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REGIONAL DIFFERENCES IN GENDER WAGE GAPS IN POLAND

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Abstract

The paper aims to estimate the adjusted gender wage gaps in Poland and in each of the 16 NUTS2 Polish regions using the new harmonised dataset of wages of individuals in 2010. The results show that the total gender wage gap in Poland, estimated with new dataset, amounts to 15.7% and indicate that the previous estimates based on the Polish Labour Force Survey data are upward biased and the estimates based on the Structure of Wages and Salaries data are downward biased. Moreover, the authors show that part of the differences in wages between men and women in Poland is due to differences in the employment structure. Gender wage gap corrected for the segregation bias decreases to 14.3%. There is significant variation among regions – estimates of corrected gender wage gap vary from 24% in Opolskie to 1% in Swietokrzyskie region. The differences in gender wage gap across regions are mainly due to different employment structure by ownership sector and occupational groups.

Keywords:
gender wage gap, Poland, regional labour markets.

JEL:
J31, R23, J16

Introduction

The paper aims to estimate the gender wage gap (GWG) in Poland and in each of the 16 NUTS2 Polish regions using newly created harmonized dataset of individuals' wages in 2010.

Statistical data show significant differences in average wage level across Polish regions. The average gross wage in Warminsko-mazurskie (2722 PLN), the region with the lowest wage level, was in 2010 only 68% of the average wage in the Mazowieckie (capital) region with the highest average wage level (4032 PLN).

The hitherto empirical researches confirm that on average women earn less than men. According to the Eurostat data the unadjusted gender wage gap[1] in Poland is, however, relatively low comparing to the other European countries. In 2010 the gender wage gap in Poland (on average in industry, construction and services sectors) reported by Eurostat was around 5% and was the second lowest among the EU countries (after Slovenia with unadjusted gender wage gap equalled to 0.7). The highest differences between wages of men and women were noted in Estonia and amounted to 26%.

The estimates of gender wage gap for Poland differ significantly mainly due to different dataset used in the analyses. The previous estimates of gender wage in Poland were based on one of two datasets available: the Polish Labour Force Survey (PLFS) and the Structure of Wages and Salaries by occupation (SWS). Both of them have, however, some disadvantages. The PLFS data, due to high percentage of non-responses to question about wages especially among the persons with relatively high income are probably downward biased. The SWS data are fully reliable as they come from the employers accounting departments, but they are representative only for enterprises with at least 10 employees.

We have linked the statistical information from both sources described above and we received the new, harmonised dataset on individual wages in Poland representative for the whole Polish

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[1] It is defined by Eurostat as the difference between the average gross hourly earnings of men and women expressed as a percentage of the average gross hourly earnings of men (http://ec.europa.eu/eurostat/statistics-explained/index.php/Gender_pay_gap_statistics).

economy. This dataset allows us to re-estimate the gender wage gap for Poland and analyse the differences between Polish regions.

Most of the hitherto empirical literature on the gender wage gap focusses on the variation of the gender pay gap between countries and its evolution over time. An aspect that has attracted far less attention is the regional variation of the gap within the same country. To the best of authors' knowledge there is only one paper (Słoczyński, 2012) analysing the regional differences in gender wage gap in Poland. The paper was, however, based on SWS data so the results are not representative for the whole Polish economy.

In this paper the authors aim to: (1) Analyse the regional differences in wages of men and women in Poland, (2) Estimating the gender wage gap in Poland and in each of the 16 NUTS2 Polish regions, (3) Answering a question which factors determine the differences in wages of men and women across regions.

The structure of the paper is as follows. In the second part the theoretical justification of regional differences in gender wage gaps and some empirical evidence are shortly presented. The third part describes the statistical data. The fourth part discusses the empirical strategy. In the fifth part the empirical results are presented. The sixth part concludes.

Regional differences in gender wage gaps – theoretical justification and empirical evidence

Regional differences in wages between men and women have been explained on the monopsonistic discrimination theory. Hirsch (2009) presents a spatial monopsony model of the labour market in which he explains the differences in gender wage gaps between regional labour markets. The model assumes that workers are located at different places, while employers do not exist at each potential location. Some workers therefore have to commute and bear some travel costs, both direct and indirect. Direct cost are concerned with travelling, whereas indirect cost follows from the fact that travelling requires time and thus imposes some opportunity costs (Hirsch et al., 2010).

Since employers and the jobs they offer are not perfect substitutes to workers, competition among employers is imperfect and firms possess some monopsony power. The model assumes moreover that, due to their domestic responsibilities, women have higher average opportunity costs than men. It translates to lower spatial mobility of women and less choice of employers. Hirsch (2009) arrives therefore to the conclusion that firms have higher monopsony power over the female workers than men therefore they offer them lower wages giving rise to a gender wage gap.

Coming to regional dimension, Hirsch (2009) argue that more competition between employers in more urbanised areas should increase wages of both men and women. Moreover, higher competition between employers in more urbanised areas should constrains employers' ability to discriminate against women which should lead to lower gender wage gaps in more urbanised regions.

Hirsch et al. (2010) confirms the findings of the spatial monopsony model for German labour market. They analysed the regional differences in the gender wage gap in Germany and found that the unexplained gender wage gap for young workers is substantially lower in large metropolitan than in rural areas. Additionally, they confirmed that the differences between regions persist in time.

