Stephanie Steinmetz

The Contextual Challenges of Occupational Sex Segregation

Deciphering Cross-National Differences in Europe

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Amsterdam, October 2011 Stephanie Steinmetz

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"It would be a thousand pities if women
wrote like men, or lived like men, or looked
like men, for if two sexes are quite inadequate,
considering the vastness and variety of the
world, how should we manage with one only?
Ought not education to bring out and fortify the
differences rather than the similarities?"
- Virginia Woolf -

1 The state of the art in occupational sex segregation research

Modern societies are affected by various processes of social change, like the increase of formal education, the shift of demographic structures and the structural change of work. In particular the latter phenomenon is often discussed as a crucial part of the social modernisation of societies in their course of the transition from an industrial to a service-orientated economy. It implies a shift in the distribution of occupations and jobs which is usually linked with other elements of the labour market determining in various ways the life chances of working people and their families.

Gender relations on the labour market are shaped by complex processes. Gender is embedded in the interplay of changing economic structures, state policies, cultural ideas and historical traditions. Gender differences within the labour market arise from conditions both inside and outside the labour market, and most importantly from their interrelations (Bruegle and Perrons 1995). In this context, regulatory frameworks as well as general economic and political-institutional structures are crucial determinants of employment and working conditions, particularly for women (Rubery et al. 1998). They may be more important to women's employment than specific gender equality policies. Labour market policies, industrial relations and collective bargaining systems, for instance, are likely to have a deep impact on the relationship between the sexes on the labour market. However, a further important reason for gender differences on the labour market is the organisation of the family and the welfare system which determines the extent to which care work is performed in the household or through public or private services in the wage economy.

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Over the past decades women have increasingly been involved in the labour market in all EU Member States. Moreover, the development of female participation is now considered a means to respond to the increasing demand for a qualified work force, whereas it has been perceived as a threat to demographic stability and the labour market equilibrium in the past (Blau et al. 1998b, Rubery et al. 1999a, Rubery et al. 2001b, Fenstermaker and West 2002, Anxo et al. 2007). In view of an aging population, the development of female employment appears as a means to preserve the equilibrium between active and inactive population segments - an equilibrium that is central to economic growth and distribution of welfare. Finally, the development of female employment can also be considered a necessary protection for women and their children against an increasing risk of poverty and instability of family life (Fagan et al. 2006).

The increased participation of women in the labour market is due to the fact that the formal education of girls has risen in the last forty years, and that women scrutinise their traditional role as housewife and mother more and more critically. Women's labour market participation is no longer regarded as 'temporary' and women continue to work when they get married or give birth to a child. Consequently, the sex composition of occupations has faced a specific change: women can currently be found in occupations and positions from which they were excluded in the past. Despite all progress some concerns remain that these changes have not fundamentally increased equal opportunities between women and men in the labour market and in society. It has been argued that although women have gained access to occupations and positions from which they were excluded in the past, they are still concentrated in the service sector and rarely hold jobs at the top. Moreover, they tend to be found in 'precarious' and 'highly flexible' jobs and are often disadvantaged in respect of social security and income. The situation can be described with the words of Cyba (1998, p. 37) as "limited integration with restricted possibilities - nothing really changed in spite of the improved participation of women on the labour market".

These negative facets of female employment are components of a phenomenon that has been labelled 'occupational sex segregation'. Generally, the concept refers to the fact that women and men work in different occupations and sectors, are assigned to different hierarchical levels, and, very often, work under different terms and conditions. Several researchers pointed out that occupational sex segregation includes two dimensions:

> "Horizontal occupational segregation exists when men and women are most commonly working in different types of occupation. Vertical occupational segregation exists when men and women are most commonly working in higher grade occupations and women are most commonly working in lower grade occupations, or vice versa" (Hakim 1979: 19).

Occupational sex segregation is a phenomenon that can be observed throughout the world (Anker 1998). It is widespread in every region, at all levels of economic development, under all political systems, and in diverse religious, social and cultural environments. The growing interest in occupational sex segregation may also be explained by its link with sex differences in status, prestige and income (Beller 1982). Policy debates often describe occupational segregation by sex as an important source of labour market inefficiency and rigidity. It represents exclusion as well as wasteful use of human resources, since many persons who are qualified and appropriate for an occupation may be excluded because of their sex. Accordingly, it is not surprising that international organisations identified occupational segregation as the main barrier to women's full participation in the labour market, and argued for policies that would 'integrate' all occupations.[1]

Furthermore, the polarisation of labour markets by sex is both cause and consequence of gender stereotypes which have a negative effect on educational and training decisions early in life and later on decisions concerning the question which parent will disrupt his or her career to look after young children. In this way, it perpetuates gender inequalities into future generations and leads to unequal opportunities undermining one of the cornerstones of overall equality in society (Melkas and Anker 1997: 342).

In consequence, from a political point of view, the request of the European Union to further gender equality in the labour market and clarify the role of gender equality as an indicator of societal and economical progress, makes it indispensable to describe and analyse occupational sex segregation. The scientific interest in sex segregation is motivated by its theoretically unexpected persistence, its tight connection to other forms of sex specific inequalities, such as the status or wage gap, and by the methodological question of adequate measurement. In sum, attempts to explain and describe the labour market participation of women should devote attention to the amount and the pattern of sex segregation (Anker 1998).

1.1. A short review of issues in occupational sex segregation research

Before sex segregation could take centre stage in sociology, it had to emerge from the shadow of the status attainment framework[2], dominating sociological

[1] The OECD (2002) identified occupational segregation as a major labour market rigidity inhibiting the efficient use of labour, and a source of labour market inequalities in pay and other benefits.

[2] The status-attainment approach attempts to explain social mobility patterns by identifying those attributes which seem to facilitate the movement of individuals into desirable occupations. The core

research on inequality during the 1970s. When feminist research questions entered sociology, results were puzzling, pointing to the fact that the status attainment approach was inappropriate with respect to gender inequality (Acker 1980).[3]

By the time, sex segregation became a central component of gender inequality research. This expanding effort devoted to understand occupational segregation by sex culminated in the 1980s and 1990s in numerous articles, books and studies in Europe as well as in the United States. In this context, different research strands emerged, treating aspects of the phenomenon methodologically (Duncan and Duncan 1955, Watts 1992, Charles and Grusky 1995) and theoretically (Hakim 1993, Blackburn et al. 2002, Achatz 2005), and comprising analyses from micro- and/or macro-sociological perspectives (Gross 1968, Oppenheimer 1970, Snyder et al. 1978, Semyonov 1980, Jacobs 1989b, Charles 1992, Reskin 1994, Hakim 1996, Nermo 1999, Preston 1999, Charles and Grusky 2004). Perhaps even more important, researchers brought to light the social and economic cost of occupational sex segregation. There has been tremendous research on the relationship between segregation and the gender wage gap (Tienda et al. 1987, England et al. 1988, Petersen and Morgan 1995, Wright et al. 1995, Blau and Kahn 2000, Grimshaw and Rubery 2001, Engelbrech and Nagel 2002), before discovering the relation with other conditions of work (fewer benefits etc.).

To provide an overview of the main research interests and recent empirical findings, the following section presents and summarises three important research areas in the field of sex segregation. As the discussion, to a large extent, focuses on methodological aspects, this issue will be examined in greater detail in chapter three.

1.1.1. Different working spheres - occupational sex typing and concentration

The gender-specific division of work prevailing in any society is a 'historical product' of human development shaped by events, ideologies and social structures which themselves embody past and present experiences of gender (Bradley 1989, Buchmann and Charles 1995). However, the fundamental separation of

question addressed is to what extent occupational outcomes are shaped by family of origin rather than personal attributes such as education. It depends upon the assumption that individuals are allocated to positions ordered in a continuous uni-dimensional hierarchy, like occupational prestige or status scales (for a useful overview of the major contributions see Treiman and Ganzeboom (1992, 1996).

