A decomposition of the unadjusted gender pay gap using Structure of Earnings Survey data
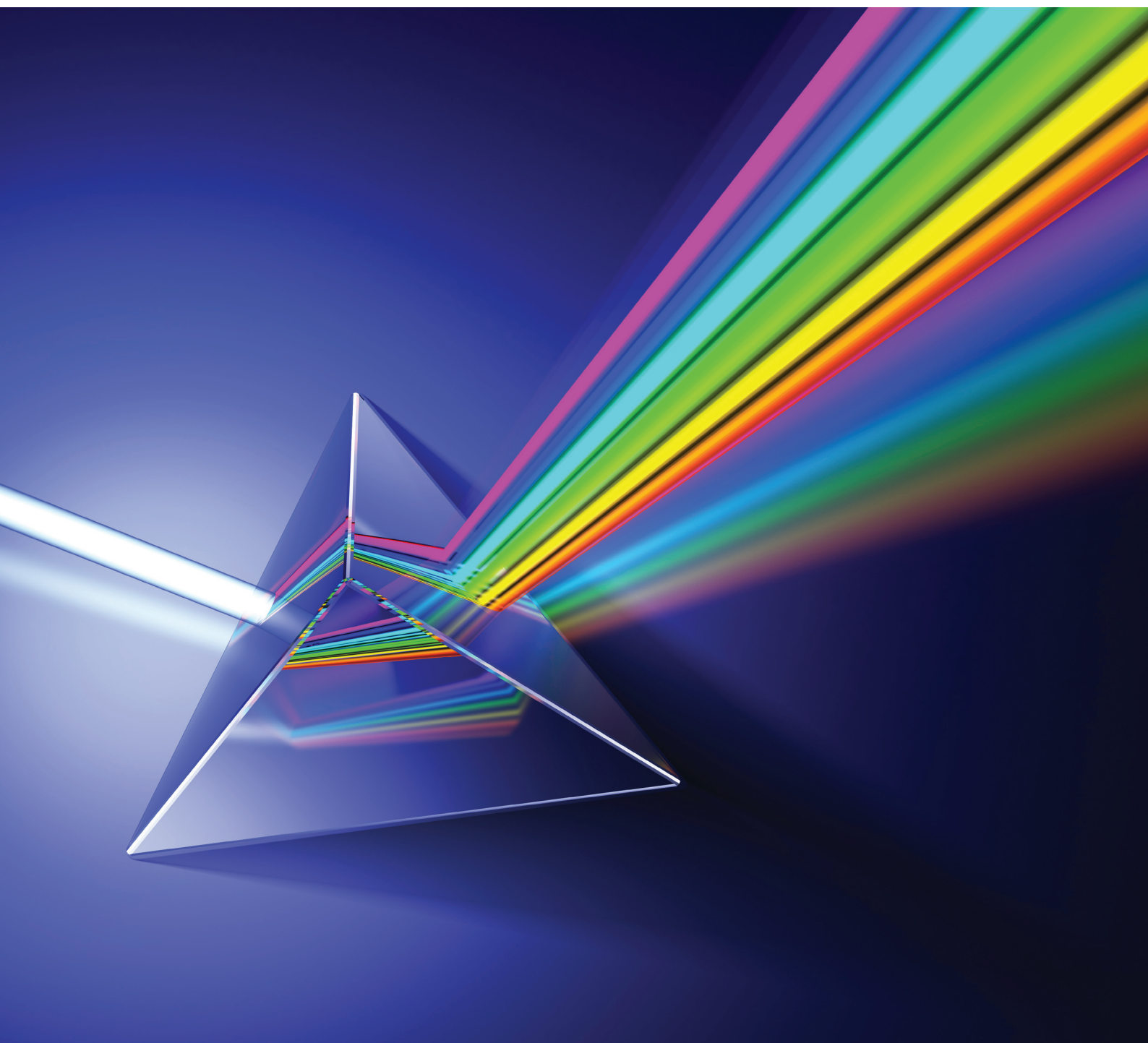
DENIS LEYTHIENNE, PIOTR RONKOWSKI

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Foreword

Tackling possible discrimination in earnings between men and women is one of the key priorities of gender policies both at EU and national levels. The unadjusted gender pay gap ('unadjusted GPG' for short), calculated as the relative difference between the average earnings of women and men, is widely used as the key indicator to monitor progress in this area.

However, the unadjusted GPG does not capture discrimination as such. It combines possible differences in pay between men and women, for 'equal work or work of equal value', with the impact of differences in the average characteristics of men and women in the labour market.

To measure the impact of differences in the average characteristics of men and women, Eurostat has used microdata from the Structure of Earnings Survey (SES) 2014. The microdata cover two broad areas: the earnings of individual employees and the observed characteristics of individual employees. These observed characteristics include: (i) the personal characteristics of individual employees such as age, education and job experience, (ii) the types of job done by individual employees, and (iii) the types of companies or enterprises that individual employees work for.

A statistical method known as the Blinder-Oaxaca decomposition method was applied on this dataset to isolate the contribution of each observed characteristic to the unadjusted GPG. According to this methodology, the unadjusted GPG can be separated into explained and unexplained parts. The explained part is the gap between male and female earnings, which is due to the differences in the average characteristics of male and female employees. The unexplained part measures the difference between the salaries of male and female employees with the same characteristics according to the SES survey.

The methodology and results were discussed with the Working Group on Labour Market Statistics in October 2017 and the European Directors of Social Statistics in March 2018. Following these discussions, it was agreed that Eurostat would publish the methodology and results as a 'statistical working paper'.

Eurostat's methodology and results — presented in this publication — should help data users and policy makers to better interpret the unadjusted GPG.

Keywords: gender statistics, gender pay gap, earnings

Authors: Denis Leythienne, Piotr Ronkowski (Eurostat, Unit F-3: Labour market statistics and lifelong learning)

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1 Introduction

1.1 Policy background

The principle of 'equal pay for male and female workers for equal work or work of equal value' has been enshrined in the European Treaties since 1957. It is currently laid down in Article 157 of the Treaty on the Functioning of the European Union (EU). An important impetus for implementing the equal pay principle was Directive 2006/54/EC of the European Parliament and of the Council of 5 July 2006 on the implementation of the principle of equal opportunities and equal treatment of men and women in matters of employment and occupation (recast)([1]). This legal framework makes reducing the gender pay gap (GPG) one of the key priorities of EU gender policy.

The European Commission has undertaken a number of initiatives on the gender pay gap. In particular, it confirmed 'reducing the gender pay, earnings and pension gaps and thus fighting poverty among women' as one of the key areas in its document *Strategic engagement for gender equality 2016-2019*.

That document calls for a substantial reduction in gender segregation in economic sectors and occupations. It also calls for an increase in women's overall paid working hours, awareness-raising, and effective implementation of equal pay legislation. In addition, it calls for policies and measures for those facing particular barriers to entry to the labour market, such as migrant women and single parents. The document also argues that the causes and consequences of the gender pension gap need to be addressed, as it is an obstacle to the economic independence of women in old age, when they face a higher risk of poverty than men.

The right of women and men to equal pay for work of equal value was also reiterated in the *European Pillar of Social Rights* that was presented by the European Commission and proclaimed by the EU leaders at the Social Summit in Gothenburg in November 2017. The unadjusted GPG indicator has taken on more importance by its inclusion in the social scoreboard of the *European Pillar of Social Rights*.

To achieve these objectives, the European Commission carries out a number of actions. One of them is the European Equal Pay Day, which takes place every year in November. This day raises awareness about the remaining (unadjusted) gap between the average earnings of men and women. The European Commission also uses the European Semester as an instrument to coordinate the efforts of EU Member States in addressing the root causes of the gender pay and pension gaps.

The unadjusted gender pay gap (unadjusted GPG) is widely used in this policy context as the key indicator to monitor and evaluate progress in reducing the gender pay gap.

([1]) OJ L 204, of 26 July 2006, p. 23.

1.2 The unadjusted gender pay gap

The unadjusted GPG indicator is published annually by Eurostat in cooperation with the national statistical institutes of the EU Member States and EFTA (European Free Trade Association) countries. It is based on the methodology of the Structure of Earnings Survey (SES), which is released every four years. The unadjusted GPG is calculated on the basis of the SES conducted in 2002, 2006, 2010 and 2014, and on the basis of other national sources for the years between the SES years. The scope and coverage of the unadjusted GPG are as follows: (i) economic activity sections B to S without O([2]), defined by NACE Rev. 2 (Statistical classification of economic activities in the European Community)([3]) (ii) only enterprises with 10 employees or more, (iii) no restrictions for age and hours worked, and (iv) both full-time and part-time employees are included. The definition of the unadjusted GPG, expressed as a percentage, is as follows:

$$\frac{\text{Mean (gross) hourly earnings of men} - \text{Mean (gross) hourly earnings of women}}{\text{Mean (gross) hourly earnings of men}([4])}$$

As an unadjusted indicator, the GPG gives an overall picture of the differences between men and women in pay. It measures a concept that is broader than the concept of 'equal pay for equal work or work of equal value'. A part of the difference in earnings of men and women can be explained by differences in the average characteristics of male and female employees (Eurofound 2010). The differences in the average characteristics can result from many factors, including the concentration of one sex in certain economic activities or the concentration of one sex in certain occupations. The first phenomenon is called 'sectoral gender segregation' and the second one is called 'occupational gender segregation'.

Sectoral gender segregation may explain part of the difference in earnings of men and women, when one sex tends to be concentrated in low-paying economic sectors and the other sex tends to be concentrated in high-paying sectors. For example, women can tend to work in lower-paying sectors whereas men can tend to work in higher-paying sectors.

Similarly, occupational gender segregation may explain the difference in earnings of men and women, when one sex tends to be concentrated in low-paying occupations and the other sex tends to be concentrated in high-paying occupations. Occupational gender segregation may also be partially caused by men being more often promoted to supervisory and management positions than women due to discrimination. The term 'glass ceiling' is used as a metaphor to describe an invisible barrier that keeps women from rising beyond a certain level in an enterprise's hierarchy.

