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THE UNADJUSTED GENDER PAY GAP IN THE EUROPEAN UNION

Note by Eurostat[1]

Invited paper

I.   THE GENDER PAY GAP INDICATOR OF THE EUROPEAN STATISTICAL SYSTEM

1.   Inequality in pay between men and women remains high in Europe. Moreover, the impact of pay gaps can be far-reaching, as lower pay increases the risk of financial dependence not only during working life, but also implies lower pensions and thus an increased risk of poverty during old age. Hence, the unadjusted Gender Pay Gap (GPG) is an important indicator used to monitor imbalances in wages between men and women. It belongs to the set of the European Structural and Sustainable Development Indicators, which are used for assessing the progress made towards the Lisbon Strategy objectives and with regard to the EU Sustainable Development Strategy. The GPG is also a key indicator in the framework of the Strategy for equality between women and men of the European Commission. Due to the importance of this phenomenon, on 5 March 2010, the European Commission released its plans and a series of measures aimed at significantly reducing the pay gap between men and women over the next five years.

2.   Against this background, this paper aims at presenting the work done within the European Statistical System (ESS) for the harmonization, calculation, analysis and dissemination of the overall national and European GPGs as well as for complementary statistical data in order to answer the political needs. From the reference year 2006 onwards, the GPG is computed annually by the ESS according to 3 main guidelines defined after in-depth discussions with the Directorate General Employment and Social Affairs of the European Commission as well as with the Directors of Social Statistics of the ESS:

*   The GPG should be unadjusted, i.e. without correcting for national differences in individual characteristics of employed men and women. The main reason is that, at this stage, there is neither consensus nor scientific evidence on which adjustment method should be used.

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[1] Prepared by Mr. Didier Dupré, Eurostat. The analyses presented in this paper were carried out together with Veronica Alvarez, Simone Casali and Hannah Kiiver in Eurostat Unit F/2 "Labour market statistics".

- The GPG should be calculated using gross hourly earnings. This choice aims at excluding from the measurement differences among EU Member States in terms of use of part time work.
- The GPG should be based on a harmonised source over the EU, the Structure of Earnings Survey (SES), a rich employer-employee matched data set[2].

3.   More specifically, the unadjusted GPG is calculated:

- Using the four-yearly Structure of Earnings Survey (SES) from the 2006 survey onwards as benchmark;
- Using national estimates (based on national sources) provided by Member States for the years between the SES benchmark years, from reference year 2007 onwards (same coverage as SES);
- Defining the GPG as the relative difference between the average (arithmetic mean) gross hourly earnings of women and men, expressed in %[3];
- On the same coverage as the SES:
  - No restrictions for age and hours worked, part-timers shall be included;
  - NACE Rev. 1.1. aggregate for sections C to O, excluding L (section L and the total C to O are optional) – NACE Rev 2 B to S excluding O - i.e. the whole economy except agriculture, fishing, public administration, private households and extra-territorial organisations;
  - Size of enterprises: only those with 10 employees or more;
  - Gross hourly earnings shall include paid overtime and exclude non-regular payments;
- The unadjusted GPG aggregates for the EU-27 and the euro area (EA-16) are calculated by Eurostat as the average of the national GPGs weighted by the corresponding number of employees, both for the overall GPG and its breakdown by main group of economic activities.

4.   The annual data provided by the Member States in between two SES rounds are broken down by economic activity, age and type of economic control of the enterprise. For their part, the four-yearly SES micro-data contain many detailed information, in particular on the characteristics of the employer and the employee, allowing analysing the GPG broken down by various additional dimensions. However, the SES has also some limitations, e.g., it does not cover employees in the public sector and in enterprises with less than 10 employees. Moreover, it does not collect information related to personal characteristics such as marital status, number of children or work history and does not cover inactive or unemployed, all of which is relevant information for assessing women's decisions to participate in education or the labour market (the so-called "self selection", i.e. decisions by women themselves anticipating inequalities in the labour market).