[3] An important finding was that gender inequality could not be reduced to social class: women and men can be in the same social class but have very different gender statuses.

'private' and 'professional' spheres firstly emerged with the development of market systems (Kreckel 1993) establishing a 'doctrine of separated spheres': women were related to the household and men situated in professional employment (Durkheim 1964, Marx Ferree 1990, Reskin and Padavix 1994). Many social actors worked (implicitly or explicitly) together to make the 'male-breadwinner' and 'female-home maker' model the social norm, with the family wage as an essential element (Fraser 1994, Kreimer 2004). However, the male breadwinner system has never been in effect for all women. At all times, most families could not survive on the sole basis of male income. Consequently, a complete separation never took place. Nonetheless, patterns of sex segregation were clearly visible in the division of occupations, sectors and industries. The system was stabilised via different mechanisms, such as limitations on access to occupations requiring a high qualification, such as medicine (Wetterer 1993). Moreover, health and safety regulations always had some excluding effects besides their protection function (see Münz and Neyer 1986), while marriage bars excluded women from the labour market completely (for the US see Goldin 1990).

Accordingly, the sex-specific separation of men and women on the labour market constitutes a core aspect of sex segregation research focusing on reasons and consequences of the unequal distribution of men and women across occupations and occupational hierarchies (Hayes 1989, Coventry 1999, Greed 2000, Whittock 2002, Cohen and Huffman 2003). Depending on the applied methods and the centre of interest, it has been shown that men dominate administrative and managerial occupations as well as scientific professions in the field of physics, mathematics and engineering. Occupations in the manual and production sector are also predominately male. Women, by contrast, are highly represented in a small number of occupational groups. A study of the OCED (2002) shows that nearly 75% of all female employment relates to 19 occupations out of 114. Moreover, it is possible to identify four female occupational areas, when comparing countries: clerical work, sales work, health-related occupations and, finally, teaching professions. Besides the fact that labour markets are divided by gender in all developed countries, occupational sex segregation became more elaborate and varied. For instance, a shift from men to women emerged in specific occupations (like clerks).[4] Nevertheless, there is a lack of consistent patterns among nations: waiters, for example, can be predominately male in one country, while it is predominantly female in another.

A further aspect in sex segregation research is the question why women are less represented in prestigious occupations, why they earn less and why they

[4] It is interesting to see that occupational feminisation is far more likely than masculinisation.

have lower career prospects. Vertical segregation often seems to develop within an occupation when women enter in increasing numbers (Reskin and Roos 1990). Even though empirical results demonstrate that the gender wage gap has narrowed over the past decades, women, on average, still earn less than men (Horrell 1989, O'Neill and Polachek 1993, Polacheck 2004, Plantenga and Remery 2006b).[5] In this respect, gender differences in observable characteristics that influence productivity, such as education, potential experience and job tenure, account for little of the remaining gender gap in wages. Besides the observable gender wage gap, studies have shown that women entering male-dominated occupations often obtain the least desirable jobs (Epstein 1970a/b, Cohn 1985, Bielby and Bielby 1988, Preston 1995). Men, in contrast, tend to get a higher salary and better positions than their female counterparts in typically female occupations (Williams 1995, Budig 2002, Cognard-Black 2004).

1.1.2. Development of occupational sex segregation - change or persistence?

A further branch of research mainly focuses on reasons for and consequences of changes in occupational sex segregation. Labour markets are not continuously in stable equilibrium but rather in a constant process of change, due to economic, technological, and social developments (Hartmann 1987, Bagilhole 1994, 2002). In this respect, it seems important that short-term forces, like labour market and employment reactions to business cycle fluctuations, as well as long-term changes in the skilled structure of employment or the qualification structure of labour supply might influence segregation processes (Asthon et al. 1990, Jacobs and Lim 1992, Rubery and Fagan 1995, Evans 1999, Müller and Wolbers 1999). As a consequence, the occupational structure is changing, occupational practice is shifting, and successive changes in production methods result in a quicker outdating of specialised knowledge and skills.

Explanations for change reach from social control theories (Epstein 1970a, Strober and Catanzarite 1994)[6], the 'queuing model'[7] (Reskin and Roos 1990) to

[5] This holds particularly if the enormous share of women working part-time is taken into account.

[6] The persistence of segregation is explained with the so-called 'male gate-keeping behaviour'. Men try to keep women out of their domain fearing that occupations are downgraded (with respect to earnings). Women, on the other side, avoid male occupations not only because of sexual harassment but also due to the specific 'male' culture (see Hacker 1981). When these negative sanctions disappear women more readily enter male occupations. However, once the gender designation of occupations has been determined, employers have little incentive to change them (Arrow 1973).

[7] The advantage of this model is that it does not only focus on changes in the sex composition but also considers the complex system in which processes of change are embedded. It factors into the equation the demand for labour, the forms and sources of labour supply, systems and levels of skill formation, patterns of industrial organisation, social and cultural attitudes, forms of work organisa-

the 'critical mass theory' (Kanter 1977a).[8] The influence of a 'female model of success' (Burke and McKeen 1990, Savenye 1990, Gibson 2004, Preston 2004), assuming that women make judgments about their working relation in comparison to other women's careers, has been examined in recent years. Moreover, the autonomous rise of egalitarian values and enhanced access of women to educational, political and social institutions may have broadened women's access to desired positions in society (Meyer 1994, Parsons 1994).

Besides these developments, it is interesting that change in occupational sex segregation has been slow and that certain occupations have remained 'hyper-segregated'[9]. Studies in this area mainly analyse changes within occupations, organisations, industries or countries (Bertraux 1991, Preston 1993, 1995, Cotter et al. 1995a/b, Blau et al. 1998a). Gross (1968), for instance, was the first who documented the remarkable stability of occupational sex segregation by gender for the US labour market. Numerous researchers followed over the next three decades showing that occupational sex segregation has indeed declined since 1970, but at a modest rate (Snyder et al. 1978, Blau and Hendricks 1979, Williams 1979, England 1981, Beller 1984, Jacobs 1989a, Carlson 1992, Charles 1992, King 1992, Jacobson 1994, 1997, Anker 1998, Rubery et al. 1999a). This confirms the result of occupational sex segregation as a time-stable phenomenon not only in the United States but also worldwide.[10] This stability over time seems of particular importance because it indicates that sex segregation has been immune against equalising forces, such as changes in attitudes towards gender roles and the precipitous increase in women's educational attainment and labour market participation during the last decades. In this period, there have also been political initiatives and campaigns to encourage young people to opt for non-gendered career patterns. The attitudes of young people towards gender roles, moreover, changed. Nevertheless, these changes are not reflected in their educational and occupational choices. The high persistence of

tion, economic rewards of the job, trade union organisation and changes brought about by equal opportunities legislation.

[8] There is disagreement on the criteria for the critical mass. It ranges from 20% (Kanter 1977b), over 30% (Reskin and Roos 1990) to 35% (Gale 1994). However, it should be questioned whether a quantifiable target can be established as a criterion for change. In this respect, the different nature and organisation of occupations held by women as well as the different power positions should be taken into account (Bryne 1978, Lantz 1982, Zimmer 1988, Williams 1992).

[9] While in some sectors/occupations desegregation occurs (like in professional and managerial jobs), some female-typed occupations (like secretary, and school teachers) have been resistant to change or have become more female-dominated (Cohn 1985, Rubery and Fagan 1995, Jonung 1998).

[10] Even though at present there are signs of falling occupational segregation among younger workers, workers with a low level of educational attainment and with children tend to be more occupationally segregated than highly educated and childless workers.

educational and occupational sex segregation indicates that young people continue to follow traditional gender patterns.

Against this background, it seems that large and systematic reductions in occupational sex segregation may only occur due to fundamental 'shocks' to the social system (defined as economic or state interventions). Bielby and Baron (1984), for instance, assume that large-scale economic changes, like changes in unemployment rates or industrialisation, alter the character of employment and gender dynamics within the labour force and might therefore also alter segregation processes.