The unadjusted GPG is therefore a rather complex indicator. Its measurement covers both possible discrimination between men and women through 'unequal pay for equal work' and the differences in the average characteristics of male and female employees.

1.3 Towards a decomposition methodology

To separate out the different factors at work in the gender pay gap, Eurostat developed a methodology to 'decompose' the unadjusted GPG. The methodology and results were discussed with the Working Group on Labour Market Statistics in October 2017 and the European Directors of

([2]) The unadjusted GPG covers all economic activities except agriculture, forestry and fishing (section A), public administration, defence and compulsory social security (section O), and activities of households as employers, undifferentiated goods- and services-producing activities of households for own use (section T).

([3]) OJ L 393, 30.12.2006, p. 1–39.

([4]) The term 'mean hourly earnings' instead of 'mean gross hourly earnings' will be used further in the document.

Social Statistics([5]) in March 2018. In these meetings, there was a broad consensus on the overall methodology proposed by Eurostat, based on the Oaxaca decomposition, although some Member States said they used different variants of the same method at national level (see Appendix 2). However, as some important variables such as the total working experience([6]) were not collected in the source (SES) used in the decomposition, it was decided to publish the results as a 'statistical working paper' rather than as European official statistics.

In the following parts of the publication, readers will find information on Eurostat's data source, the methodology and statistical software used to decompose the unadjusted GPG, and the results of this decomposition.

([5]) The Working Group on Labour Market Statistics includes delegates from national statistical institutes in EU Member States and EFTA countries. The European Directors of Social Statistics includes directors for social statistics in the national statistical institutes in EU Member States and EFTA countries.

([6]) Total working experience is the total number of years the employee has been working as a professional in all enterprises right from the first job till the current one. In SES only information on job experience in the current enterprise is collected.

2 Data source and methodology

2.1 Data source

To decompose the unadjusted GPG, Eurostat has used microdata from the Structure of Earnings Survey (SES). The microdata cover two broad areas: the earnings of individual employees and the observed characteristics of individual employees. These observed characteristics include: (i) the personal characteristics of individual employees such as age, education and job experience, (ii) the types of job done by individual employees, and (iii) the types of companies or enterprises that individual employees work for.

The scope of the microdata in the decomposition analysis is the same as the scope and coverage of the unadjusted GPG calculated for:

- economic activity sections B to S excluding O according to NACE Rev. 2 (Statistical classification of economic activities in the European Community)([7]);

- enterprises with 10 employees or more;

- employees with no restrictions for age and hours worked and including full- and part-timers.

The 2014 SES microdata are used in the decomposition of the unadjusted GPG presented in this publication.

2.2 Methodology

Eurostat applies the Oaxaca (1973) decomposition, also called the Blinder-Oaxaca decomposition, to decompose the unadjusted GPG. This method is carried out in two stages: a regression analysis and a decomposition analysis of the structure of earnings. In the first stage, a regression analysis is conducted to estimate the earnings equations separately for men (M) and women (W) as detailed in the following equations:

$$\ln y_i^M = \beta_0^M + \sum_{k=1}^{K} x_{ki}^M \beta_k^M + u_i^M$$

$$\ln y_i^W = \beta_0^W + \sum_{k=1}^{K} x_{ki}^W \beta_k^W + u_i^W$$

([7]) See footnotes 2 and 3.

where:

- $\ln y_i$ represents the natural log of hourly earnings for observation i;

- x_{ki}, from k=1 to k=K, are explanatory variables covering the observed personal, job and enterprise characteristics that may impact on the log hourly earnings of individual i;

- β_0 is a constant and β_k, from k=1 to k=K, are the parameters for the corresponding variables covering the observed characteristics;

- u_i is a disturbance term for observation *I*, independent from each other and normally distributed.

The regression analysis includes the SES variables as explanatory variables covering the observed personal, job and enterprise characteristics (see Table 1). More information on the SES variables can be found in the SES implementing arrangements (Eurostat 2014).

Table 1: Observed characteristics from the SES used in the regression analysis

Observed characteristics	Values	Codes of the corresponding SES variables
Personal and job characteristics		
Age	Years / years squared	Variable 2.2
Education	Level of education according to the ISCED classification* in the four groups: Group 1 (ISCED 0+1+2), Group 2 (ISCED 3+4), Group 3 (ISCED 5+6), Group 4 (ISCED 7+8)	Variable 2.5
Occupation	Occupation according to the ISCO-08* classification at 2-digit level	Variable 2.3
Job experience in the current enterprise	Years / years squared	Variable 2.6
Employment contract	Indefinite duration, temporary duration or apprentice	Variable 2.8
Working time	Full time or part time	Variable 2.7
Enterprise characteristics		
Principal economic activity	Economic activity according to the NACE Rev. 2 classification* at section level	Variable 1.3
Enterprise size	Enterprise with 10-49 employees, 50-249 employees, 250-499 employees, 500-999 employees or 1 000+ employees	Variable 1.2
Enterprise control	Public or private	Variable 1.4

NACE Rev. 2: Statistical classification of economic activities in the European Community; ISCED: International Standard Classification of Education; ISCO-08: International Standard Classification of Occupations

The regression equations are a result of adjusting and expanding the standard Mincer (1974) earnings equation, which relates, in a linear way, the log hourly earnings to years of education and a quadratic function of job experience (tenure). In Eurostat's model, the regression equations relate the log hourly earnings to age and age squared, education, occupation, job experience (in the current enterprise) and job experience squared, employment contract, working time, principal economic activity, enterprise size and enterprise control. The explanatory variables covering education, occupation, employment contract, working time, principal economic activity, enterprise size and enterprise control are categorical.

After fitting separate regression models for men and women, a decomposition analysis of the difference between the means of log hourly earnings of men and women is carried out:

$$\Delta = \overline{\ln y}^M - \overline{\ln y}^W$$

The Oaxaca decomposition uses the following regression property for the means of log hourly earnings of men and women:

$$\overline{\ln y}^M = \hat{\beta}_0^M + \sum_{k=1}^{K} \bar{x}_k^M \, \hat{\beta}_k^M$$

$$\overline{\ln y}^W = \hat{\beta}_0^W + \sum_{k=1}^{K} \bar{x}_k^W \, \hat{\beta}_k^W$$

These equations provide insights into the male and female earnings structures by showing the relationship between the mean of log hourly earnings and the observed average characteristics for men and women ($\bar{x}_k^M$ and $\bar{x}_k^F$, respectively). In this relationship, the estimated constant $\hat{\beta}_0^M$ and coefficients $\hat{\beta}_k^M$ measure the financial returns to the characteristics of male employees, whereas the estimated constant $\hat{\beta}_0^K$ and coefficients $\hat{\beta}_k^K$ measure the financial returns to the characteristics of female employees.

Within the decomposition approach, it must be decided which earnings structure constitutes the non-discriminatory benchmark against which to decompose the difference Δ between the means of log hourly earnings of men and women (Bazen 2011). It is assumed, in accordance with the definition of the unadjusted GPG, that the male earnings structure constitutes this benchmark([8]). The estimated constant and coefficients in the men's equation are treated as the non-discriminatory benchmarks for the financial returns to characteristics of employees. Because of this, a 'counterfactual' equation is constructed where the constant and coefficients in the women's equation are replaced by those of the men's equation:

$$\overline{\ln y}^{W*} = \hat{\beta}_0^M + \sum_{k=1}^{K} \bar{x}_k^W \, \hat{\beta}_k^M$$

This equation can be interpreted as what the average female worker would have earned if she had been paid on the same basis as an equivalent male worker. The difference between the means of log hourly earnings of men and women can then be decomposed as follows:

$$\Delta = E + U$$

$$\text{where } E = \overline{\ln y}^M - \overline{\ln y}^{W*} \text{ and } U = \overline{\ln y}^{W*} - \overline{\ln y}^W$$

The first part of the equation, which is marked as *E*, is the difference between the actual mean of the log hourly earnings of men and the 'counterfactual' mean of the log hourly earnings of women. This comparison, $\overline{\ln y}^M - \overline{\ln y}^{W*}$, can be expressed as:

$$E = \sum_{k=1}^{K} \hat{\beta}_k^M \, (\bar{x}_k^M - \bar{x}_k^W)$$

([8]) The following other options are possible:

- the female earnings structure constituting a non-discriminatory benchmark (Oaxaca 1973);

- both the female and male earnings structures constituting non-discriminatory benchmarks with some weighted average applied (Cotton 1988 and Reimers 1983);

- the whole population earnings structure constituting a non-discriminatory benchmark (Neumark 1988).

It measures the part of Δ that is due to differences in the average characteristics of men and women weighted by the male coefficients. This represents the 'explained' part (*E*) of the difference in earnings between men and women (Δ).

The second part of the equation, which is marked as *U*, is the difference between the 'counterfactual' and actual means of log hourly earnings of women. This comparison, $\overline{\ln y}^{W*} - \overline{\ln y}^W$, can be expressed as:

$$U = \left(\hat{\beta}_0^M - \hat{\beta}_0^W\right) + \sum_{k=1}^{K} \bar{x}_k^W \left(\hat{\beta}_k^M - \hat{\beta}_k^W\right)$$

It measures the part of Δ that is due to the difference in the estimated constants for men and women, plus the difference in the estimated coefficients for men and women weighted by the average characteristics of women. This second component corresponds to the different financial returns paid to men versus women for each SES variable. The part *U* shows what a female worker with average characteristics would have earned if she had been treated in the same way as a typical male worker, and compares that with what she actually earns (Bazen 2011).

In the decomposition, the part *U* is interpreted as the 'unexplained' part of the difference in earnings between men and women (Δ). An interpretation of the part *U* as discrimination is not recommended as some other explanatory factors that are not observed in the Structure of Earnings Survey (e.g. the number of children and the age of children in a family, personal abilities or negotiating skills) would most likely change the unexplained part. This limitation should be borne in mind when interpreting the unexplained part, in particular, for those countries with a low coefficient of determination[9] (see Appendix 1).

