explanatory variable in the regression enhances the overall model fit (Graph I.5, line PV2). The low level of productivity growth observed in the current recovery has been pushing wage growth down compared with the immediate pre-crisis period. However, this effect remains relatively small and reduces the gap between observed and estimated wage growth over the past three years only modestly. [17]

Nominal wage growth reflects past inflation and inflation expectations. Workers account for price developments in their wage demands to protect their purchasing power. Inflation has 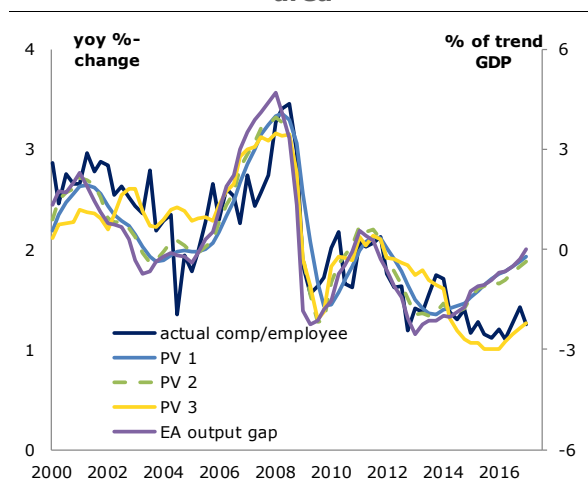been low in recent years, not only because of weak wage growth, but also as a result of low energy and unprocessed food prices. Price inflation can have a lasting impact on wages, if inflation expectations are "sticky" and wage negotiations backward looking.

Graph I.5: **Compensation per employee: realised and estimated growth in the euro area**

(1) PV1: comp/employee on constant and OG (Box II.2 reg. 1); PV2: comp/employee on constant, OG and productivity growth (Box II.2 reg. 2); PV3: comp/employee on OG, productivity growth, core inflation and SPF (Box II.2 reg. 3)
Source: Source: DataInsight, Commission calculations

Controlling for past inflation and inflation expectations leads to significant improvements in the model fit. If, in addition to the output gap, backward and forward-looking inflation measures are included in the model (and no constant is included), both inflation variables are significant and help explain a considerable part of the low wage growth registered over the recent period. The gap between observed and fitted growth rates identified in the previous specifications largely disappears (Graph I.5, PV3). Adding a constant to the specification improves the model fit slightly, but comes to the detriment of the inflation expectations variable becoming insignificant. This latter finding supports the view that the constant actually captures a large share of the information otherwise provided by forward looking inflation variables, suggesting that inflation expectations in the euro area wage formation process have a strong sticky component.

To account for possible non-linearities, a time-varying parameter version of the wage Phillips curve has also been estimated. The results suggest visible changes in the estimated coefficient of the baseline model over time. In particular, the results point to an increasing tendency towards a more backward looking wage formation system during the first decade of the euro. The non-linear model similarly points to a slight flattening of the wage Phillips curve since about 2011. [18]

I.3.3. Broader measures of labour underutilisation

Traditional measures of slack such as the unemployment rate may underestimate the extent of underemployment in the post-crisis world. [19] Available data suggest that discouraged and underemployed or involuntary part-time workers constitute a significant part of the population in some countries of the euro area and may exert additional downward pressures on wages. The effect of these factors is not straightforward to identify empirically as a result of data availability

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[17] Schwellnus et al. (2017) find that over the past two decades, aggregate labour productivity growth in most OECD countries has decoupled from real median compensation growth, implying that raising productivity is no longer sufficient to raise real wages for the typical worker. This decoupling is explained by declines in both labour shares and the ratio of median to average wages. See Schwellnus, C., A. Kappeler and P. Pionnier (2017), Decoupling of wages from productivity – macro facts, OECD Economics Department Working Papers, No. 1373.

[18] Similar results have been reported in European Commission (2017), Labour Market and Wage Developments in Europe. Annual Review 2017, Directorate-General for Employment, Social Affairs and Inclusion

[19] See e.g. ECB (2017a) Assessing labour market slack. Economic Bulletin Issue 3; Coeuré, B. (2017), Scars or scratches? Hysteresis in the euro area, ECB, 19 May 2017; Ciccarelli, M. and C. Osbat (2017), Low inflation in the euro area. Causes and consequences, ECB Occasional paper series, No 181; European Commission, 2017, as above; IMF (2017) Recent wage dynamics in advanced economies: drivers and implications, Chapter 2, World Economic Outlook, August 2017; Bell, D., Blanchflower, D. (2018) Underemployment in the US and Europe. NBER WP 24927.

Box I.1: **Estimating wage growth using an augmented Phillips curve**

A new Keynesian wage Phillips curve (WPC) for the euro area is estimated,[1] taking in its standard specification the following form:

$$\pi_t^w = const + \alpha\, gap_t + \beta\, prod_t + \gamma\, \pi_{t-2}^c + \delta E_t\, \pi_{t+4} + \varepsilon_t$$

Where π^w_t denotes quarter-on-quarter wage growth measured by compensation per employee[2] and *gap* the level of the output gap based on trend real GDP published in DG ECFIN's AMECO database. *prod* denotes quarter-on-quarter changes in labour productivity defined as real output per employee, π_{t-2} is a backward-looking inflation measure (lagged by two quarters)[3] and $E_t\pi_{t+4}$ 1-year ahead inflation expectations obtained from the ECB's Survey of Professional Forecasters (SPF). ε_t is an independently and identically distributed error term.

Various specifications of the WPC in its broadest form are estimated. This includes specifications on the one hand relying only on the output gap or labour productivity growth as explanatory variables and more detailed ones which also reflect particular labour market situations or time variations in the constant using dummy variables. The regressions underlying the predicted relationships in Graph II.4 are presented in Table 1. [4]

Table 1:

p-values in italics	Reg. 1	Reg. 2	Reg. 3
Constant	0,51	0,49	
	0,00%	*0,00%*	
Output gap (level, %)	0,07	0,08	0,04
	0,02%	*0,01%*	*0,35%*
Labour productivity (qoq %-change)		0,13	0,21
		8,51%	*0,06%*
Core inflation (yoy %-change, 2 quarter lag)			0,10
			9,38%
Inflation expectations 1 year ahead (SPF1, %)			0,20
			0,14%
Sample period	*95Q2 - 17Q1*	*95Q2 - 17Q1*	*99Q1 - 17Q1*
R²	0,15	0,18	0,34
Adjusted R²	*14,22%*	*16,21%*	*31,42%*

Different robustness checks are carried out (but not reported here). Model specifications using the unemployment gap as an alternative measure of economic slack result in a deterioration of the overall fit as the variable is not highly significant. If the unemployment rate is used, results are comparable to the standard specification based on the output gap. A broader measure of the unemployment rate, i.e. one including underemployed part-time workers or discouraged workers, is available for a very limited time span covering only the period 2008 to 2017. The output gap is therefore retained as preferred slack variable as it provides a more compressive assessment of the state of the economy in the cycle. Moreover, it allows for more straightforward interpretations of the constant (i.e. it largely captures inflation expectations).