1.1.3. Occupational sex segregation across nations

While some of the discussed results point towards similarities in patterns of segregation between countries, a closer inspection reveals important national differences. The research strand focusing on cross-national differences in occupational sex segregation appeared to open new perspectives and tasks in analysing the division of labour markets based on sex. As Anker (1998: 10) underlines "They help to identify the extent to which various aspects of occupational segregation by sex are universal in nature as opposed to being specific to a particular culture, country or region..."

Older studies primarily rely on the comparison of segregation indices. Anker (1998: 175), for example, found the highest degree of segregation in the Middle East and North Africa, average levels in OECD countries, and the lowest levels in the Asian and Pacific region. However, within the OECD countries, he surprisingly shows that the Nordic countries, known for their developed gender-egalitarian policies, reach the highest level of occupational sex segregation (see also Melkas and Anker 1997, Nermo 2000), while the lowest values can be observed in Southern Europe where a more traditional division of labour between men and women is still dominant (Moltó 1992, Conduto de Sousa 2005). Meadows (1996), in addition, shows that in many Southern EU countries, men appear to be more willing to take jobs traditionally held by women than in Northern European countries (like catering and waiting). Meanwhile, scholars also focus on the relation of cross-national variations in patterns of occupational segregation and various macro-economic factors (Charles 1992, Cotter et al. 1997, Chang 2000, Bettio 2002, Dolado et al. 2002, Charles and Grusky 2004). In this respect, the effect of institutional, structural and cultural determinants, like the female employment rate, the size of the service sector as well as social policies and egalitarian forces, have been analysed.

Cross-national studies focusing on the vertical dimension of segregation mostly analyse determinants of the gender wage gap (Treiman and Roos 1983, Blau and Kahn 1992, 1996, OECD 2002, Jurajda 2005). The findings reveal substantial differences in the gender wage gap across countries. It is smallest in the Mediterranean countries and highest in Anglo-Saxon countries like the United States and the United Kingdom. As to explanations for cross-national differences in the gender wage gap, studies underline the importance of institutional factors. For example, Blau and Kahn (2003) have found that more compressed male wage structures and lower female net supply are both associated with a lower gender gap in earnings. Moreover, where collective bargaining coverage is high, the gender pay gap is low. A study by Boeri et al. (2005) supports this result. It examines the effect of country-specific institutions, such as employment protection and parental leave policies as well as product market regulation, on the gender wage gap. The main findings show that a high union bargaining coverage tends to decrease the gender wage gap, while more generous parental leave policies seem to significantly increase it.[11]

Based on the presented results of contemporary segregation research, the findings can be summarized as follows:

a. Although women tend to be more educated and more attached to employment, occupational sex segregation is still a crucial characteristic of modern labour markets;
b. Even in times of increasing egalitarian values, change in occupational sex segregation, particularly with respect to the horizontal dimension, is very slow;
c. Even though occupational sex segregation is a universal phenomenon, individual patterns and varying degrees of intensity are to be found from country to country. For instance, while countries with high egalitarian principles reach the highest values of occupational sex segregation, traditional countries are characterised by relatively moderate levels.

Finally, it has to be pointed out that recent research devotes attention to the distribution of the sexes across labour market structures other than occupations. Job-level analyses have burgeoned in popularity (Tomaskovic-Devey 1993, 1995). The analysis of firm-level data demonstrates that there is inter-firm segregation influencing earnings, career opportunities and other labour market outcomes (Bielby and Baron 1986, Petersen and Morgan 1995, Hinz and Schübel 2001, Tomaskovic-Devey and Skaggs 2001, Weeden and Sørensen 2001, Kaufmann 2002).

[11] Rosenfeld and Kalleberg (1990) found also an indirect effect of family policies on the gender wage gap.

1.2. Occupational sex segregation and European gender policies

As pointed out above, institutional contexts and cultural traditions have a deep impact on individual employment decisions during the life course. They seem of particular importance for women as they are essential for the ability of balancing employment and family responsibilities. The close link between employment issues on the one hand, and gender equality on the other, has also been underlined by Rubery et al. (1998: 17). They present three main arguments: the first argument emphasises that employment policy is critical to gender equality, because there is little evidence that women will achieve greater power without first improving their position in the labour market. The second argument addresses the goal of high employment in Europe that will not be achieved without further and major expansion of women's involvement in the labour market. The last argument arises from the fact that employment does not only have a productive but also a social reproductive role. In this respect, it is essential that social structures are in flux and that employment policies need to be integrated into a broader agenda, involving a more articulated development of employment, family and welfare policy.

Against this background, various efforts have been made by the EU, with its diverse institutional and cultural settings, to harmonise and create a common basis for the equal treatment of men and women in general, and more specifically on the labour market. The EU equality legislation defines the principle of equal treatment as a prohibition of discrimination on grounds of sex and marital status aiming at material equality, e.g. an equal distribution of work, care tasks and income between men and women implying a change in the life of both (Treaty of Amsterdam, Article 3[2] EC, Council Directive76/207/ EEC).[12]

In this respect, an analysis of the development of the European Employment Strategy (EES) during the last 10 years reveals that the 'gender dimension' within employment has undergone fundamental changes. In the initial EES version (1997-2002), the strengthening of equal opportunities policies for women and men constituted one of the four pillars[13] under which all employment guidelines were organised. One of the main aims was the closing of so-called 'gender gaps' in the labour market, defined as gaps in employment and unemployment, gender segregation or unequal payment.[14] The Commission

[12] Strictly speaking the term 'equal opportunities' refers to a formal equality concept focusing on equal starting points for women and men.

[13] The four-pillar structure included employability, entrepreneurship, adaptability and equal opportunities and has been introduced for employment policy guidelines.

[14] In the guideline the Commission called for 'positive' action in three areas: first, tackling gender gaps through active state support for an increased employment of women; second, improving the reconciliation of work and family life (most notably by raising levels of childcare provision); and

further had the impetus of integrating equal opportunities into employment by introducing the term 'gender mainstreaming'[15] as a central element of employment in 1999 (Rees 1998, Behning and Serrano Pascual 2001, Mazey 2001). The European Council underlined the commitment towards gender equality within employment by setting quantitative (gender) targets at the Lisbon and Barcelona summit 2000 and 2003.[16] As a consequence, political actors have demonstrated in recent years that the issue of equal opportunities in employment is not only a normative goal of the EU, but also a practical task. Various studies have been supported to visualise existing 'gender gaps' and make the Member States and their citizens more sensitive to this issue. Furthermore, the annual joint guidelines and the required national reports (NAPemps) on progress towards implementing gender equality testifying to a sort of 'peer-pressure' exercise to encourage Member States to formulate their national employment policies in response to common EU priorities.

Even though the European efforts towards improving gender equality on the labour market seem to be substantial at first glance, several attempts to refocus the EES since 2002 'negatively' affected the gender equality dimension: first, the replacement of the old pillar structure with three overarching key objectives (full employment, quality and productivity at work, cohesion and an inclusive labour market) taking the form of 'Ten Commandments'[17] and second, the Kok Report and its argumentation for refocusing the strategy around four new key priorities (European Commission 2003). The most significant intervention, however, was finally the re-launch of the Lisbon Strategy and the integration of the EES into a comprehensive Strategy for Growth and Jobs (European Commission 2005c). With this step, the explicit gender equality guideline disappeared and the key contents of previous gender equality provisions were scattered across all guidelines.

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third, making it easier for women to re-enter the labour market after an absence (by improving their access to vocational training).

[15] This term refers to the systematic integration of situations, priorities and needs of women and men in all policies. The aim is to promote gender equality by taking into account the effects of all general policies and measures on the respective situations of women and men. It has been implemented during the fourth action program of the European Commission (Commission of the European Communities 1996).

[16] The targets, on the one hand, called for an increasing availability of childcare facilities and, on the other hand, for a specific overall target to increase women's employment from 51% in 2000 to 60% by 2010 (European Commission 2001: 15).