Another explanation of regional differences in gender wage gaps comes from the differences in the structure of employment. Empirical analyses confirm that the gender wage gap increases along the wage distribution. For instance, Arulampalam et al. (2007) for eleven European countries found that gender pay gaps are typically bigger at the top of the wage distribution, a finding that is consistent with the existence of glass ceilings.

Differences in gender wage gap across regions can also be the result of the differences in human capital (both formal education and on-the-job training) and the differences in the rates of returns to endowments. Lopez-Bazo and Motellon (2009) analysed the effect of human capital on regional wage differentials in Spanish regions. Their results confirm that the regions differ in the endowment of human capital but also that the return that individuals obtain from it varies sharply across regions.

Regional heterogeneity in returns is especially intense in the case of education. The differences in return to human capital accounts for a significant proportion of the differences in regional wage gaps in Spain.

The literature about gender wage gap in Poland is extensive (for a comprehensive review see for instance Majchrowska et al., 2015 or Van den Velde et al., 2013). Besides the regional dimension appeared in many of hitherto analyses as a control variable, see for example Łatuszyński and Woźny (2008), Matysiak et al. (2010) or Goraus and Tyrowicz (2014), in only one paper (Słoczyński, 2012) the regional differences in gender wage gaps in Poland has been analysed.

Słoczyński (2012) analysed the gender wage gaps in 16 NUTS2 regions in Poland in 2008 with the Structure of Wages and Salaries (SWS) data in October 2008. He performed standard Oaxaca-Blinder decomposition. His results show very strong diversification of gender wage gaps between Polish regions (from 25% in very urbanised Slaskie region, with relatively high share of working in the mining industry to 6% in Podkarpackie, one of the less developed regions in the Eastern part of Poland). As the data concerned employers in the enterprises with at least 10 employees the results are not representative for the whole economy. Another problem is that he took into account the total sample of occupational groups not controlling for segregation effect. Taking into account the huge disproportions in the employment structure which are present in some occupational groups (eg. more than 98% of nurses are women). Including the occupations with big disproportions among men and women employees into the sample can lead to biased results.

Data

In this paper the newly created, unique database of individual data on wages for Poland in 2010 representative for the whole economy is used. The dataset has been constructed by linking the statistical information from two sources: the Polish Labour Force Survey (PLFS) data (in I-IV quarter

2010) and the Structure of Wages and Salaries by occupations data (in October 2010). Both sources have some limitations.

The PLFS data contains full information about the employment structure in the economy, but perform much worse in case of data on wages. Due to high percentage of non-responses to question about wages especially among the persons with relatively high income the data about wages are downward biased. The SWS data are fully reliable as they come from the employers accounting departments but they are representative only for enterprises with at least 10 employees. Taking into account that wages in micro-enterprises are much lower than in medium and big companies[2] the SWS data on wage level must be upward biased.

Therefore, we decided to create the harmonised dataset which could be representative for the whole economy. Firstly, we standardised the definitions of socio-demographics and firm characteristics in both datasets. Secondly, using the multiple imputation technique we have imputed the wages from the SWS data to employment structure given by the PLFS. For people working in micro sector we have left the information given by the PLFS. The total sample of the new harmonised data set is about 100 thousand of observations.

If our new dataset performs well the average wage level should lie in between the PLFS and the SWS data. In particular, we expect the following hypothesis to be confirmed: PLFS data on average wage of men and women are downward biased in Poland and in each of the 16 NUTS2 regions (Hypothesis 1). At the same time the SWS data on average wage of men and women are upward biased in Poland and in each of the 16 NUTS2 regions (Hypothesis 2).

Looking at the mean wage level of men and women in Poland by the three data sources (see Figure 1 and Table 1) we can confirm that both in case of men and women the harmonized data on wages lie in between the PLFS and the SWS data. The average wage level of men and women by the PLFS are

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[2] According to data from Central Statistical Office in Poland, in 2010 the average monthly gross wage in micro-enterprises sector (firms with less than 9 employees) was 2006 PLN and was twice lower than the average monthly gross wage in big enterprises (250 employees and more; 4012 PLN; source: Local Data Bank, CSO).

respectively 28 and 33% lower than the ones produced by harmonized data. In case of the SWS the average wages of men and women are only slightly higher (by 2 and 5% respectively) than in the harmonized data.

Analysing the differences at the regional level (see Figure 1 and Table 1) we can confirm that in each of the 16 NUTS2 regions the average wage of men and women based on PLFS data are much lower than in the harmonized data. In case of men wages the differences amounts to 12-26%, those of women' are higher (20-28%).

In the SWS data, the average wages of women are about 3-11% higher than those from harmonized data in each of the 16 NUTS2 regions. In case of men in most of the regions wages from the SWS data are higher than from harmonised data, however, the differences are smaller than in case of women (maximum 8%). In five of the regions, however, wages in the harmonised data are slightly (1-3%) higher than in the SWS data.

Looking at the differences at the regional level we can see that the highest differences in the average wages for men between the PLFS and the harmonised data are noted in Slaskie, Dolnoslaskie, Wielkopolskie and Mazowieckie and they amount to 25% (see Figure 2). The lowest (12-13%) – in Pomorskie and Warminsko-mazurskie regions.

