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Segregation in Education: A Cross-National Com-
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Abstract

The main aims of this article are to conduct a cross-national comparison of levels of occupational gender segregation and to examine the relation between the level of occupational gender segregation and gender segregation in education (both vertical and horizontal). The analyses include 18 European countries covered by the European Social Survey (ESS) conducted in 2004. The comparison pays a special attention to the position of the Czech Republic and differences and similarities between the EU-15 countries and the new EU member states, i.e. post-socialist countries.

Key words: gender segregation, labour market, educational segregation, cross-national comparison

1. Introduction

Literature mentions a range of factors participating in the emergence and perpetuation of gender segregation in the labour market: labour market supply and demand, welfare state system, the level of economic development, the development of the tertiary sector, etc. This study focuses on exploration of the influence of human capital, or, in more concrete terms, of the level and field of education on occupational gender segregation.

The theory of human capital indicates that the more skills and experience an individual acquire thanks to the system of education or to her or his participation in the labour market, the more successful her or his participation in the labour market is, including the rate of pay (Chiplin, Sloane 1976). The increasing qualification of women in relation to the qualification of men should therefore contribute to the gender equality in the labour market. Consequently, it is possible to assume that the increasing level of education will be accompanied by the decreasing level of occupational gender segregation. However, the existing empirical studies do not confirm this kind of direct relation. Although the level of education of women has risen dramatically over the last decades and women now a days spend in education as many years as men it not more, the occupational gender segregation does not show any substantial changes. A possible explanation is that women and men choose, or, as a matter of fact, are directed towards a choice of different fields of education, and thus contribute to the gender segregation in the sphere of education. Men are overrepresented in the fields of study which are different from those of dominated by women. Research confirms that this tendency does not change significantly over time, not even in those countries, where women participate sufficiently in the labour market, or where a campaign has been led for the promotion of democratic and non-discriminatory practices in the system of education Bradley (2000). As long as most of women acquire education in traditionally “feminine” fields of study from childhood, which prepare them for a participation in the labour market in occupations, which do not enable a quick and easy promotion, but are characteristic with lower reward, it is then not surprising that women, on average, earn less than men, their advancement on the career ladder is slower, and thus achieve the supervisory positions less often.

It is, therefore, the objective of this article: 1) to conduct a cross-national comparison of occupational gender segregation and 2) to explore the relation between the occupational gender segregation and the horizontal and vertical gender segregation in education. The comparison will

involve 18 European countries, for which there were available data in the European Social Survey (ESS) from 2004. This comparison will pay a particular attention to the situation in the new EU member states including thus the Czech Republic. This article will then attempt at interpretation of the level of gender segregation in these countries placed in a wider European context.

The most important contribution of this article is its attempt at relating information on occupational gender segregation to the data on educational gender segregation, investigating both its vertical form (segregation by the level of education) and its horizontal form (field of education). In the existing accessible data sources, allowing cross-national comparison, there were completely missing data specifying the field of respondents' educational attainment, the information which would enable the analysis of horizontal segregation in education. For that reason, the empirical analyses scrutinizing the relation between educational segregation and segregation in the labour market are only possible now. The ESS (2004) survey provided indispensable data to test hypotheses on the interconnection between occupational gender segregation and the horizontal and vertical educational segregation.

While the previous research into horizontal educational segregation was limited mainly to the subpopulation with tertiary education, this text focuses on the respondents across all levels of education.

Furthermore, the article contributes to the academic debate on the process of gender segregation by including new EU member states. Literature touches on the segregational effects of socialist regimes and their impact on the women's position in the labour market in the present time (Hakim 1992, Chang 2000, Sirovátka 2004); however, a systematic comparison including both old and new EU countries has not yet come into existence.

The paper is outlined as follows: the first chapter defines the occupational gender segregation and its relation with the gender segregation in education. The second chapter specifies and operationalizes the main research questions, as well as defines the main research hypotheses and describes the ESS data, methods and techniques. The third chapter presents the output of our analyses, which is the cross-national comparison of the level of occupational gender segregation contextualized and related to the educational gender segregation. The fourth and last chapter summarizes briefly the main results of our analyses and relates them to their theoretical starting points.

2. Theory and Existing Research Concerning Gender Segregation in the Labour Market

There are a few ways to conceptualize gender segregation in the labour market. Literature mentions two basic kinds of gender segregation in the labour market: horizontal and vertical. Horizontal segregation may be defined as high concentration of men or women in a particular sector of the labour market or in particular occupations. A labour market showing a strong horizontal segregation harbours a lot of clearly separated typically male or typically female occupations or sectors (Reskin 1993). Vertical segregation may be characterized as a disproportional participation of women or men at different degree levels of occupational hierarchy, for instance in supervisory positions, middle management, in positions requiring a certain degree of responsibility and made distinct by a possibility of defining the work of subordinates, etc. In the majority of European countries, women are found at lower degree levels of the job ladder, holding supervisory positions less often than men (Coré 1999).

While working with the concept of gender segregation, which is the major topic of this study, we must be aware of the fact that all categorizations of occupations in the labour market, applied

empirically and existing so far, do not strictly pursue only the horizontal layer of segregation. Simultaneously, they carry an implicit reference to the vertical segregation in the labour market. Considering, for example, the following three categories of employment – manager/ress, teacher, and labourer – it becomes evident that these categories do not only represent three distinguishable sorts of employment by their type, they concurrently involve a notion of hierarchy. The significance of these three types is not merely horizontal (“nominal”), but also vertical (“ordinal”). This is why theoretical positioning of occupational gender segregation as the horizontal type of segregation remains inaccurate to a significant extent.

2.1. Occupational Gender Segregation

Occupational gender segregation is characterized by the fact that women or men are strongly overrepresented in certain categories of employment which in turn create relatively separated female or male segments of the labour market. Empirical studies confirm that women are overrepresented in the service sector – mainly its public section – as far as the sectors are concerned (Charles 1992, Coré 1999, Bettio 2002, Esping-Andersen 2002). Coré (1999) states that more than half of observed occupational categories in the OECD countries are (fe)male dominated (the [fe]male share being 80%). A closer examination of particular occupations reveals that women are mainly concentrated in administrative occupations, service sector and trade. Alternatively, men are overrepresented in managerial and technical occupations (Charles 1992). Analyses of time series and trends have proven that gender segregation within occupational categories remains relatively stable in the course of time and does not decline in the majority of countries (Bettio 2002). This is true even about countries which have endeavoured to intervene in the form affirmative action in order to lower gender segregation.