[1] See e.g. Galí, J. (2011) The Return of the Wage Phillips Curve, Journal of the European Economic Association, 9(3): 436-461.
[2] Although compensation of employees diverges somewhat from wages actively negotiated between social partners, it is the most encompassing measure of labour costs as it includes employees' remuneration as well as social contributions paid by the employer.
[3] Core inflation (measured in annual percentage changes of the HICP index excluding energy and unprocessed food as per the EC definition) is used as it leads to better results regarding model fit and regressor significance compared to headline inflation.
[4] For more details and results, see European Commission (2018c) Wage dynamics in Europe, background note prepared by the Commission for the EPC/EMCO Joint Seminar on Wage Developments and Dynamics of January 31 2018.

issues (notably long time series data on these broader measures). That being said, Commission analysis suggests that the additional explanatory power provided by these labour market measures is relatively low, although it could be more significant in some Member States where the increase in underemployed part-time workers since the crisis has been very large. [20]

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[20] European Commission (2017), as above.

I.3.4. Structural labour market characteristics

While structural labour market reforms can contribute to sustainable job creation and growth, in the short term, they may (temporarily) exert downward pressure on wage growth. [21] Commission analysis suggests that structural unemployment in the euro area has declined over the period 2013-2017 by almost 1 ppt, helped by structural labour market reforms that have been undertaken. [22] This decline has been associated with a small temporary fall in wage growth. These results are in line with findings from other studies. [23]

Though the effects are difficult to quantify, some studies have posited that other ongoing structural changes in the labour market are exerting downward pressure on wages. Key drivers that have been referred to in the literature are globalisation, technological progress, declining unionisation, and the emergence of new forms of employment. Increased trade and globalisation have reinforced workers' exposure to international competition, and this may have a negative impact on real wages. [24] Some types of workers are particularly vulnerable as a result of ongoing trends such as the de-routinisation of jobs and skill-biased technological progress. IMF finds that institutional factors such as declining union density and coverage of collective bargaining agreements and the decentralisation of such agreements can weaken workers' bargaining power. [25] Their analysis suggests that automation may have weighed on nominal wage growth, although the impact has been limited. BIS provides suggestive evidence of the fact that the fall in pricing power of

workers (stemming from reduced employment protection, union density and union coverage) is a possible explanation for the flattening of the Phillips curve. [26][27] Another factor that has been blamed for exerting drag on wage growth is the increase in non-standard forms of work. Some researchers have pointed at the low quality of jobs created since the crisis in several advanced economies, with relatively high rates of (involuntary) temporary and part-time positions. [28] These non-standard forms of employment may be associated with lower bargaining power for workers. [29] Some have argued that these structural trends trigger a decoupling between real wages and productivity growth, reflected in a declining labour share. [30]

I.3.5. Trends in hours worked

A structural downward trend in hours worked per employee is likely to contribute to subdued wage growth as well as far as annual earnings are considered. Between 2000 and 2017, the annual hours worked per employee declined by more than 5% (Graph I.6). This does not just reflect cyclical conditions; there is also a long-term structural trend in lower hours worked. [31] Increased labour market participation of women and older workers,

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[21] Labour economics theory predicts that, under the assumption of imperfect competition, where firms set their prices as a fixed mark-up over their marginal cost and face a downward sloping demand curve in the short run, and workers' labour supply slopes upward, the increase of labour supply at a given wage will have a negative impact on real wages in the short run. In the longer run, however, firms will raise investment in order to take advantage of the cheaper work force (and/or because the central bank lowers the interest rate to bring inflation back to its target), and labour demand will increase proportionally, bringing real wages back to their original level (e.g. Carlin, W., Soskice, D. (2005) Macroeconomics: imperfections, institutions, and policies. Oxford University Press).

[22] see European Commission (2018c), as above.

[23] such as Duval, R., Furceri, D. (2016) The Effects of Labor and Product Market Reforms: The Role of Macroeconomic Conditions and Policies. Mimeo, International Monetary Fund.

[24] see e.g. for the US: Autor, D., Dorn, D., Hanson, G. (2013) The China Syndrome: Local Labor Market Effects of Import Competition in the United States. American Economic Review, 103(6): 2121-2168.

[25] IMF (2017) as above

[26] BIS (2017), 87th Annual Report, Box IV.A: Exploring the wage Phillips curve. Bank for International Settlements, Basel.

[27] The analyses by IMF and by BIS include countries outside the EU, which means that the results are not necessarily driven by EU countries. Moreover, the BIS report does not report detailed regression results, such that the magnitude of the identified impact is difficult to assess.

[28] Between the beginning of 2012 and Q2 2017, 4.4 million jobs have been created in net terms of which 29% were temporary contracts and 64% were part-time jobs. At the same time, a high share of non-standard labour contracts among newly created jobs is not unusual by historical standards, particularly in the early stages of a recovery.

[29] see e.g. European Commission (2017) as above and Haldane, A.G. (2017) Work, wages and monetary policy. Speech by A. G. Haldane, Chief Economist, Bank of England at National Science and Medium Museum, Bradford, 20 June 2017. At the same time, some of the structural changes reported in this paragraph were already observed in the pre-crisis period, so it is not clear that they would be able to explain the apparent decoupling between wages and the business cycle in the ongoing recovery.

[30] see e.g. for evidence from the US: Elsby, M.W. L., Hobijn, B., Sahin, A. (2013) The Decline of the U.S. Labor Share, Brookings Papers on Economic Activity 47(2), 1-63; Acemoglu, D., Restrepo, P. (2016). The Race between Machine and Man: Implications of Technology for Growth, Factor Shares, and Employment, NBER Working Paper No. 22252; Kehrig, M., Vincent, N. (2017) Growing Productivity without Growing Wages: The Micro-Level Anatomy of the Aggregate Labor Share, Economic Research Initiatives at Duke Working Paper No. 244..