The differences in wages of women between PLFS and harmonised data are on average higher than those of men. The highest are noted in Wielkopolskie, Zachodniopomorskie, Slaskie and Lubuskie (27-28%). The lowest (20-21%) – in Warminsko-mazurskie, Podlaskie and Pomorskie regions.

Looking at the differences at the regional level between the SWS and the harmonised data we can see that for all regions they are much smaller than in case of the PLFS data. The highest differences in men wages appear in Warminsko-mazurskie (8%), Lubuskie and Opolskie regions (5%). The lowest in Dolnoslaskie and Lubelskie – the average wages of men by the SWS and the harmonised dataset are almost the same.

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Again, in case of women, the differences in wages reported by the SWS and the harmonised data are higher than in group of men. They are the highest in Opolskie (11%), Zachodniopomorskie, Kujawsko-pomorskie and Lubuskie (10%). The lowest (2%) in Malopolskie and Dolnoslaskie. In the next section we analyse how the differences transform to gender wage gap level.

Empirical strategy

In a first step the authors estimate the gender wage gap in Poland and in each of the 16 NUTS2 regions of Poland using the above described three sources of data: the PLFS, the SWS and the harmonised data on wages and compare the differences.

The SWS data provides higher average wages of both men and women, however due to the fact that more women than men work in the small firms and financial sector (not covered by the SWS data), we can expect that the upward bias is higher in case of women. If it is true, the gender wage gap estimated with the SWS data will be lower than the one estimated on harmonised dataset. Following the intuition, one can expect that at the regional level the average wage of women based on the SWS data should be more upward biased in regions with relatively high share of small enterprises (less developed, more rural regions).

The prediction is much more difficult in case of the PLFS data. The PLFS data on wages are downward biased both for men and women due to high share of refusals to answer the question about wages among the people with relatively high income. However, this information is not sufficient to derive conclusions regarding the distribution of the biases across regions and gender.

What is important, the different sectoral employment structure between regions has been taken into account, in particular the fact that the share of workers employed in the agricultural sectors amounts in some Eastern regions of Poland to 30% of all employees. Because most of the workers in the agriculture do not receive regular salaries but the income from agricultural production we decided to exclude the agricultural workers from our sample.

In the second step, the harmonised dataset is used to estimate the gender wage gap adjusted for the segregation bias for Poland and for each of the 16 NUTS2 regions. Following the European Commission (see Burchell et al., 2014) the segregation bias is measured as the share of workers in the highly feminised and masculinised occupational groups. The dataset allows us to work with three-digit level occupational groups (according to the International Standard for Classification of Occupations[3]).

An occupation is defined as "male-dominated" if more than 60% of the employees in that occupation are male, "female-dominated" if more than 60% of employees are female, and "mixed" if the proportions of men and women are between 40% and 60%. The European Commission (see Burchell et al., 2014) underlines that the 0.4-0.6 interval for mixed occupations is wide enough to take into account only the groups of workers with similar share of men and women. If the interval was wider (0.3-0.7 for example) the occupation could have more than twice men than women and still be treated as "mixed".

After eliminating the feminised and masculinised occupational groups, about 23-24 relatively homogenous occupational groups with similar share of men and women are left in the sample, depending on dataset.

Both total and adjusted gender wage gaps have been estimated with the standard Oaxaca (1973) – Blinder (1973) decomposition:

$$D = (X_F - X_M)\beta_M + (\beta_F - \beta_M)X_M \qquad (1)$$

where:

$(X_F - X_M)\beta_M$ - are the differences in characteristics of individuals (explained part of wage gap) and

$(\beta_F - \beta_M)X_M$ - are the differences in parameters (unexplained part of wage gap).

The decomposition is based on extended Mincer-type wage equation:

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[3] http://www.ilo.org/public/english/bureau/stat/isco/

$$\ln(w_i) = \beta_0 + \beta_1 EDU_i + \beta_2 EXP_i + \beta_3 EXP_i + \sum \gamma X_i + \sum \delta X_i X_j + \varepsilon_i$$

(2)

In the extended Mincer-type wage equation two characteristics of working individual are included: education measured as a number of years necessary to achieve certain level of education and working experience measured as the implied years of work experience (age minus preschool years and years in educational system). Implied values are used to achieve coherency in analysis on three sets of data.

Additionally, several firm level characteristics are included, such as dummy for public sector with private sector as the reference level, 1-digit level occupational groups and the economic section for main activity of the firm (according to the NACE classification). Additionally, the set of dummies describing the size of the firm is included. The population of firms has been divided into small firms (11-50 employees), medium sized firms (51-250 employees) and big firms (251 and more employees), with establishments with no more than 10 employees as a baseline category.

Gender wage gap in Poland and 16 NUTS2 regions - Empirical results

In the first step the total gender wage gap in Poland in 2010 has been estimated on the three datasets described in the previous section. The results show that the total gender wage gap is the highest with the PLFS data and amounts to almost 20% (see Figure 3 and Table 2). The gender wage gap estimated with the SWS data is the lowest (12.7%). The value of gender wage gap estimated with harmonised dataset lie in between of these two and amounts to 15.7%. All the gender wage gap estimates are significant at 1% significance level.