Furthermore, it is rather imperfect to use age and job experience (tenure) in the current enterprise as an approximation of an employee's potential experience, because it does not account for gender differences in career breaks, especially those related to birth and child care. The Structure of Earnings Survey does not collect information on the whole professional experience of employees. This is why it seems to be more appropriate to view the part *U* as a 'residual' in that it is the part of the difference in earnings between men and women (Δ) that is not explained by the difference in average characteristics of male and female employees observed in the labour market.

The final decomposition equation for the difference between the means of log hourly earnings of men and women is as follows:

$$\overline{\ln y}^M - \overline{\ln y}^W = \underbrace{\left(\hat{\beta}_0^M - \hat{\beta}_0^W\right) + \sum_{k=1}^{K} \bar{x}_k^W \left(\hat{\beta}_k^M - \hat{\beta}_k^W\right)}_{\textbf{U}\text{nexplained}} + \underbrace{\sum_{k=1}^{K} \hat{\beta}_k^M \left(\bar{x}_k^M - \bar{x}_k^W\right)}_{\textbf{E}\text{xplained}}$$

Each of the components, *E* and *U*, can be expressed as a proportion of the overall difference *Δ*. Furthermore, each subcomponent of the explained part *E*, i.e. $E_k = \hat{\beta}_k^M (\bar{x}_k^M - \bar{x}_k^W)$, can be presented as a proportion of the overall difference Δ in order to estimate the magnitude of the effects of the specific personal, job and enterprise characteristics in explaining the difference Δ. These effects will be called 'explanatory factors'[10].

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[9] The coefficient of determination (R-squared) refers to the proportion of variance in log hourly earnings that is accounted for by variability in the explanatory variables.

[10] In the case of the categorical variables (e.g. economic activity), only the overall effect of the categorical variable will be interpreted and not the effect of each category. The coefficient estimates for the categories of a categorical variable are sensitive to the choice of the reference category. In the explained part E, nevertheless, the overall effect of the categorical variable (e.g. the overall effect of economic activity) in the decomposition does not depend on the omitted category.

Finally, the explained and unexplained GPGs can be calculated by applying the decomposition results to the unadjusted GPG as follows:

$$GPG_{expl} = GPG_{unadj} * \frac{E}{\Delta} \text{ and } GPG_{unexpl} = GPG_{unadj} * \frac{U}{\Delta}$$

We can also calculate the subcomponents of the explained GPG by applying the decomposition results ($\frac{E_k}{\Delta}$) to the unadjusted GPG.

2.3 Statistical software

The software programme SAS was used to carry out the regression analysis and decomposition. Because the Structure of Earnings Survey is a two-stage survey, Eurostat applied the SAS procedures that have been created for complex surveys (Lewis 2017), namely 'proc surveyreg' and 'proc surveymean'. The procedure 'proc surveyreg' was used to fit the linear regression models and the procedure 'proc surveymean' was used to calculate the means of the variables.

When applying these SAS procedures, the sampling design of the Structure of Earnings Survey was taken into account. The sampling procedure used for the Structure of Earnings Survey usually contains two stages. In the first stage, a stratified random sample of enterprises (or local units) is drawn. For the second stage, a simple random sample of employees is usually taken within each of the selected enterprises. This sample design implies that enterprises can be treated as clusters of employees. These clusters can be identified using one of the SES keys, namely 'KEY_L'. The sample weights for employees are provided in the SES variable 5.2 'Grossing up factor for the employees'. The sample weights and clusters were specified in the SAS procedures 'proc surveyreg' and 'proc surveymean'. More information on the SES keys and weights can be found in the SES implementing arrangements (Eurostat 2014).

3 Results and analysis

3.1 Decomposition of the difference between log hourly earnings of men and women

This section presents the results of the decomposition analysis based on the 2014 microdata of the Structure of Earnings Survey. Table 2 shows the results of the decomposition of the difference between log hourly earnings of men and women. The overall explained part (E) and its subcomponents (E_k - explanatory factors) as well as the unexplained part (U) are expressed as a percentage of the difference between log hourly earnings of men and women. The positive explained part means that the differences in average characteristics between male and female workers are in favour of men, whereas the negative explained part means that the differences in average characteristics between male and female workers are in favour of women. The differences concern only those characteristics that are measured in the Structure of Earnings Survey. The proportions of the overall explained part (positive or negative) and the unexplained part sum up to 100 %.

The differences in average characteristics for categorical variables covering job and enterprise characteristics (namely: occupation, employment contract, working time, principal economic activity, enterprise size and enterprise control) can be interpreted as gender segregation. For example, a positive value for economic activity means that men worked, on average, in better paid economic sectors than women, while a negative value means that women worked, on average, in better paid economic sectors than men.

At the EU level, the overall explained part − calculated as the weighted average of the overall explained parts in EU Member States − is 31 %. This means that 31 % of the difference between log hourly earnings of men and women can be attributed to the difference in average characteristics between male and female workers that is in favour of men at the EU level. The EU explained part is mostly driven by two explanatory factors, namely, economic activity and working time, which attribute 32 % and 13 % respectively to the difference between log hourly earnings of men and women. Job experience (tenure) explains only 1 % of the difference, whereas age and enterprise control have no explanatory effect. The positive explanatory factors are partially cancelled out by the negative explanatory factors for education (-7 %), enterprise size (-5 %), occupation (-3 %) and employment contract (-1 %). At the EU level, the effect of occupation is rather smaller than expected due to its uneven effect across EU Member States, as can be seen in Table 2.

Across EU Member States, the overall explained part varies from -283 % in Romania to 65 % in Germany. The explained part is mostly driven by three explanatory factors: economic activity, occupation and education. Economic activity accounts for more than 10 %, irrespective of the sign, of the difference between log hourly earnings of men and women (as highlighted in Table 2) in 25 Member States, occupation in 20 and education in 14.

Table 2: Decomposition of the difference between log hourly earnings of men and women, 2014
(% of the difference between log hourly earnings of men and women)*

	Explained part										Unexplained part
	Overall explained part	Personal and job characteristics						Enterprise characteristics			
		Age	Education	Occupation	Job experience	Employment contract	Working time	Economic activity	Enterprise size	Enterprise control	
EU28	31	0	-7	-3	1	-1	13	32	-5	0	69
Belgium	63	1	20	-7	2	0	20	30	-6	2	37
Bulgaria	-30	-3	-32	-15	-17	1	1	15	12	10	130
Czech Republic	17	-3	0	-2	0	1	1	21	0	-1	83
Denmark	42	0	-3	6	-1	-3	-1	30	-5	20	58
Germany	65	-1	4	6	2	0	30	26	-3	0	35
Estonia	29	3	-6	10	-2	0	3	24	-2	-1	71
Ireland	-14	2	-4	8	5	0	1	-7	-14	-5	114
Greece	32	10	-14	-11	-1	0	12	36	-2	1	68
Spain	27	2	-8	3	7	1	4	27	-9	-1	73
France	31	1	-6	-10	1	0	-2	51	-3	-1	69
Croatia	-94	-11	-92	-14	-9	-1	-4	56	-1	-17	194
Italy	-99	-16	-51	-153	5	-2	58	106	-15	-31	199
Cyprus	14	-5	-5	29	-7	0	2	11	-11	0	86
Latvia	6	5	-31	5	-16	1	0	69	-25	-3	94
Lithuania	-82	-1	-29	-71	-31	0	6	69	-25	0	182
Luxembourg	-55	32	-15	-20	8	-3	13	0	-30	-41	155
Hungary	-4	-5	-27	-26	-8	1	-21	82	-21	22	104
Malta	-3	14	-18	11	9	0	3	-3	-17	-1	103
Netherlands	47	11	-2	14	3	0	19	-29	-6	37	53
Austria	58	0	1	15	8	-5	17	22	-1	0	42
Poland	-118	-15	-87	-105	-12	-3	3	95	21	-16	218
Portugal	11	1	-32	14	1	-1	-1	40	-10	-2	89
Romania	-283	-1	-149	-182	-43	0	10	217	-118	-17	383
Slovenia	-121	-10	-87	-102	-25	-9	2	137	-6	-23	221
Slovakia	9	-3	-5	-11	-3	0	4	22	1	4	91
Finland	43	-2	-3	14	1	1	-1	32	-5	7	57
Sweden	49	-2	-9	-6	-1	:	2	58	-9	15	51
United Kingdom	37	0	0	21	1	-1	4	21	-4	-5	63
Iceland	35	-7	-14	-34	-4	-1	10	40	5	39	65
Norway	43	0	-8	-15	1	0	9	58	-5	3	57
Switzerland	34	4	11	5	4	0	-5	17	-1	1	66

Note: The figures for the explanatory factor 'age' are the sums of the results for the variables 'age' and 'age squared'; the figures of the explanatory factor 'job experience' are the sums of the results for the variables 'job experience' and 'job experience squared'; for Romania, employees whose weights belong to the fifth highest percentile are excluded.

3.2 Decomposition of the unadjusted gender pay gap

Figure 1 presents the results of a decomposition of the unadjusted GPG for 2014 into the explained GPG and the unexplained GPG. At the EU level, the overall explained GPG is 5.1 % against 16.6 % for the unadjusted GPG. This means that women are expected to earn 5.1 % less than men according to their average characteristics on the labour market, which are less remunerative than those of males.

Across EU Member States, the overall explained GPG varies from -12.7 % in Romania to 14.5 % in Germany. A negative gap of 12.7 % in Romania means that women are expected to earn 12.7 % more than men according to their average characteristics on the labour market, which are more favourable than for men.

The overall explained gap is negative in 11 Member States: Bulgaria, Ireland, Croatia, Italy, Lithuania, Luxembourg, Hungary, Malta, Poland, Romania and Slovenia, and positive in 17 Member States. For the countries with the negative explained gap, the unexplained GPG is higher than the unadjusted figure.

For the EU as a whole, the estimated unexplained GPG is 11.5 % against 16.6 % for the unadjusted GPG. This means that women still earn 11.5 % less than men after correcting for the different average characteristics of men and women.