[31] Alesina et al. (2006) show that annual hours per employed person were already on a decline in the 1960s (see Alesina, A., Glaeser, E., Sacerdote, B., 2005. Work and leisure in the US and Europe: Why so different? NBER Macroeconomics Annual, pp. 1–64)

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who work less hours than prime age men on average, may contribute to this observation. However, the reduction in hours worked is also visible for prime age male workers, possibly reflecting, at least partially, better work-life balance opportunities. [32] The structural shift of employment in many economies from manufacturing to the service sector, where part-time employment is more common (and often involuntary), is likely to play a role as well. [33]

Graph I.6: **Trends in hours worked in the euro area, 2000-17 (index: 2000=100)**

Employment (based on persons)
Employment (based on hours worked)
Annual hours worked per employee
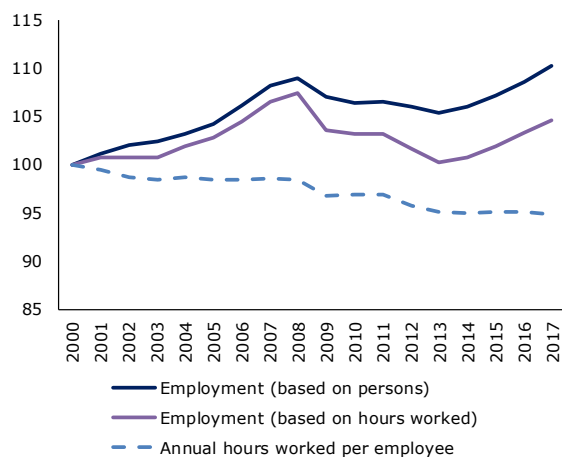
Source: European Commission, based on Eurostat [nama_10_a10_e]

I.3.6.   Downward nominal wage rigidities

Wage moderation during the latest recovery may also partially be explained by downward nominal wage rigidities. Wage rigidities have long been considered a factor that may interfere with a smooth functioning of the labour market. Such rigidities can have different origins, including government regulations such as minimum wages, the use of fixed-term nominal wage contracts between employers and employees, and other behavioural factors that lead both employers and/or employees to focus on nominal rather than real wages.

Some have observed that wage growth was stronger than expected during the crisis, and weaker than expected at the onset of the recovery. This has been argued to be the result of nominal

wage rigidities or "pent-up" wage inflation: in the absence of downward wage flexibility, employers are unable to reduce wages in line with soaring unemployment during the crisis. When the economy recovers, wage increases are held back until the "pent-up" wage cuts are worked off by inflation and productivity growth. [34] Most of the evidence in favour of this argument has been based on US data. However, it is likely to be equally (if not more) relevant for the European context, where the existence of nominal wage rigidities has been documented extensively. [35]

Commission analysis indeed finds a positive (but not always significant) coefficient on the interaction between low inflation and economic slack, [36] indicating that in a low inflation environment, nominal wage rigidities cause wage growth to be higher during economic downturns than in a higher inflation environment. This brings about some inertia in wage growth when the economy picks up again, as firms make up for corrections not done during the crisis.

I.4.   Wage dynamics and rebalancing in the euro area

Labour cost developments have an impact on cost competitiveness and may therefore have important implications for developments of the trade balance and the current account. [37] If not offset by productivity developments or matched in partner countries, wage shocks influence price competitiveness. All else equal, unit labour cost (ULC)-based REERs [38] increase (fall) in the event of shocks leading to higher (lower) unit labour costs, and theory predicts that this will lead to a deterioration (improvement) of the trade balance and the current account balance. Most empirical estimates indeed point to a negative impact of REER increases on the current account balance

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[32] Bodnár, K. (2018) Labour supply and employment growth. ECB Economic Bulleting, Issue 1/2018 – Article. pp. 35-59.

[33] European Commission (2017: Box I.1.1) shows that the structural reduction in hours worked per employee tends to accelerate during recessions.

[34] see Daly and Hobijn (2015), as above; Yellen (2014), as above.

[35] see e.g. Marotzke, P., Anderton, R., Bairrao, A., Berson, C., Tóth, P. (2017) Asymmetric wage adjustment and employment in European firms. ECB Working Paper No. 2103. Wage Dynamics Network, European Central Bank

[36] European Commission (2018c), as above

[37] See footnote 10

[38] The real effective exchange rate (REER) is a measure of a country's price or cost competitiveness relative to its principal competitors in international markets. It is calculated as a weighted average of bilateral exchange rates against currencies of competing countries, deflated using a cost deflator (such as unit labour costs) or a price deflator (e.g. the consumer price index). As a result, changes in the REER reflect not only exchange rate movements but also cost/price trends. A rise in the indicator means a loss of competitiveness.

over the medium term. [39] The overall impact of changes in labour costs on the current account depends on other transmission channels beyond price competitiveness and on general equilibrium interactions. Exogenous changes in wage rates or labour taxes can for example affect the current account balance through their impact on disposable income, domestic and import demand.

Since the establishment of the monetary union, and in particular in the run-up to the crisis, imbalances have developed within the euro area. In the initial stages of the monetary union, the decline in risk premia on interest rates led to a surge in net capital inflows in some countries of the euro area (such as Spain, Portugal, Greece, Ireland). This was followed by overheating and strong inflation dynamics, resulting in competitiveness losses, growing current account deficits and large negative net international investment positions. At the same time, other countries (such as Germany) increased and largely sustained their current account surpluses, even during the crisis (Graph I.7).

In theory, internal imbalances can be re-absorbed through the reaction of wages to cyclical conditions. If a shock drives output in a given country much above (below) that in other members of a monetary union, stronger (weaker) wage pressure leads to a deterioration (improvement) of price competitiveness and then to weaker (stronger) growth via an adjustment of net exports. In a currency union, however, there is no automatic adjustment mechanism in response to external imbalances. The adjustment to cyclical divergences may either work in favour of or against the correction of external imbalances.

In the pre-crisis period, the response of wages to tightness in the domestic labour market exacerbated the accumulation of external imbalances through higher inflation and falling net exports. Since the start of the crisis, imbalances have come down, helped by supportive labour cost

developments in the former deficit countries – partly reflecting productivity increases due to labour shedding rather than nominal wage adjustment. [40] Several among the latter (such as Italy, Spain, and Ireland) have succeeded in turning their current account deficit into a surplus by 2014. This observation is consistent with a causal link between competitiveness and the current account balance.

