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Gender employment gap in EU before and after the crisis

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Abstract

The gender gap in European labour markets presents different patterns across countries and years. In the late decades, the participation of men decreased, while the participation of women increased. The recent global crisis had a different impact on the employment of men and women that is reflected by a narrower gender gap. The paper aims to analyse the variation of employment gap in EU and to identify the factors with significant influence. The data used in the paper concern the time span 2003-2012. The methods applied in the study of gender gap variation under the influence of influence factors are the analysis of variance and the fixed effects model. The results of the study prove that, after the crisis, the gender gap in employment in EU shows some convergence, though there is important variation among regions and by education levels.

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Keywords: gender gap; labour market; global crisis; analysis of variance; panel data.

1. Introduction

In the last decades, the participation of men and women on the labour market showed different trends as men's participation decreased while women's participation increased. Therefore, the employment gender gap narrowed considerably, though it is far from being closed.

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The recent trends in employment gap are explained in Fitzenberger et al. (2001) by various factors such as: changes in the labour demand and supply, life cycle effects, cohort behaviour, institutional factors, migration, etc.

The increase of women's participation on the labour market could be explained by the rise in the labour demand that could not be satisfied only by men's labour force and by the substitution between men and women due to the lower wages of women compared to men. OECD (2012) shows that, in advanced economies, 85% of women are employed in services, mainly in education and health.

One consequence of the trends in the labour markets is the narrowing of the gender pay gap. However, earnings inequalities between men and women are persistent and are due individual qualifications and experience, though these factors are not the most important, but are easier to quantify, as described in Perrons (2009).

The institutional frameworks related to child care facilities and employment guarantee during maternity leave explain also the changes in the women participation on the labor market.

Moreover, the different employment patterns of men and women over the life cycle accounts for the divergent trends on the labour market. In their studies, Fitzenberger et al. (2001), OECD (1988), and Rubery et al. (1999) show that, traditionally, there are three age specific patterns of participation on the labour market: the inverted U-shaped curve (specific for men's employment), the M shaped curve (corresponding to women participation profile), and the left hand peak curve (specific to women that permanently exit labor market after marriage and children). However, the dissimilarities between the employment patterns of men and women have diminished in recent years.

There are also differences in gender gap across education levels. Labor force participation rates of men and women rise with increasing educational attainment as proved in Blossfeld and Hakim (1997). Thus, the gender gap in labor force participation is much narrower for those with higher levels of education than among those with lower levels of educational attainment, as described in OECD (2012) and Campa et al. (2009).

Another factor that explains the growth in female employment is the migration process. For example, Farré et al. (2011) and Guner et al. (2012) highlight that, in Spain, the effects of immigrants on native female labor supply are reflected by shorter children-related breaks from the labor market and later retirement from the labor force.

The global crisis caused important job losses in most countries. The effects of the global crisis on the participation of men and women on the labour market are different, and, as a consequence, the employment gender gap narrowed during the economic crisis.

OECD (2012) study illustrates that, in early stages of the crisis, male employment experienced a more important reduction compared to female employment. This could be explained by the decline in sectors with a predominantly male workforce such as trade, construction and manufacturing. On the contrary, the sectors where women are predominant, such as services, experienced only a moderate decrease in jobs or even a rise.

During the crisis, in many countries, women increased the number of worked hours to compensate for the employment loss of their partners. Hurley et al. (2011) explain that the growth in female employment has been higher in the top wage quintile, mainly because of the expansion of well-paid jobs in health and education.

This study aims to assess the gender gap in employment and its evolution under the influence of determinant factors. We compare the employment gender gap before and after the crisis for different EU regions in order to highlight the existence of convergence or differentiation and to identify the factors with influence.

The rest of the paper is structured as follows. In section 2 the population and the variables considered in the study are presented, as well as the methods applied in the analysis of employment gender gap variation. Section 3 presents the results obtained, while section 4 underlines the main conclusions of the study.

2. Data and method

2.1. Population and variables

The population considered in the study consists of the 28 member states of the European Union. The EU 28 member states are grouped according to the accession order in the following clusters: EU 15 (the 15 member states, namely Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxemburg, Netherlands, Norway, Portugal, Sweden, Switzerland, and UK), ACC10 (the 10 countries, namely Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia, that joined the EU in 2004), Romania and Bulgaria group (the two countries that joined the EU in 2007), and Croatia (2013).