However, this does not mean that the unexplained GPG measures discrimination through 'unequal pay for equal work'. Indeed, SES data miss some important variables such as the total working experience, which, if taken into account, might change the unexplained gap. The unexplained GPG should rather be viewed as a 'residual gap' i.e. the part of the unadjusted GPG that remains after correcting for different characteristics of men and women in the labour market as observed in SES data.

The unadjusted GPG varies from 4.5 % in Romania to 28.1 % in Estonia, whereas the unexplained GPG varies from 2.5 % in Belgium to 24.2 % in Lithuania.

Figure 1: Decomposition of the unadjusted GPG, 2014
(difference between male and female hourly earnings as % of male hourly earnings)
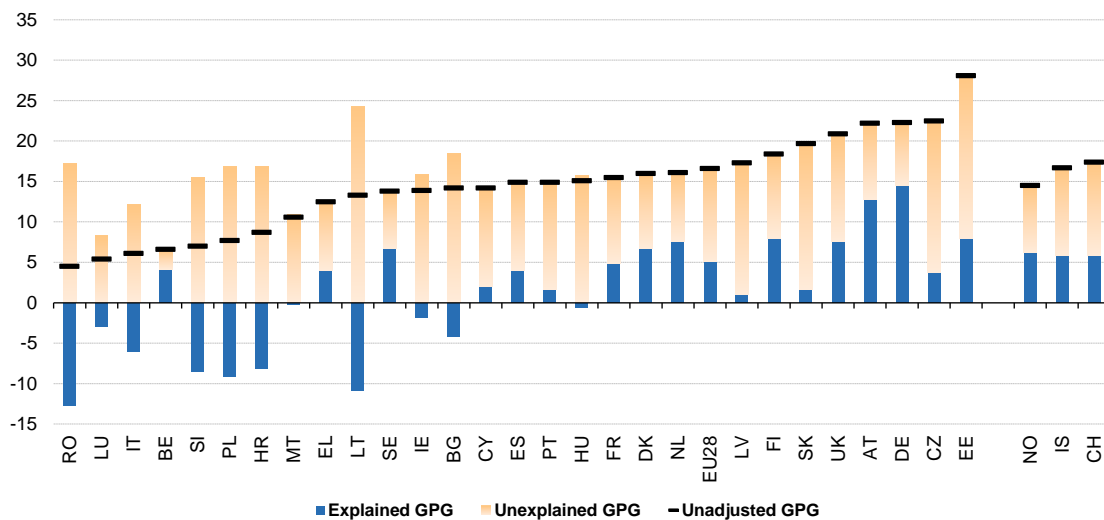
Having presented the overall explained and unexplained GPGs, it is interesting to look closer at the explanatory factors. As shown in Table 3 and Figure 2, the EU explained GPG is strongly driven by economic activity (5.4 % gap) and working time (2.1 % gap), whereas a small positive value (0.1 %) is recorded for job experience (tenure). The positive explained gaps for those characteristics are partially offset by the negative gaps recorded for education (-1.2 %), enterprise size (-0.8 %) occupation (-0.4 %), age and employment contract (both -0.1 %). For example, the negative gap of 1.2 % for education means that women are expected to earn 1.2 % more than men due to their average education level being higher than for men. Finally, there is no explained gap for enterprise control at the EU level.

Across EU Member States, the overall explained GPG is mostly driven by the following three explanatory factors: economic activity, occupation and education. The explained gap of at least 1 % (irrespective of the sign) as highlighted in Table 3 is recorded for economic activity in 25 Member States, for occupation in 22, and for education in 18. Among those three characteristics, economic activity and education have the most uniform effect across EU Member States.

The explained gender pay gap is positive for economic activity in all EU Member States, except, Ireland, Luxembourg, Malta and the Netherlands, which is the only country with the explained gap below -1 % for that characteristic. On the other hand, in the Netherlands, the highest explained gap of 5.9 % is recorded for enterprise control due to a higher proportion of men working in the private sector where earnings are higher on average than in the public sector.

For education, the explained gender pay gap is negative in all EU Member States, except Belgium, Germany and Austria, of which Belgium and Germany recorded an explained gap of 1 % or more for that characteristic. This means that women have, on average, a higher level of education than men in most European labour markets, which should translate into their higher earnings, thus making a negative contribution to the unadjusted GPG.

Table 3: Decomposition of the unadjusted GPG, 2014
(difference between male and female hourly earnings as % of male hourly earnings)

	Unadjusted GPG	Explained GPG										Unexplained/ adjusted GPG
		Overall explained gap	Personal and job characteristics						Enterprise characteristics			
			Age	Education	Occupation	Job experience	Employment contract	Working time	Economic activity	Enterprise size	Enterprise control	
EU28	**16.6**	**5.1**	**-0.1**	**-1.2**	**-0.4**	**0.1**	**-0.1**	**2.1**	**5.4**	**-0.8**	**0.0**	**11.5**
Belgium	6.6	4.1	0.1	1.3	-0.5	0.1	0.0	1.4	2.0	-0.4	0.1	2.5
Bulgaria	14.2	-4.2	-0.5	-4.6	-2.2	-2.4	0.1	0.1	2.2	1.7	1.4	18.4
Czech Republic	22.5	3.8	-0.6	-0.1	-0.4	0.0	0.3	0.2	4.8	0.0	-0.3	18.7
Denmark	16	6.7	0.0	-0.5	0.9	-0.2	-0.4	-0.2	4.8	-0.9	3.2	9.3
Germany	22.3	14.5	-0.2	1.0	1.3	0.5	-0.1	6.8	5.7	-0.6	0.1	7.8
Estonia	28.1	8.0	0.7	-1.5	2.9	-0.6	0.0	0.8	6.6	-0.6	-0.2	20.1
Ireland	13.9	-1.9	0.3	-0.6	1.2	0.7	0.0	0.2	-0.9	-2.0	-0.7	15.8
Greece	12.5	4.0	1.3	-1.7	-1.3	-0.2	0.0	1.5	4.6	-0.2	0.1	8.5
Spain	14.9	4.0	0.3	-1.2	0.5	1.1	0.1	0.6	4.1	-1.3	-0.2	10.9
France	15.5	4.8	0.2	-0.9	-1.6	0.2	0.0	-0.3	7.9	-0.4	-0.2	10.7
Croatia	8.7	-8.2	-1.0	-8.0	-1.2	-0.8	-0.1	-0.4	4.9	0.0	-1.5	16.9
Italy	6.1	-6.0	-0.9	-3.1	-9.3	0.3	-0.1	3.6	6.5	-0.9	-1.9	12.1
Cyprus	14.2	2.0	-0.7	-0.7	4.1	-0.9	0.0	0.2	1.5	-1.5	0.0	12.2
Latvia	17.3	1.0	0.9	-5.3	0.9	-2.7	0.2	0.0	11.9	-4.3	-0.6	16.3
Lithuania	13.3	-10.9	-0.1	-3.8	-9.5	-4.1	-0.1	0.8	9.2	-3.4	0.0	24.2
Luxembourg	5.4	-2.9	1.8	-0.8	-1.1	0.4	-0.2	0.7	0.0	-1.6	-2.2	8.3
Hungary	15.1	-0.6	-0.8	-4.0	-3.9	-1.2	0.1	-3.2	12.4	-3.2	3.3	15.7
Malta	10.6	-0.3	1.5	-1.9	1.1	0.9	0.0	0.3	-0.4	-1.8	-0.1	10.9
Netherlands	16.1	7.6	1.8	-0.4	2.2	0.5	0.1	3.1	-4.6	-0.9	5.9	8.5
Austria	22.2	12.8	0.0	0.3	3.4	1.8	-1.2	3.8	5.0	-0.2	0.0	9.4
Poland	7.7	-9.1	-1.2	-6.7	-8.1	-0.9	-0.2	0.3	7.3	1.6	-1.2	16.8
Portugal	14.9	1.6	0.1	-4.8	2.1	0.2	-0.2	-0.1	6.0	-1.5	-0.3	13.3
Romania	4.5	-12.7	0.0	-6.7	-8.2	-1.9	0.0	0.4	9.7	-5.3	-0.8	17.2
Slovenia	7	-8.5	-0.7	-6.1	-7.2	-1.7	-0.6	-0.4	9.6	-0.4	-1.6	15.5
Slovakia	19.7	1.7	-0.6	-1.0	-2.2	-0.5	0.0	0.8	4.3	0.2	0.8	18.0
Finland	18.4	8.0	-0.4	-0.6	2.5	0.1	0.3	-0.2	5.9	-0.9	1.4	10.4
Sweden	13.8	6.7	-0.2	-1.3	-0.8	-0.2	:	0.3	8.0	-1.2	2.1	7.1
United Kingdom	20.9	7.6	0.0	-0.1	4.4	0.3	-0.2	0.8	4.4	-0.8	-1.1	13.3
Iceland	16.7	5.9	-1.1	-2.3	-5.7	-0.6	-0.2	1.7	6.7	0.8	6.5	10.8
Norway	14.5	6.2	0.0	-1.2	-2.2	0.2	0.0	1.3	8.4	-0.8	0.4	8.3
Switzerland	17.4	5.9	0.7	1.9	0.8	0.6	-0.1	-0.9	3.0	-0.2	0.1	11.5

Note: The figures for the explanatory factor 'age' are the sums of the results for the variables 'age' and 'age squared'; the figures of the explanatory factor 'job experience' are the sums of the results for the variables 'job experience' and 'job experience squared'; for Romania, employees whose weights belong to the fifth highest percentile are excluded.

A more mixed picture can be observed for occupations, as the countries are split almost equally between those recording positive or negative gaps. The explained gap for occupation varies from -9.5 % in Lithuania to 4.4 % in the United Kingdom. Nevertheless, quite a clear pattern can be observed for countries such as Italy, Lithuania, Poland, Romania and Slovenia showing an overall explained gap below -5 %. Those countries recorded negative explained gaps for both occupation and education. This illustrates the impact of 'self-selection' in the labour market: female employees tend to have a higher education level and to take better paid occupations than men.