II.   SELECTED RESULTS AND INTERPRETATION

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[2] The SES is set up by Council Regulation (EC) No 530/1999 of 9 March 1999 concerning structural statistics on earnings and on labour costs and Commission Regulation 1738/2005 amending Regulation (EC) No 1916/2000 as regards the definition and transmission of information on the structure of earnings

[3] $\text{Unadjusted GPG} = \frac{\text{average gross hourly earnings of male paid employees - average gross hourly earnings of female paid employees}}{\text{average gross hourly earnings of male paid employees}} \%$

II.1   Overall GPG at Member State and European level

5.   Looking at the whole economy, in 2008 women earned on average 18.0% less gross and per hour than men, in the EU-27 as well as in the EA-16. The GPG ranged from below 5% for Italy to above 30% for Estonia, i.e., seven times more (Figure 1).

Figure 1. The unadjusted Gender Pay Gap, whole economy, 2008 (%)
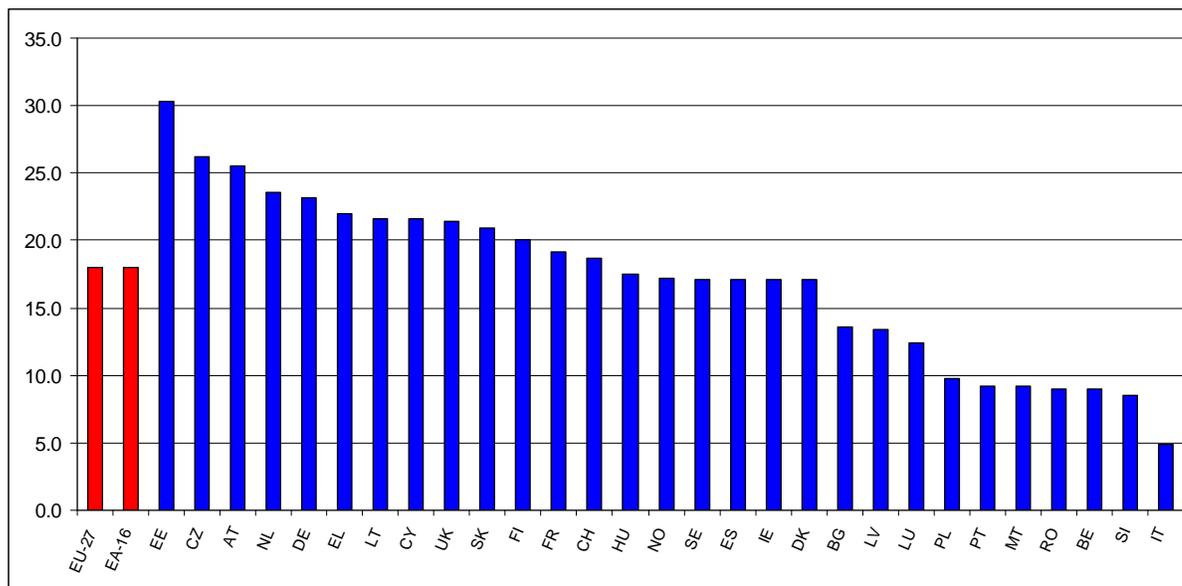
Source: Eurostat (tsiem040);
EE, IE, NL and CH: 2007; ES, FR, CY, NO, EU-27 and EA-16: provisional; SES scope for all countries.

6.   Reasons for the existence and size of the GPG are diverse and may differ strongly between Member States, e.g., kind of jobs held by women, consequences of breaks in career, or part-time work due to childbearing and decisions in favour of family life, etc. Moreover, a different share of women, with different characteristics, work in each Member State, in particular because institutions and attitudes governing the balance between private and work life - which impacts on the careers and thus pay of women - differ significantly between countries. Hence, correcting for national differences in individual characteristics of employed men and women (e.g., economic activities in which they are employed, age structure, etc.) would provide different values of the GPG.