In the next step, the total gender wage gap for each of the 16 NUTS2 Polish regions is estimated on the three datasets and the results are compared. All the estimated gender wage gaps are significant at 1% significance level. Although the estimated gender wage gaps with the three dataset show some similarities (the highest gender wage gap is in Slaskie region with all three datasets), the differences are notable (see Figure 4 and Table 3).

The regional gender wage gaps estimated with the PLFS data are the highest. In almost all regions they are higher than the gender wage gaps estimated with the harmonised dataset. The two exceptions are Dolnoslaskie and Mazowieckie regions. The regional gender wage gaps estimated with the SWS data are the lowest. In almost all regions (with exception of Warminsko-mazurskie) they are lower than the gender wage gaps estimated with the harmonised dataset.

In case of the SWS data in almost all Polish regions (apart from Warminsko-mazurskie) the gender wage gaps are lower than the estimates obtained on the harmonised dataset. Looking at the scale of the differences in gender wage gap estimates one can easily notice that in case of the SWS data the smallest (negative) differences are noted in regions with big agglomerations (Mazowieckie – capital region, Dolnoslaskie and Wielkopolskie) and they do not exceeds -2 pp (see Figure 5). The highest differences in gender wage gap estimates on the SWS and the harmonised data are noted in less developed, Eastern regions of Poland (Podlaskie, Podkarpackie, Lubelskie) and in Western regions (Zachodniopomorskie, Kujawsko-pomorskie) and amount from -6 to -8 pp.

In case of the PLFS data in almost all Polish regions (apart from Dolnoslaskie and Mazowieckie regions) the gender wage gaps are higher than the estimates obtained with the harmonised dataset. The highest differences (exceeding 10 pp) are observed for Zachodniopomorskie and Pomorskie regions. The lowest are found in Slaskie and Wielkopolskie (2 and 4 pp. respectively).

In the second step of the empirical analyses, the harmonised dataset the authors estimate the gender wage gaps adjusted for the segregation bias for Poland and for each of the 16 NUTS2 regions separately. Then, the adjusted gender wage gaps are compared with the ones obtained on the whole sample. The intuition is that part of the differences in gender wage gap estimated on the whole sample of individuals is not due to discrimination, but is the result of different employment structure. After controlling for the segregation bias, the adjusted gender wage gap should be lower than the total one.

When we compare the total gender wage gap and the adjusted one for Poland (Figure 6) we can see that the latter is in fact lower. The total gender wage gap amounts to 15.7%; the adjusted one equals 14.3%. At the regional level one can notice that in majority of Polish regions (12 out of 16) the adjusted gap is lower than the one estimated on the whole sample. The results confirm, therefore, that part of the total gender wage gap can be assigned to the segregation bias.

We have to underline that although in case of Polish economy treated as an aggregate the differences between total and adjusted gender wage gap are not very huge (they are lower than 2 pp.) there exists quite remarkable differences at the regional level. In most of the region the adjusted gender wage gap is lower than the one obtained on the whole sample. In these regions significant part of the differences in average wages of men and women are due to different employment structure. In Slaskie and Swietokrzyskie regions the estimated with harmonised data gender wage gap is more than 6 pp. lower than the estimates based on the whole sample. On the other hand, in Zachodniopomorskie and Opolskie regions the adjusted gender wage gap is more than 8 pp. higher than the total gender wage gap.

Factors determining differences in regional wage gaps in Poland

Coming back to the theoretical explanations of regional differences in gender wage gap presented in the previous sessions the gender wage gaps adjusted for segregation bias are related to the urbanisation ratios. The results show that the relation between them is positive. The most urbanised regions (Slaskie, Dolnoslaskie and Zachodniopomorskie – all of them in Western part of Poland, at the German border) are the regions with one of the highest gender wage gaps. On the other hand, the regions with the lowest urbanisation ratio (Podkarpackie, Swietokrzyskie, and Lubelskie – all of them Eastern regions) have low or very low gender wage gap level.

The above findings are contrary to the monopsonistic discrimination theory according to which the gender wage gaps should be the smallest in the most urbanised regions due to higher level of competition between employers who then offer the women higher wages.

According to Oaxaca-Blinder decomposition the differences in average wages between the group of men and group of women can be due to different characteristics of men and women in the sample and/or differences in parameters (rates of returns). The attempt is made to answer the question which of them can explain the differences in gender wage gaps between Polish regions.

The results of the Oaxaca-Blinder decomposition of the gender wage gap for Poland (see Figure 8) show that in the adjusted sample the explained part of the gender wage gap is negative and significant. It means that on average women in the sample have better labour market characteristics than men. But much greater unexplained part shows that the gender wage gap in Poland is due to differences in parameters.

To better understand the differences in wages of men and women across regions, the authors performed the Oaxaca-Blinder decomposition for each of the 16 NUTS Polish regions separately. The differences between regions are significant.

In Western regions of Poland (Opolskie, Zachodniopomorskie, Dolnoslaskie and Slaskie) the explained part is positive but very small and not significant. The differences in wages in these regions are due to differences in the rates of returns. In most of Polish regions, however, the explained part is negative and in most cases significant. It indicates that women in these regions have better labour market characteristics and should have higher wages than men. Significant differences in rates of returns to different endowments, however, transform to differences in wages.