Note that working time (full/part time) plays a significant role in explaining the unadjusted gender pay gap in Germany. It is the only country with an explained gap above 5 % for working time due to women working more frequently on a part-time basis than men. This is also the case, albeit to a lesser extent, for Belgium, Greece, Italy, the Netherlands and Austria. At the other extreme, Hungary recorded a negative explained gap of -3.2 % for this variable.

Figure 2: Decomposition of the explained GPG, 2014
(difference between male and female hourly earnings as % of male hourly earnings)

Legend: Age, Education, Occupation, Job experience, Employment contract, Working time, Economic activity, Enterprise size, Enterprise control, Overall explained gap
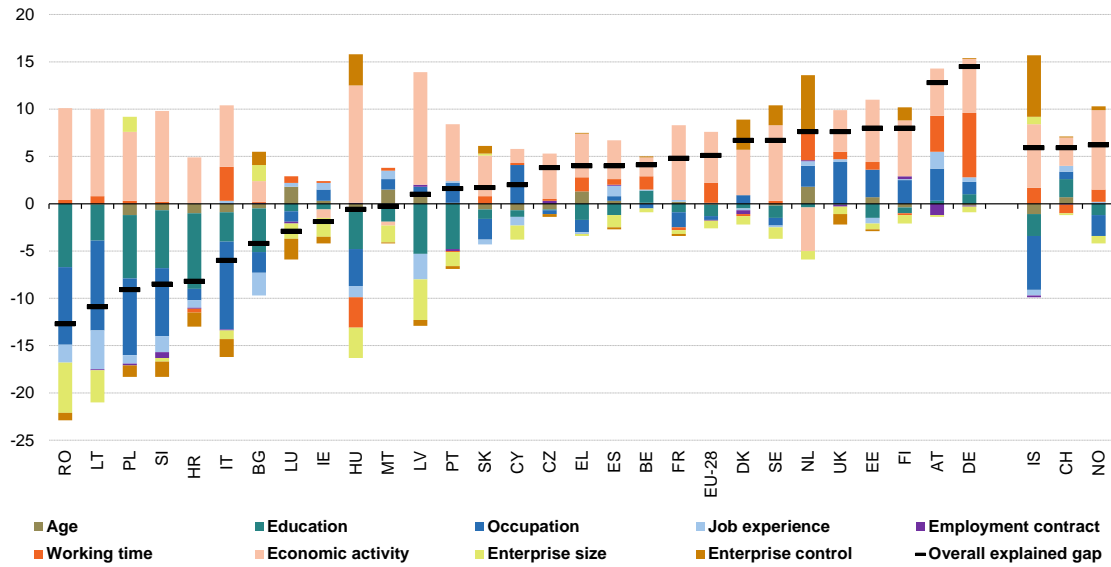
Figure 3 compares the unexplained and unadjusted GPGs. When comparing the ranking of EU countries (arranged from the smallest to largest gaps) we observe the most significant impact for Romania, Lithuania, Croatia, Poland, Slovenia, Bulgaria and Italy. All these countries moved by at least 10 positions downwards in the ranking when moving from the unadjusted GPG to the unexplained GPG, whereas Germany, Austria, the Netherlands, Finland and Denmark all moved by at least 10 positions upwards.

Figure 3: Unexplained and unadjusted GPGs, 2014
(difference between male and female hourly earnings as % of male hourly earnings)

■ Unexplained GPG ■ Unadjusted GPG
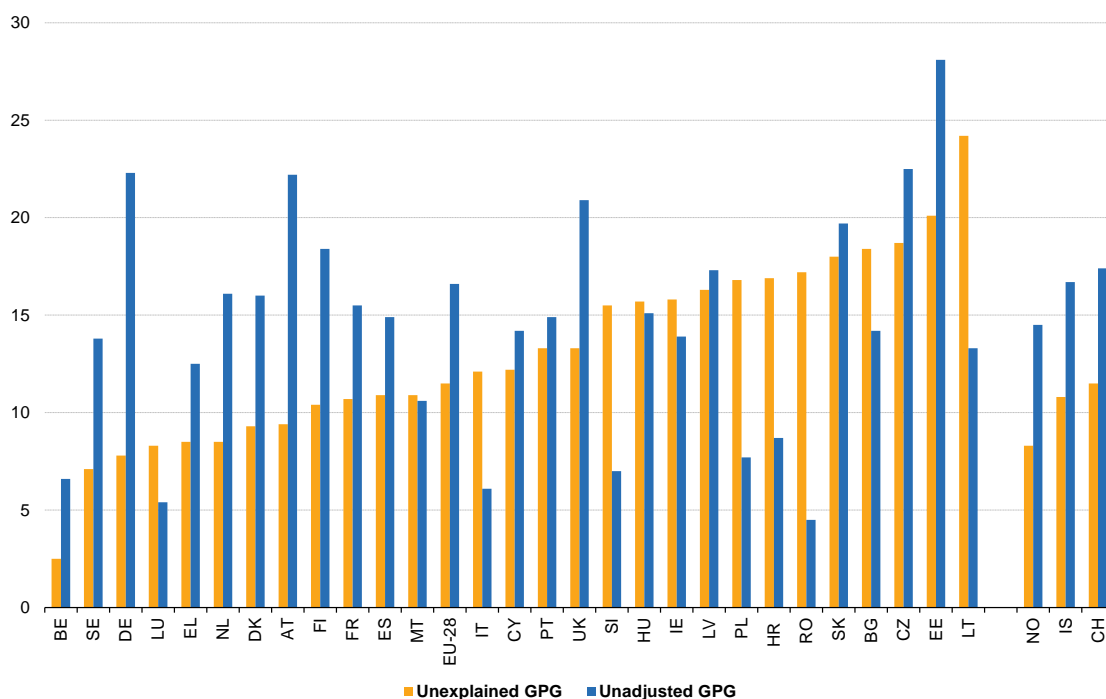
3.3 Other gender segregation effects and 'self-selection'

Note that the decomposition of the unadjusted GPG does not capture all segregation effects between men and women in the labour market (see Figure 4). In particular, women work, on average, fewer hours per month than men in the labour market. This is not captured by the unadjusted GPG, which is calculated on an hourly basis. Moreover, a lower proportion of women than men participate in the labour market. This is shown by the lower employment rates for women than men across EU Member States.

Figure 4: Gender segregation effects

Lower employment rate of women

Lower number of hours worked

Gender segregation effects

Sectoral and occupational segregation

Unadjusted gender pay gap

Unequal pay for equal work

Table 4 presents Eurostat's data on the average number of hours paid per month and the employment rate. In 2014, women were paid on average 14 % fewer hours per month than men at

the EU level. The gap between the number of hours paid to men versus women varies substantially across EU countries. At one end of the scale, women were paid on average 28 % fewer hours than men per month in the Netherlands. At the other end of the scale, this difference was about only 1 % in Bulgaria, Latvia and Romania.

In 2014, the employment rate of men was 10.5 percentage points higher than that of women at the EU level. Across EU Member States, the difference between the employment rate of men and women varied from 1.5 percentage points in Finland to 25.4 percentage points in Malta.

To give a complete picture of the gender earnings gap, Eurostat developed a new synthetic indicator, the 'gender overall earnings gap', which measures the impact of the three combined factors, namely: the difference in the average hourly earnings, the monthly average of the number of hours paid and the employment rate for men and women. The results are published in a *Statistics Explained* article on gender statistics (Eurostat 2013).
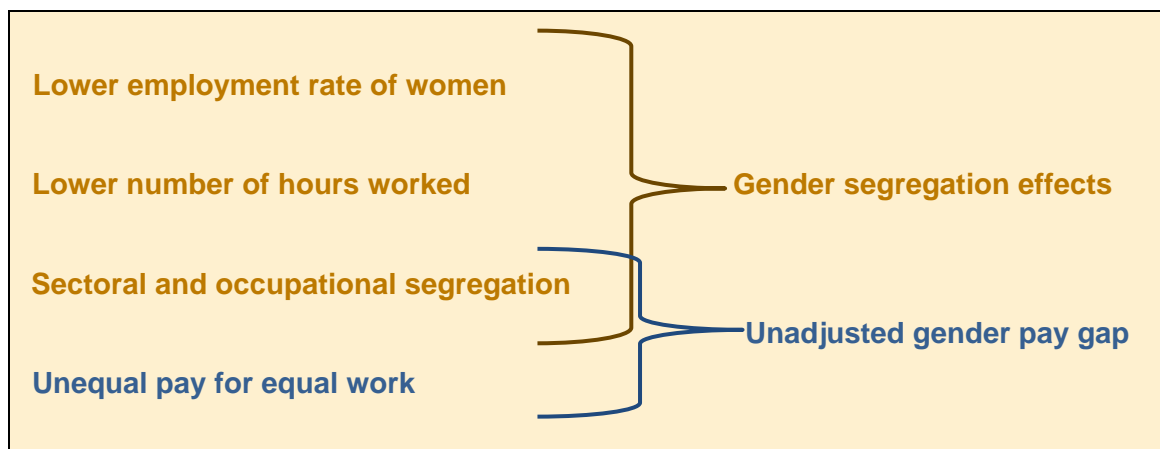
Table 4: Average number of hours paid per month and employment rate, 2014

	Average number of hours paid per month		Employment rate for age group 15-64 (%)	
	Men	**Women**	**Men**	**Women**
EU-28	162	139	70.1	59.6
Belgium	160	134	65.8	57.9
Bulgaria	179	177	63.9	58.2
Czech Republic	171	167	77.0	60.7
Denmark	131	125	75.8	69.8
Germany	154	122	78.1	69.5
Estonia	177	167	73.0	66.3
Ireland	149	129	68.3	58.0
Greece	164	155	58.0	41.1
Spain	162	145	60.7	51.2
France	154	140	67.3	60.4
Croatia	183	179	59.1	50.0
Italy	175	145	64.7	46.8
Cyprus	169	162	66.0	58.6
Latvia	159	158	68.4	64.3
Lithuania	170	162	66.5	64.9
Luxembourg	181	155	72.6	60.5
Hungary	171	166	67.8	55.9
Malta	163	150	74.9	49.5
Netherlands	145	104	78.1	68.1
Austria	167	133	75.2	66.9
Poland	180	165	68.2	55.2
Portugal	168	161	65.8	59.6
Romania	183	181	68.7	53.3
Slovenia	179	174	67.5	60.0
Slovakia	173	168	67.6	54.3
Finland	161	153	69.5	68.0
Sweden	165	148	76.5	73.1
United Kingdom	162	129	76.8	67.1
Iceland	168	141	85.4	80.5
Norway	150	126	77.0	73.4
Switzerland	168	127	83.4	74.1

Source: Eurostat (online data codes: earn_ses_monthly, lfsa_ergaed)

Further investigation of a possible relationship between the employment rate of women and the unadjusted gender pay gap would be helpful. Figure 5 shows a positive relationship between both measures: countries with a high female employment rate tend to exhibit a large unadjusted gender pay gap and vice versa. This could be due to 'self-selection' of women into paid employment. This is more evident for countries such as Croatia, Italy, Luxembourg, Poland, Malta, Romania and Slovenia, which record a negative explained GPG.