[17] Due to this, gender equality was turned from a higher-order principle into one out of ten. In this respect, it has to be critically underlined that even though the sixth priority calls for a significant reduction of the gender pay gap, it sets no quantitative target and is, in general, less concrete than the former fourth pillar.

From a scientific point of view, the described developments have been assessed differently. In the beginning the EES has been described as an important instrument for equal opportunities (Rubery 2002, Benhing and Serrano Pascual 2001). Since 2003, however, comments have become increasingly critical. They warn of the declining visibility of the gender dimension and a total loss of the EU commitment towards gender equality (Rubery et al. 2003, 2004, Woodward 2003, Daly 2005, Walby 2005). In most of the guidelines, for instance, equal opportunity policy has become a narrow set of policies focusing on specific issues of social policy (e.g. childcare). Moreover, they predominantly consist of goodwill provisions rather than concrete actions. Therefore, very pessimistic voices not only complain about decreasing visibility but question in how far EU commitment towards gender equality will survive in a new round of 'focused policy' (Fagan et al. 2006b, Pfister 2007).

The described problem of fading 'gender awareness' and questionable potential of EU actions to increase gender equality also appears when addressing the specific issue of occupational sex segregation. Recognised as a main 'gender gap' in employment within the ESS, mainly five forms of action have been implemented to desegregate the labour market (following Rubery et al. 2003): incentives or programmes aiming to diversify occupation or training programmes for unemployed women or female returners (for instance in Portugal, France, Sweden); schemes to increase women's representation in IT occupations (like in Belgium, Greece, Sweden and Germany); positive action programmes particularly in public services (Ireland, Luxembourg, Germany) and, finally, limited incentives for employers to diversify occupations in some countries (like Spain). However, with the continuous disappearance of a gender equality dimension within the guidelines, the motivation of EU Member States to tackle the problem of gender inequalities seems to be vanishing. A synthesis report of the EU expert group on gender, social inclusion and employment in 2004 (see Rubery et al. 2004) clearly showed that within guideline six[18] of the National Action Plans on employment (NAPemps) most of the EU Member States rarely recognise the gender wage gap as a persistent serious problem and therefore make only general commitments with regard to reduction strategies.[19] Also in the other 'gender sensible' guidelines (three and four), the issue of occupational

[18] Guideline six refers explicitly to gender equality in employment. It aims to reduce the gender pay gap by addressing a wider range of underlying factors including occupational segregation and unequal opportunities in education and training.

[19] With respect to occupational sex segregation, only five NAPemps (of Belgium, Greece, the UK, Denmark and Sweden) directly address this issue under guideline six.

sex segregation is hardly addressed seriously by EU Member States any longer.[20]

1.3. Research questions

This short overview demonstrates that the phenomenon of occupational sex segregation has been analysed extensively in recent years - both from a scientific as well as a political perspective. While considerable efforts have been made to refine methodological approaches, and understand why women and men choose different occupations, and why changes have occurred so slowly, some 'puzzles'[21] still remain unsolved or need at least further examination: particularly the interplay of individual characteristics and institutional settings requires more detailed studying that extends to a systematic assessment of the situation in entire Europe on the macro scale. This work, therefore, will focus on the questions how cross-national differences in occupational sex segregation can be explained, why certain countries produce higher rates of occupational sex segregation than others, and how the differences can be analysed from a horizontal and a vertical perspective. Moreover, the emergence of possible 'new sex segregation regimes', represented by Eastern European countries, needs to be examined in more detail.

As the title of this study already indicates, the underlying view is that, to a significant extent, cross-country differences in the occupational allocation process by gender reflect institutional and structural characteristics of national states. There is clear evidence that differences between men and women concerning human capital and socio-demographic characteristics, account, to some extent, for variations in the gender-specific occupational distribution across countries. However, external circumstances, like country-specific educational, economic, social and cultural developments, constitute a further influence factor. In this framework, the situation of men and women on the labour market can be seen as a social product resulting from a country's institutional context. Hence the question arises in which way the situation of men and women in EU Member States relates to variations in the institutional setting of these States. The subsequent comparative study pursues an integrated approach. It combines a micro and macro perspective that includes an examination of factors influencing occupational and career decisions. Accordingly, it responds to the need to

[20] The missing reference to occupational sex segregation in the NAPemps of the 'new' EU Member States may be explained by the high restructuring of the economies in Eastern Europe displacing women from their traditional areas of employment.

[21] Here Charles and Grusky's terminology (2004) is followed.

relate these factors to the broader social and economic context within a given society. Moreover, it is assumed that the institutional and structural conditions under which such individual decisions are made vary among countries.

The key research question, however, is not necessarily the role of individual characteristics which, without doubt, influence individual occupational decisions. Instead, an emphasis is laid on the influence of the country-specific context. Which institutional characteristics impact on the distribution of men and women across occupations? Which role is played, for instance, by post-industrial restructuring and egalitarian processes, like those emphasised by Charles and Grusky (2004)? In this respect, particular attention will be devoted to the influence of education and, particularly, the organisation of the educational system, on cross-national differences in occupational sex segregation. As women are nowadays increasingly represented in tertiary education, it is surprising that they still seem to be less successful on the labour market with respect to income and career options. This can partly be explained by the fact that men and women still enrol in gender-typical fields of study, and that women are more likely than men to choose fields that tend to lead to higher labour market risks (Jacobs 1989b, Kelly and Slaughter 1991, Reimer and Steinmetz 2007). However, this development might also be due to the organisation of the educational system, particularly the tertiary system, and its interrelation with the labour market. For instance, it might be possible that systems with a strong link between education and the labour market are more often transferring educational into occupational sex segregation. Therefore, a further question concerns the extent to which differences in education and training systems result in gender-specific segregation outcomes across countries. Finally, the question will be addressed in how far the findings of this study clarify the contextual challenges to EU Member States seeking to attain higher 'gender equality' on the EU labour market.

1.4. Data and limitations of the study

Data for the present study were obtained from the European Union Labour Force Surveys (EULFS) for the years 1995, 1997, 2000, 2004 and 2005 (second quarter). The EULFS is a large-scale and annually repeated national survey which offers rich data on EU Member States that allow comparative research. It provides standardised, cross-sectional information on labour force participation and employment and also offers core demographic and educational background information (for details, see European Communities 2003 and Eurostat 2007). In each country the national statistical institute is responsible for selecting the

sample, preparing the questionnaires in the national language(s), conducting the direct interviews among households, and forwarding the results to Eurostat in accordance with the common coding scheme. Although perfect comparability among countries is difficult to achieve, the degree attained in the EU Labour Force Survey is considerably higher than that of any other existing set of statistics on employment that are available for EU Member States.

Despite the EULFS being one of the best sources of standardised and comparable data across the various European Union countries, the EULFS data available for this study also have some drawbacks. In the context of occupational sex segregation analyses, detailed occupational categories (ISCO88 three or four digit) and information on variables, like the existence of children and the available income, would be particularly important. However, due to restrictions of Eurostat, these indications were not provided.[22] Nevertheless, it was possible to classify occupations according to the ISCO88 at the 1- and 2-digit level in all samples (see annex, general part, table B).

Although the original data includes information on 26 EU Member States, the analysis is limited to 21(23) countries. The selected countries provide detailed information on educational, employment and basic demographic variables as well as information on relevant macro indicators. Cyprus and Norway are excluded from the sample, while Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, the Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom are included (the Czech Republic and Luxembourg are only included in the descriptive part of the study; they are excluded from the empirical analyses because of missing data on core variables).

Besides the aforementioned data limits further problems arise from cross-national comparative research. It is beyond the scope of the present inquiry to discuss the manifold topics in this research area in detail. Three core aspects should nevertheless be mentioned.

