Low wage growth in the euro area: main conclusions from an ESCB Wage Expert Group with a focus on Belgium

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Introduction

Since 2012, inflation has been surprisingly moderate, particularly in the euro area, falling to very low levels considering the recovery in economic activity and giving rise to a "missing inflation puzzle" (Constâncio, 2015, Cicarelli and Osbat, 2017). Similarly, a "wage growth puzzle" has also been identified. Despite improvements in the economic activity since 2013 in the euro area, wage growth remained subdued over the years from 2013 to 2017. Moreover, during that period, wage growth was systematically overpredicted in Eurosystem and ECB staff projection exercises. For that reason, the ESCB set up a Wage Expert Group (WEG), to identify the drivers behind this phenomenon. This article will highlight its main findings [1] and look more closely at the Belgian situation in particular.

Every country within the euro area has its own particularities as regards wage formation, which are related among other things to the institutional set-up and cultural factors. In Belgium, the wage formation process is strictly framed by the Law on the Promotion of Employment and the Preventive Safeguarding of Competitiveness (see box), hence the economic cycle plays more of an indirect role. Real wage increases are determined every two years, in principle by the social partners in an interprofessional agreement. Wages in Belgium are also systematically adjusted to inflation developments (as measured by the health index [2]). Over the period under investigation however, wage moderation policies were imposed by the federal government in order to restore the country's competitive position. So, the negative forecast errors were more limited for Belgium and were mainly made in the 2013-2015 period.

* Results presented in this article are partly based on microdata from Eurostat, specifically the EU-SILC. We wish to thank Eurostat for the provision of the data. The responsability for the results drawn from the data lies entirely with the authors.

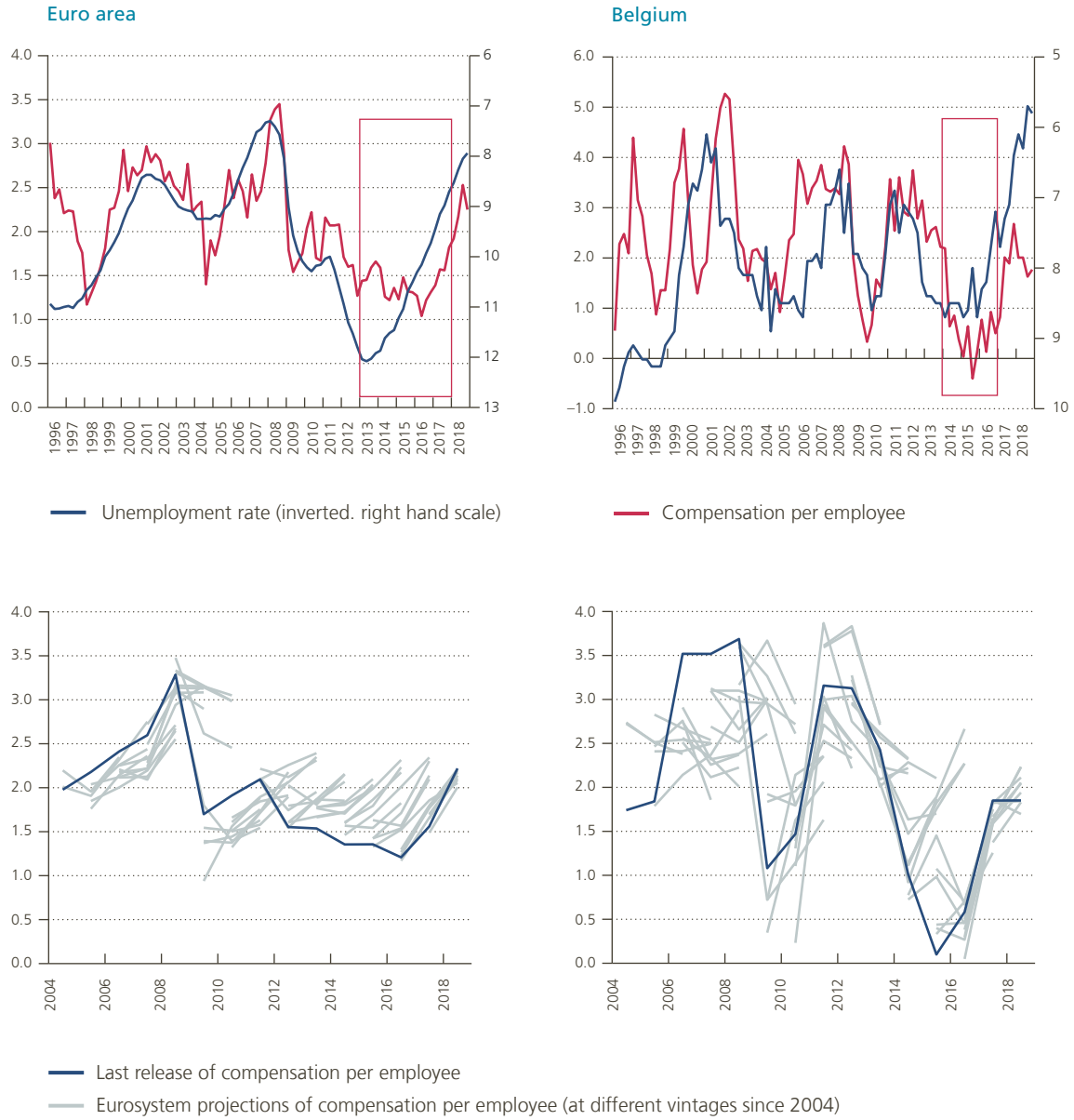
1 Nickel *et al.* (2019), *Understanding low wage growth in the euro area and European countries*, ECB occasional paper, 232, September.