Authors, as for example Charles (1992) and Bettio (2002), mention an existing and statistically significant relation between the female employment rate and occupational gender segregation. There is a higher level of gender segregation in the countries with a higher rate of female participation in the labour market¹. The Scandinavian countries are the European leaders in the female employment rate; however, looking at women’s and men’s shares in particular occupations, the Scandinavian labour market comes out as sustaining gender-segregation. Hakim (1992) evidences this situation and states that gender segregation is a real problem in the countries which ideologically promote, or did so in the past, equality of social opportunities for women and men. The countries he uses as examples include not only Sweden, but also the former Soviet Union or Israel. Assuming direct proportionality between the rate of female participation in the labour market and the level of horizontal segregation enables us to expect that the countries

¹ Studying the labour force participation rate from the gender perspective, we notice a trend lasting for several decades. Next to the traditionally high and for decades unchanging active male participation in the formal labour market in all European countries (70-85%), the rate of female participation in paid forms of employment rises continuously. The female inactivity rate in the labour market¹ in the EU-15 dropped from 48% in 1980 to 27% in 2001. Not only is there a growing number of single women entering the labour market, but also the employment of mothers of young children increases continuously (Cook 2001, ILO 2003). The Scandinavian countries, the Netherlands and Great Britain may boast of the highest rates of female employment (more than 65%). On the contrary, the lowest rate of employment which does not surpass 55% may be found in Italy, Greece, Spain, Poland, Hungary, Slovakia and Luxembourg. In Germany, France, Ireland, the Czech Republic, Cyprus, Latvia, Slovenia and Estonia the rate of employment fluctuates between 55 and 60% (http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL).

with a low rate of female participation in the labour market (i.e. Italy, Greece and Spain) have got labour markets with the least developed gender segregation (Bettio 2002).

Gender segregation in the labour market is also related to part-time women workers' participation in the labour market. Bettio (2002) states that the more women work part-time in a given country, the higher is the level of horizontal segregation for the country. Part-time work is the most wide-spread in the private sector which is what may shed light on this fact; this is also why it is much attractive for women who desire to combine career and family life. Another possible way to explain this might be the fact that employers tend to appoint men into full-time positions as they are less likely to go part-time for family reasons.

2.2. Factors Influencing Occupational Gender Segregation

There are many factors which determine or influence occupational gender segregation, among others for example: the influence of state intervention briefly (equal opportunities policies, antidiscriminatory policies, policies to enable balancing career and family life), the factors of labour force demand (female labour demand, employers' preferences) and other factors of labour force supply (workers' preferences and their human capital). This text will unveil merely the influence of factors tied with the human capital (education) of workers.

2.2.1. Education and Gender Segregation in the Labour Market

(Chiplin, Sloane 1976). As far as the educational attainment is concerned, As the relation between the occupational gender segregation and educational gender segregation forms the key question of this study, this problematics will be scrutinized in the following subchapter.

The main goal of this study is to compare the level of occupational gender segregation across different countries in the context of gender-based segregation by the level (vertical segregation in education) and field of education (horizontal segregation in education). The human capital theory represents influential argument related to labour supply and the position of women in the labour market. Its basic thesis assumes that the improving level of women's education and of qualification (skills and experience acquired through the system of education or through work experience) pushes up the rate of female participation in the labour market as well as its quality and women's rate of pay. The theory of human capital presupposes as well the growing level of educational attainment and improvement of skills applicable in the labour market to bring about gender desegregation of the labour market (Chiplin, Sloane 1976, Charles 1992, Charles 2002, Hakim 2002).

Coré (1999) holds that despite the fact that the education gender gap has been closing over the past decades, occupational gender segregation has not changed significantly since the 1970s. Nowadays young women spend more years in the educational process than men, and the numbers of women attaining tertiary education equate or even surpass those of men (http://www.oecd.org/document/31/0,2340,en_2649_37455_33710751_1_1_1_37455,00.html). Thus, young women have caught up with men or even surpassed them in some countries; this development, though, has not significantly affected the level of gender segregation in the labour market. These facts about the level of educational attainment raise a question of whether it is not rather the field of education than its level, what determines the later career of an individual.

As Charles (1992) highlights, within the modern, bureaucratized, output- and efficiency-oriented societies, the qualification and the type of skills are decisive for the subsequent integration into the labour market. Provided that differences between women's and men's skills

and qualifications exist, they will re-emerge in the form of their positioning in the labour market. The reproduced gender-based division of skills results in the segregation in the labour market. Thus, the choice of the field of study may predetermine the whole of the future professional career.

A closer examination of academic programs shows that boys' and girls' choices differ substantially. According to Esping-Andersen (2002) programs as health care and social care are dominated by women (84%) as well as humanities (69%), whereas the female share at technical colleges is mere 15%. On the contrary, men dominate sciences and technical fields as information technologies and engineering programs.

Especially inspiring work to this study is by Bradley, Charles and Hakim. Bradley (2000) compares tertiary gender segregation in different countries and concludes that horizontal gender segregation in education does not show significant changes over decades, not even in those countries, where a campaign has been led for the promotion of democratic and non-discriminatory practices in the system of education (i.e. Sweden). She further argues that the highest level of gender segregation remains in the Scandinavian countries which promote equality of opportunities. Bradley states that unequal shares in (fe)male representation in academic programs exist where the female enrolment at academic programs is higher than male and maintains that horizontal gender segregation in education tends to persist and outlast the vertical gender segregation.

There are clear consequences affecting women's participation in the labour market. Charles (2002) names as the main causes culturally embedded gender patterns and structural barriers. These cause women to anticipate a more difficult access to certain positions and certain environments during the process of selecting the future field of study, therefore they select fields which will transform into an easier and more acceptable career. Hakim's arguments (2002) relate to this fact when she maintains that women emphasize atmosphere and relationships in the working environment far more than men. They select such fields of study that will later enable them to find a job corresponding with their expectations and preferences

Although many authors recognize a close implication of horizontal segregation in education with the horizontal segregation in the labour market, none of them investigates the given topic systematically nor evidences it by empirical data covering a whole of adult population active in the labour market.

The accessible studies investigating the problematic of horizontal segregation in education limit their analyses to the subpopulation of tertiary students and ignore gender segmentation in lower study programs. This article gives the first evidence of the horizontal segregation in education at all its levels. This allows us to link the facts about gender segregation in education to those about occupational gender segregation.