The more detailed decomposition of explained part shows that women in the sample were on average better educated than men, had more work experience and worked in the (better paid) public sector. The factors which partly explain the lower earnings of women are the size of firm (as more

women work in (less paid) small and medium size firms) and experience squared which confirms that women on average quit labour market earlier than men.

The simple result of the decomposition does not explain which factors are responsible for the differences between regions. To answer this question the authors have analysed the detailed results of Oaxaca-Blinder decomposition and performed the principal component analysis on the results of decomposition. It shows that the unexplained part of the adjusted gender wage gap is strongly correlated with two factors: negatively with ownership sector and positively with occupational group (see Table 4 and Table 5).

Conclusions

The aim of the paper was to estimate the gender wage gap in Poland and in each of the 16 NUTS2 Polish regions using newly created harmonized dataset of individuals' wages in 2010. The results of the analyses performed in the paper show that the newly created, harmonised dataset describes the individual data on wages in Poland very well. In particular, estimates from harmonised data confirm that the Polish Labour Force Survey data on wages are downward biased for Poland and in each of the 16 NUTS2 regions. The differences in wages between the two datasets are significant and in some of the regions amounts to 25%.

On the other hand, the new dataset indicates that the Structure of Wages and Salaries data are upward biased in relation to average wage in the economy. The differences, however, are much smaller than in case of the PLFS data and in most extreme cases amounts to 11%. In both datasets compared, the differences in wages in comparison to harmonised data are higher for women than for men.

The results of the paper show that the gender wage gap estimated with the harmonised dataset equalled 15.7% in 2010. When we compare the number with the ones obtained with other datasets it turns out that the gender wage gap estimated with the PLFS data is much higher (19.8%) and the

one estimated on the SWS data is much lower (12.7%). Consequently, previous estimates of the gender wage gap in Poland based on the PLFS data can be upward biased and the ones based on the SWS data biased downward.

The regional differences in gender wage gap estimated with the three datasets are significant. With some small exception the gender wage gaps estimated with harmonised data lie in between the estimates obtained with the PLFS and the SWS data. The differences in estimated gender wage gaps in regional dimension are higher in case of the PLFS data. In two of the 16 NUTS2 regions they exceed 10 pp. In case of the SWS data the differences in gender wage gap in comparison to the harmonised data are 8 pp the highest.

It is found that a part of the differences in wages between men and women are not consequence of discrimination but due to differences in employment structure by occupations. The gender wage gap adjusted for the possible segregation bias decreased in 2010 from 15.7% to 14.3%. The differences at the regional labour market are even higher. In majority of Polish regions (in 12 out of 16) the adjusted gap is lower than the one estimated on the whole sample. Our results confirm, therefore, that part of the total gender wage gap is the segregation bias. The adjusted gender wage gap across regions varies from 24% in Opolskie to 1% in Swietokrzyskie region.

The higher competition between employers in most urbanised regions, according to the monopsonistic discrimination theory, should transform to lower gender wage gaps. The results of the study indicate, however, that the relation between urbanisation ratio and the adjusted gender wage gap is positive, contrary to the theory. The results of the principal components analyses show that differences in gender wage gap across regions are mainly due to different employment structure by ownership sector and occupational group. Women, on average, tend to work in the more stable, public sector and tend to choose more stable, but in most cases, less paid occupations. The sectoral and occupational differences in employment structure of men and women across regions explain significant part of the differences in gender wage gaps.

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Figure 1. Average monthly wage level of men and women in Poland and 16 NUTS2 Polish regions in 2010 according to PLFS, SWS and harmonised (HARM) datasets (PLN)
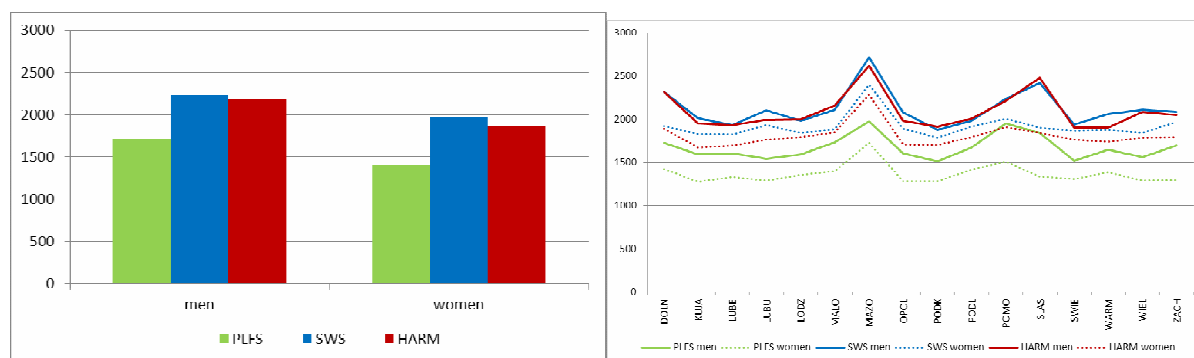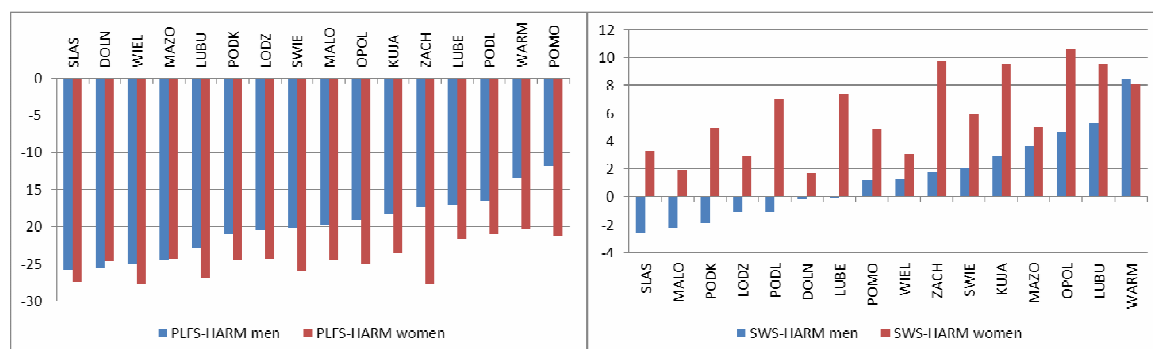