2 The health index is derived from the national consumer price index, and excludes products that are deemed detrimental for health, i.e. tobacco products, alcoholic beverages and motor fuels.

Chart 1

In the euro area, compensation per employee was systematically overpredicted from 2013 to 2017

(Year-on-year growth, in %)



Source: ECB.

Note: Data for Belgium are updated with the new statistics, published in October 2019. The new figures deviate mostly from the old ones for the year 2018, as new statistics have become available to estimate notably the wage drift more accurately for that year. For the WEG report the cut-off date was 2018Q4.

BOX 1

Reformed 1996 Law on Competitiveness

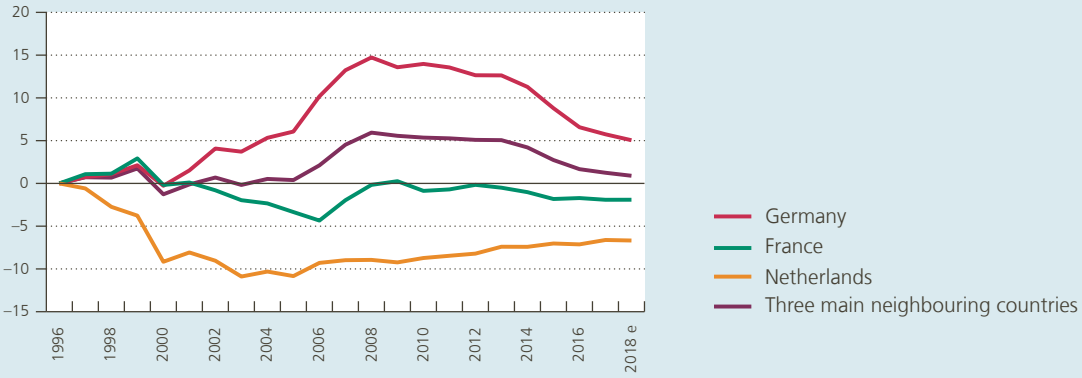
Wage formation in the private sector in Belgium depends largely on a centralised wage bargaining framework centred around the Law on the Promotion of Employment and the Preventive Safeguarding of Competitiveness.

The Law passed in 1996 created a framework to keep labour costs in the Belgian private sector in line with those in the country's three main trading partners, namely Germany, France and the Netherlands.

Its cornerstone is a comparison of the cumulative changes in hourly labour costs since 1996 to those in the neighbouring countries, referred to as the "wage gap" (handicap if positive), which is officially established by the Central Economic Council (CEC). The bargaining process to determine the maximum available margin for wage negotiations every two years is both backward-looking (taking into account the wage handicap) and forward-looking (taking into account the forecasts for the next two years of hourly labour costs in the neighbouring countries and the forecast for inflation in Belgium).

Belgium's wage handicap in terms of hourly labour costs

(cumulative differences[1] since 1996 in the private sector, in %)



Source: CEC.

1 In keeping with the calculation methodology as set out in the amended Employment and Competitiveness Law. A positive sign indicates a competitiveness gain for the relevant economy compared with Belgium.

Yet, the Law failed to prevent Belgium from seeing the wage gap open up in the 2005-08 period, a gap that it did not manage to close until 2016. In practice, the 1996 Law has not always proved suitable for the task of preventing labour costs from derailing. For that reason, the federal government proposed a series of adjustments and an amended Law was adopted in March 2017. Although the new legislation

provides for an arsenal of measures to prevent and/or rapidly correct any build-up of a wage handicap, there are still some elements that need to be monitored:

- First, the adjusted method of calculating the wage margin resulted in a maximum of 1.1 % on top of indexation for the period 2019-2020 due to a safety margin (minimum 0.5 %) and a correction mechanism (based on the cumulated wage handicap since 1996). Such a small margin for wage increases could potentially contribute to the already low wage dispersion in Belgium.

- Secondly, wage formation is not yet strictly linked to changes in productivity. The reformed Law requires the wage handicap calculation to also take productivity into account. However, this indicator is not binding for the determination of the maximum available wage margin.