The field of education substantially influences the position in the labour market. If the majority of women and men acquire education in gender-typical fields, they will probably end up in typically female or male employments, the female one being characteristic by lower rewards. The gender segregation has come full circle (segregation in education, segregation in the labour market, gender pay gap), while the choice of the study program stands at its very beginning. It is the objective of the following chapter of this study to fill in the blank spaces on the map of empirical analyses that deal with the linkage between gender segregation in education and in the labour market.

3. Empirical Part

3.1. Main Research Questions, Indicators, Hypotheses, Data

The subject of this analysis is a comparison of several European countries from the perspective of occupational gender segregation and of vertical and horizontal segregation in education.

To identify the occupational position, we applied a complete Goldthorpe scheme of 11 classes. Based on an individual's classification in the labour market – whether he or she participates on the demand side or the supply side or neither – three basic class positions may be recognized in the Goldthorpe class scheme: employers, employees and self-employed. Employers are further divided into large and small. Hotel owners, shop owners, restaurant owners or owners of smaller companies are marked as large employers and they make up class I. Smaller employers differ from the large owners as to the number of employees: they most probably employ dozens of workers than hundreds (class IVa and IVc), or do not employ any (class IVb and class IVc). Furthermore, smaller employers differ from the larger ones in their share in the company management.

The class position of employees is differentiated by the type of working agreement or the employer-employee relation. One side is taken by those who have entered an employment contract. The employer-employee relation is therefore a service relation. The other side is taken by workers who have entered a labour contract. The employer-employee relation is defined by the means of job performance.

The employment contract establishing a service relation typifies all professionals, managers, higher-grade technicians and higher-grade administrators and officials. Depending on the level of education, decision-making responsibility and the rate of pay, we may distinguish between higher class (class I) and lower class (class II). All labourers are typified by the labour contract. They may be distinguished into industrial and agricultural labourers. Skilled workers in industry make up a separate class (class VI). They differ from the remaining classes (unskilled workers class VIIa and farm labours VIIb) in the rate of pay, stability of employment and the extent of autonomy.

There are positions in between these classes which are formed by contract of employment, but this contract combines two types: service relation and labour contract. Their income consists of two parts: contractual pay and performance-based wage. This category consists of routine non manual employees (sales, administration and services). Depending on the level of income and expertise, the category is divided into a higher-grade rank (class IIIa), where the positions are mostly occupied by men, and a lower-grade rank (class IIIb), mostly occupied by women (working conditions do not differentiate this class substantially from unskilled manual workers). Furthermore, lower-grade technicians and supervisors also range among these positions (class V). It is especially difficult to specify whether the reward within this group depends on the service relation or whether it is performance-based. In most cases their employment may be qualified as the “service relation,” which distinguishes them from workers (class VI a VII).

Those who do not employ anybody and those not employed range into the category of self-employed. The type of their entrepreneurial activities fits them either into the industrial sector (class IVb) or agriculture (class IVc). The difference between the self-employed farmers (class IVc) and farm labours (class VIIb) is that the former are holders, the latter employees. Regarding the land tenure, the family-oriented organisation of agricultural production, and the source of income, it is necessary, according to Goldthorpe and his colleagues, to distinguish them into two classes.

Insert table no. 1

To identify the level of education (vertical dimension of educational attainment) we applied the ISCED97 system of seven levels.² We modified this system into a system of four levels by merging categories 0) and 1), categories 3) and 4), and categories 5) and 6). The following analysis therefore works with these levels of education: *basic education*; *vocational or technical education*; *secondary education* and *tertiary education*.

Insert table no. 2

As an indicator of the type of education, we used the ESS question of what field or program the respondents' highest qualification is in.³ Respondents could select one of fourteen categories, by which the whole of the scope of possible study programs was represented: general (not specific) field, humanities, technical and engineering programs, agriculture and forestry, teacher training education, science and mathematics, medical studies and health service, economics and commerce, social studies, law and legal service, personal care service, public order and safety, transport and communication.

Insert table no. 3

The main hypotheses tested in this study are as follows: Based on the above mentioned theoretical and empirical evidence, the countries with a high level of horizontal gender segregation in education will presumably show a high level of horizontal occupational gender segregation in the labour market. Supposedly, segregation of women and men across varied fields of study will be reflected in the gender segregation in the labour market. Based on the evidence presented in the 2.2.1.subchapter, the level of vertical gender segregation in education across the sample countries is not expected to reproduce the level of occupational gender segregation.

To analyse occupational and educational gender segregation we use data from the *European Social Survey (ESS)*.⁴ There are two facts recommending the ESS data. First, the survey covers both old and new EU member states. This facilitates hypotheses testing of differences between

² ISCED 1997 (International Standard Classification of Education) comprises the following levels of education: 0) Pre-primary education; 1) Primary education or first stage of basic education; 2) Lower secondary or second stage of basic education; 3) (Upper) secondary education; 4) Post-secondary and non-tertiary education; 5) First stage of tertiary education; 6) Second stage of tertiary education (cf. International Standard Classification of Education, 1997)

³ The original wording of the question about the field of study, as it is recorded in the international ESS questionnaire. F6a - In which of these fields is your highest qualification? 1) general or not specific field, 2) art – fine or applied, 3) humanities – languages, classics, history, theology, etc., 4) Technical and engineering, 5) agriculture and forestry, 6) teacher training education, 7) science, mathematics, computing, 8) medical, health service, nursing, 9) economics, commerce, business administration, accountancy, 10) social and behavioral studies, public administration, media, culture, sport and leisure studies, 11) law and legal service, 12) personal care services, 13) public order and safety, 14) transport and communication. Owing to a lot of researchers' critical view of this question because of its low variance of answers from respondents with lower educational attainment, we applied descriptive techniques to examine whether or not their answers are concentrated in two or three categories. Our analyses did not prove the variance of respondents' answers to be limited in a significant manner.

⁴ Specifically, the ESS (2004) data from the Round 2 file are included: the *Integrated File – Edition 2.0*. This round covered 26 countries and was fielded in the years 2004 and 2005. To achieve comparability and a sufficient number of respondents in respective social classes, we had to exclude eight countries from the analysis. Slovenia; The analysis combines design weight (dweight) and probability weight (pweight).

post-socialist countries and old EU member states. Second, the data contain information on the type of education. This is an important fact, as a lot of cross-national research focuses merely on the indicator of the highest level of educational attainment, but the information on its type is missing. In order to compare occupational gender segregation across various countries in the context of horizontal segregation in education, the ESS appears to be an ideal data source.