An important obstacle has always been the *issue of comparability* in cross-national research and the question in how far quantitative cross-national analyses can be conducted at all (Ragin 1987, 1997). The question triggered a debate between case- and variable-oriented researchers. The main argument from case-oriented researchers is that, with societies consisting of different cultures and unique historical contexts, comparisons are deemed to fail from the beginning. They even argue that although the standardisation of cross-national surveys is

[22] The EULFS was kindly made available to me by the Mannheim Centre for European Social Research. Even though it contains very detailed information on the individual level, like income and the existence of children etc., it does not provide such information to researchers because of an obligation of anonymity.

quite advanced, the meaning and interpretation of words and phrasing differs so much that a meaningful comparison is nearly impossible. As a consequence, countries can only be studied in detail as entities in themselves (a single country or just a few) taking into account the 'complex and unique socio-historical configuration' (Skocpol and Somers 1980: 178). However, strong and convincing counter-arguments have been advanced by variable-oriented researchers (Lieberson 1991, Goldthorpe 1997) underlining that it is false to conclude that different societies cannot be compared. From a variable-oriented perspective, particularly the observed 'social variation' between societies is the fundament for all comparative macro-research (Przeworski and Teune 1970). Researchers are less concerned with the understanding of specific outcomes. It is much more important to derive broad theoretically-based concepts of macro-social phenomena from similarities between correlations discernible across many societies or countries. In this vein, the analysed properties of countries may explain observed similarities and differences between countries (Crompton and Lyonette 2006, Kittel 2006).

A further well-known problem in macro-comparative research is the *Small N-problem* (Goldthorpe 1997, Ebbinghaus 2005). It refers to the assumption that the number of macro cases is generally too small relative to the number of explanatory variables. Statistically, this means that there are insufficient degrees of freedom. Models become 'over-determined' in the sense that intercorrelations among independent variables cannot be adequately dealt with and that results may not be robust. As a consequence, testing (competitive) theories seems difficult. On the basis of a few cases, conclusions may be drawn incorrectly (Huber et al. 1993).

The so-called *'black box' problem* is often presented as a closely related problem (Esping-Anderson 1993, Rueschemeyer 1991). The core argument is that comparative research on the one hand, indeed, identifies dependent and independent variables. On the other hand, however, the results of the 'black box' of statistical models do not reflect what occurs in terms of individuals who act intentionally. With the words of Goldthorpe (1997: 9) "We know the 'inputs' to the analysis and we know the 'outputs' from it; but we do not know much about why it should be that, within the 'black box' of the statistical model that is applied, the one is transformed into the other." According to case-oriented researchers, this is a particular problem of variable-oriented research. In their opinion only the analysis of a 'few' individual cases allows theoretical interpretations of social processes and underlying actions (Huber et al. 1993). However, Goldthorpe maintains that the black box is a problem of both approaches. Moreover, the problem can be mitigated when 'intervening' as well as independent variables are included in the analysis that are chosen on sound

theoretical grounds. Under these circumstances, certain causal processes may at least be implied.

Recognising the aforementioned problems, the present study meets core fundamental methodological standards. Firstly, cross-national comparability is enhanced by using the EULFS. As already pointed out, this survey offers rich standardised data on EU Member States. A further advantage is that all important variables used in this study are coded according to international classifications, like the ISCED97 and the ISCO88. Even though these classifications themselves are not unproblematic, they provide a minimum of comparability (for a general overview see Hoffmeyer-Zlotnik 2003). Within this work, arising problems are discussed in the relevant chapters. With respect to the *Small N-problem* it has always been underlined that a small number of cases is less problematic when there are fewer explanatory variables. Hence, the models in the analytical chapter 6 are kept very parsimonious by including macro-level factors. Furthermore, only those macro-level indicators are selected that are not highly correlated. This seems reasonable, as a high association between two variables makes it more difficult to estimate the effect of these variables and verify an underlying theory. Therefore, bivariate correlations between all macro-level indicators have been computed and one of the two has been eliminated from the analysis when the co-linearity has been too high (see tables A6.1-A6.4 in the appendix).

To deal with the '*black box' problem*, the study measures as directly as possible the theoretical concepts included in the analysis. It can be stated that the more direct the measure, the more likely it is that the interpretation of the effect found in the statistical analyses indeed represents the underlying concepts. However, it is obvious that, with the used data, a proper causal analysis is not possible. Nevertheless, the discovered statistical associations in combination with the broader theoretical framework developed in the chapters 2, 5 and 6 shed some light on the interrelation between micro- and macro-level processes of occupational sex segregation. So far, common studies on the role of micro- and macro-level factors in the occupational distribution of men and women have relied on different types of research design. However, it seems fruitful to link both approaches for the understanding of patterns of cross-national variability of occupational sex segregation as exercised in the framework of this study. While 'macro' explanations paint the broad global picture of gender inequality in different societies, micro theories provide valuable insights into mechanisms underlying individual action. Although the focus of this work is on the question in how far educational, economic, political and cultural institutions are able to produce specific gender stratification systems, it should also encourage further micro-oriented research that clarifies in how far such processes might affect and

might be affected by individual action. Hence, an integrated approach linking the two perspectives may contribute to the understanding of cross-country differences.

1.5. Outline

Chapter 2 outlines the conceptual and theoretical framework on which the analysis is built. Starting with a description of traditional approaches to explain occupational sex segregation and their inherent limits, the chapter aims to demonstrate the necessity of combining micro- and macro-approaches for the understanding of the complex processes shaping cross-national differences in occupational sex segregation. A second objective of the chapter is to widen the theoretical perspective. In this respect, particular attention will be paid to the relationship between educational and occupational sex segregation. Finally, the chapter will raise the issue of how the allocation process of men and women across occupations can be influenced by the national institutional context, and why this might differ between societies.

As a core question of occupational sex segregation research is the appropriate measurement of the phenomenon, *chapter 3* provides an overview of traditional and newly-developed methods, and discusses their respective advantages and limits. In a second step, the argument will be advanced that the methodological discussion in segregation research could profit substantially from solutions applied in social mobility research, where similar problems have occurred. It will be shown that, when insisting on the use of single number indices in sex segregation research, a theoretical clarification of the term 'segregation' is necessary. Furthermore, a new single measure is introduced which avoids the problem of marginal dependency of the common segregation indices.

Chapter 4 continues with an empirical description providing an overview of recent trends on the labour market with respect to female employment and its relation to occupational sex segregation. Current developments of occupational sex segregation are presented in the second part of the chapter. Using cross-sectional data from the EULFS for the late 1990s and early 2000s, both the horizontal and the vertical dimension of occupational sex segregation are examined with regard to 23 EU Member States. For the analysis, the traditional indices will be employed. To overcome their deficiencies, a detailed analysis of recent segregation patterns will be conducted. The final part of the chapter addresses the development of important institutional structures. In particular, the role of educational systems, gender legislation, social policies and social-cultural norms and attitudes will be discussed in more detail by describing re-

cent trends and their importance to cross-national differences in occupational sex segregation.

After the description of important cross-national differences in occupational sex segregation, *chapter 5* raises the question whether it is possible to classify EU Member States in accordance with the theoretical considerations of chapter 2 and the description of selected institutional factors in chapter 4. As recent typologies of welfare states and gender regimes have only limited potential for explaining cross-national differences in occupational sex segregation, the chapter aims to create a 'typology of sex segregation regimes' on the basis of a hierarchical cluster analysis that includes the Eastern European countries. For this purpose, different macro indicators are used which refer to the organisation of the educational system, the post-industrial structure of labour markets, the welfare system and the 'gender culture' in a given country. The chapter also draws a line between the findings and expectations regarding cross-national variations in horizontal and vertical occupational sex segregation.

Chapter 6 forms the main empirical application of the theoretical considerations underlying this work. It answers the question which contextual factors are able to explain cross-national differences in occupational sex segregation horizontally and vertically. In this context, multi-level modelling is applied which takes into account the nested sources of variability and allows the combination of different analytical levels. The resulting single framework devotes attention to both individual attributes, such as key demographic and human capital characteristics, as well as macro-level factors that potentially influence gender-specific occupational allocation processes. The analyses are based on the EULFS for 2004/5 and comparable macro data from different European sources for 21 EU Member States.