The relationship between wage growth ("wage inflation") and unemployment can typically be identified within a Phillips curve setting, which aims to capture the cyclical drivers of wage growth. One would expect the Phillips curve slope to have flattened, since wage growth has not developed in line with the cyclical drivers in the last few years. Besides that, it is also possible that other, more structural, factors have been slowing down wage growth. For instance, changes in the composition of the workforce in terms of age and education also have a significant impact on wage developments.

1. Cyclical drivers of wage growth in a Phillips curve setting

1.1 Phillips curve setting

1.1.1 A thick-modelling approach

The relationship between the unemployment rate and wage growth can be given a formal setting within a Phillips curve. Back in 1958, William Phillips identified a negative relationship between unemployment and wage inflation in the United Kingdom for the period 1861-1957. When unemployment falls, the labour market becomes more constrained, which in turn leads to higher wage growth. Two years later, Samuelson and Solow (1960) revealed a similar type of relationship, this time between the unemployment rate and price inflation, for the United States.

A quick preview from chart 1 shows that, in the euro area too, such a relationship between wage growth and the unemployment rate could be identified. The fact that wage inflation has been lagging behind even though the unemployment rate started to fall in 2013 – which led to overpredictions of wage growth by international institutions and professional forecasters – has raised questions as to whether the traditional Phillips curve relationship in the euro area and in its individual countries still holds, or whether its slope has flattened. In Belgium, the two variables also move in opposite directions, although the correlation is less strong than in the euro area. As wage formation in Belgium is strictly framed by the Law on the Promotion of Employment and the Preventive Safeguarding of Competitiveness, the macroeconomic environment exerts its influence on wages more indirectly.

Suppose we have the following model:

$$\pi_t^w = c + \rho(L).\pi_t^w + \beta(L).y_t + \gamma(L).prod_t + \delta(L).\pi_t^e + \varepsilon_t$$

where π_t^w is compensation per employee, y_t is a real economy variable (such as the unemployment rate), $prod_t$ is a measure of productivity, π_t^e represents inflation expectations and L are lag polynomials.

By extension, the unemployment rate can be replaced by other variables that determine the cyclicality of the economy, such as (real) GDP, the unemployment gap, etc. All these variables are intended to proxy the cyclical "economic slack", which is in fact an unobservable variable, hence the choice of various indicators. Similarly, inflation expectations can be measured by backward inflation expectations, such as the past HICP inflation rate, or by forward inflation expectations, such as forecasts by professionals or surveys. Both measures of inflation expectations are defendable, but here the focus will be on backward inflation expectations, since in this set-up, this indicator has been shown to perform better (Nickel *et al.*, 2019).

When combining all the different indicators with one another, a wide range of Phillips curve specifications are possible. The approach of estimating various specifications using different variables that represent economic slack and inflation expectations addresses model uncertainty. It is called a "thick-modelling approach" and is particularly useful in the context of a common euro area research project, like the WEG, to the extent that it is not possible to estimate a single model that fits both the area as a whole and each individual country, as each country has its own characteristics. In total, the approach uses a dataset that contains 17 real economy variables and 7 inflation expectation measures: this gives a total number of 119 different Phillips curve specifications.

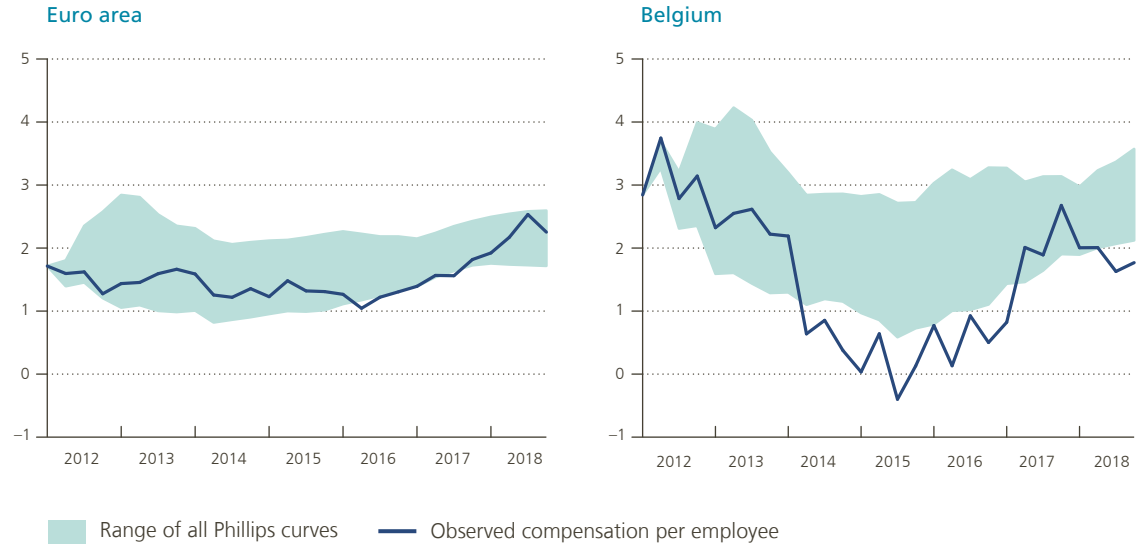
An out-of-sample forecast, conditional on the observed path of the independent variables, is conducted in order to see whether the Phillips curve is useful in explaining wage growth. In the euro area's case, the observed compensation per employee lies within the range of estimates. However, during the period of wage overestimation, the observation lies at the bottom of the range of Phillips curves and for some observations below the range. This leads to the conclusion that the cyclical variables explain a large part, but not everything, about the subdued wage growth.