II.2   High participation of women in the labour market tends to be associated with high GPG

7.   A key indicator related to the complex underlying factors affecting the situation of women in the labour market is indeed their participation. At least for some countries female participation in the labour market seems to be related with the GPG for the whole economy (Figure 2). In the Member States with the lowest GPG in 2008, the employment rate of women 15-64 years old is low in comparison to the EU-27 average of 59.1%, e.g., 47.2% in Italy, 37.4% in Malta or 52.4% in Poland. This reflects mainly the particularly low share of low-or unskilled women in the workforce: the employment rate of women 15-64 with lower education is between 25% and 30% in Bulgaria, Italy, Latvia and Malta and only 19.5% in Poland against 38.7% on average in

the EU-27 in 2008. On the other side, the situation of those EU15 countries (EU before 2004) that have a relatively high GPG, as observed for Germany, the Netherlands, Austria and the United Kingdom, may also be explained to some extent by their high female employment rate (between 40% and 55% for women with lower education). This is in particular achieved by resorting to part-time employment: the share of women employed part-time in these four Member States is 44.9%, 75.2%, 41.1% and 40.9%, respectively, for those 15-64 years old, compared to 34.2% for the EU-27 in 2008.

8.   A possible explanation of these results could be that, in Member States with an overall low participation of women in the labour market, women working are often those who can take home relatively high wages. This is a self-selection effect, i.e., only those women that can expect high earnings participate in the labour market, and they are concentrated in sectors or jobs where wages are particularly high. By contrast, in countries with high female participation women with low-pay perspectives also enter in the labour market, for example under specific working-time arrangements.

Figure 2. The unadjusted GPG and participation in the labour market of women with lower education: Member States with very low and very high GPG, 2008
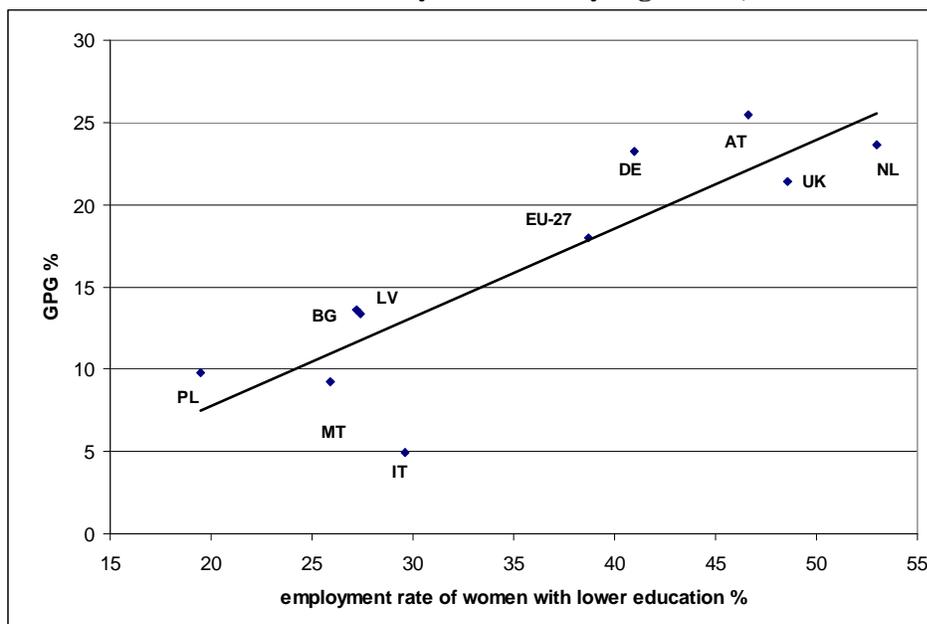
Source: Eurostat (earn_gr_gpg: GPG), SES scope (NL: 2007); (lfsa_ergaed: employment rates)
Lower education: pre-primary, primary education or first stage of basic education & lower secondary or second stage of basic education (ISCED 1997 groups 0-2);

II.3 The GPG is generally bigger for highly educated workers

9.   As already mentioned, educational attainment is another key element affecting both female participation in the labour market and their level of earnings. On average, in the EU-27 and EA-16 the GPG is much higher for people with higher educational level (tertiary education) than with lower education level (up to lower secondary education): it is respectively 26.1% and 13.9% in the EU-27 in 2006 (23.6% and 15.0% in the EA-16), see Figure 3. Consequently, underlying factors of the GPG seem, on average, to slow down the career development of women particularly in high human capital jobs. Possible explanations could be seen in gender segregation for, e.g., manager jobs and in the fact that decisions of women in favour of family

life hamper them more in professional and managerial activities where there is a high dispersion of wages.