Finally, *chapter 7* summarises the main theoretical considerations and the most important empirical results. Furthermore, it approaches the question which steps have to be taken to handle the contextual challenges of occupational sex segregation. The work concludes with an overall evaluation of and recommendations for the further study of cross-national variations in occupational sex segregation.

2 Explaining occupational sex segregation

The persistent gendering of labour markets appears surprising in the face of women's increased integration into employment and political efforts for equal opportunities. As a consequence, numerous theoretical approaches have been developed that seek to answer the questions why women and men are distributed unequally over occupations and hierarchical positions, why there are country differences, and why occupational sex segregation still persists.

Resulting theories can be classified into three broad categories: neoclassical theories, sociological-feminist theories and institutional theories. According to the issue of interest, they focus on individual preferences, resources, or family constraints, to explain differences in the job allocation process of men and women (micro-approach). On the other hand, macro approaches rather emphasise the influence of institutions and structural conditions on the distribution of women and men across occupations (Heintz et al. 1997).

In this chapter, the main theoretical approaches are introduced and discussed. In particular, their potential for explaining the horizontal and vertical dimension of occupational sex segregation and cross-national variations will be assessed. In addition, the chapter devotes attention to the central role of educational sex segregation and its translation into the labour market which has rarely been done. Finally, an integrative model of occupational sex segregation will be developed. Referring to underlying micro- and macro-mechanisms, and more importantly to their interrelation, it will be clarified how horizontal and vertical segregation arises, how different factors and their interaction influence this development, and how cross-national differences evolve.

2.1. Neo-classical theories of human capital

In general, economic theories are based on the *homo oeconomicus*. They assume that individuals on the labour market are acting 'rational'. The intention of 'rational actors' is to maximise their profits by an efficient investment of available resources. Viewed from a neoclassical perspective, workers choose the best-paid job, considering their own personal endowments (human capital), constraints (e.g. children to take care of) and preferences (e.g. specific working conditions

S. Steinmetz, *The Contextual Challenges of Occupational Sex Segregation,*
DOI 10.1007/978-3-531-93056-5_2,

with respect to working time)[23]. Most individual career options and earnings depend on personal endowments, i.e. accumulated human capital including the educational level, occupational training and job experience. On the other hand, employers are supposed to choose the 'best' worker with an adequate profile for an open position. Individual labour market positions, ultimately, are the product of the interplay between both factors: for instance, supply interacts with and responds to demand via the wage and other working conditions. In accordance, economic theories distinguish between *supply* and *demand* side factors influencing the positioning of women and men in the labour market.

Labour supply approaches generally explain occupational sex segregation with differences in occupational selection behaviour. Sex segregated labour markets are understood as the sum of choices of employees where gender-specific affinity and ability lead to a self-selection into different occupations (Achatz 2005). Based on these considerations, several theories have been developed assuming that occupational choices are cost-benefit equations. According to Polachek's (1979, 1981) prominent 'theory of self-selection', women, in comparison to men, invest less in their personal human capital because of anticipated future family obligations. This effect is intensified by their temporary or even permanent withdrawal from the labour market which avoids the accumulation of job experience. As a result, women's occupational chances and expected earnings are lower. From an economic point of view, the 'lower' human capital investment of women seems rational because they anticipate the described discontinuities.

A further 'human capital' approach was developed by Becker (1985) who starts with similar considerations on the important role of the work division within families. In his view, men invest more in employment, thereby increasing their 'productivity on the labour market' which is remunerated by employers. Women, on the other side, limit their job opportunities by focusing on family and household work. Becker concludes that women are more interested in occupations which allow the combination of work and family responsibilities.

A key hypothesis of these neoclassical approaches, therefore, is that women prefer occupations with higher starting pays, lower returns to experience, and lower penalties for temporary withdrawals. This also includes, for instance, occupations with flexible working hours (Polachek and Siebert 1994, Reskin and Padavic 1994).[24]

[23] Becker 1964, Mincer 1974, Jonung 1996.

[24] Researchers, like England (1982: 366) have disproved these considerations by showing that women in pre-dominantly female occupations (like clerical work) also suffer from high penalties for time spent out of the labour market.

In sum, women rather seek to combine work and family than gaining a high lifelong income (Filer 1989, Bender et al. 2005)[25], while men, by contrast, undertake the necessary human capital investments that enable them to get the better jobs. Due to that, sex segregation, both in terms of the gender differences in the occupational distribution and the gender wage gap, reflects women's and men's 'preferences'. In their reactions to these labor supply preferences, employers create a corresponding segregated male and female employment structure that supposedly fulfils the needs of women and men, especially those with family obligations (Polachek 1981).

Turning to the *labour demand side*, the questions arise why employers 'prefer' to hire women or men for particular occupations, and why women and men have different opportunities for career development within enterprises.[26] In this regard, it is assumed that employers assign workers to jobs either directly or through personnel practices governing their 'internal' (firm-specific) labour markets (Granovetter 1974). Similar to supply side arguments, it is assumed that occupations requiring skill-specific qualifications and job experience are more often offered to men than women.

The main approach developed by Becker (1971) assumes that 'rational' employers may have a *'taste of discrimination'* against specific 'social groups'. Analysing the gender wage gap, Becker defines 'discrimination' as an unequal treatment of potential employees with the *same* productivity.[27] The mechanisms underlying this behaviour refer to prejudices against specific groups of employees (like women or migrants) and the 'wish of distance' which refers to the idea that some workers, employers or customers do not want to work with or come into contact with members of these specific groups. Based on such ascriptive characteristics, the employer is willing to pay a reward for the preferred 'male' worker. A female job applicant would be hired only if the employer's detriment of having such an employee is fully neutralized by lower hiring costs. In gen-

[25] However, it should be critically underlined in both cases that the causality of the association between occupational choice and possible income is not fixed. The gender wage gap itself offers a strong economic incentive for the above-discussed 'traditional' role specialisation which underlines that they are closely related (Ott and Rinne 1994). It is possible that, at the same time, increasing wages and career prospects encourage the motivation for work (Prendergast 1999). Further motivation factors influencing both sexes are a good working environment and a supporting surrounding (Cassirer and Reskin 2000).

[26] It should be noted that this 'preference' is largely determined by learned cultural and social values about appropriate gender role models. These models often discriminate against women (and sometimes against men), and stereotype occupations as 'male' or 'female'.

[27] The taste for discrimination is due to individuals' preferences and prejudices. Employers are prepared to sacrifice profit to avoid female workers, and male employees are prepared to sacrifice wages to avoid female workers because of this distaste.

eral, these mechanisms would lead to both lower wages and higher unemployment rates for women.

On the other hand, the *'statistical discrimination'* approach by Phelps (1972) and Arrow (1973, 1976) seeks to explain the gender wage gap without assuming that employers have such preferences or prejudices. The exclusion of women is rather seen as a result of employer's 'imperfect information' about a potential employee's productivity during the recruitment process. As receiving full information is too costly, most employers rely on productivity signals or group characteristics (like educational qualifications or gender) which are easy to ascertain (Reskin 1993, 2000, Bielby 2003). When this occurs, workers with the same individual characteristics will receive different wage and employment offers as a result of the groups to which they belong. England (1992: 60) with her *'concept of error'* argues in a similar direction. It is assumed that due to a lack of information, false beliefs are imputed about the 'true' productivity of workers. Thus, women appear as victims of employers' uncertainty over information relating to true productivity.

Finally, theories of *'monopsonistic discrimination'* assume a lack of competition for labour on the demand side (Madden 1973, Robinson 1933). According to this approach, it might be rational for a monopsonistic firm to pay different wages to workers belonging to distinct groups if these groups show different elasticity of supply and can be clearly distinguished as in the case of men and women. In this context, it is conceivable to assume that female labour supply is less elastic than male labour supply because of job immobility following from family responsibilities. In case of monopsonistic power, women will hence earn less than men relative to their productivity, and thus face a higher level of exploitation in the labour market.