In the case of Belgium, the observed compensation per employee lies outside the range of Phillips curves over the 2014-2016 period. This is not surprising, since there were strong wage moderation policies at play at the time, to restore Belgium's competitiveness. In 2018, the declining labour cost growth was not entirely forecast by the models either. Part of it is due to a new package of tax shift measures for 2016-2020 that came into force in that year (most importantly, a further reduction of the base rate for employers' social contributions). However, a part of this more recent decline cannot be explained by tax shift measures, nor by the Phillips curve.

Chart 2

The Phillips curves confirm low wage growth and explain a large part, but not everything

(Year-on-year growth, in %)



Sources: ECB, NBB.

Notes: Data for Belgium are updated with the new statistics, published in October 2019. For the WEG report the cut-off date was 2018Q4.
The regressions are estimated by OLS. The range includes out-of-sample forecasts conditional on the actual realisations of the independent variables. Estimation sample spans 1995Q1-2012Q1 and forecasts are made for the period 2012Q2-2018Q4.
The dependent variable is compensation per employee.
The real economy variables that are included in the various models are the unemployment rate, unemployment gap, DFM lowpass[1], unemployment gap according to the European Commission, unemployment gap according to the IMF, unemployment gap according to the OECD, unemployment gap according to the ECB estimated by an unobserved components model, u6[2], u6 estimated by the ECB using an unobserved components model, narrow u6[3], narrow u6 gap, *underemployment* rate[4], uxx[5], average hours of work of employment according to the ECB estimated by an unobserved components model, labour force shortage in the manufacturing sector, labour force shortage in the construction sector, participation rate estimated by the ECB using an unobserved components model.
The productivity measure is productivity per employee.
The inflation expectations measures included are: past YoY HICP inflation, past HICP index, past HICP excluding energy index, past HICP excluding energy and food index, past GDP deflator, past consumer deflator, and the consumer survey according to the European Commission that reflects consumer expectations for prices over the next 12 months.

1 DFM lowpass: 1st common factor of the cyclical components of various labour market series, each filtered with a low pass filter with cut-off periodicity of 150.

2 u6: Constructed as ratio of (Population Unemployed + Available but do not seek work + Seek work but not available + Underemployed) to Augmented Labour force (Population Unemployed + Available but do not seek work + Seek work but not available + Employed).

3 Narrow u6: Constructed as ratio of (Population Unemployed + Available but do not seek work + Underemployed) to Augmented Labour force (Population Unemployed + Available but do not seek work + Employed).

4 Underemployed part-time workers (in percent of the labour force).

5 Unemployment plus underemployment rate (in percent of the labour force).

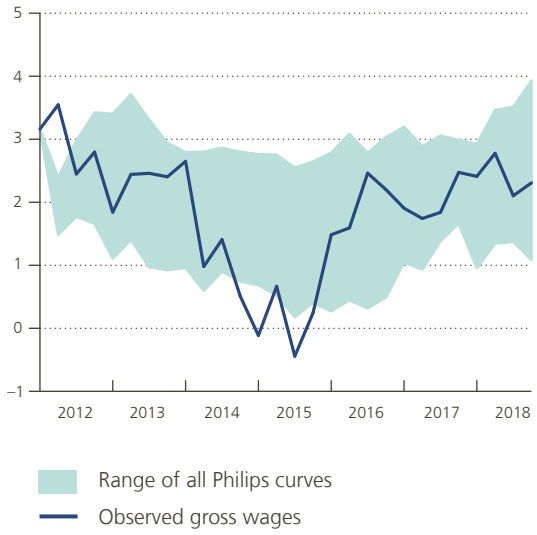
1.1.2 Compensation per employee as dependent variable

Compensation per employee can be decomposed into gross wages and employers' social security contributions on wages. As the Phillips curve studies how (wage) inflation variables interact with the cyclical macroeconomic environment, one might wonder why the explained variable used here is compensation per employee and not gross wages alone. Employers' social contributions on wages may in fact be subject to discretionary measures by the government and thus less related to the economic cycle, which could blur the relationship. As illustrated in chart 3, Belgian observed gross wages indeed lie closer to their Phillips curve range. Still, the observation does not lie in the middle of the Phillips curve forecasts, as the moderation policies not only affected employers' social contributions; they also encompassed an index jump in March 2015 and zero real wage increases for 2014-2016.