3.1.2. Index of Gender Segregation

As the participation rate of economically active population by class and gender is marked by the type of occupational structure, and, simultaneously, the female and male shares in particular levels of education are affected by the educational structure, the data will be analysed with the help of the index of gender segregation designed by Maria Charles and David Grusky (1995). This index enables us to identify a “net” sex ratio in particular occupational categories, levels of education or fields of education.

The index of gender segregation is based on classification of both the general (for a state) and the specific (for every occupational category or educational category separately in a particular country) gender segregation score. This score shows the rate of relative segregation by sex and is represented by the *ratio index* (R). Contrary to the (fe)male participation rate in occupational or educational categories, this index is not influenced by multinational difference in occupational and educational structures across particular countries. The index is computed in the following way:

$$R = 1/I \sum_{i=1}^I \{\ln(F_i / M_i) - [1/I \sum_{i=1}^I \ln(F_i / M_i)]\},$$

where F_i is the number of women in a given employment or educational level, i , M_i is the number of men in a given occupational class position, level of education or field of education, i , and I is the number of occupational or educational categories.

Values of R give the sum for individual class-specific or education-specific deviations from proportional representation of the sexes in a class average or educational category. The factor indicative of to what extent women in a given country are disproportionately represented in the labour market or in the educational structure is indicated by $\exp(R)$. A situation in the labour market or within educational structure which does not show any gender segregation, $R = 0$ and $\exp(R) = 1$. With ultimate gender segregation, R cannot be identified as $M_i = 0$ in every typically female occupation, at every level of education or field of education (Charles, Grusky 1992; Charles 1992).

Besides the over whole ratio index R and $\exp(R)$ we can obtained as well the ratio index score of gender segregation in particular occupational positions or educational level or field (the specific R_i). This value is computed by deviating the ratio of females to males in the i^{th} occupational (or educational) category and the corresponding ratios averaged from all occupational positions (or educational levels or fields). The ratio index score is computed as follows:

$$R_i = \ln(F_i / M_i) - [1/I \sum_{i=1}^I \ln(F_i / M_i)],$$

where the terms are defined as in the previous case. The parameter for each class position may be interpreted as a deviation of the given class position from equal representation of women and men in this class position.

Working with the index described above, it is necessary to take into account the fact that index is sensitive to the number of categories which enter the analysis. Too large categories, associating too many occupations or types of education make the index into a very rough tool for exposing gender segregation. A general rule is that the rougher is the categorization, the less accurate data about gender segregation you achieve.

3.2. Results of Analyses

3.2.1. Level of Gender Segregation in the Labour Market and in Education

The first column of table 4 shows the ratio index of segregation (R) in the labour markets of the sample of 18 European countries. The second column indicated as $\exp(R)$ is more interesting to look at for the sake of interpretation. It measures the overrepresentation of women or men in average occupation (if the sample of occupational categories is complete). For instance in Ireland, men or women are overrepresented by the factor of 2.72 in the average Irish occupation. Slovenia shows the factor of 1.40. We may then conclude that the level of gender segregation in the labour market is higher by 94 % (or by the factor of 1.94) than in Slovenia (computed as $2.72/1.40=1.94$). The Czech Republic is located among countries with a lower level of occupational gender segregation (the Czech Republic is evidently at the beginning of the last third of the ladder of countries ordered according to the ratio index of gender segregation). Another 11 columns of table 3 show the ratio index score of gender segregation in particular class positions (we mean the specific R_i).

Looking at average scores for all analysed countries (the bottom-line in the table) we can conclude that gender segregation in the European labour market exists. Women are overrepresented in class II (*lower-grade administrators, and officials; higher grade technicians, managers in small industrial establishments; supervisors of non-manual employees*), IIIa (*routine non-manual employees, higher grade – administration and commerce, salespeople, service sector employees*), IIIb (*Routine non manual employees, lower grade (sales and services)*), IVb (*small proprietors, artisans with no employees*) and slightly in class VIIa (*Unskilled workers outside the primary production*). Men dominate class I (*higher-grade administrators, and officials; managers in large industrial establishments; large proprietors*), IVa (*small proprietors, artisans with employees*), IVc (*farmers and small holders; other self-employed workers in primary production*), V (*lower grade technicians; supervisors of manual workers*), VI (*Skilled workers*) and VIIb (*agricultural and other workers in primary production*). The Czech Republic has got a similar pattern as there is in Europe.

The Czech Republic differs significantly from the European mean values especially in categories IVb and IVc – women are represented above the European average among small proprietors, artisans, with no employees (difference = 0,5) men are often farmers, small holders and self-employed in primary production (difference $R= 1,4$). Furthermore, in comparison to the European average, women are more often represented in class IIIa (*routine nonmanual employees*) and VIIa (*unskilled workers outside the primary production*), on the contrary, men prevail in class I (*professionals, managers, high-grade salariat*) a V (*supervisors of manual workers*).

Insert table no. 4

Table 5 shows the level of vertical gender segregation in education, which is the level of segregation regarding the level of education in the select sample countries. The computation is, as well as with occupational gender segregation, based on the ratio index. Four levels of education entered the analysis: basic, vocational, secondary and tertiary. The data document that the highest segregation by the level of education among men and women exists in Germany, Ukraine, Poland, Switzerland and the Netherlands. Contrarily, the most equal distribution of men and women across all levels of education exists in Estonia, Belgium, Denmark Finland, and the Czech Republic. The Czech Republic shows the most disproportionate representation by gender in the category of vocational education, where women are overrepresented. The remaining categories show an altogether balanced ratio.

Insert table no. 5

The Czech Republic appears as a country with a larger share of women with vocational training as compared to the European average. Other categories reproduce the European average.

The third type of segregation that we will scrutinize in this study is the horizontal segregation in education. As stated above, this type of segregation examines the disproportional representation of men and women in different fields of the educational attainment. Table 6 shows that the highest level of gender segregation in the system of education exists in Finland, Sweden, Slovakia, Belgium, Ukraine and Ireland. The most even distribution of men and women across different fields of study is in Estonia, Austria, Germany and the Czech Republic. The Czech Republic ranges among the five countries which may boast of the lowest level of average segregation of men and women in different fields of study.

Focus on the Czech Republic brings to light that women are significantly overrepresented in the fields of study as medicine and health service, personal care service, teacher training education, economics, commerce and business administration, and humanities. Contrarily, male dominated fields are public order and safety, transport and communication, technical and engineering programs, agriculture and forestry, science and mathematics. This is also a composition corresponding to the European average, showed in the bottom line of the table.