10.   Nevertheless, again, the situation varies among Member States. While, e.g., the GPG in the Czech Republic, Greece and France has a similar pattern by educational attainment as for EU-27 and EA-16, Belgium and Lithuania have a reverse pattern (lower GPG for those with tertiary education: 14.8% and 21.8% respectively) and the GPG is less dependent on the educational attainment in Bulgaria or the United Kingdom, between 20% and 24% for both lower and higher education.

Figure 3. The unadjusted GPG by educational attainment in average in the EU-27 and EA-16 as well as some Member States, 2006 (%)
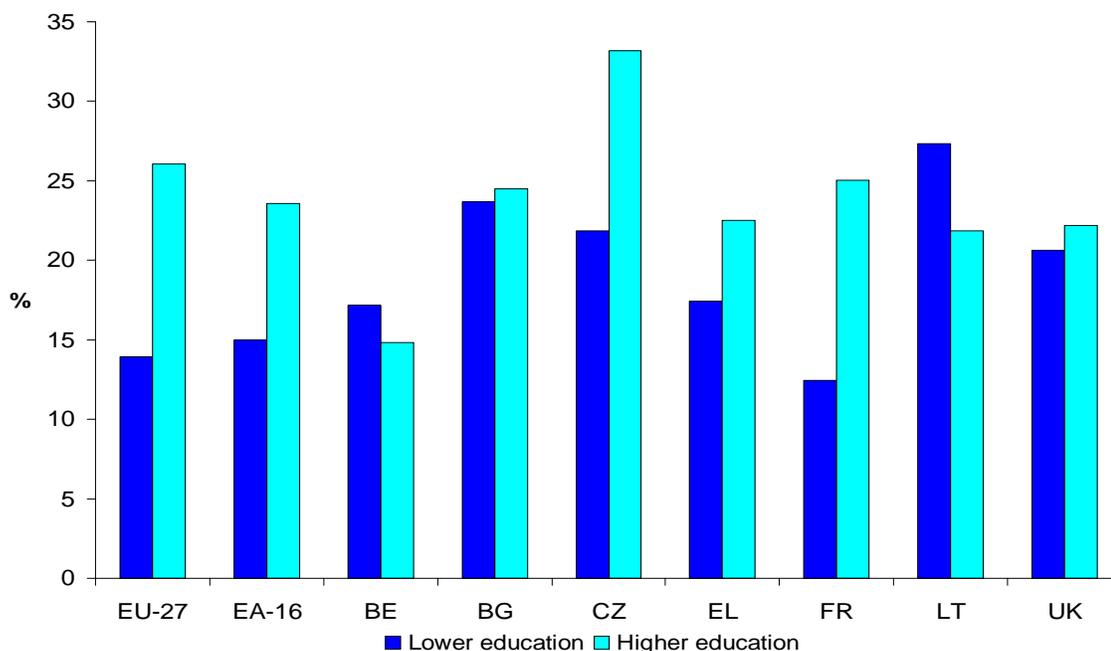
Source: Eurostat (earn_ses06_16), SES scope.
Lower education: pre-primary, primary education or first stage of basic education & lower secondary or second stage of basic education (ISCED 1997 groups 0-2);
Higher education: tertiary programmes with academic/ occupation orientation & second stage of tertiary education leading to an advanced research qualification (ISCED 1997 groups 5-6).