Source: PLFS data, SWS data and harmonised data, own calculations.

Table 1. Average monthly net wage level in Poland and 16 NUTS2 Polish regions according to PLFS,

SWS and harmonised data

Region		PLFS men	PLFS women	SWS men	SWS women	HARM men	HARM women
POLAND		1712.6	1404.9	2232.9	1966.9	2183.8	1866.7
Dolnoslaskie	DOLN	1723.8	1422.7	2313.1	1921.0	2316.9	1888.8
Kujawsko-pomorskie	KUJA	1593.9	1278.4	2010.7	1831.9	1952.6	1672.4
Lubelskie	LUBE	1606.6	1330.3	1932.8	1822.9	1935.0	1697.9
Lubuskie	LUBU	1541.3	1291.2	2101.1	1931.4	1995.3	1763.6
Łódzkie	LODZ	1592.4	1353.6	1979.5	1842.4	2001.8	1789.8
Małopolskie	MALO	1732.8	1395.1	2110.3	1883.2	2159.2	1847.3
Mazowieckie	MAZO	1975.5	1727.4	2714.1	2398.9	2619.6	2284.8
Opolskie	OPOL	1604.4	1281.8	2076.2	1890.5	1983.3	1709.1
Podkarpackie	PODK	1513.3	1285.1	1876.9	1784.3	1913.3	1699.8
Podlaskie	PODL	1673.3	1416.1	1980.6	1916.1	2002.6	1790.1
Pomorskie	POMO	1950.1	1504.5	2238.5	2003.4	2212.1	1910.5
Slaskie	SLAS	1841.4	1338.0	2415.9	1901.7	2480.3	1841.3
Swietokrzyskie	SWIE	1517.1	1305.6	1940.4	1865.1	1901.3	1760.9
Warminsko-mazurskie	WARM	1647.5	1386.1	2061.0	1878.9	1901.2	1739.2
Wielkopolskie	WIEL	1560.9	1290.8	2111.3	1840.7	2084.5	1785.4
Zachodniopomorskie	ZACH	1693.6	1297.7	2084.4	1969.5	2047.3	1794.8

Source: PLFS, SWS and harmonised dataset, own calculations.

Figure 2. The differences between the average monthly wage level of men and women in 16 NUTS2 Polish regions in 2010 between the PLFS and harmonised data (left) and SWS and harmonised data (right; %)


Source: PLFS data, SWS data and harmonised data, own calculations.

Table 2. The estimates of gender wage gap in Poland by PLFS, SWS and harmonised dataset