Limitations

Even though they allow concrete predictions for cross-national variations in occupational sex segregation, economic theories have been criticised for several reasons. A frequent argument is their focus on one aspect of occupational sex segregation, namely the gender wage gap (vertical dimension). Blackburn et al. (2002: 516), for instance, underline that "…pay differentials are not even a measure of overall segregation but only of vertical segregation". Also Anker (1998: 14) points out that "…many theories and explanations treat the determinants of occupational segregation by sex and female-male pay inequality as if they are synonymous [which] is unfortunate since segregation is only one cause among many of pay differentials".

Besides this weakness, an extensive literature questions the general explanation power of economic theories (England 1982, 1984, England et al. 1988, Anker 1997). In line with human capital approaches, the amount of gender inequality, for instance, should decrease with a reduction of gender difference in human capital. With respect to observable pay differentials between women and men in the EU Member States, however, a sizeable portion of the gender wage gap still cannot be explained by differences in individual human capital characteristics only (Plantenga and Remery 2006). Instead, the role of workplace characteristics and institutional frameworks in determining wage rates has more and more become the focus of consideration (see e.g. Blau and Kahn 1996, 1997, Abowd et al. 1999). Major changes should, moreover, be observed with respect to the type of occupations preferred by and offered to women. However, empirical results show the opposite: occupational sex segregation, in terms of the unequal distribution of men and women across occupations and positions, remains high even though women's educational attainment and labour force commitment has increased, fertility is falling, and more households are headed by women implying the need of continuous work (Buvinic 1995, Polachek 2004). In addition, specific family-related characteristics (like marriage and children) seem to have little influence on the occupational distribution of men and women (Beller 1982, Rosenfeld 1983). Finally, particularly the human capital explanation has been criticised for assuming that individuals' preferences and choices are voluntary without considering the possibility of pre-labour market (societal) discrimination. For example, social norms and customs may constrain women's ideas about appropriate careers (see section 2.2. for more detail).

As to the assumptions of discrimination theories, Becker's 'taste for discrimination' does not explain why employers should be prejudiced. In addition, discrimination should decrease over time because it is costly and restricts the employer's options and profitability in a competitive market. Particularly, the assumption that male employers and employees are willing to give up income for the added satisfaction of avoiding women, is not consistent with neoclassical theory because the incentive of monetary reward will induce non-discriminatory entrants to take advantage of the lower costs involved in hiring women (Darity 1995: 432). Hence, employers may not be able to afford discrimination under strong market competition. Consequently, the wage gap between men and women with equal skills should narrow and may - under certain conditions - eventually disappear, as discriminators are forced by market pressure to change their discriminatory practices or are bought out by non-discriminating firms (Arrow 1973, Cain 1986). Statistical discrimination, by contrast, is more convincing because it explains why firms may rationally treat men and women differently as a result of imperfect information concerning individual productiv-

ity. Furthermore, empirical evidence suggests that employers still use their 'statistical' beliefs about women and men (Fryer 2007, Bjerk 2008). Monopsonistic explanations, however, fail because female labour supply is found to be at least as elastic as that of men (Humphries 1995, Rubery et al. 1998).

2.2. Sociological and feminist theories

Sociological and feminist approaches explain the emergence of occupational sex segregation with gender power relations in family and society at large. They point out that individual preferences and resources as well as welfare state developments are embedded in a system of norms, beliefs and attitudes about appropriate gender roles and power relations (Hartmann 1976, Blumberg 1978, 1984, Chafetz 1984, Reskin 1988). In contrast to economic and institutional approaches, sociological and feminist theories thus inquire into the origin of gender-specific occupational preferences considering social and cultural constraints with respect to women and paid work.

Some research explains occupational sex segregation on the basis of sex definitions and their allocated function in society. This includes sex-role stereotypes, occupational sex labels and cultural values, like attitudes concerning equality of the sexes and the role of women in society. In socialisation research, for example, it is argued that occupational choices are largely related to gender-specific role socialisation (Marini and Brinton 1984, Cororan and Courant 1985, Perlman and Pike 1994). During early childhood, boys and girls develop different self-perceptions and preferences directly influencing their educational choices and future labour market behaviour (Heintz et al. 1997). In this context, occupational sex segregation is perceived as a 'self-selection' process along 'classical' gender stereotypes (Beck-Gernsheim 1981) which is also affected by *'parental role models'* (Chodorow 1978, Moen et al. 1997). Parent's education and labour market activity are believed to affect their children's view and preferences. Furthermore, Breen and García-Peñalosa (2002) argue that gender role preferences of prior generations influence current segregation processes.

However, as indicated, the adopted sex-stereotypes do not only influence workers' preferences but also employers' opinions about appropriate workers (Reskin 1993: 248) which results in the development of sex-labelled occupations (see section 2.1.). Typically female occupations are associated with attributes of 'serving' and 'caring', while men's occupations are associated with attributes of 'physical strength' and 'power'. As Anker et al. (2003: 21) point out "It is especially striking how stereotypes in society about appropriate roles for women and men are replicated in the labour market."

Feminist-oriented research, however, attributes women's disadvantaged position in the labour market to the concept of patriarchy and women's subordinate position within society (Hartman 1976, Walby 1986, 1990, 1997). In the so-called *'dual system'* approach, women's position in the labour market is seen as a consequence of the interrelation between capitalism and patriarchy. Hartmann (1976) argues that, in 'patriarchal' capitalism, power relations of male dominance and female subordination have been sustained. In most societies, household work and childcare are still seen as the main responsibility of women, while men are perceived as the breadwinner. Occupational sex segregation conserves these patterns. The gendering influence of patriarchy on occupations is also demonstrated by Wetterer (2002) who shows that women, irrespective of formal education and human capital, are excluded from occupations due to their inherent gender nature (social closure of occupations and spheres). Moreover, Strober and Catanzarite (1994) emphasise that supply and demand side decisions on the labour market are influenced by gender power relations[28]. As a result, employers' hiring preferences are not only determined by profit maximization but also by an interaction with gender power relations. This is understood to lead to men's and women's unequal access to occupations and hierarchical positions. Collective actors, like unions and administrations seem to encourage the described development. They are believed to contribute and increase the gendered job allocation process. In most countries, unions are quite powerful within typical male occupations. Women, by contrast, are less often members of such organisations (Cockburn 1996, Solga and Konietzka 2000, Munro 2001, Colgan and Ledwith 2002).

Finally, recent research refers to the importance of cultural factors, like attitudes and beliefs about the appropriate role of women in society (Connell 1987, Pfau-Effinger 1998b, 1999b, 2000). National policy configurations operate in and are influenced by specific ideological contexts and cultural norms. Misra (1998) stresses the significance of the gender ideology of the nation-state, and more specifically the value placed on women's work, both paid and unpaid. Furthermore, 'national gender ideologies' can influence not only the acceptance of female employment but also preferences and choices of both employers and workers (Mencken and Winfield 2000, Correll 2004).[29] Turning to cultural perceptions shared by both sexes, horizontal sex segregation particularly results

[28] Defined as an ideology, a set of practices, and a set of feelings enabling men to have social, economic, and personal power over women. It also includes a personal component that is derived from the familial relation of women and men.