Chart 3

Phillips curve using gross wages per person as dependent variable

(Year-on-year growth, in %)



Sources: ECB, NBB.
Note: The specifications are the same as in chart 2 except for the wage measure.

However, in Europe, social contributions represent an important part of the labour costs borne by the employer and, for the employee, if workers understand that these contributions give them right to future benefits, they will consider them not as taxes but as a component of their earnings (see Bozio *et al.*, 2019). So, compensation per employee – that include social contributions on wages – may indeed be the most relevant variable in the European context. The WEG was also set up to improve the Eurosystem/ECB staff forecasts of wage growth and provide cross-checking tools. For these exercises, compensation per employee is the variable of interest. That is, during the projection exercises, not only wage costs are forecast, but also other variables such as inflation, GDP, government budget, etc. The coherence between all the macroeconomic variables is strongest when looking at total labour costs, rather than only at gross wages.

For these reasons, the WEG chose to use compensation per employee in the Phillips curve exercise. In this article, it has been decided to use the same measure for Belgium, to ensure comparability.

1.2 Decomposition of cyclical factors that drive wage growth

The Phillips curve model makes it possible to calculate the contributions of the different cyclical drivers to wage growth. Looking at the benchmark specification, that is using the unemployment rate as the measure of slack and the past year-on-year inflation rate as the inflation expectations measure, it is found that the high unemployment rate explained the low wage inflation period up to 2014 for the euro area. After that, as the unemployment rate started to decline, this variable lost its explanatory power in favour of the inflation rate, that was particularly low in 2014 and 2015. Hence, the so-called "wage puzzle" can be partly explained by integrating inflation expectations – in particular based on past inflation – into the model.

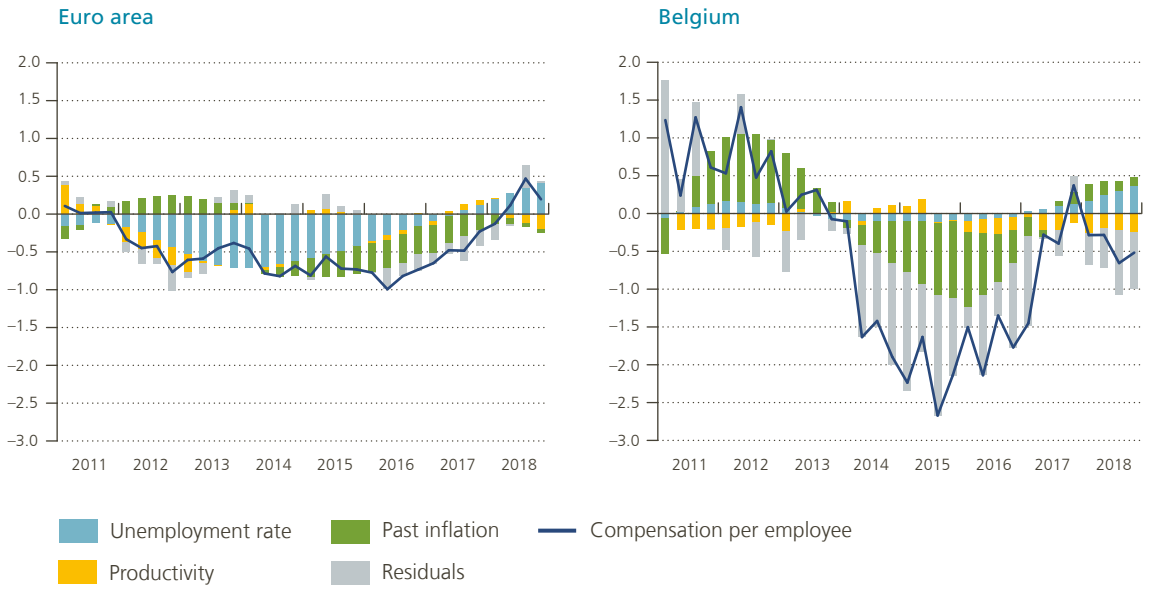
For Belgium, the Phillips-curve-based decomposition shows that it has mostly been the low inflation and the residuals (i.e. the wage moderation policies) that explain wage growth. Notably due to some government

measures that have had an impact on consumer prices (among others, the higher tuition fees in Flanders, the higher excise duties on alcohol and the introduction of the so-called "soda tax" on soft drinks containing sugar), inflation rates in Belgium picked up faster in 2015 than in the euro area. The relative contribution of the unemployment rate appears to be marginal for Belgium, according to this decomposition.

Chart 4

Decomposition of the cyclical factors to wage growth [1]

(contributions of factors in percentage points)



Sources: ECB, NBB.

Note: Data for Belgium are updated with the new statistics, published in October 2019. For the WEG report the cut-off date was 2018Q4.