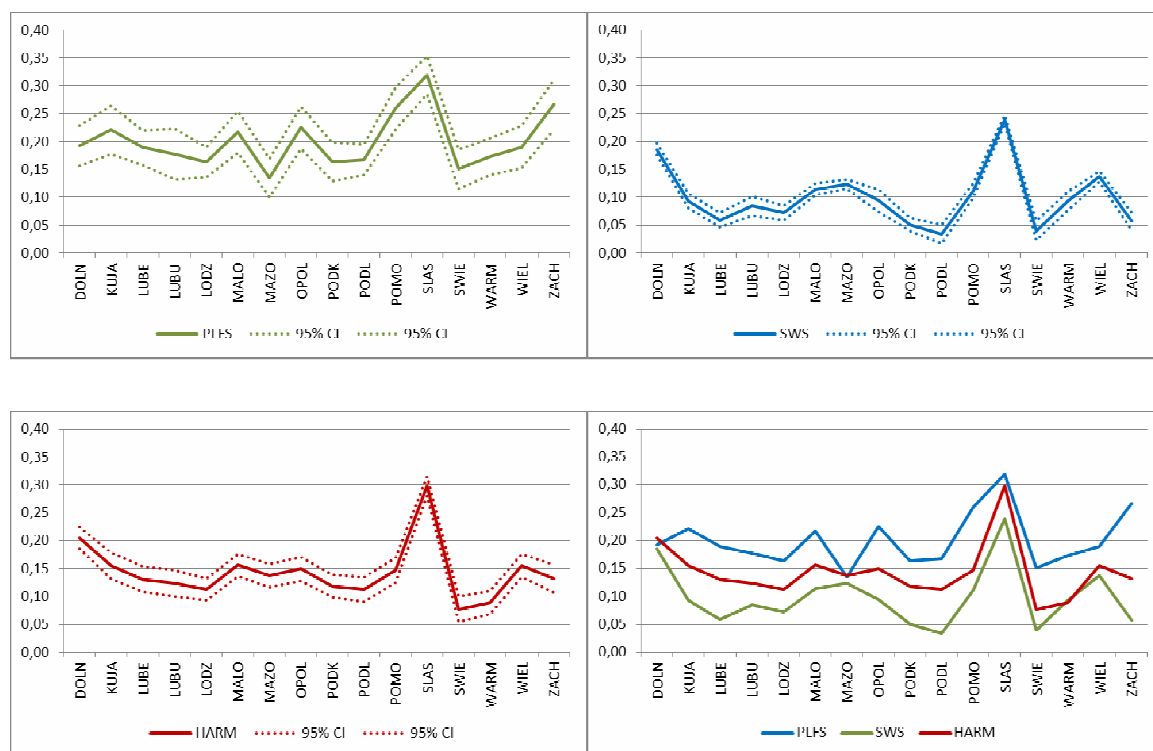|		PLFS	SWS	HARM
Number of observations	Total	43957	681747	101947
	Men	22610	333923	53852
	Women	21347	347824	48095
Wages (log)	Men	7.446***	7.711***	7.689***
	Women	7.248***	7.584***	7.532***
Difference (Gender wage gap)		0.198***	0.127***	0.157***
Explained part		-0.009**	-0.013***	-0.013***
Unexplained part		0.207***	0.140***	0.170***

Source: own estimates.

Figure 3. The estimates of gender wage gap in Poland by PLFS, SWS and harmonised dataset with Oaxaca-Blinder decomposition
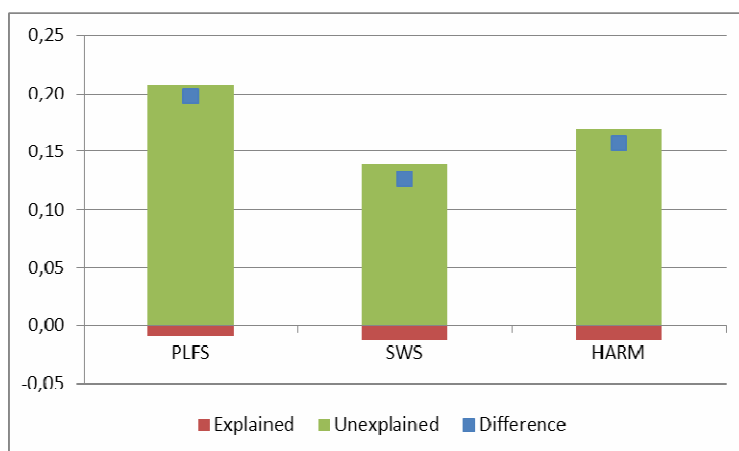
Source: own estimates.

Figure 4. Regional differences in gender wage gap* estimated with Oaxaca-Blinder decomposition using the PLFS, SWS and harmonised datasets in 2010

*95% confidence intervals are marked with dotted lines

Source: own estimates.

Table 3. The estimates of gender wage gap in Poland and in 16 NUTS2 Polish regions in 2010 by PLFS, SWS and harmonised data

| Region	No. of observations	Gender wage gap		
		PLFS	SWS	HARM
POLAND	43957	0.198***	0.127***	0.157***
DOLN	2481	0.192***	0.186***	0.204***
KUJA	2158	0.221***	0.093***	0.155***
LUBE	3368	0.189***	0.059***	0.131***
LUBU	1824	0.177***	0.084***	0.123***
LODZ	3474	0.162***	0.072***	0.112***
MALO	1823	0.217***	0.114***	0.156***
MAZO	3820	0.134***	0.123***	0.137***
OPOL	3095	0.224***	0.094***	0.149***
PODK	2085	0.164***	0.051***	0.118***
PODL	3.743	0.167***	0.033***	0.112***
POMO	2.923	0.259***	0.111***	0.147***
SLAS	2.977	0.319***	0.239***	0.298***
SWIE	2.242	0.150***	0.040***	0.077***
WARM	3.05	0.173***	0.092***	0.089***
WIEL	2.887	0.190***	0.137***	0.155***
ZACH	2.007	0.266***	0.057***	0.132***

Source: PLFS, SWS and harmonised data, own calculations.