As already mentioned in Chapter 3.2, lower-educated or lower-skilled women tend not to engage in the labour market in some countries. In its earlier methodological study, Eurostat (2009) quantified the effect of the 'self-selection' of women on the unadjusted GPG using other data sources.

Figure 5: Employment rate for women and the unadjusted gender pay gap, 2014
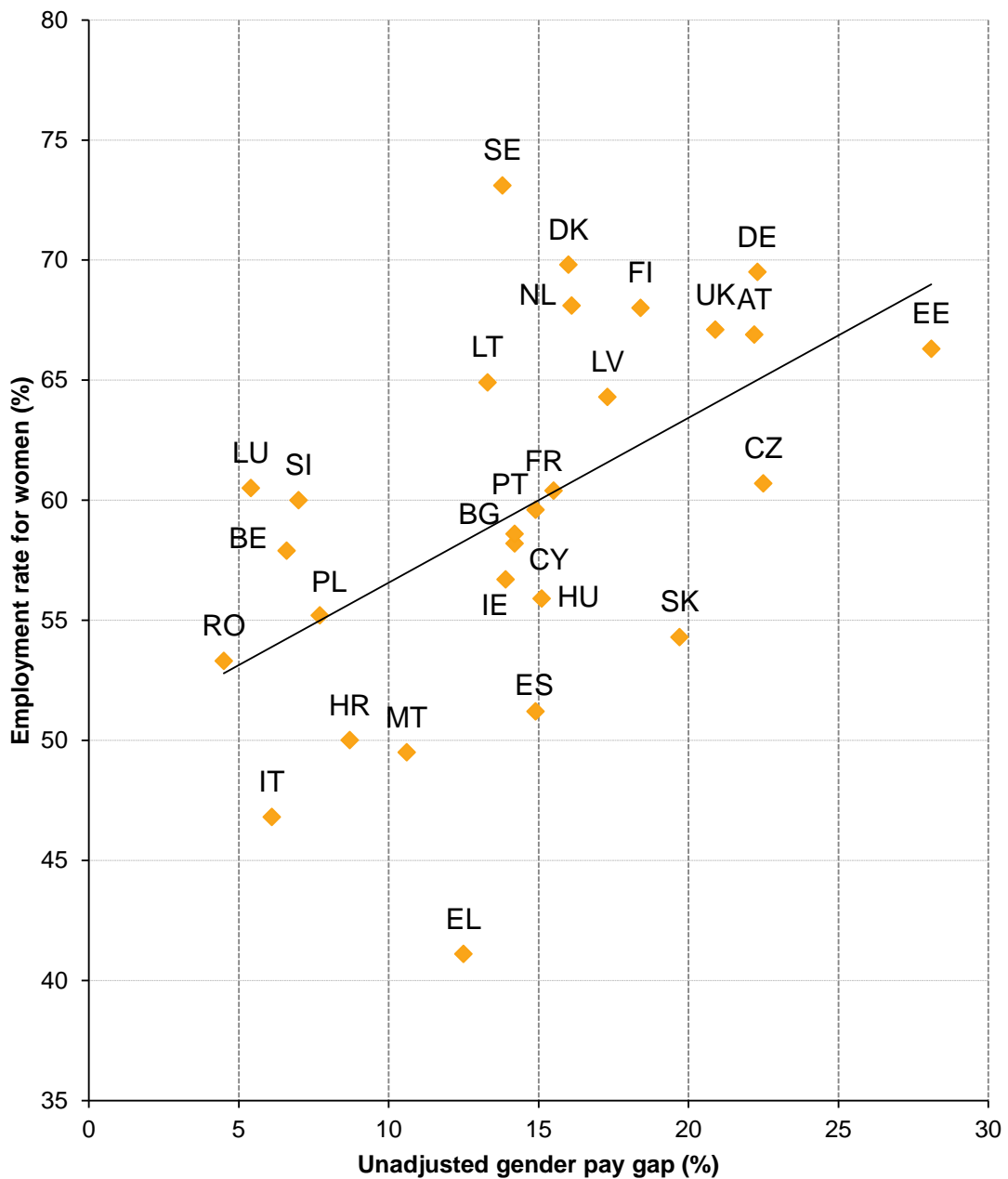
Source: Eurostat (online data codes: lfsi_emp_a, earn_gr_gpgr2)

4 | Conclusions

'Unequal pay for male and female workers for equal work' is just one of the possible causes of the unadjusted gender pay gap, and understanding all its causes is therefore very important. The results presented in the publication show that there are clear policy and statistical reasons to decompose the unadjusted GPG into the explained and unexplained parts. The unadjusted GPG indicator, together with the explained gap and its explanatory factors, allow for a better identification and interpretation of the causes of the gender pay gap. As a consequence, policy actions can be better targeted.

The explained GPG shows the gap between male and female hourly earnings that is due to differences in the average characteristics of male and female employees as observed in Structure of Earnings data. The unexplained GPG can be viewed as a 'residual gap' i.e. the part of the unadjusted GPG that is not explained by those differences.

Being a residual, it is not recommended to interpret the unexplained GPG as a measurement of a possible discrimination through 'unequal pay for equal work'. This limitation should be borne in mind when interpreting the unexplained GPG, in particular, for those countries with a low coefficient of determination. Indeed, some important variables, such as the total work experience, are not collected in the Structure of Earnings Survey. Including such additional variables in the regression analysis may substantially change the results.

The users of GPG data should focus on the explained part of the decomposition. For some countries, the explained GPG constitutes more than half of the unadjusted GPG. In those cases, more than half of the unadjusted gap can be explained by differences in the average characteristics (economic sectors, occupations, management responsibilities etc.) of male and female employees on the labour market, in favour of men.

At the other extreme, some countries record a negative explained GPG, meaning that female employees present average characteristics on the labour market that are more remunerative than those of men. This is the case in particular for countries where only women with higher education and skills engage in the labour market (the 'self-selection' effect).

When the explained GPG is negative, this turns into the unexplained GPG being higher than the unadjusted GPG. As a consequence, the ranking of countries based on the size of the unexplained GPG differs significantly from the one based on the size of the unadjusted GPG. This confirms that the unadjusted GPG is not a good indicator to rank countries according to possible gender discrimination in the labour market.

The decomposition also makes it possible to identify the main factors behind the explained GPG. In most EU Member States, the explained GPG is strongly driven by three explanatory factors: economic activity, occupation and education. However, these factors have different explanatory effects on the decomposition.

On the one hand, the explained gender pay gap for education is negative in the vast majority of EU Member States. This means that employed women have, on average, a higher level of education than men in most European labour markets. On the other hand, the explained gender pay gap for economic activity is positive in the vast majority of EU Member States. This means that men tend to be employed in better paid economic activities than women (sectoral segregation).

A more mixed picture can be observed for occupation, where the countries are split almost equally between those recording positive or negative gaps for this explanatory factor. This means that in the EU Member States with a positive gap for occupation, men tend to work in better paid occupations than women, whereas in the countries with a negative gap, women tend to work in better paid occupations than men, generally due to 'self-selection' effects. Occupational gender segregation thus has a more uneven effect across EU Member States than sectoral gender segregation.

Note that the decomposition of the unadjusted GPG does not capture all segregation effects between men and women in the labour market. In particular, women work, on average, fewer hours per month than men. This is not captured by the unadjusted GPG, which is calculated on an hourly basis. Moreover, a lower proportion of women than men participate in the labour market.

'Self-selection' of women into paid employment is an issue in some EU countries, and affects the measurement of the unadjusted GPG and its decomposition. This seems to be especially the case in countries recording both a low unadjusted GPG and a low employment rate for women. This phenomenon is usually associated with the negative explained GPG, which occurs because a significant share of low-skilled women stays out of the labour market, especially when there are few job opportunities.

The methodology and results of the decomposition were discussed with the Working Group on Labour Market Statistics in October 2017 and the European Directors of Social Statistics in March 2018. Eurostat hopes that this publication will stimulate further discussion within the European Statistical System on how to provide users with official statistics to better interpret 'Gender Pay Gap Indicators'.