Graph I.7: **NULC in euro area deficit and surplus countries, 2000-2019, annual % change**
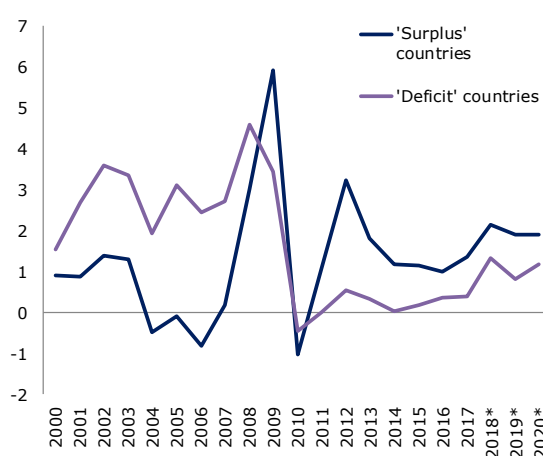
(1) Aggregate NULC growth rates reflect population-weighted averages. Figures for 2018-20 are based on ECFIN's Autumn 2018 forecast. Belgium, Germany, Luxembourg, the Netherlands, Austria and Finland are referred to as 'surplus' countries. 'Deficit' countries are all other euro area Member States. This classification is based on the current account situation around 2008. All surplus countries recorded a current account position balanced or in surplus over the 2000-2012 period (the only exceptions being DE and AT before 2002 and FI after 2010), while all deficit countries recorded a deficit between 2000 and 2012. This grouping of countries is in line with the methodology of the 2018 Alert Mechanism Report.
Source: Source: European Commission based on AMECO

The adjustment process has however been painful. The current account improvement partly reflected the consequences of a domestic demand contraction. The onset of the crisis triggered an increase in credit risk for countries that had been receiving substantial foreign capital inflows, resulting in a significant disruption in these inflows. This contributed to a closing current account deficit and at the same time to a contraction of domestic demand, which was associated with a reduction in labour cost growth and a strong increase in unemployment. At the same time, the net international investment positions in these

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[39] This suggests that typically, the so-called Marshall-Lerner condition is satisfied, i.e. import and export elasticities are large enough to compensate for the reduced relative local-currency price of imports associated with real exchange rate appreciations. Nevertheless, estimates of current account elasticities are notoriously uncertain due to well-known difficulties in estimating trade elasticities (see e.g. Imbs, J., Mejean, I. (2017) Trade elasticities. Review of International Economics, 25: 383-402). The semi-elasticity of the current account balance (measured as % of GDP) to the percentage change in the REER is estimated to lie between 0.1 and 0.7 (see IMF (2018), External Sector Report: Tackling Global Imbalances amid Rising Trade Tensions, Table 2)

[40] ECB (2014) Economic and Monetary Developments: Output, Demand and the Labour Market. Monthly Bulletin, January 2014.

countries remain negative and large and are generally associated with large stocks of private or government debt and constitute a vulnerability, pointing at a need for further rebalancing efforts.

The unit labour cost growth differentials between surplus and formerly deficit countries, observed since the crisis, are gradually winding down. This is the result of the recovery of wage growth from very low rates in formerly deficit countries coupled with weak productivity gains, while wage growth has remained moderate in surplus countries in spite of relatively tight labour market conditions.

The post-crisis reduction of most current account deficits has not been matched by significant progress in terms of reducing large surpluses. Countries with large surpluses like Germany and the Netherlands have actually seen their surpluses grow considerably since 2001. As a result of the simultaneous reduction of large deficits and the lack of correction in large surpluses, the euro area as a whole has gradually moved to a current account surplus exceeding 3% of GDP. This contributes to the aggregate surplus position of the Eurozone and (in combination with other factors) to low price inflation, making the intra-euro area rebalancing process more difficult. In a low inflation/high debt environment, it has put pressure on deficit countries to pursue deflationary policies to regain competitiveness and aggravated the employment and social costs of the adjustment.

From this perspective, stronger wage growth in these creditor countries would arguably support domestic demand and aggregate demand in the euro area, and contribute to the economic recovery and the rebalancing, while easing the competitiveness adjustment of deficit countries.

I.5. Policy instruments that influence wage developments

Although wage developments are mainly the result of the interaction between market forces and the institutions underpinning collective bargaining, governments can influence these dynamics in in a number of ways, including through the setting of minimum wages and government wages, the tax and benefit system, the steering of collective bargaining in the private sector via tripartite agreements and social pacts, or, where collective bargaining is regulated by law, the review of the legislated frameworks regulating wage setting in consultation with social partners. Structural reforms can also influence wage and labour cost developments, albeit in a more indirect way. Since these different instruments interact in different ways with the rest of the economy, their effectiveness in steering wage developments and their impact on the rest of the economy varies as well. [41]

I.5.1. Minimum wages

A statutory minimum wage is a policy instrument that directly affects wages, particularly for workers in a weak bargaining position. [42] They set a floor to earned labour income, and compress the wage distribution from below. In some countries, statutory wage floors are combined with additional sectoral wage floors negotiated between social partners. Minimum wage policies have attracted a vigorous debate in the literature. A major issue of contention is their potential impact on employment. Some argue, based on a competitive labour market assumption where workers are paid according to their productivity, that imposing a wage floor will price low-skilled/low-productive workers out of the market. Others argue, based on a monopsonistic labour market assumption, that imposing a wage floor can actually expand employment, as firms will increase their output in response to a reduction of their profit margins per unit produced. [43] The empirical literature has found evidence in favour of both hypotheses, underlining the importance of the context (e.g. in terms of the level of the minimum wage compared to the rest of the wage distribution, and the proportion of the workforce that is covered by it), but seems to broadly converge on the conclusion that the aggregate employment effects of observed minimum wages increases have been minor, if significant at all (e.g. Neumark, 2017; Allegretto et al., 2011). [44] Slightly more negative but still modest effects have been found for employment

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[41] For instance, policies that help raising labour demand and employment are more likely to stimulate output in the own economy and in the rest of the euro area, see e.g. IMF (2015).

[42] OECD (2015) Focus on minimum wages after the crisis: Making them pay. Directorate for Employment, Labour and Social Affairs, Paris: OECD Publishing.

[43] For a review of the theoretical arguments and empirical evidence, see European Commission (2016), Labour Market and Wage Developments in Europe. Annual Review 2016, Directorate-General for Employment, Social Affairs and Inclusion.