Comparing the differences between the countries within the vertical and horizontal gender segregation in education, it becomes clear that there is a distinct separation of men from women in the sphere of fields of education. By implication, the difference between the country with the highest index score of segregation by the level of education and its lowest score accounts to 44%. Consequently, German score of vertical gender segregation in education is by 44% higher than Estonian. The countries show a much more significant difference in horizontal gender segregation in education. The difference between the lowest index score and its highest level amounts to 68%; this means that the Finnish level of gender segregation by the field of study is higher by 68% than the Estonian.

Insert table no. 6

When focusing on the comparison of partial categories in the Czech Republic with the European average, men are overrepresented in technical and engineering programs (difference $R = 1.88$), women in medicine and health care services (1,09), and personal care services (1,06). Contrasted with the European average, Czech women acquire education less often in the fields as

transport and communication, Czech men study law and legal services programs less often than it appears to be current in Europe.

3.2.2. Relation between Gender Segregation in the Labour Market and Educational Gender Segregation

The text which is to follow will concentrate on the occupational gender segregation and educational gender segregation. We will employ a descriptive comparison of the ratio index score (R) in the sample countries.

Figure 1 compares occupational and vertical gender segregation in education in the analysed sample of countries. All countries show higher values for occupational gender segregation than gender segregation within the levels of educational attainment. The values representing the Czech Republic are located very close to Finland, Belgium, Austria and Denmark, which are all countries characterised by a low level of segregation in educational attainment and by an average level of occupational segregation. The remaining new EU member states, i.e. post-socialist countries (apart from Poland), sustain relatively good values when compared to other European countries. Slovakia and Slovenia demonstrate a very low level of occupational segregation while the level of vertical segregation in education fluctuates slightly above the European average.

Insert figure no. 1

Figure 2 relates the level of occupational gender segregation to the level of segregation within the educational attainment in the analysed sample of 18 European countries. Comparing figures 1 and 2, the difference between the level of horizontal gender segregation in education and occupational gender segregation becomes quickly evident: it is not significant. Belonging to countries with exceptional scores are: Finland (with a relatively high level of segregation within the field of study whereas the level of occupational gender segregation belongs to the lowest in Europe), Estonia (where exists extremely low level of segregation within the field of study, whereas the level of occupational gender segregation remains comparable to the European average) and Slovenia (where the level of segregation within the field of study is average when placed into the European context but the level of occupational gender segregation is the lowest in Europe). The Czech Republic belongs in the group of countries, where the levels of both types of segregation are almost identical. Compared to other countries involved in the sample, it demonstrates relatively low values.

As far as the relation between the gender segregation in the labour market and horizontal segregation in education, the Czech Republic is located near the countries with a lower level of gender segregation in education and of the segregation in the labour market, which is near the countries as Austria, Germany, and, to certain extent, Portugal. The remaining new member states, apart from Slovakia, sustain relatively good values as well.

Insert figure no. 2

4. Conclusions

An important finding implicated in the analyses which have been undertaken reveals that the sample countries differ as to the occupational gender segregation. The difference amounts to as much as 94%, meaning that the country with the highest level of segregation (Ireland) proves to have a double level of occupational gender segregation when compared to the one of the lowest congregational levels (Slovenia). The sample countries vary much less when compared by the criterion of horizontal educational segregation. The countries' values show a difference of 68%. We detected values indicating an ideal distribution of men and women in the area of level of educational attainment: the values do not exceed 44%.

Our analyses have documented that the highest level of occupational gender segregation, as defined in this research, exists in Ireland, the Netherlands, Norway, Ukraine and the Scandinavian countries. The Czech Republic has got the seventh lowest ratio index of occupational segregation. There is only lower level of segregation in Belgium, Estonia, Portugal, Greece, Slovenia and Slovakia. We may infer that the lower level of occupational segregation is characteristic of the new member states, being lower than in the most of old member states. In other words, the labour market in the new member states (i.e. in the post-socialist countries) does not show a propensity towards segregating into typically (fe)male categories. Female dominated types of employment in the Czech Republic are mainly routine nonmanual employment in administration and higher-grade positions in commerce, routine nonmanual lower-grade positions in commerce and service sector, sales assistant positions and service sector employees, small proprietors and artisans with no employees. Men are overrepresented in professional and managerial occupations, in positions of supervisors of manual workers, small proprietors with employees, and among workers and farm labour.

Comparing European countries through the prism of gender segregation by the field of study, the evidently highest level of gender segregation in the system of education exists in Finland, Sweden, Slovakia, Belgium, Ukraine and Ireland. Most of these countries also demonstrate significantly high rates of gender segregation in the labour market. On the other hand, women and men are relatively least isolated in individual fields of study of educational systems in Estonia, Germany, Austria, the Czech Republic, Portugal, Switzerland and Greece. As far as the horizontal educational structure is concerned, the Czech Republic is located on the fourth degree level out of eighteen. Further focus on the Czech Republic reveals that women are overrepresented in the study programs such as medicine and health services, personal care, teacher training education, economics and commerce, and humanities. Contrarily, male dominated fields are public order and safety, transport and communication, technical and engineering programs, agriculture and forestry, science and mathematics.

Completing this information with the vertical segregation data, and hence of difference in (fe)male share in different positions across levels of educational attainment, it shows that the Czech Republic retains a good position even in this area. It occupies the fifth place. Less significant differences between women and men regarding the level of educational attainment exist only in Denmark, Finland, Belgium and Estonia. This, in turn, implies that despite the relatively small differences between women and men in the Scandinavian countries as far as education is concerned, the male-female ratio in different fields of study demonstrates that women prefer to a large extent only a few specific study programs. Germany reveals the largest difference in the level of educational attainment; however, the horizontal segregation in education is not extensive. The category with the least balanced male-female ratio in the Czech Republic is

that of vocational education: here women are overrepresented. On the whole, the remaining categories show a balanced ratio.

The data analysis shows that most of the post-socialist countries proved to sustain a relatively low level of gender segregation both in the labour market and in education.

The data presented support the inference that the level of occupational gender segregation is more closely intertwined with the horizontal segregation in education than with the vertical segregation in education. The descriptive figures included in our study show that the differences among different countries as to the level of vertical segregation in education are so small that it is a complicated process to identify any kind of relation between vertical segregation in education and the segregation in the labour market. This is different, though, in case of horizontal segregation in education. Most of the analyzed countries – with the only exceptions of Estonia, Finland and Belgium – demonstrate that the higher the level of gender disparity across different occupational categories, the higher the level of gender disparity across different fields of study. The Czech Republic, Austria, and Germany thus range among the countries with relatively low levels of occupational gender segregation and of gender segregation in education. On the other hand, the highest levels of occupational segregation and horizontal segregation in education may be found in Sweden, Ireland, and the Netherlands.