The gender gap variation among the four groups of countries and its evolution in time are analysed considering the following indicators that describe the difference in gender according to employment and education:

- The gender employment gap – measured as the percentage point difference between the employment rates for men and for women.
- The gender employment gap by educational attainment; Three educational attainment levels are considered as defined by ISCED 1997 classification: pre-primary, primary and lower secondary education (levels 0-2), upper secondary and post-secondary non-tertiary education (levels 3 and 4), and first and second stage of tertiary education (levels 5 and 6).
- The gender employment gap in part-time workers measured in % of total employment.

Moreover, an indicator that reflect the economic development of the countries, that is the Gross Domestic Product per capita, is considered in the analysis with the aim to explain the variation of the employment gender gap in time and by countries.

The gender gap indicators and the GDP are observed for 10 years, from 2003 to 2012. In order to compare the gender employment gap before and after the crisis, we split the time span in two periods: before the crisis (the time span 2003-2008) and after the crisis (the time span 2009-2012).

The data source is the Labour Force database available from EUROSTAT.

2.2. Method

For the analysis of the variation of gender gap in employment by EU groups, we estimated the means of gender gap for total population and by education levels, at each of the two time points, before and after the crisis. We applied the general linear model (GLM) univariate procedure in SPSS.

The variation of gender employment gap under the influence of GDP, educational level and part-time work is estimated using a fixed effects model as described in Baltagi (2008). The estimated effects of explanatory variables on gender employment gap are net effects and are expressed by the β_j coefficients ($j=1, 2, \dots, k$) while the influence of country specific characteristics is expressed by the γ_i coefficients ($i=1, 2, \dots, n$), and the time influence is expressed by the δ_t coefficients ($t=1, 2, \dots, T$).

The country and time fixed effects model used in the study has the following expression:

$$Y_{(it)} = \beta_0 + \beta_1 X_{1(it)} + \dots + \beta_k X_{k(it)} + \gamma_1 C_1 + \dots + \gamma_{n-1} C_{n-1} + \delta_1 P_1 + \dots + \delta_{T-1} P_{T-1} + u_{(it)}$$

where:

- Y is the dependent variable, Gender employment gap (%) - *GG*;
- i represents the country identifier, $i=1, \dots, 28$;
- t represents the time identifier, $t=1, \dots, 10$;
- X_j are the explanatory variables, $j=1, \dots, 5$
  - X_1: Gross Domestic Product – *GDP*
  - X_2: Gender employment gap for primary and lower secondary education (%) – *GG_educ0-2*
  - X_3: Gender employment gap for upper secondary and post-secondary education (%) – *GG_educ3-4*
  - X_4: Gender employment gap for tertiary education (%) – *GG_educ5-6*
  - X_5: Gender gap for part-time workers (%) – *GG_part-time*
- $C_1, C_2, \dots, C_{n-1}$ are the dummy variables *Country*. The number of *Country* variables included in the model is equal to the number of countries minus 1;
- $P_1, P_2, \dots, P_{T-1}$ are the dummy variables *Time* and we have *T-1* time periods;
- β_j are the coefficients of the explanatory variables (the coefficients are common for all the countries);
- γ_i represents the coefficients of the dummy variables *Country*;
- δ_t represents the coefficients of the dummy variables *Time*;

- u is the error term of mean equal to 0.

The estimation of the fixed effects model is done using the SAS 9.2.

3. Results

3.1. The crisis impact on gender employment gap

In 2003, the gender gap was particularly high in the countries within the EU15. However it decreased constantly over the time span 2003-2012, especially after 2008. A different pattern can be seen for the ACC10 group, as well as for Croatia. For the ACC10 countries, the difference between the employment rate of men and women showed a constant level before 2008. The trend changes after 2008 when the gender gap shows a steep decline.

The lowest level for the gender gap is registered for the group formed of Romania and Bulgaria. For the group RO+BG, the employment gender gap increased before the crisis and started to drop off afterwards.

The convergence trend of the employment gender gap for the EU countries appears clearly after the crisis (see Fig. 1). The average values for the gender employment gap before and after the crisis are estimated for each group of countries.

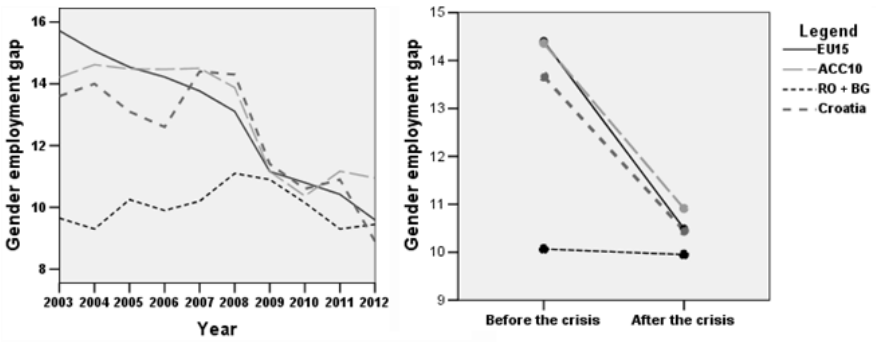

Fig.1. Gender employment gap evolution by EU groups over the period 2003-2012 and by sub-periods

The mean values of the gender employment gap are different between the two time periods. Furthermore, the distribution of countries according to gender employment gap is characterized by different values of the standard deviation; skweness and kurtosis, before and after the crisis (see Fig. 2).