Figure 5. The differences in gender wage gap estimates obtained with PLFS and harmonised data and
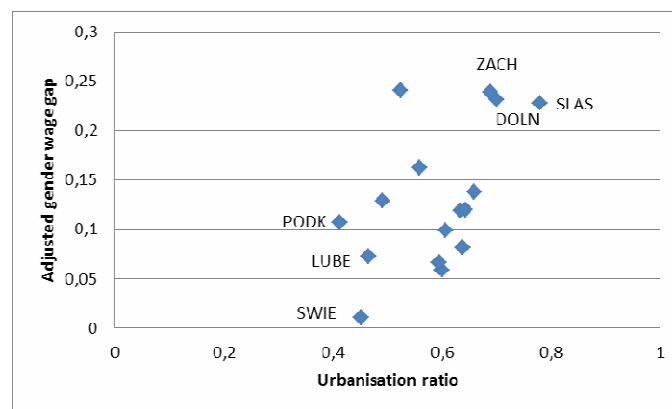
SWS and harmonised data (pp)
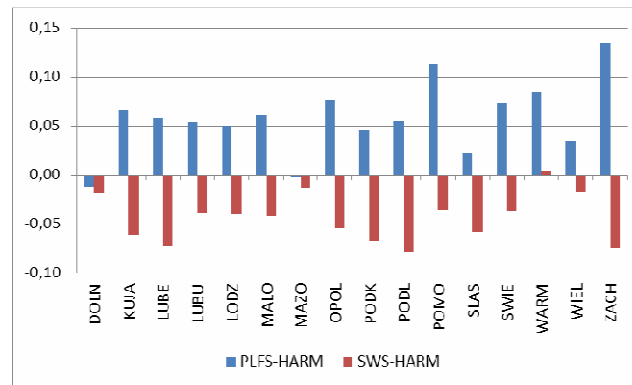
Source: own estimates.

Figure 6. The total and adjusted for the segregation bias gender wage gap in Poland and 16 NUTS2 regions (left, %) and the differences between them (right, pp)
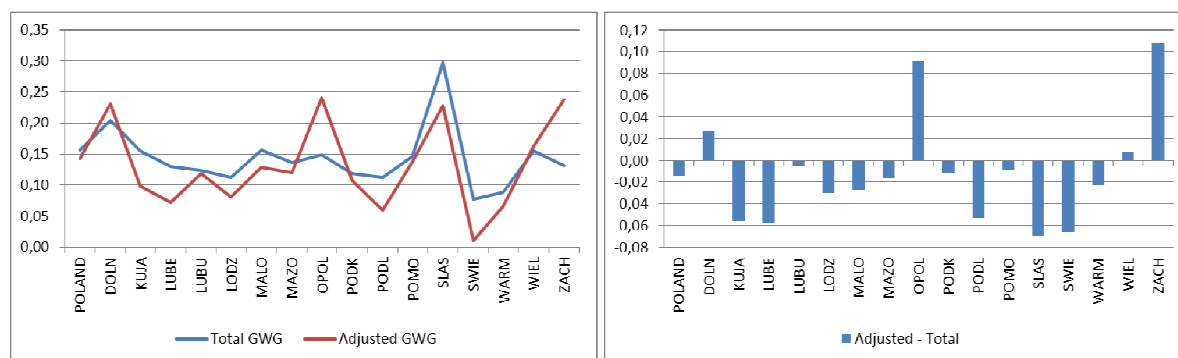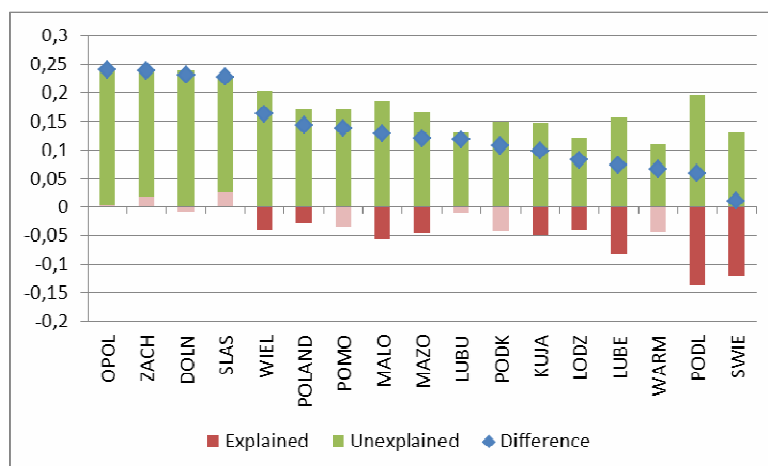

Source: own estimates.

Figure 7. Relation between urbanisation ratio and adjusted gender wage gap in Poland in 2010

Source: Local Data Bank and own estimates.

Figure 8. Oaxaca-Blinder decomposition of adjusted gender wage gap in Poland and in 16 NUTS2 regions in 2010.

Source: own estimates based on harmonised dataset.

Table 4. The results of the Principal Component Analysis

Components	Eigenvalue	Explained variance
Component 1	4.39266	0.5491
Component 2	1.80955	0.2262
Component 3	.834963	0.1044
Component 4	.751255	0.0939
Component 5	.166578	0.0208
Component 6	.035246	0.0044
Component 7	.008857	0.0011
Component 8	.000893	0.0001

Source: own calculations.

Table 5. Eigenvectors (no values reported for absolute loadings below 0.3)

Variable	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6	Comp 7	Comp 8
Unexplained		0.5365		0.6955	0.4190			
Education	0.4647					-0.6691	0.3321	0.4364
Experience			0.7061	0.4507	-0.3576			
Size	0.4563					0.5446	-0.3692	0.5184
Sector		-0.6995			0.6715			
NACE	-.4724					0.3174	0.6326	0.5095
Occupation		0.4391	0.5078	-0.5159	0.4803			
Interactions	-0.4523					-0.3371	-0.5608	0.5145

Source: own calculations.