The outcomes of our analysis suggest that there horizontal segregation in education is more closely related to the occupational gender segregation than the vertical segregation in education. On the basis of our descriptive data we can observe that the higher the horizontal segregation in education the higher occupation segregation. In the following research we would like to test these findings by using more sophisticated statistical techniques which would allow us to statistically test the magnitude and statistical significance the effect of the level gender segregation in education on the level occupational.

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Tables and Figures:

Table 1: Economically Active Population by Sex across All the Sample European Countries

EGP class scheme		Men	Women	Total
I	Higher-grade professionals, administrators, and officials; managers in large industrial establishments; large proprietors.	14.61	7.28	10.77
II	Lower-grade professionals, administrators, and officials; higher grade technicians; managers in small industrial establishments; supervisors of non-manual employees.	18.69	19.56	19.14
IIIa	Routine non-manual employees, higher grade - administration and commerce.	5.56	19.14	12.67
IIIb	Routine non manual employees, lower grade (sales and services).	5.57	19.53	12.87
IVa	Small proprietors, artisans, etc, with employees.	2.05	1.11	1.56
IVb	Small proprietors, artisans, etc, with no employees.	1.54	2.11	1.84
V	Lower grade technicians; supervisors of manual workers.	6.23	1.17	3.58
VI	Skilled workers.	20	8.27	13.86
VIIa	Unskilled workers outside the primary sector.	19.06	15.86	17.39
VIIb	Farm labours (agricultural and other workers in primary production)	3.85	4.16	4.01
IVc	Farmers, etc. (farmers and small holders; other self-employed workers in primary production).	2.85	1.8	2.3

Source: ESS 2004

Table 2: Educational Structure by Sex in 18 European Countries

Education	Men	Women	Total
Basic	16.6	19.36	18.09
Vocational	21.78	20.6	21.14
Secondary	41.41	42.23	41.85
Tertiary	20.21	17.81	18.92

Source: ESS 2004

Table 3: Fields of Study Outline by Sex in All the Sample European Countries

Type of Education	Men	Women	Total
General or not specific	25.24	30.54	28.06
Art – fine or applied	1.77	1.99	1.89
Humanities	3.29	4.93	4.16
Technical and engineering	32.09	5.55	17.97
Agriculture and forestry	5.12	4.17	4.61
Teacher training education	2.51	6.73	4.76
Science and mathematics	6.12	3.23	4.58
Medical and health service	2.3	10.7	6.77
Economics and commerce	8.99	15.04	12.21
Social studies and public administration	2.61	4.35	3.53
Law and legal service	1.12	0.99	1.05
Personal care services	3.68	10.89	7.52
Public order and safety	1.91	0.31	1.06
Transport and communication	3.24	0.58	1.83

Source: ESS 2004

Table 4: Ratio Index of Occupational Gender Segregation across Different European Countries

Country	Ratio Index		Ratio Index for Particular Class Categories										
	R	exp R	I	II	IIIa	IIIb	IVa	IVb	V	VI	VIIa	VIIb	IVc
Ireland	1,00	2,72	-0,68	0	1,64	0,87	-0,75	1,49	-0,89	-0,56	0,15	-0,98	-0,4
Netherlands	0,96	2,61	-0,53	0,45	1,1	1,51	-0,18	0,38	-1,65	-0,44	0,23	-0,17	-0,91
Norway	0,94	2,55	-0,88	-0,11	1,36	1,95	0,17	0,13	-1,76	-0,73	0,49	-0,03	-0,56
Ukraine	0,93	2,53	-0,77	0,23	0,85	1,31	0,62	0,25	-1,45	-0,79	0,06	0,6	-0,78
Sweden	0,91	2,48	-0,98	0,32	1,56	1,34	-0,35	0,77	-1,83	-1,01	0,12	0,01	0,08
Finland	0,87	2,39	-0,65	0,28	1,69	1,81	-0,81	0,84	-0,84	-0,79	-0,06	-0,94	-0,67
Denmark	0,85	2,35	0,07	0,39	0,9	1,22	-0,14	0,57	-1,31	-0,52	0,21	-0,36	-1,43
Britain	0,83	2,29	-0,75	0,56	1,83	2,22	-1,29	-0,32	-1,44	-1,03	0,07	0,07	0,02
Poland	0,80	2,22	-0,29	0,33	1,66	1,63	-0,24	0,83	-0,73	-0,42	-0,23	-2,06	-0,75
Austria	0,77	2,15	-0,59	-0,12	1,22	0,88	-0,53	0,17	-1,86	-0,32	0,17	0,77	0,09
Germany	0,76	2,14	-0,25	0,93	1,96	1,88	0,06	0,61	-0,96	-0,86	-0,02	-1,15	-2,36
Switzerland	0,74	2,10	-0,45	0,94	1,29	1,6	-0,5	0,6	-1,15	-0,3	0,71	-1,4	-1,62
Czech Republic	0,70	2,02	-0,19	0,21	1,64	1,71	-0,46	0,96	-1,59	-0,77	0,41	-0,12	-2,26
Belgium	0,69	1,99	-0,47	0,37	1,54	1,68	-0,58	0,6	-2,06	-0,9	-0,33	0,1	0,14
Estonia	0,65	1,91	-0,23	0,11	0,56	0,91	-0,85	0,74	-1,31	-0,1	0,23	0,83	-0,9
Portugal	0,62	1,85	-0,31	0,26	1,5	2,15	0,25	0,58	-1,56	-1,1	0,07	-0,64	-1,54

Greece	0,61	1,84	0,18	0,18	0,09	0,3	-0,78	-0,55	-0,5	0,41	0,58	0,09	-0,02
Slovakia	0,60	1,82	-0,31	0	1,47	1,43	-0,6	0,1	-1,35	-0,39	-0,31	0,26	-0,37
Slovinia	0,33	1,40	-0,19	0,5	2,17	1,95	-0,46	-0,1	-1,51	-0,4	-0,26	0,62	-2,07
Average	0,77	2,18	-0,44	0,31	1,37	1,49	-0,39	0,46	-1,36	-0,58	0,12	-0,24	-0,86

Source: ESS 2004

The countries reported in the table are ordered by the values of the average index, from its highest rate, i.e. from the highest level of gender segregation in the labour market to its lowest rate.