Before the crisis, the estimated mean of the gender gap in employment for the EU15 group was 14.4%, while after the crisis it dropped to 10.49%. For the ACC10 group, the change in the employment gender gap before and after the crisis is also important. It declined from 14.36% to 10.91%.In Croatia, the gender gap fell by 3.22%, from 13.67% before the crisis to 10.45% after the crisis. The evolution of the gender gap in Romania and Bulgaria shows an insignificant decrease. During the time span before the crisis, the employment gender gap has an estimated mean value of 10.07% for RO+BG group , while after the crisis, the gender gap went down to 9.95%.

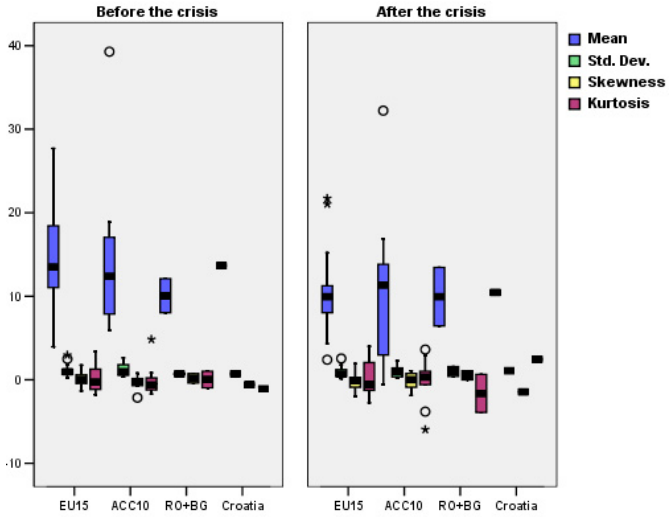

Fig.2. The distribution of statistical indicators of gender employment gap by EU groups

The dispersion of the mean levels of the gender employment gap, before and after the crisis, presents different patterns by group of countries. Thus, for EU 15, the dispersion of the mean levels decreases, while for ACC10 and RO+BG it increases. The same model could be seen for the distributions of the other statistical indicators of gender employment gap, namely the distribution of standard deviation, skewness and kurtosis. The effects of these changes are highlighted by the convergence in some regions, and divergence in other regions, respectively. The grounds for this situation could be found in the specific action of the determinant factors, such as education level, part-time work and GDP, on the gender gap in employment.

3.2. Gender employment gap by educational attainment

For all the four clusters and over the entire period, the gender employment gap is much narrower for the persons with high level of educational attainment than for those with lower levels of education.

For the EU15 cluster, the increase of educational attainment among employed persons is reflected by the decrease in the gender gap. Over the last decade, there is some convergence in the gender employment gap among the educational levels, due to the decreasing trend of the gender gap for the low educated persons.

For the ACC10 cluster, the highest difference between the employment rates of men and women is observed for secondary educational attainment. After a sudden decrease in the gender gap in the years following the crisis, the gender gap shows an upward trend during the last years.

For RO+BG the gender gap in employment shows no convergence according to the educational attainment, while for Croatia the gender gap has a decreasing trend especially for primary education attainment level.