[44] Neumark, D. (2017) The employment effects of minimum wages: some questions we need to answer. NBER Working Paper No. 23584; Allegretto, S. A., Dube, A. and Reich, M. (2011), Do Minimum Wages Really Reduce Teen Employment? Accounting for Heterogeneity and Selectivity in State Panel Data. Industrial Relations: A Journal of Economy and Society, 50: 205–240.

of specific groups such as low-skilled, young, and/or female workers. [45]

Minimum wage setting frameworks vary considerably across countries, with possible implications for wage developments. Some countries in the EU do not have a statutory minimum wage at all. [46] Where minimum wages exist, governments are typically formally involved in establishing the procedure of minimum wage setting, but their scope for influencing the level varies. In some countries, such as Estonia, the statutory minimum wage is mostly negotiated between social partners, with very little discretion from the government's side. At the other extreme, the minimum wage is largely set at the government's discretion in Bulgaria. In other countries, minimum wages are established in tripartite negotiations involving the government and the social partners; or upon the recommendation of experts and/or based on analysis that takes into account economic and social criteria, labour market conditions, and other relevant dimensions. [47]

Usually only a small proportion of the labour force is covered by the (increased) minimum wage and therefore directly affected. The minimum wage may however also have some more indirect spillover effects on wage growth further up in the wage distribution, for example because other workers might demand wage increases to preserve existing wage differentials [48] and/or because social partners use the minimum wage as a reference for sectoral wage negotiations. Positional income concerns and fair wage considerations may also play a role. [49] The empirical literature (mostly based on US data) has found evidence of small effects on wages beyond the quintiles that are directly affected by minimum wage increases. [50]

Other have found no spillover effects; or that they only matter in the short run. [51]

Minimum wage floors can also have indirect effects on the economy. For example, minimum wages can induce investment in (physical and/or human) capital to offset the increased cost of labour. Minimum wages can also cushion fluctuations in the aggregate demand during economic downturns, by helping to avert risks of wage deflation.

I.5.2. Institutional settings of collective bargaining frameworks

Different aspects of collective bargaining institutions may have a bearing on wage outcomes. Key dimensions are (a) the level at which collective agreements are concluded (at the national, regional, sectoral, or firm-level); (b) union density; and (c) provisions on who is covered by collective agreements (e.g. through rules on representativeness as a condition for extension or on the conditions for exemptions); [52] (d) the framework for coordinating wage bargaining across the economy; (e) the frequency at which wages are re-negotiated, including provisions on retro- and ultra-activity, [53] and possible indexation clauses. The level at which collective agreements are concluded and the size of the workforce for which they apply (through extension provisions) matter for the extent to which wages can respond to firm-level, sectoral and regional differences in

[45] Neumark, D., Wascher, W.L. (2007) Minimum wages and employment, Foundations and Trends in Microeconomics: 3(1-2): 1-182.

[46] Eurofound (2017) Statutory minimum wages in the EU 2017. Dublin: Eurofound.

[47] European Commission (2016) provides an overview of different observed minimum wage setting institutions and the ensuing implications for wage developments.

[48] Bossler, M. and Gerner; H.-D. (2016) Employment effects of the new German minimum wage. IAB Discussion Paper 10/2016.

[49] Falk, A., Fehr, E., Zehnder, C. (2006). Fairness perceptions and reservation wages—the behavioral effects of minimum wage laws. Quarterly Journal of Economics, 121(4), 1347-1381.

[50] Card, D., Krueger, A.B. (1995), Myth and Measurement: The New Economics of the Minimum Wage, Princeton University Press; Autor, D. H., Manning, A., Smith, C.L. (2016). The Contribution of the Minimum Wage to US Wage Inequality over Three

Decades: A Reassessment. American Economic Journal: Applied Economics, 8(1): 58-99; Arpaia, A., and Van Herck, K., (2017) Wage distribution spillovers from minimum wages increases in France, DG Employment and Social Affairs. Analytical Webnote 1/2017; Vodopivec, M. (2015) The employment and wage spillover effects of Slovenia's 2010 minimum wage increase. European Scientific Journal, Special Edition, July 2015: 82-109.

[51] Dickens, R., Manning, A. (2004) Has the national minimum wage reduced UK wage inequality? Journal of the Royal Statistical Society: Series A (Statistics in Society) 167(4): 613-626; Neumark, D., Wascher, W.L. (2008). Minimum Wages. Cambridge, MA: MIT Press.

[52] For an interesting analysis on how these rules affect bargaining, see e.g. Hijzen, A., Martins, P.S., Parlevliet, J. (2017) Collective bargaining through the magnifying glass: a comparison between the Netherlands and Portugal. IMF Working Paper WP/17/275.

[53] Retro-activity means that a collective agreement can be applied retro-actively. This can have significant implications in the case of firm liquidity constraints. While in some countries, retro-activity only applies to signatory firms, in other countries, it applies to all covered firms. Ultra-activity implies that collective agreements remain valid after their expiry date, in the absence of a new collective agreement. It is meant to ensure continuity, but can also act as a disincentive to renegotiate (by the partner expecting a worse bargaining position in new negotiations) (see Hijzen et al., 2017, as above; and OECD (2017) Collective bargaining in OECD and accession countries: the duration, ultra-activity and retro-activity of collective agreements. Paris: OECD Publishing).

productivity and labour market tightness. Union density can influence the bargaining power of workers in wage negotiations and as a result have a positive impact on wage outcomes. The extent to which unions internalise needs of "outsiders" (be it the unemployed or those on less favourable contract types) also matter. This is typically not under direct government control, but the government may exert some influence in the case of tripartite agreements. [54]

The frequency at which wages are re-negotiated has a relevant interaction with inflation. On the one hand, higher inflation makes more frequent renegotiations necessary to maintain purchasing power. On the other hand, frequent wage adjustments tend to make inflation more persistent. Similarly, a relevant role in this respect is played by the presence of ex-post wage indexation mechanisms enshrined in law or in collective contracts, and the legal framework and practice followed for negotiating and renewing contracts.

Theoretical predictions on the impact of the degree of centralisation are ambiguous. [55] Some have argued that decentralisation weakens the power of trade union and hence that it would result in lower wage demands. Others have argued that centralised wage negotiations are more likely to take into account possible negative externalities (e.g. on employment or on real wages if higher wage demands pass through to consumer prices), resulting in more moderate wage demands. Both views are reconciled in Calmfors and Driffill's (1988) integrated framework which argues that the highest wage levels are obtained when collective bargaining is done at an intermediate level (e.g. the sectoral level). [56] In an increasingly globalised world, however, these arguments may be losing relevance, as prices and wages are increasingly under pressure from developments abroad and

therefore more likely to closely follow productivity developments. [57]

There are important strategies for wage coordination beyond formal centralisation. Coordination can refer to horizontal coordination (across sectors), and this can be achieved in an explicit way (e.g. in the case of "peak-level coordination" involving bilateral or trilateral agreements or social pacts) or in an implicit way, for instance through regular interaction between sectoral trade unions or through "wage leadership" or "pattern bargaining", where some sectors base their negotiations on agreements made in other sectors. [58] Coordination can also refer to vertical coordination, such as in the case where lower level agreements can only improve upon conditions negotiated at higher levels. Some have argued that wage coordination reduces the sensitivity of inflation to domestic output, thus keeping inflation in check when unemployment is low, and reducing the inflation-dampening impact of high unemployment during economic downturns, [59] in line with the impact of nominal wage rigidities as discussed before.