1 The compensation per employee here is a deviation from its model-implied mean.

In both the euro area and in Belgium, weak productivity growth has also played a role in tempering wage growth, albeit to a limited extent. This weak productivity growth is partly related to the fact that the services sector has gained in importance in relation to the manufacturing sector – where productivity is typically higher. However, even within individual sectors, weak productivity gains have been observed, owing to a deceleration in the rate of technological progress and business dynamism [1].

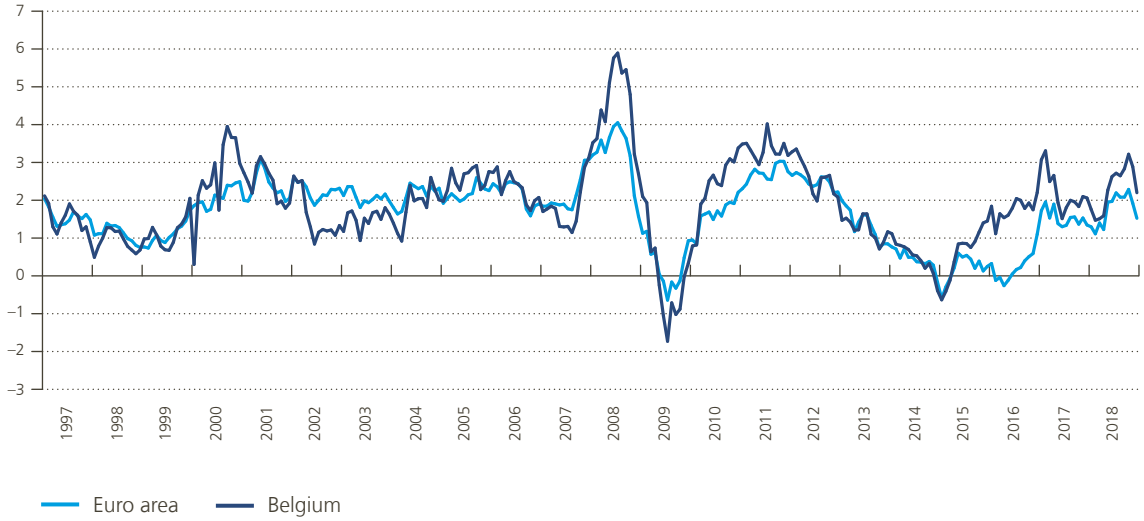
As pointed out before, the reductions in employers' contributions cannot entirely explain the renewed slowdown in wage growth in 2018 in Belgium, hence the large residuals in the decomposition. The real wage increase concluded under the interprofessional agreement in 2017 and 2018 was 1.1 % for the two years; a relatively high figure compared to the previous years of wage moderation. At the time of conclusion, it was expected that this real wage increase would be entirely granted, given that real wage rises had been very modest for some years. Quite surprisingly, the observed real conventional wage increases (0.2 % in 2017 and 0.4 % in 2018) have been well under the agreed margin. The puzzle of the incomplete use of the margin at sectoral level could be explained notably by the will to leave more room for manoeuvre at local level, allowing increases to be granted in companies that could afford it without jeopardising the competitiveness of others.

1 In the WEG report, the link between productivity and wage developments is discussed in box 5.

Chart 5

Inflation[1] in Belgium and in the euro area

(year on year growth, in %)



Source: EC.

1 Total inflation rate according to the Harmonised Index of Consumer Prices (HICP).

It should be emphasized that these results should be interpreted with caution. That is, there is not necessarily a causal relationship between the explanatory variables and low wage growth, as all of them could potentially be reacting to the same common shocks that are not included in this reduced-form framework.

2. Going further: structural explanatory factors

2.1 Compositional effects

The hourly wage derived from the national accounts is by construction an aggregate measure of hours-weighted workers' wages. In this way, those who work more hours receive more weight in this statistic. The same holds true for average employee compensation per person. It is well documented that low-skilled workers' employment and youth employment are very sensitive to cyclical fluctuations, which means that low-skilled workers/youth – who are generally lower paid than higher-skilled or older workers – get less weight in aggregate wage statistics during recessions than they do during expansions. This imparts a countercyclical bias to aggregate wage statistics (Elsby *et al.*, 2016).

Structural movements in the workforce also alter its composition over time. The increasing participation of women in the labour market and the ever-larger share of entrants with a higher educational level also contribute to changes in the aggregate wage. However, the wage rate related to these characteristics changes as well. For example, the gender pay gap has narrowed over time, while the education pay gap has widened. Economic policies and reforms also have a direct impact on the composition of the labour force. In all European countries, including Belgium, the curtailing of early retirement schemes since the beginning of the 2000s has partly succeeded in raising the employment rate of older workers. In the longer term, these policies have both price and quantity effects, with the consequence that the age pay gap is shrinking.