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Appendix 1: Statistical tests

Table 5: Coefficient of determination (R-squared)

Country	R-squared	
	Model for men	Model for women
Belgium	0.82	0.77
Bulgaria	0.54	0.56
Czech Republic	0.56	0.56
Denmark	0.58	0.54
Germany	0.71	0.66
Estonia	0.40	0.53
Ireland	0.47	0.49
Greece	0.60	0.65
Spain	0.52	0.55
France	0.56	0.51
Croatia	0.50	0.59
Italy	0.61	0.71
Cyprus	0.70	0.76
Latvia	0.38	0.44
Lithuania	0.43	0.54
Luxembourg	0.71	0.75
Hungary	0.52	0.57
Malta	0.57	0.55
Netherlands	0.68	0.68
Austria	0.68	0.66
Poland	0.55	0.66
Portugal	0.66	0.75
Romania	0.54	0.55
Slovenia	0.55	0.64
Slovakia	0.47	0.51
Finland	0.61	0.59
Sweden	0.54	0.53
United Kingdom	0.60	0.62
Iceland	0.70	0.69
Norway	0.59	0.57
Switzerland	0.60	0.49

Table 6: F-test of model effects for the men

Country	Intercept F value	P value	Age F value	P value	Age squared F value	P value	Education F value	P value	Occupation F value	P value	Job experience F value	P value	Job experience squared F value	P value	Employment contract F value	P value	Working time F value	P value	Economic activity F value	P value	Enterprise size F value	P value	Enterprise control F value	P value	Overall for model F value	P value
Belgium	13946	<.01	1479.45	<.01	647.17	<.01	364.32	<.01	107.81	<.01	291.09	<.01	107	<.01	29.36	<.01	62.62	<.01	37.62	<.01	24.55	<.01	4.17	0.04	777.38	<.01
Bulgaria	1026.5	<.01	48.61	<.01	61.97	<.01	79.44	<.01	85.95	<.01	144.48	<.01	69.16	<.01	4.49	0.01	4.98	0.03	9.85	<.01	81.26	<.01	2.21	0.14	145.1	<.01
Czech Republic	34946	<.01	402.57	<.01	392.4	<.01	291.79	<.01	157.57	<.01	216.33	<.01	96.8	<.01	73.79	<.01	11.75	<.01	23.4	<.01	72.59	<.01	0.61	0.44	243.63	<.01
Denmark	75982	<.01	2716.66	<.01	2488.33	<.01	1197.67	<.01	322.56	<.01	833.7	<.01	480.24	<.01	1743.86	<.01	151.61	<.01	61.38	<.01	56.35	<.01	126.2	<.01	1014.63	<.01
Germany	24149	<.01	2065.42	<.01	1895.2	<.01	1024.74	<.01	321.67	<.01	1084.24	<.01	183.52	<.01	16003	<.01	915.85	<.01	115.43	<.01	548.55	<.01	1.26	0.26	2329.92	<.01
Estonia	1107.7	<.01	136.43	<.01	208.07	<.01	68.09	<.01	55.98	<.01	39.66	<.01	9.48	<.01	1.15	0.28	29.91	<.01	10.89	<.01	19.1	<.01	0.1	0.75	471.88	<.01
Ireland	818.38	<.01	255.87	<.01	202.65	<.01	75.09	<.01	45.96	<.01	5.56	0.02	18.43	<.01	20.81	<.01	0.36	0.55	24.12	<.01	98.37	<.01	4.56	0.03	114.25	<.01
Greece	191.24	<.01	115.89	<.01	54.14	<.01	87.99	<.01	22.17	<.01	209.55	<.01	40.56	<.01	36.81	<.01	95.64	<.01	18.41	<.01	53.1	<.01	0.2	0.65	154.04	<.01
Spain	2881.2	<.01	146.6	<.01	84.79	<.01	227.26	<.01	87.65	<.01	201.9	<.01	3.68	0.05	117.74	<.01	9.58	<.01	37.34	<.01	74.05	<.01	3.57	0.06	316.23	<.01
France	4845.7	<.01	245.24	<.01	121.6	<.01	516.33	<.01	237.54	<.01	109.61	<.01	20.73	<.01	309.29	<.01	2.84	0.09	40.63	<.01	26.15	<.01	2.11	0.15	1521.09	<.01
Croatia	2549.4	<.01	46.52	<.01	29.56	<.01	110.47	<.01	24.9	<.01	28.12	<.01	17.1	<.01	60.54	<.01	2.4	0.12	7.76	<.01	9.66	<.01	3.6	0.06	74.25	<.01
Italy	3634.7	<.01	52.41	<.01	8.08	<.01	210.09	<.01	166.93	<.01	93.43	<.01	26	<.01	67.23	<.01	237.5	<.01	48.44	<.01	48.67	<.01	43.7	<.01	419.22	<.01
Cyprus	125.63	<.01	54.77	<.01	39.3	<.01	11.03	<.01	15.71	<.01	70.13	<.01	14.77	<.01	1.89	0.17	0.89	0.35	7.7	<.01	3.62	<.01	0	0.98	71.31	<.01
Latvia	327.76	<.01	11.73	<.01	31.34	<.01	52.97	<.01	23.6	<.01	99.85	<.01	56.88	<.01	4.7	<.01	0.06	0.81	17.45	<.01	45.11	<.01	0.24	0.62	81.99	<.01
Lithuania	1290.3	<.01	25.83	<.01	35.99	<.01	41.4	<.01	22.23	<.01	59.09	<.01	22.49	<.01	5.33	0.02	26.31	<.01	13.1	<.01	43.93	<.01	0	0.97	117.24	<.01
Luxembourg	1245.6	<.01	140.41	<.01	77.49	<.01	17.85	<.01	44.08	<.01	42.15	<.01	2.77	0.1	116.16	<.01	0.97	0.32	10.55	<.01	8.63	<.01	18.9	<.01	186.11	<.01
Hungary	67262	<.01	197.98	<.01	163.87	<.01	484.81	<.01	123.87	<.01	167.27	<.01	36.6	<.01	40.15	<.01	1226.85	<.01	28.4	<.01	127.41	<.01	33.74	<.01	356.76	<.01
Malta	536.77	<.01	80.99	<.01	69.61	<.01	30.18	<.01	30.14	<.01	3.59	0.06	0.34	0.56	0.86	0.43	2.32	0.13	6.17	<.01	8.63	<.01	0.28	0.6	56.21	<.01
Netherlands	586.6	<.01	848.79	<.01	634.1	<.01	394.59	<.01	150.02	<.01	86.09	<.01	24.91	<.01	81.78	<.01	49.46	<.01	29.89	<.01	15.24	<.01	43.85	<.01	472.64	<.01
Austria	11869	<.01	691.65	<.01	407.93	<.01	507.67	<.01	186.02	<.01	540.22	<.01	67.14	<.01	1914.98	<.01	120.21	<.01	49.78	<.01	95.05	<.01	2.94	0.09	688.24	<.01
Poland	13261	<.01	716.53	<.01	669.07	<.01	504.91	<.01	238.66	<.01	150.83	<.01	54.7	<.01	529.84	<.01	6.15	0.01	33.44	<.01	259.72	<.01	9.26	<.01	1250.69	<.01
Portugal	475.28	<.01	84.89	<.01	53.43	<.01	178.69	<.01	56.08	<.01	155.35	<.01	49.86	<.01	37.78	<.01	0.44	0.51	35.83	<.01	43.81	<.01	1.23	0.27	266.24	<.01
Romania	3579.2	<.01	21.16	<.01	14.63	<.01	119.16	<.01	83.16	<.01	92.53	<.01	23.12	<.01	0.09	0.77	88.64	<.01	36.23	<.01	299.58	<.01	2.64	0.1	245.52	<.01
Slovenia	1743.8	<.01	34.04	<.01	19.3	<.01	269.63	<.01	54.42	<.01	124.85	<.01	81.34	<.01	79.5	<.01	7.71	<.01	19.17	<.01	1.64	0.16	3.87	0.05	149.35	<.01
Slovakia	734.99	<.01	155.23	<.01	139.41	<.01	229.83	<.01	47.1	<.01	127.13	<.01	59.96	<.01	10.4	<.01	30.23	<.01	20.41	<.01	57.57	<.01	2.09	0.15	163.71	<.01
Finland	13250	<.01	894.04	<.01	595.61	<.01	536.3	<.01	330.43	<.01	210.17	<.01	133	<.01	89.09	<.01	5.74	0.02	50.08	<.01	55.32	<.01	27.79	<.01	666.45	<.01
Sweden	46196	<.01	524.96	<.01	378.28	<.01	227.73	<.01	120.62	<.01	145.88	<.01	100.7	<.01	:	:	2.44	0.12	36.55	<.01	19.4	<.01	27.16	<.01	177.2	<.01
United Kingdom	8018.5	<.01	1891.85	<.01	1420.93	<.01	25.7	<.01	628.7	<.01	318.1	<.01	92.25	<.01	161.97	<.01	20.67	<.01	121.72	<.01	185.3	<.01	29.66	<.01	1096.5	<.01
Iceland	23341	<.01	107.76	<.01	81.99	<.01	74.76	<.01	39.96	<.01	44.88	<.01	29.73	<.01	9.1	<.01	16.34	<.01	4.52	<.01	0.38	0.83	14.93	<.01	147.08	<.01
Norway	123797	<.01	4719.34	<.01	3609.52	<.01	1174.31	<.01	447.51	<.01	77.41	<.01	114.63	<.01	30.78	<.01	135.01	<.01	102.18	<.01	49.37	<.01	0.94	0.33	1006.79	<.01
Switzerland	6516.5	<.01	705.5	<.01	419.26	<.01	375.21	<.01	76.98	<.01	263.17	<.01	39.45	<.01	3.46	0.06	5.02	0.03	37.34	<.01	63.77	<.01	2.14	0.14	415.1	<.01