More effective coordination between social partners helps achieving macroeconomic goals such as increasing resilience, stabilising inflation, tackling unemployment, and correcting external imbalances. [60] Governments can foster such coordination and good social partner relationships more broadly by supporting bi- and tripartite agreements, providing platforms for regular discussions between social partners and promoting a shared understanding of the main challenges. [61] The government can also influence bargaining through flanking measures such as tax concessions to support net wages at times of wage moderation.

[54] For example, Dolado and Bentolilla (1993) observe a positive link between the number of fixed-term contracts (the "outsiders") and the real wages (and hence the implied market power) of permanent workers (the "insiders").

[55] Borghijs, A., Ederveen, S., de Mooij, R. (2003) European Wage Coordination: Nightmare or dream to come true? European Network of Economic Policy Research Institutes Working Paper No. 20.

[56] Calmfors, L., and John Driffill, J. (1988), Bargaining structure, corporatism and macroeconomic performance, Economic Policy, 6, 13-61.

[57] Camarero, M., D'Adamo, G., Tamarit, C. (2016) The role of institutions in explaining wage determination in the Eurozone: a panel cointegration approach. International Labour Review, 155(1): 25-56.

[58] see e.g. European Commission (2011), Labour Market and Wage Developments in Europe. Annual Review 2011, Directorate-General for Employment, Social Affairs and Inclusion; Traxler, F., Blaschke, S., Kittel, B. (2001) National labour relations in internationalised markets: a comparative study of institutions, change and performance, Oxford University Press.

[59] Rovelli, R. (2016) Wage coordination in new and old EU member states. IZA World of Labor 2016: 222.

[60] see e.g. Ball, L., Romer, D. (1991) Sticky Prices as Coordination Failure. *American Economic Review*, 81(3): 539-552; Blanchard, O., Wolfers, J. (2000), The Role of Shocks and Institutions in the Rise of European Unemployment: the Aggregate Evidence *Economic Journal*, 110: 1–33.

[61] see Hijzen et al. (2017), as above.

Certain features of collective bargaining systems can contribute to building trust between social partners, such as the inclusiveness of bargaining parties, effective procedures for extensions and exemptions, built-in incentives for regular renegotiation, and mechanisms to generate ownership and accountability among social partners (e.g. by ensuring transparent access to information on negotiated working conditions and effective enforcement of the agreement through independent labour inspectorates). [62]

The question of which wage setting institutions are most compatible with a resilient economy has no clear-cut answer. From a resilience perspective, the focus is not necessarily on the level of wages but more on the speed of adjustment. Some authors have argued that a combination of national and firm-level bargaining seems attractive to ensure macro-flexibility. [63] Firm-level bargaining allows wages to adjust to firm-specific and local developments. On the other hand, national agreements (in which governments are often involved alongside social partners) can support adjustment in response to major macroeconomic shocks: by providing guidance for average wage growth, such agreements can avert wage deflation while taking into account the interaction between wage developments and (un)employment. [64] At the same time, other efficient forms of wage setting institutions can also be found, and details with regard to how bargaining regulations are operationalised matter a lot. Moreover, collective bargaining institutions are deeply rooted in countries' history and underlying social norms; hence, in order to succeed, trust between social partners might be more important than any particular bargaining structure.

Well-functioning collective bargaining systems also play an important role in mitigating inequality, and ensuring that the benefits from productivity growth are shared fairly. [65] It is important to ensure that wages are set in a transparent and predictable way according to national practices and respecting the autonomy of social partners. In this context, a stable industrial relations environment plays an important role in delivering the trust that is needed to adopt, both in good and in bad times, innovative bargaining solutions with the support of the social partners.

I.5.3. Public sector wages

Public employment [66] represents a considerable share of total employment and hence public wage dynamics can have relevant impacts on aggregate wage developments. Public wage dynamics may spill over to the private sector through different channels, and especially so in the presence of a large public sector. An increase in public sector wages makes government jobs more attractive—especially if there is already a positive public sector premium and other job characteristics (such as employment protection regulations) are more favourable too—crowding out employment in the private sector and exerting upward pressure on wages and productivity in the private sector. [67] By increasing the value of being employed in the public sector, higher wages strengthen the bargaining position of workers in the private sector and trigger imitation effects between public and private wages. [68] Public wage increases can also have a positive impact on demand, and as such foster private sector employment. On the other hand, if private wage increases are not supported by increases in labour productivity, they may exert upward pressure on unit labour costs. [69]

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[62] IMF (2016) Time for a supply-side boost? Macro-economic effects of labour and product market reforms in advanced economies, Chapter 3, World Economic Outlook, April 2016.

[63] Blanchard, O., Jaumotte, F., Loungani, P. (2013) Labor Market Policies and IMF Advice in Advanced Economies during the Great Recession, IMF Staff Discussion Note. SDN/13/02.

[64] Examples include the Wassenaar Agreement in the Netherlands in 1982; the Moncloa Pact in Spain in 1977, the Alliance for Jobs (Bündnis für Arbeit) in Germany in 1998; and the more recent 2016 Competitiveness Pact in Finland.

[65] The Right to Fair Wages is one of the 20 key principles of the European Pillar of Social Rights, which was launched on April 26 2017.

[66] The government wage bill represents around 10% of total GDP in Europe: 11% on average over the period 1999-2012 in the EU; slightly above 10% in the euro area in 2014 (see European Commission (2014) Government wages and labour market outcomes. European Economy Occasional Papers 190; and Pérez, J.J., Aouriri, M., Campos, M.M., Celov, D., Depalo, D., Papapetrou, E., Pesliakaité, J., Ramos, R., Rodríguez-Vives, M. (2016) The fiscal and macroeconomic effects of government wages and employment reform. ECB Occasional Paper Series No. 176).

[67] Helpman, E. (1976) Macroeconomic policy in a model of international trade with a wage restriction. International Economic Review, 17: 641-654; Algan, Y., Cahuc, P., Zylberberg, A. (2002). Public employment and labour market performance, Economic Policy, 17 (34), 7-66.

[68] Afonso, A., Gomes, P. (2008) Interactions between private and public sector wages. European Central Bank Working Paper Series No. 971; Ardagna, S. (2007). Fiscal policy in unionised labor markets, Journal of Economic Dynamics and Control, 21 (5), 1498-1534.

[69] Lane, P.R., Perotti, R. (1998) The trade balance and fiscal policy in the OECD. European Economic Review, 42(3-5): 887-895; Rovelli (2016), as above.