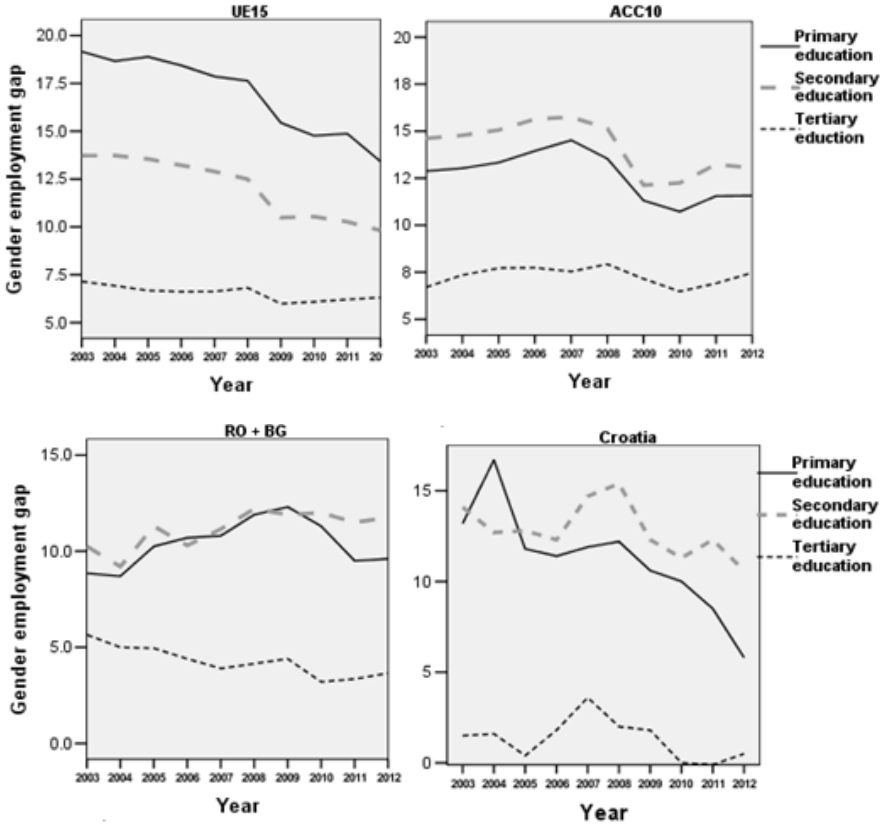

Fig.3. Gender employment gap evolution by EU groups and educational attainment

3.3. The variation of gender employment gap under the influence of GDP, educational level and part-time work

The fixed effects model is applied separately by group of countries. The estimates of the parameters β_0 and β_j with standard errors in parentheses are presented in Table 1.

Table 1. Parameter estimates for fixed effects models estimated for EU groups of countries over the period 2003-2012

Variable	EU 15	ACC10	RO+BG
Intercept	0.61676 (1.7076)	-1.88488 (0.8706)	0.32912 (0.9257)
GDP	0.07266* (0.0276)	-0.02059 (0.0198)	0.03312 (0.0273)
GG_educ0-2	0.27476*** (0.0321)	0.304978*** (0.0318)	0.00879 (0.1222)
GG_educ3-4	0.43974*** (0.0575)	0.517133*** (0.0439)	0.50338* (0.0937)
GG_educ5-6	0.19901** (0.0562)	0.294291*** (0.0529)	0.20546 (0.1384)
GG_part-time	-0.04784 (0.0488)	0.195349 (0.0780)	-0.19345 (0.4074)

% of significant Cross Sectional Effects	57.14%	100%	100%
% of significant Time Series Effects	77.78%	66.67%	66.67%
F Test for No Fixed Effects	33.86***	86.21***	22.80*

Note: *** p<0.0001, ** p<0.001, * p<0.01

Source: own computation in SAS 9.2

The GDP effect on gender gap is positive and significant only for the EU15 countries, while for the other groups the effect of GDP is not significant.

The influence of education levels on gender gap is significant. The highest effect is obtained for the upper secondary and post-secondary non-tertiary education level, for all the three groups of countries. The differences in the educational attainment of men and women influence the differences in the employment.

The difference in the percentages of significant country effects among the observed clusters points out that countries in the EU15 cluster are more heterogeneous than countries in the ACC10 cluster with respect to gender employment gap. The percent of the significant country effects for the EU15 cluster is 57.14%.

In the same time, the percentage of significant time effects is different among the observed clusters (77.78% of time effects are significant for the EU15 cluster as compared to 66.67% for the ACC10 cluster). The higher percent of significant time effects for EU15 cluster indicate a more important variation in time within this cluster compared to the other clusters.

4. Conclusions and discussions

The paper assessed the gender gap in employment and its evolution under the influence of determinant factors. In order to highlight the convergence or the differentiation of the gender employment in the EU countries, there were considered two time spans: before and after the crisis.

The analysis of the labour market indicators showed that gender employment gap narrowed during the last decades but is far from being closed.

The findings of the detailed analysis by groups of countries defined according to the accession order and by levels of education showed that, for all the four clusters and over the entire period, the gender employment gap is much narrower for the persons with high level of educational attainment than for those with lower levels of education.

The results of panel data regression proved that education had a significant influence on the gender employment gap, while the influence of GDP is significant only for EU15 cluster.

A further study should take into consideration the analysis of the convergence indicators in order to improve the interpretation of the results on gender employment gap.

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