The higher the value of the average index, the higher is the level of gender segregation. Negative values stand for male overrepresentation.

I Higher-grade professionals, officials and administrators; managers in large industrial establishments; large proprietors.; **II** lower-grade professionals, administrators, and officials; higher grade technicians; managers in small industrial establishments; supervisors of non-manual employees; **IIIa** Routine non manual employees, higher grade (sales and services); **IIIb** Routine non manual employees, lower grade (sales and services); **IVa** Small proprietors, artisans, etc., with employees; **Ivb** small proprietors, artisans, etc., with no employees; **V** Lower grade technicians; supervisors of manual workers; **VI** Skilled workers; **VIIa** Unskilled workers outside the primary sector; **VIIb** Farm labours (agricultural and other workers in primary production); **IVc** Farmers and small holders; other self-employed workers in primary production.

Table 5: Ratio Index for Vertical Gender Segregation across Different European Countries

Country	Ratio index		Ratio index for particular educational categories			
	R	exp R	basic	vocational	secondary	tertiary
Germany	0.45	1.58	0.60	0.47	0.08	-0.66
Ukraine	0.31	1.37	0.42	0.35	0.17	0.31
Poland	0.30	1.35	0.07	-0.48	0.27	0.38
Switzerland	0.29	1.34	0.16	0.52	0.06	-0.43
Netherlands	0.28	1.33	0.34	0.42	0.12	-0.24
Slovenia	0.27	1.31	0.44	-0.43	0.19	0.02
Greece	0.22	1.25	0.40	-0.09	0.16	-0.23
Ireland	0.22	1.24	-0.18	0.14	0.34	0.22
Slovakia	0.21	1.24	0.23	0.33	-0.15	-0.16
Portugal	0.17	1.19	-0.01	0.16	0.21	0.31
Austria	0.16	1.18	0.15	0.19	0.04	-0.28
Sweden	0.16	1.17	0.01	-0.10	-0.25	0.27
Norway	0.15	1.16	0.35	-0.01	-0.13	-0.10
Czech Republic	0.15	1.16	0.03	0.45	-0.03	-0.08
Denmark	0.14	1.15	-0.13	0.23	-0.09	0.11
Finland	0.12	1.13	-0.04	0.01	-0.08	0.35
Belgium	0.10	1.11	0.22	-0.03	-0.10	0.06
Estonia	0.09	1.10	0.10	0.01	-0.25	0.01

Average	0.21	1.24	0.17	0.12	0.03	-0.01
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Source: ESS 2004

The countries reported in the table are ordered by the values of the average index, from its highest rate, i.e. from the highest level of vertical gender segregation in education to its lowest level

The higher the value of the average index, the higher is the level of gender segregation.

Table 6: Ratio Index for Gender Segregation by the Field of Study across Different European Countries

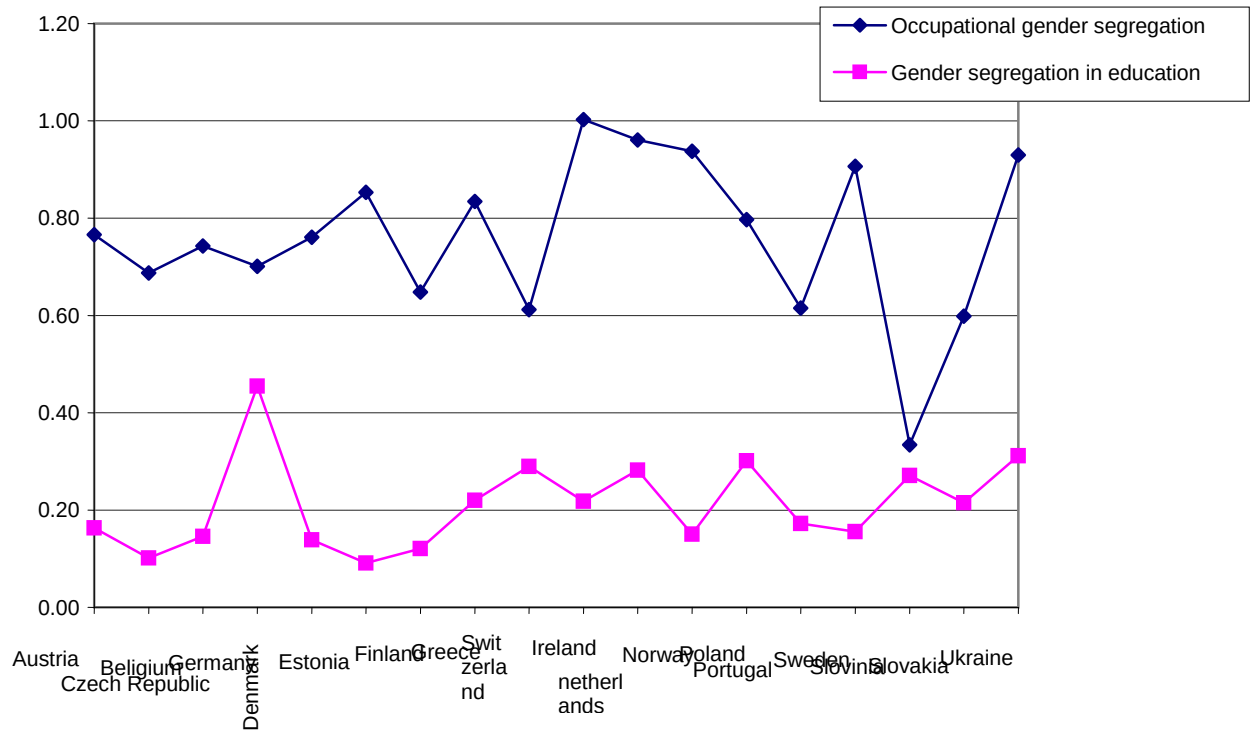
Country	Ratio Index															
	R	exp R	General or not specific field	Arts	Humanities	Technical and engineering,	Agriculture and forestry	teacher training education	Science, Mathematics and computing	Medical, health service, nursing	Economics, commerce, business administration	Social studies, public administration	Law and legal services	Personal care services	Public order and safety	Transport and communication
Finland	1.10	3.02	0.1	1.22	0.67	-	-	0.67	0.17	1.8	0.67	1.73	0.34	1.34	-3.39	-
Sweden	1.10	2.99	-	0.59	0.22	-	-	1.72	2.11	-0.4	0.28	0.93	1.36	1.99	-1.23	1.17
Slovakia	1.09	2.96	-	1.14	1.01	0.5	-	0.86	2.37	-1.8	0.64	1.13	0.64	-2	-2.51	2.12
Belgium	1.04	2.84	0.74	0.66	0.64	-	-	1.47	1.17	2.02	0.64	0.86	0.45	1.3	-0.54	-
Ukraine	1.02	2.78	-	-0.1	1.56	1.72	-	2.12	1.13	-	-	-	1.47	1.27	-0.12	1.01
Irland	0.99	2.69	0.29	0.6	1.85	-	-	-0.97	1.87	0.23	0.87	0	1.08	1.71	-1.27	0.59
Netherlan ds	0.97	2.64	0.03	-2.3	1.57	1.21	-	1.71	0.42	1.13	0.19	1.84	1.78	1.53	-0.03	0
Denmark	0.97	2.63	0.65	0.48	0.51	-	-	1.34	0.46	2.15	0.24	0.22	0.55	1.45	-1.1	-
Poland	0.94	2.56	-	1.31	0.54	2.58	-	0.39	0.04	0.67	-	-2.9	1.27	0.63	-2.12	0.72
Norway	0.93	2.53	-	-1.6	0.76	0.95	-	0.15	0.84	0	2.01	1.19	1.39	0.19	0.71	-
Slovinsko	0.89	2.44	-0.1	2.36	0.61	0.66	-	1.58	3.93	-	0.21	1.29	0.12	2.08	-0.06	1.91
Greece	0.88	2.41	0.73	0.36	0.83	2.41	-	1.53	0.19	1.44	0.45	1.05	0.19	2.53	-4.81	-
Switzerlan d	0.87	2.40	0.68	-0.1	1.97	0.91	-	0.97	0.11	1.44	0.67	0.88	0.05	0.3	-4.07	-
Portugal	0.83	2.29	0.87	-0.1	2.05	1.35	-	0.13	0.71	-	-	1.9	0.67	1.14	-3.18	1.09
Czech Repulic	0.77	2.16	0.08	-0.1	0.78	-1.3	-	1.17	0.44	1.67	0.82	0.33	-0.6	1.03	-1.61	-
Austria	0.75	2.12	0.57	0.24	0.63	2.18	-	0.73	0.06	1.47	0.65	0.77	0.61	0.93	-0.69	2.13
Germany	0.74	2.09	0.43	0.48	0.03	1.77	-	1.06	1.03	1.49	0.55	0.54	-0.3	1.07	-1.25	-
Estonia	0.59	1.80	0.17	0.99	0.2	2.14	-	0.6	0.48	1.33	0.4	0.5	0.3	0.33	-0.19	-
Average	0.91	2.52	0.05	0.34	0.47	0.58	0.07	0.96	0.51	0.58	0.33	0.38	0.16	0.03	-1.53	0.71