II.4 The GPG is lowest for young employees

11.   Intuitively, the GPG is expected to increase with age: at the beginning of the working life, negative effects on career development such as those of childbearing, parental leaves, etc., do not apply yet, the education attainment is nowadays rather similar for young women and men and the youngest employees can take advantage of current active policies to promote the equality of men and women in the labour market. By contrast, the oldest female workers have suffered the effects of breaks in their working life and could not benefit of specific equality measures that did not exist when they started to work or gave birth to their children. This is indeed confirmed by a clear increase of the GPG with age in the EU-27, from 3.1% for employees younger than 30 years to 17.5% for those 30-39 and 23.8% for those 40-49 years old in 2006. It decreases slightly, however, for those 50 and older (50+), 21.8%, see Table 1. In the

EA-16 there is a similar increase with age and the highest GPG is even recorded in the group 50+ (also 21.8%).

Table 1. The unadjusted GPG by age, %, 2006

	EU-27	EA-16
< 30 years	3.1	5.0
30-39 years	17.5	14.9
40-49 years	23.8	20.4
50 years+	21.8	21.8

Source: Eurostat (earn_ses06_14), SES scope.

III. TOWARDS AN ADJUSTED GPG

12.   It is clear that the GPG is strongly affected by the share and characteristics of men and women who choose to participate in the labour market in the first place, the characteristics of men and women employed (such as their educational attainment, experience, age, occupation, type of work contract) and the characteristics of the businesses in which they work (firm size, industry, wage setting mechanism, share of females). Thus, controlling for observable characteristics of workers and enterprises can provide a first indication of the contributions of different factors to the size of the pay gap and consequently provide information on the relevance of different variables – and their interactions - for the analysis of the GPG (though relevant variables may differ from one country to another). It might result in methodological elements for possible adjustments of the GPG in Europe.

13.   Hence, Eurostat launched in 2008 a study on the "Development of econometric methods to evaluate the Gender pay gap using Structure of Earnings Survey data". The study shows that, by performing OLS regressions correcting for individual characteristics readily available in the SES (age, educational level, private/public sector, full/part-time work, term of contract, firm size, as well as occupation), the gender pay gap is, at least in some countries, smaller than the raw (non adjusted) GPG. In addition, a self-selection modelling was carried out and in various countries the gender pay gap in the model with controls for self-selection was found to be smaller.

14.   However, one should consider that any survey provides only a limited number of observable variables and an adjusted GPG would not provide a fully comparable measure. Most likely, it would remain difficult to differentiate between the major causes of the GPG. The final report presenting the results of this study has been published in the Working Papers series of Eurostat in 2009[4].

IV. COMPLEMENTARY MEASUREMENTS OF INEQUALITIES IN PAY BETWEEN MEN AND WOMEN

15.   As shown by the analysis above, the GPG, as it is currently measured in the ESS (unadjusted), gives an overall picture of gender inequalities in terms of pay but it cannot be used as a measurement of the underlying concept of equal pay for equal work. This last part of the paper looks at potential improvements and complementary statistical data collected by the ESS and recently published by Eurostat.

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[4] See http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/KS-RA-09-011/EN/KS-RA-09-011-EN.PDF

IV.1 Possible additional calculation or use of gender pay gaps

16.   Because of the well-known discussion on which measure for the average earnings to use, either mean or median, it has been recommended by the Labour market statistics Working Group of Eurostat to calculate a second complementary gender pay gap using the same methodology as the current unadjusted GPG but based on the median gross hourly earnings of men and women. Actually, the mean tends to increase the average gross hourly earnings mainly for men as they occupy the majority of the few jobs with extremely high wages, what tends to increase the GPG. Using the median, as done in some Member States, e.g., the UK, will not be a way to artificially decrease the pay gap but would provide a measurement of an overall pay gap closer to the inequalities experienced by the majority of women. This calculation could be implemented on the basis of the SES 2010 microdata (available in 2012).