The objectives of the WEG's study of compositional effects were twofold. The first question was whether compositional effects did contribute to the subdued wage growth in the 2013-2017 period in the euro area. The second was to calculate a wage time series purged from compositional effects and to check whether such a series does actually provide a better fit for the wage Phillips curve.

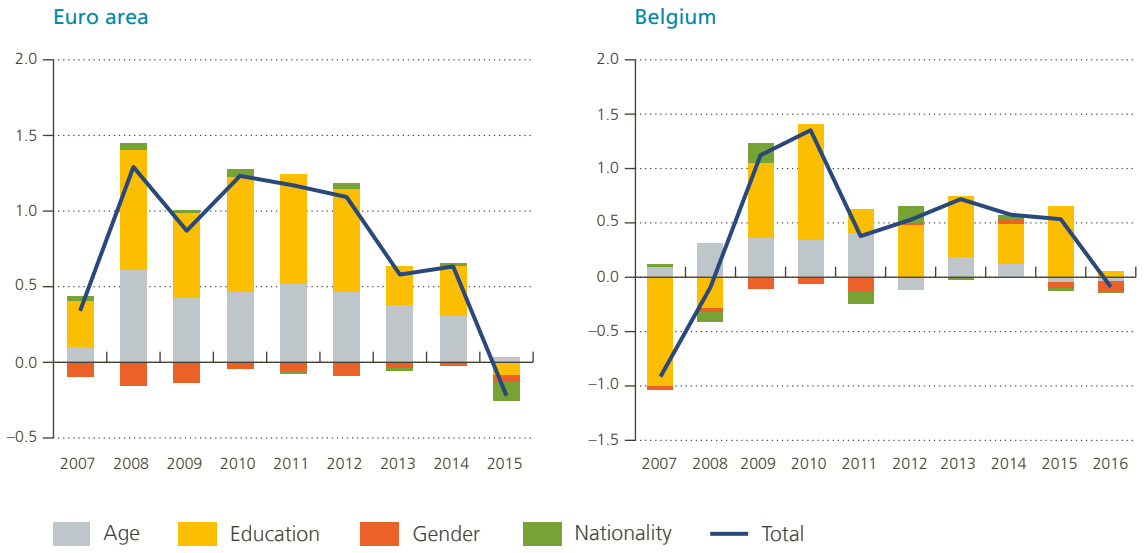
The research work in the WEG was mainly based on the EU Statistics of Income and Living Conditions (EU-SILC), as well as on the Structure of Earnings Survey (SES). Administrative individual data from the social security systems of the different Member States are not easily accessible and do not allow for a consistent approach covering all euro area countries, while the EU-SILC and the SES were developed precisely to provide comparative statistics within the European Union.

One of the advantages of the SES is that the information on wages is provided by employers themselves, while household survey measures of wages like in EU-SILC are notoriously less accurate. Both the wage rate and hours worked are often tainted with uncertainty, even more so if the survey questionnaire is completed by a proxy for the household and not the wage-earner him- or herself. The main drawback of the Structure of Earnings Survey is that it is only mandatory once every four years within the European Union, making it for most Member States ill-suited to identifying cyclical changes in the composition of the salaried workforce and its impact on aggregate wages. Only the Belgian and Czech national statistical offices collect these data with at least a yearly frequency. Given the necessity to dispose of annual data to calculate year-on-year changes and in order to ensure comparability between the euro area and Belgium, this article presents the results using the SILC database.

Chart 6

Impact of compositional effects on wage growth for the euro area and for Belgium

(percentage points)



Source: EU-SILC, ECB calculations, based on Nickel *et al.* (2019).

There are many ways to compute compositional effects. Those used here are based on an Oaxaca-Blinder decomposition and defined as the differences in aggregate wages only due to the changed composition of employees from year to year. The determinants of hourly gross wage growth are assumed to be only driven by four characteristics of the employee (age, education, gender and nationality). Alternative specifications give different results (in particular, a higher volatility if education is replaced by skills) but no substantial changes (Kouvavas *et al.*, 2019).

As explained previously, recessions imply a lower share of low-skilled and younger workers. Besides these cyclical evolutions, trend movements are at play, such as more women and more high-skilled workers in the workforce. Note that the year-to-year effects do not distinguish between cyclical and trend movements. According to Kouvavas *et al.*, trend developments might have a pronounced impact on compositional effects but are unlikely to cancel out cyclical patterns.

With the chosen specification, the largest contribution to the overall effect comes from changes in education and age structure. Euro area aggregate results suggest that compositional effects pushed wage growth up early on in the economic and financial crisis. However, from 2013 onwards (when the "wage puzzle" started to emerge), this effect has worn off. It has even turned slightly negative in 2015, "thereby contributing to the relatively muted response of aggregate wage growth to cyclical improvements" [1].