In practice, wage setting institutions in the government sector vary considerably across the EU. (70) A key distinction is that in some countries, government wages are mostly set by legislative action; while in others they are set by collective bargaining. As a consequence, governments have direct control on wage setting in the former case, while wage setting in the public sector results from interactions with wage formation in the private sector in the latter case. More generally, dynamic interactions between private and public wages can be quite complex depending on the specific characteristics of wage bargaining in both sectors which influence their leadership behaviour in wage setting. (71) For example, research has found that public sector wages exert a stronger impact on private wages the greater the government's involvement in collective bargaining, the more centralised and coordinated is collective bargaining, the larger the public sector and the lower the external openness to trade is. (72) In countries where government wages are set by collective bargaining, wages in the manufacturing sector have been found to be better aligned with productivity and more responsive to unemployment, possibly because bargaining processes are generally closer to the market than unilateral government decisions. (73)

I.5.4. Tax and benefits policies

While their impact is less direct and relatively complex, labour tax policies can influence wages through different channels. Personal income tax liabilities and social security contributions (whether payable by employees or by employers) (74)

generate a wedge between labour cost and take-home pay and can therefore drive up labour costs and/or drive down net wages and disposable income. The wage impact of a change in the tax wedge is country- and context-specific. (75) It depends on the relative responsiveness of labour demand and supply, and falls typically on the least elastic side of the market. (76) In the presence of downward nominal wage rigidities, labour tax reductions are likely to be passed on to the worker, as gross wages cannot be reduced. The institutional framework for wage negotiations and the interaction of taxation with other institutional factors (e.g. the tax treatment of unemployment benefits) also play a role.

Empirical evidence shows that the largest share of the tax burden on labour is borne by the employee in the form of lower wages. (77) This is observed to apply even more strongly to countries with more centralised bargaining systems and in countries where social security benefits are more tightly linked to contributions, presumably because labour unions internalise the benefits from income protection in their wage demands. (78) In other words, workers and labour unions are more likely to recognise the provided insurance as non-wage benefits in this case, moderating the impact on labour supply and wage demands.

Governments sometimes use fiscal devaluations (i.e. tax system adjustments as to increase the cost of imports relative to exports) as an instrument to regain competitiveness. In a currency union, economies cannot rely on nominal depreciations or devaluations to improve competitiveness. A fiscal devaluation can to some extent mimic a nominal

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(70) For a survey of collective bargaining institutions in the public service and their effect on labour market outcomes see European Commission (2014).

(71) See e.g. D'Adamo (2014) for a review of wage spillovers between the public and the private sector in 10 European Union member states over the period 2000-2011.

(72) Lamo, A., Pérez, J. J., Schuknecht, L. (2012), Public or Private Sector Wage Leadership? An International Perspective. Scandinavian Journal of Economics, 114: 228–244; Lamo A., Perez J.J., Schuknecht L. (2013), Are government wages interlinked with private sector wages? Journal of Policy Modeling, 35(5), 697-712.

(73) Marzinotto, B., Turrini, A. (2017) Co-movements between public and private wages in the EU: what factors and with what policy implications? IZA Journal of European Labor Studies, 6(2).

(74) While the statutory incidence of a tax may be relevant for political and short-term economic reasons, it should not have an impact on wage levels over the longer term. See European Commission (2015) Study on the effects and incidence of labour taxation. Final Report. Working Paper No. 56, Taxation Papers; Kugler, A., Kugler, M., Herrera Prada, L.O. (2017) Do payroll tax breaks stimulate formality? Evidence from Colombia's reform. NBER Working Paper 23308.

(75) Melguizo, Á., González-Páramo, J.M. (2013) Who bears labour taxes and social contributions? A meta-analysis approach. SERIEs, 4(3): 247-271.

(76) Theory predicts that if labour demand is completely elastic, an increase in the tax wedge will fall fully on the worker in the form of a lower net wage. If labour demand is fully inelastic, it will fall fully on the employer in the form of higher labour costs. For any intermediate elasticity of labour demand, the costs will be shared between workers and employers; and the more elastic labour supply is, the lower the share of the tax burden will be borne by the worker (European Commission, 2015). The response to a change in the tax wedge can be asymmetric, e.g. if wages are downwardly rigid but can increase flexibly (Kugler et al., 2017).

(77) See European Commission (2015), as above; Gruber, J. (1997) The Incidence Of Payroll Taxation: Evidence From Chile, Journal of Labor Economics, 15(3): S72-S101; Ooghe, E., Schokkaert, E., Flechet, J. (2003) The Incidence of Social Security Contributions: An Empirical Analysis. Empirica, 30(2): 81-106.

(78) see Melguizo and González-Páramo (2013), as above; Ooghe et al. (2003), as above; Summers, L., J. Gruber, and R. Vergara (1993) Taxation and the Structure of Labor Markets: The Case of Corporatism, Quarterly Journal of Economics 58, 385–411.

devaluation: imports can be made more costly and exports cheaper by financing a tax cut on domestic production (e.g. by reducing the tax burden on labour) through the increase of the value-added standard tax (VAT) rate. [79] Earlier analyses by the European Commission and by the ECB conclude that fiscal devaluations can accelerate real exchange rate adjustments and thus contribute positively to regaining competitiveness, but the impact is likely to be small and short-lived. [80] As such, it cannot be used as a substitute for structural reforms that address fundamental problems underlying external imbalances and weak growth. Still, as it presents a shift towards more growth-friendly taxation, a fiscal devaluation can have wider economic benefits. [81]

Generous unemployment benefits (both in terms of their levels or replacement rates and in terms of their duration) are expected to raise workers' reservation wage, and therefore also wage demands. If not accompanied by cost-effective activation policies, they may have a negative impact on labour supply as well. [82] These factors may strengthen the bargaining power of unions and workers and lead to higher wages as a result. On the other hand, if workers incorporate in their wage demands the benefits from income protection provided by the social security system or from public goods provided with the help of labour taxes, the negative effects on labour supply, and the upward pressure on wage demands may be mitigated to some extent. [83]

I.5.5. Other structural reforms in product and labour markets

Changes in product market and labour market regulations may also have an indirect impact on wage formation. A well-known example in the area of labour market regulations are regulations on

dismissal costs. Research has established that firms can compensate for the future expected costs of dismissal by reducing the entry wage of the worker, so that the expected cumulative wage bill from the employment relationship remains unaffected. [84] If this is the case, theory predicts that employment protection deregulation should trigger a proportional increase in wages. [85] On the other hand, a reduction in firing costs from high levels may lead to a temporary increase of unemployment, which might have short-run negative impacts on aggregate demand in periods of economic slack. [86] These effects may be mitigated by devising reform packages that support workers during transitions between different jobs, including with effective unemployment benefits and activation policies as per the "securiflex" model. Employment protection reforms can also be devised to reduce labour market segmentation, which can also have a positive impact on wage developments. [87]

Product market deregulation can foster competition and reduce mark-ups, although the full effects usually take time to materialise. By reducing consumer prices, and raising productivity and output, such reforms can have a positive impact on real wages. Creating favourable conditions for firm entry, exit and growth can also raise productivity (e.g. by promoting allocative efficiency).