17.   In addition, in order to come closer to the concept of equal pay for equal work, the idea was launched to provide GPG values according to a multidimensional table crossing various variables from the SES. The difficulty is that, working on the raw SES microdata at such a detailed level, confidentiality or small sample issues don't allow providing results for all possible combinations of the values of the dimensions. A modelling approach, such as the OLS regressions discussed under part "III) Towards an adjusted GPG" would be preferable. Nevertheless, as a first attempt, an interactive tool has been developed by Directorate General Employment and Social Affairs using SES 2006 multidimensional data provided by Eurostat. This Gender pay gap Calculator is available online and allows employees to have an idea of the gender pay gap among employees with the same characteristics and employers to calculate the gender pay gap in their enterprise. The dimensions considered for these characteristics were: country, age class, educational attainment (ISCED), economic activity (NACE), occupation (ISCO) and size of enterprise. The Gender pay gap Calculator is available on line in DG Employment and Social Affairs web site[5].

IV.2 Complementary indicators on gender inequalities in terms of pay

18.   On the basis of the SES 2006 data, Eurostat recently published a Statistics in Focus on low wages in Europe, including an analysis by gender[6]. Low-wage earners among full-time employees are defined as those earning less than two-thirds of the national median wage per year. Annual earnings include non-regular payments such as annual bonuses, "13th month" wages and other irregular work-related allowances which affect final take-home pay.

19.   In the EU-27 in 2006, 17% of full-time employees were low-wage earners. This category included 23.1% of all female full-time workers (20.1% in the euro area), whereas only 13.5% of all male full-time employees were low-wage earners (Table 3). The proportion of female low-wage earners was higher than the proportion of male low-wage earners in all Member States except Hungary. The countries with the highest proportion of female low-wage earners were Cyprus, Latvia, the United Kingdom and Lithuania (more than 30% in each of theses countries). Their proportion was the lowest in Finland, France, Denmark, Belgium, Malta and Sweden (less than 15%).

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[5] http://ec.europa.eu/social/main.jsp?catId=835&langId=en

[6] "17% of full-time employees in the EU are low-wage earners", Eurostat Statistics in focus n° 3/2010: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-10-003/EN/KS-SF-10-003-EN.PDF

Table 3. Distribution and proportion of low wage earners (full-time employees) by sex, %, 2006

	EU-27	EA-16	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV
Men	13.5	11.7	4.8	26.5	9.5	4.7	15.9	11.7	15.6	12.4	11.2	7.7	11.5	11.0	29.2
Women	23.1	20.1	12.8	27.7	26.1	11.6	28.0	28.7	28.7	23.2	22.6	10.6	16.2	33.4	32.3
	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	NO
Men	25.0	11.9	24.5	10.1	10.5	9.2	18.3	14.5	25.7	12.1	10.8	3.3	7.6	15.6	4.9
Women	30.1	24.6	22.3	13.3	25.0	28.7	26.3	26.6	27.8	21.3	25.0	8.8	14.9	30.6	8.8

Source: Eurostat, SES 2006 (earn_ses_adeci), SES scope
Low-wage earners among full-time employees: those earning less than two-thirds of the national median wage per year.

IV. CONCLUSIONS

20. The GPG indicator implemented by the ESS is an indicator harmonised at EU level and provides consequently important information for European and national policy makers in the area of equality of women and men. It gives a first overall picture of gender inequalities in terms of pay in Europe.

21. However, being non-adjusted and calculated at macro level, it continues to be critically seen. On the other hand, calculating a measure of the underlying concept of equal pay for equal work is probably easier at micro level, e.g. in a company, but this does not provide a statistical tool for policy monitoring.

22. As a consequence, it is important to continue improving the GPG (additional tools using the median gross hourly earnings and multidimensional presentations). It is also necessary to supplement the GPG with other indicators on inequalities in terms of pay, such as the measurement of wage dispersion and of low-wages, broken down by gender. More generally, statistical data on different aspects of earnings by gender should be made available. Finally, the access to micro-data by researchers should be improved and Eurostat has now set up, together with the participating Member States, access for researchers to the SES microdata in its Safe Centre and to the SES anonymised microdata in CD-Rom form[7].

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[7] For access to the earnings data and metadata in the web site of Eurostat and for information on the procedures to access to microdata for researchers, see http://epp.eurostat.ec.europa.eu/portal/page/portal/labour_market/earnings