However, the country-by-country results are much more heterogeneous. According to the WEG results, compositional effects seem to be particularly important in Spain and Italy, while Germany and France experienced only small compositional effects throughout the cycle. The results for Belgium seem to be more cyclical than for the euro area as a whole. At the onset of the great recession, large positive compositional effects are observed, driven by the increases in average age and level of education of the salaried population, even if the Belgian labour market has been very resilient in terms of job losses. The effects remained sizeable in the following years before turning slightly negative in 2016.

To sum up, compositional effects may have had a role in the observed subdued wage growth for both the euro area and Belgium, but it appears to be rather marginal.

Even if it is appealing to estimate a Phillips curve for wage growth net of compositional effects, the experience of the WEG has shown that it seems very difficult to implement in practice, in particular because of the substantial time lag before the release of the microdata (Nickel *et al.*, 2019).

2.2 Other (structural) factors

The WEG report argues that the greater the slack in the economy, the less steep the slope of the Phillips curve (or the less strong the relationship between wage growth and the amount of slack in the economy). In other words, there is a non-linearity in the relationship between wage growth and the cyclical position of the labour market. For the euro area as a whole, the slope would be flat and at a low level, for unemployment rates above 9.5 %. In fact, the unemployment rate reached a peak in 2013 (12 %) and even though it started to decline again after that, it remained above its "turning point value" of 9.5 % up to 2017.

Besides this, the WEG points out that the trend in wage growth in the euro area seems to have been moving downwards, which is primarily linked to the decline in trend inflation. Ciccarelli and Osbat (2017) found a decline over the period 2012-2015 in particular and related this to increased inflation persistence. In other words, decelerating oil price growth has slowed the inflation rate down significantly since 2011, which in turn also affected inflation expectations. Secondly, the falling trend wage growth can also be linked to a slowdown in trend productivity growth; a global tendency caused by lower technological progress and business dynamism.

Lastly, the report gives some hint about the effects of globalisation, migration, demographic change or digitisation on wage growth, and suggests that further research is needed. As regards migration, some countries reported to have found some effect on their wage growth. In an augmented wage Phillips curve setting, the Deutsche Bundesbank (2018) shows that, in Germany, labour-market-oriented net immigration

1 Kouvavas *et al.* (2019).

flows from other EU Member States have helped to meet the increasing demand for labour. As many immigrant workers are active in sectors that are relatively low-paid, migration has generally dampened aggregate wage growth in Germany since 2013.

In Belgium, migrants account for a much lower share of entrants on the labour market, so that this factor is less relevant. It should be noted that posted workers are not included in this analysis, since they are included in the employment statistics of the country of their chief firm. Take, for example, the construction sector and to a lesser extent the transport sector, both of which have been characterised by an increasing share of their workforces coming mostly from Eastern Europe, whose wages are less costly for Belgian firms. However, secondment has no direct impact on the Belgian payroll. Still, Belgian firms have turned to foreign workers to cope with labour force shortages at home. Since their labour costs are lower, this has relaxed somewhat pressure on wages that would have risen sharply without the use of foreign workers. Hence indirectly, this has exerted downward pressures on wages in those sectors[1].

3. Conclusion and main findings of the WEG

Despite notable improvements in the labour market since 2013, wage growth has remained subdued in the Euro area and in Belgium. This has been investigated by the ESCB Wage Expert Group. The relationship between economic slack and wage growth can be formalised in a Phillips curve setting. Given that the precise functional form of the wage Phillips curve (in terms of lag structure, non-linearity, etc.) and its determinants remain subject to debate, a thick-modelling approach has been chosen to deal with model uncertainty. The results of the WEG have shown that a Phillips curve set-up explains cyclical changes in compensation per employee relatively well for the aggregate euro area data, but less well for individual country data. For Belgium, the results of this approach were satisfactory, except over the 2014-2016 period. This is not surprising since there were strong wage moderation policies at play at that time in a bid to restore Belgium's cost competitiveness.

A breakdown of the contribution of the explanatory variables confirms for the euro area that the slow decrease in the unemployment rate has had a dampening effect on wages mostly up to 2014. After that, when the labour market started to improve, the economic slack lost explanatory power in favour of the inflation rate, that was particularly low in 2014 and 2015. Note that there is not necessarily a causal relationship between the explanatory variables and low wages, as they could potentially be reacting to the same common shocks not included in this reduced-form framework. The same decomposition exercise for Belgium seems to attribute less weight to the economic slack variable than for the euro area as a whole. The large residuals in Belgium are directly related to the moderation policies, that are not captured by the model.

The empirical work done by the WEG has shown that compositional effects do exist in the aggregate wage data. These effects may have had a role in the observed subdued wage growth for the euro area and for Belgium but it appears to be fairly marginal.

Even if the wage Phillips curve remains one of the most useful conceptual frameworks for understanding the relationship between nominal labour cost growth and macroeconomics conditions, the WEG findings also point up the considerable heterogeneity that still exists between individual countries.

1 It has also positively contributed to the competitive position of Belgian enterprises in the light of Law on Competitiveness.

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