Source: ESS 2004

The countries reported in the table are ordered by the values of the average index, from its highest rate, i.e. from the highest level of horizontal gender segregation in education to its lowest rate.

The higher the value of the average index, the higher is the level of gender segregation.

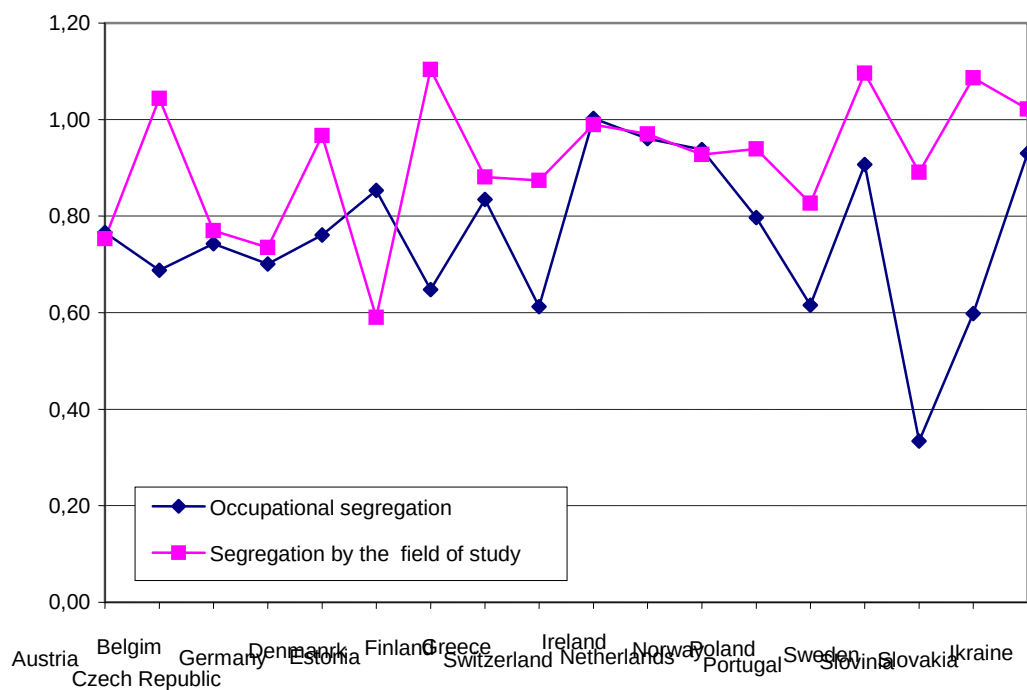
Figure 1. Comparison of occupational gender segregation and of gender segregation in education across different EU countries



Source: ESS 2004

The figure represents the values of the average index R from tables 4 and 5

Figure 2. Comparison of occupational segregation and of segregation by the field of study across different EU states



Source: ESS 2004

The figure represents the values of the ratio index R from tables 4 and 6.



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What is offered?

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Topics

The major resource offered to visitors is access to a series of internationally comparable longitudinal surveys on living conditions at the household and individual level. The anonymised micro-data provide information on wages and income, health, education, employment and professional activities, accommodation, social relations,... Comparable micro-data are available for EU countries, Central European countries, as well as the USA. These data offer opportunities to carry out research in fields such as *survey and panel data methodology, income distribution and welfare, income and poverty dynamics, multi-dimensional indicators of poverty and deprivation, gender, ethnic and social inequality, unemployment and labour supply behaviour, education and training, social protection and redistributive policies, fertility and family structures, new information technologies in households and firms, ...*

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