Table 7: F-test of model effects for women

Country	Intercept F value	Intercept P value	Age F value	Age P value	Age squared F value	Age squared P value	Education F value	Education P value	Occupation F value	Occupation P value	Job experience F value	Job experience P value	Job experience squared F value	Job experience squared P value	Employment contract F value	Employment contract P value	Working time F value	Working time P value	Economic activity F value	Economic activity P value	Enterprise size F value	Enterprise size P value	Enterprise control F value	Enterprise control P value	Overall for model F value	Overall for model P value
Belgium	13255.1	<.01	995.61	<.01	573.86	<.01	175.87	<.01	123.21	<.01	326.43	<.01	67.2	<.01	65.79	<.01	41.81	<.01	26.98	<.01	19.4	<.01	2.54	0.11	624.64	<.01
Bulgaria	1038.23	<.01	0.41	0.52	2.09	0.15	116.02	<.01	93.51	<.01	205.89	<.01	107.43	<.01	1.38	0.25	1.4	0.24	15.83	<.01	100.26	<.01	60.35	<.01	416.22	<.01
Czech Republic	39242.2	<.01	47.8	<.01	35.32	<.01	546.21	<.01	261.56	<.01	232.78	<.01	139.78	<.01	66.6	<.01	11.21	<.01	17.41	<.01	40.08	<.01	5.73	0.02	409.29	<.01
Denmark	108637	<.01	2917.18	<.01	2298.15	<.01	1244.27	<.01	249.52	<.01	1068.78	<.01	709.76	<.01	844.4	<.01	587.6	<.01	57.04	<.01	30.54	<.01	273.61	<.01	908.37	<.01
Germany	22267.7	<.01	1739.26	<.01	1718.01	<.01	702.01	<.01	305.32	<.01	1454.25	<.01	368.52	<.01	12227	<.01	734.6	<.01	83.47	<.01	405.79	<.01	0.46	0.5	1590	<.01
Estonia	2251.85	<.01	47.5	<.01	91.88	<.01	123.72	<.01	163.7	<.01	88.39	<.01	50.11	<.01	0.78	0.38	2.08	0.15	7.74	<.01	17.04	<.01	35.6	<.01	260.35	<.01
Ireland	921.86	<.01	119.77	<.01	139.35	<.01	60.2	<.01	43.87	<.01	2.57	0.11	5.59	0.02	3.32	0.07	8.71	<.01	18.92	<.01	97.45	<.01	0.13	0.72	117.33	<.01
Greece	232.71	<.01	72.54	<.01	30.88	<.01	83.23	<.01	21.37	<.01	273.34	<.01	59.99	<.01	11.53	<.01	72.1	<.01	19.96	<.01	32.32	<.01	0.05	0.82	241.43	<.01
Spain	3108.94	<.01	64.36	<.01	37.46	<.01	147.78	<.01	79.44	<.01	115.51	<.01	1.2	0.27	28.43	<.01	24.99	<.01	29.55	<.01	20	<.01	84.2	<.01	304.3	<.01
France	4525.6	<.01	130.47	<.01	68.02	<.01	267.42	<.01	120.08	<.01	52.71	<.01	1.45	0.23	271.4	<.01	0	0.98	43.54	<.01	17.44	<.01	15.56	<.01	402.65	<.01
Croatia	4354.03	<.01	26.15	<.01	9.15	<.01	127.34	<.01	42.15	<.01	24.01	<.01	6.73	<.01	48.41	<.01	1.35	0.25	6.3	<.01	2.65	0.03	1.43	0.23	156.38	<.01
Italy	4431.1	<.01	16.8	<.01	0.02	0.89	244.78	<.01	143.53	<.01	65.71	<.01	10.3	<.01	60.49	<.01	123.66	<.01	58.23	<.01	44.68	<.01	271.07	<.01	437.12	<.01
Cyprus	235.32	<.01	21.82	<.01	18.16	<.01	15.3	<.01	18.69	<.01	69.55	<.01	2.71	0.1	0.65	0.42	1.09	0.3	4.12	<.01	4.15	<.01	11.8	<.01	584.18	<.01
Latvia	327.86	<.01	0.04	0.84	1.85	0.17	46.89	<.01	39.95	<.01	61.85	<.01	40.31	<.01	5.05	<.01	6.11	0.01	16.77	<.01	21.51	<.01	10.34	<.01	122.18	<.01
Lithuania	1702.76	<.01	1.97	0.16	3.1	0.08	112.78	<.01	39.55	<.01	24.66	<.01	13.46	<.01	47.05	<.01	8.94	<.01	9.88	<.01	38	<.01	21.4	<.01	104.64	<.01
Luxembourg	818.04	<.01	99.21	<.01	63.52	<.01	21.38	<.01	20	<.01	28.92	<.01	0.2	0.66	99.48	<.01	10.57	<.01	13.7	<.01	6.21	<.01	34.37	<.01	160.79	<.01
Hungary	77103.2	<.01	63.61	<.01	29.75	<.01	570.64	<.01	145.87	<.01	102.93	<.01	15.02	<.01	83.72	<.01	2957.58	<.01	27.58	<.01	67.88	<.01	93.2	<.01	807.15	<.01
Malta	1065.01	<.01	32.39	<.01	30.4	<.01	25.95	<.01	29.78	<.01	12.66	<.01	2.14	0.14	3.53	0.03	35.76	<.01	17.36	<.01	4.27	<.01	4.02	0.05	175.41	<.01
Netherlands	638.73	<.01	575.66	<.01	528.66	<.01	487.84	<.01	93.85	<.01	190.79	<.01	76.3	<.01	49.96	<.01	104.15	<.01	41.77	<.01	13.23	<.01	13.18	<.01	730.69	<.01
Austria	10164.9	<.01	566.73	<.01	362.73	<.01	330.81	<.01	163.46	<.01	385.91	<.01	14.4	<.01	1413.67	<.01	73.2	<.01	40.6	<.01	39.9	<.01	6.76	<.01	511.19	<.01
Poland	7479.1	<.01	200.28	<.01	134.29	<.01	1006	<.01	428.83	<.01	270.64	<.01	163.6	<.01	374.29	<.01	13.39	<.01	32.32	<.01	106.45	<.01	14.81	<.01	1252.64	<.01
Portugal	795.31	<.01	64.94	<.01	23.58	<.01	107	<.01	50.26	<.01	61.55	<.01	6.21	0.01	7.84	<.01	0.42	0.52	38.57	<.01	18.88	<.01	0.91	0.34	323.05	<.01
Romania	3271.15	<.01	1.69	0.19	0.02	0.87	132.39	<.01	95.47	<.01	113.38	<.01	41.42	<.01	3.97	0.05	30.08	<.01	32.55	<.01	272.42	<.01	0.95	0.33	255.75	<.01
Slovenia	1458.91	<.01	10.33	<.01	0.02	0.9	374.94	<.01	96.98	<.01	204.86	<.01	111.53	<.01	54.79	<.01	0.05	0.83	14.61	<.01	2.42	0.05	1.35	0.25	320.84	<.01
Slovakia	1176.8	<.01	20.68	<.01	10.1	<.01	311.57	<.01	72.48	<.01	76.12	<.01	63.87	<.01	51.53	<.01	17.25	<.01	15.11	<.01	16.06	<.01	0.01	0.94	271.13	<.01
Finland	55296.4	<.01	176.99	<.01	52.06	<.01	1194.5	<.01	331.37	<.01	656.1	<.01	552.82	<.01	89.82	<.01	12.98	<.01	47.18	<.01	28.55	<.01	150.37	<.01	765.97	<.01
Sweden	72478.5	<.01	430.16	<.01	282.4	<.01	297.08	<.01	156.86	<.01	224.06	<.01	141.92	<.01	:	:	28.64	<.01	30.39	<.01	6.06	<.01	58.98	<.01	185.86	<.01
United Kingdom	10481.7	<.01	1434.29	<.01	1181.19	<.01	49.78	<.01	851.33	<.01	435.37	<.01	91.5	<.01	97.12	<.01	389.33	<.01	80.87	<.01	85.44	<.01	72.64	<.01	1375.16	<.01
Iceland	38074.4	<.01	18.82	<.01	11.47	<.01	202.11	<.01	60.1	<.01	42.94	<.01	22.36	<.01	9.2	<.01	9.62	<.01	10.7	<.01	2.44	0.05	1.77	0.18	259.11	<.01
Norway	245449	<.01	7164.86	<.01	5158.4	<.01	1324.81	<.01	390.88	<.01	161.53	<.01	231.21	<.01	9.6	<.01	2.99	0.08	85.03	<.01	96.09	<.01	60.27	<.01	1459.37	<.01
Switzerland	7088.34	<.01	347.3	<.01	255.87	<.01	274.42	<.01	49.73	<.01	83.34	<.01	23.42	<.01	7.73	<.01	26.32	<.01	17.69	<.01	17.84	<.01	0.37	0.54	264.15	<.01

Appendix 2: Methodology and results at the national level

This appendix provides an indicative list of publications at national level on decomposing the GPG:

Belgium: L'écart salarial entre les femmes et les hommes en Belgique. Rapport 2017, Institut pour l'égalité des femmes et des hommes.

Denmark: Lønforskelle mellem mænd og kvinder 2007-2011, Det Nationale Forskningscenter for Velfærd.

Germany: Verdienstunterschiede zwischen Männern und Frauen. Eine Ursachenanalyse auf Grundlage der Verdienststrukturerhebung 2014, Statistisches Bundesamt.

Netherlands: Gelijk loon voor gelijk werk? Banen en lonen bij de overheid en bedrijfsleven, 2014, Centraal Bureau voor de Statistiek.

Austria: Gender Pay Gap. Analysen zum Einfluss unterschiedlicher Faktoren auf den geschlechtsspezifischen Lohnunterschied, Statistische Nachrichten, 6/2017, Statistik Austria.

United Kingdom: Understanding the gender pay gap in the UK, Office for National Statistics

Switzerland: Analyse der Löhne von Frauen und Männern anhand der Lohnstrukturerhebung 2014, Büro für arbeits- und sozialpolitische Studien.

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KS-TC-18-003-EN-N

A decomposition of the unadjusted gender pay gap using Structure of Earnings Survey data

This publication provides information on the data source, the methodology and statistical software used by Eurostat to decompose the unadjusted gender pay gap, and the results of this decomposition. The unadjusted gender pay gap combines possible differences in pay between men and women, for 'equal work or work of equal value', with the impact of differences in the average characteristics of men and women in the labour market. To measure the impact of differences in the average characteristics of men and women, Eurostat has used microdata from the Structure of Earnings Survey 2014. A statistical method known as the Blinder-Oaxaca decomposition method was applied on this dataset to isolate the contribution of each observed characteristic to the unadjusted gender pay gap. Eurostat's methodology and results should help data users and policy makers to better interpret the unadjusted gender pay gap.

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