Raising productivity is the most sustainable way to support wage growth and aggregate demand. In addition to labour and product market reforms, adequate investment in human capital, research and innovation can boost productivity and wage growth at the same time. Investment in human capital can moreover help mitigating the possible loss of bargaining power stemming from de-routinisation and skills-biased technological change, as skilled (unskilled) labour is more likely to be a complement to (substitute of) capital. [88]

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[79] Hohberger, S., Kraus, L. (2016) Is fiscal devaluation welfare enhancing? Economic Modelling, 58: 512-522.

[80] See European Commission (2013) Study on the impacts of fiscal devaluation. Working paper 36, Taxation Papers; ECB (2011) Economic and Monetary Developments: Fiscal Developments. Monthly Bulletin, December 2011, box I2.

[81] In cases where fiscal devaluations would have negative impacts for equity, this can be addressed by focusing income tax cuts on lower income groups (European Commission, 2013, as above).

[82] With less generous unemployment benefits, an increase in unemployment benefit generosity is less binding.

[83] Rosen, S. (1986) 'The Theory of Equalising Differences', in O. Ashenfelter and R. Layard, eds., Handbook of Labor Economics I. Amsterdam: Elsevier; Summers, L. (1989) Some Simple Economics of Mandated Benefits, American Economic Review 79(2), 177–183.

[84] Lazear, E. P. (1988) Employment-at-will, job security, and work incentives. In: Hart, R.A. (ed.) Employment, Unemployment, and Labor Utilisation. Unwin Hyman: Boston.

[85] Garibaldi, P., Violante, G. L. (2005). The employment effects of severance payments with wage rigidities. The Economic Journal, 115(506), 799-832.

[86] e.g. Duval and Furceri (2016), as above.

[87] e.g. European Commission (2017), as above.

[88] Berman, E., Bound, J., Machin, S. (1998). Implications of skill-biased technological change: international evidence. The Quarterly Journal of Economics, 113(4), 1245-1279; Sala, H., Trivín, P. (2017). The Effects of Globalisation and Technology on the Elasticity of Substitution, IZA Discussion Papers 10898.

A case study using the Commission's global macroeconomic model suggests indeed that structural factors can have a significant impact on wage formation. The analysis shows important contributions of productivity-increasing investment and labour market rigidities to explaining wage developments in Italy and Spain. [89]

I.6. Conclusions

The euro area is entering its sixth year of uninterrupted economic growth, and is expected to continue growing, albeit at slightly slower pace. The impact of the recovery is also observed in the labour market, with employment surpassing pre-crisis levels since 2017 and unemployment rates approaching levels prior to the recession and set to decline to 7.5% by 2020.

At the same time, nominal wage growth [90] was not picking up until recently in line with what one would expect based on its historical relationship with standard indicators of slack. This note has set out different reasons that contribute to the observation of subdued wage growth. The analysis in Box I.1 illustrates the role of weak productivity developments, low core inflation, and "sticky" inflation expectations. In some countries, where unemployment remains high compared to pre-crisis levels, labour market slack and "pent-up" wage inflation continue to exert downward pressure on wage growth. Other structural changes such as downward trends in working hours per employee and the possible role of globalisation, technological progress and declining unionisation have been discussed as well.

In the post-crisis period, the adjustment of wages to diverging domestic cyclical developments across euro area countries has been supportive of external rebalancing. Nevertheless, this effect seems to be weakening in recent years, as a result of the recovery of wage growth from very low rates in net debtor countries coupled with weak productivity gains, while wage growth has remained moderate in surplus countries in spite of the recovery gaining pace. From this perspective, stronger wage growth in countries with a strong and persistent current account surplus would arguably support domestic demand and aggregate demand in the euro area, and contribute to the economic recovery and the

rebalancing, while easing the competitiveness adjustment of those countries that remain vulnerable as a result of large negative net international investment positions.

Wage growth in the euro area has accelerated in 2018, helped by the closure of the output gap, the surge in labour shortages in several Member States, and the gradual increase of core inflation that has started to feed into wage negotiations. Looking ahead, with growth slowing down amid economic uncertainty, wage growth is forecast to slightly decelarate again by 2019. In the absence of structural changes, sluggish labour productivity growth and the downward trend in hours worked per employee may as well continue to exert downward pressure on wage growth in the future. Developments related to increasing global competition (e.g. in the framework of global supply chains), the emergence of new forms of work, and the structural shift towards the service sector (with lower union density) are likely to continue, potentially weakening workers' bargaining power and therefore wage growth. Low union membership among young workers might as well further exacerbate the de-unionisation trend. [91]

Governments have some instruments at hand with which they can directly or indirectly influence wage developments, even though the brunt of wage formation results from the interplay of market forces. Wage growth is influenced by the presence of statutory minimum wages, the institutional settings of collective bargaining frameworks, policies regarding the setting of public sector wages, and tax and benefits policies. Other structural reforms in product and labour market can play a role as well, e.g. through their impact on non-wage labour costs (e.g. dismissal costs), segmentation, price mark-ups, innovation and productivity. Since these instruments interact in different ways with the rest of the economy, their effectiveness in steering wage developments and their impact on the rest of the economy varies greatly as well. Country-specificities play an important role in this context.

Raising productivity can support wage growth, the expansion of demand, and sustainable growth and job creation at the same time. This underscores the

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(89) See European Commission (2018c), as above.
(90) Measured in terms of nominal compensation per employee

(91) European Commission (2017), Fostering intergenerational fairness through social dialogue, chapter 5 of Employment and Social Developments in Europe 2017. Directorate-General for Employment, Social Affairs and Inclusion.

importance of productivity-increasing structural reforms, such as reforms that make labour markets more adaptable and responsive in order to improve allocative efficiency, reforms that make product markets more open and competitive, and reforms that improve the overall business environment, with stimulating conditions for firm entry, growth and innovation. Adequate investment in human capital, research and development is key as well, along with measures that ensure the efficient formation of skills in initial as well as post-compulsory education and training for individuals of all ages. These structural reforms not only strengthen the supply side of the economy, but can also boost demand through increased real wages and higher investment.