[29] Lück and Hofäcker (2003) demonstrate that nation-specific attitudes regarding the labour market participation of mothers with young children can indeed influence the process of individual preference.

from perceptions about sex differences in skills and traits. Furthermore, they contain a general assumption as to the higher competence of men (Ridgeway 1997). For instance, the ideological belief in 'male primacy' shapes vertical segregation by portraying men as more status worthy than women (Conway et al. 1996, Fiske et al. 2002, Charles and Grusky 2004, Ridgeway and Correll 2004). Employers believing in the value of 'male primacy' will choose male applicants for high-status and high-paying jobs, and female applicants for low-status and low-paying jobs. An assumption of this kind does not only influence employers' allocation and promotion decisions, but may also prompt women to eschew high status occupations as a result of self-evaluation processes (Correll 2004). As a consequence, the occupational differentiation between the sexes is more articulated (horizontally and vertically) in countries with a more traditional concept of women's role in society. Women in such countries favour female-dominated occupations allowing a combination of work and family while offering less career options.

Limitations

As these theories consider societal developments, they make a valuable contribution to the explanation of both dimensions of occupational sex segregation. Horizontal segregation occurs when certain jobs are stereotyped as being either 'feminine' or 'masculine', while vertical segregation arises from cultural norms defining authority as a masculine quality (Brothun 1988: 322, Nermo 1999: 77). Moreover, feminist and sociological approaches indicate that cross-national differences in occupational sex segregation are rooted in cross-national differences in cultural beliefs about gender roles.

Nevertheless, particularly the concept of patriarchy has often been criticised for the presentation of women as passive victims in their relationship with men. It also fits badly into recent developments where changes in the labour market are destroying traditional male occupations. In this respect, Hakim's 'preference theory' (1996a, 2000) seeks to include arguments from different theoretical strands by identifying three basic types of women's relation to their family and work commitment: the poles are '*work-centred'* and '*home-centred'* women. Between these two poles, *'adaptive women'* can be found who form the largest group. Work- and career-oriented women are often employed in gender-mixed occupations with similar numbers of women and men. Occupational sex segregation is low for these women. For segregation processes, *'family-centred'* women only become an issue if they enter the labour market because they are likely to work temporarily and on a part-time basis. The group of *'adaptive women'* is a diverse category. Unlike the *'work-centred'*, these women are not

aiming at career success. They content themselves with less demanding female occupations. The preference theory itself is frequently criticised for treating men and women as separate homogenous categories. While the typology is useful in identifying significant aspects of women's experience, it does not capture the variety of people's orientations and experiences in contemporary societies.

2.3. Segmentation and institutional theories

In general, *segmentation theories* attribute occupational sex segregation to the inflexibility of institutional arrangements that hinder competition within firms and the labour market. Similar to statistical discrimination theory, institutional economists argue that occupational sex segregation does not result from employers' discrimination but from formal structures of work organisation inhibiting market forces. The main assumption is that labour markets can be divided into different segments in accordance with payments, promotion rates, turnover rates, levels of education, on-the-job training, etc. (Biehler and Brandes 1981)[30]. The segments are able to function relatively independently because both jobs and workers are divided by demand-side (e.g. skill and educational demands, employment stability, wages, etc.) and supply-side processes (such as education, job skills, occupational preferences, etc.). Due to the different functioning of the segments, workers are prevented from changing from one segment to another. Segmentation theories comprise diverse and overlapping models of labour markets, including dual (primary, secondary), tripartite (core, peripheral, irregular), stratified, hierarchical and job competition models.[31] A prominent approach is the dual labour market theory (Doeringer and Piore 1971) which distinguishes between a 'primary' and a 'secondary' sector. Jobs in the primary sector are relatively good in terms of pay, security and career opportunities, while jobs in the secondary sector are characterised by opposite features.

In this framework, occupational sex segregation arises because men are more likely to be hired for 'good' jobs in the primary sector, while women tend to be hired for 'poor' jobs in the secondary sector that are more likely to be offered by competitive industries. Gender-specific segments are the result of specific recruitment strategies of employers aiming to lower the costs of employment. Particularly women represent an insecure investment which banishes them into the 'secondary' (female) segment (Edgeworth 1922, Bergmann 1974,

[30] Other labour market segmentation theories divide the labour market into 'static' and 'progressive' jobs (Standing 1989) or 'formal' and 'informal' sectors (ILO 1972).
[31] A fundamental dichotomy between 'internal' and 'external' labour markets is related to dual and tripartite theories.

Willms-Hergert 1985). Once women are assigned to a specific segment, internal processes continue to constrain promotion opportunities, inhibit free competition and preserve segregation (Thurow 1975, Hartmann 1987, Jonung 1998). Reskin and Roos (1990) enhance the concept of a dual labour market by proposing a more complex *'queuing'* model. Labour markets are seen as comprising labour queues (employer's ranking of potential workers) and job queues (worker's ranking of jobs)[32] leading to a "…matching process in which the top ranked workers get the most attractive jobs and so forth, so that the lowest workers end up in the jobs that others have rejected" (Reskin and Roos 1990: 307). The labour queues are heavily gendered: men are located highest, while women are classified at the bottom. Besides *'sex'* as a selection criterion, women and men are ranked in accordance with other criteria, like marital and parental status, ethnicity, disability and sexuality. Changes occur only due to modifications in the conditions of both *'queues'*. For example, wage reductions may lead to a shortage of male workers and increase the recruitment of women.

In recent decades, comparative approaches have sought to link sex-specific occupational differences with national variations in the organisation of labour markets and the welfare state (Dale 1986, Connell 1987, Crompton et al. 1990, Nelson 1990, Dex et al. 1993, Orloff 1993, 1996, Pfau-Effinger 1993, Buchman and Charles 1995, Rubery et al. 1998). As these approaches and their results will be discussed in more detail in the following chapters, only a short summary of the results is provided. With respect to the labour market, some studies analyse the relationship between occupational sex segregation and female employment rates (Hakim 1981, Jonung 1998, Nermo 1999, Rubery et al. 2001b). It is assumed that a high female employment rate has an integrative effect because women spend more time in employment and gain levels of human capital similar to men. The findings, however, are divergent and point in various directions: Charles (1992) found neither segregative nor integrative effects. Jacob and Lim's (1992) results indicate a positive effect. Jacobs (1989b), by contrast, showed a significant negative association[33] between both aspects. With respect to post-industrial developments, service sector expansion and a growing employee class (Charles and Grusky 1995, Charles 1998, 2003) are believed to have a positive effect, particularly, on the horizontal dimension of occupational sex segregation. Findings demonstrate that, with an increasing service sector, the industrial mix of occupations becomes more service-based. This shift enhances women's representation in services because affected occupations often

[32] The concept refers to Thurow's (1969) conceptualisation of the labour market as a labour queue in which employers rank prospective employees.

[33] This is also confirmed by Swedish studies showing that the level of segregation has declined in spite of the dramatic increase in female labour force participation (Jonung 1998, Nermo 1999).

involve tasks that are functionally and symbolically similar to women's traditional female domestic activities (Bell 1973, Boje and Nielsen 1993, Melkas and Anker 1997). Post-industrial developments also lead to a growing necessity of flexibilisation. With a higher demand for non-employed wives and mothers, a labour marker offering flexible working times becomes indispensable. This, in turn, might serve as a new important structural factor related to higher levels of occupational sex segregation. Analyses testing this assumed positive association, however, are divergent: while some studies confirm the association (Birkelund 1992, Birkelund and Rosenfeld 1995), others deny any relation between occupational sex segregation and part-time work (Kim and Levanon 2004).

There is also disagreement as to the impact of welfare policies on occupational sex segregation (Gornick et al. 1997, Gornick 1999, Blackburn et al. 2000, Korpi 2000, Stier et al. 2001). A first important mechanism refers to the role of legislation promoting or inhibiting women's unrestricted access to occupations, like anti-discrimination and protective legislation (Chang 2000, 2004). Rubery et al. (1999b) underline that labour laws and regulations may prohibit women from working in certain occupations and/or under certain conditions.[34] Family policies are a second mechanism through which welfare states facilitate women's labour market access and reduce the conflict between work and family. However, findings show that, besides the positive effect of facilitating women's economic activity, such policies can also have the unintended detrimental consequence of limiting women's economic opportunities (Safa 1995, Anker 1998, Estévez-Abe et al. 2003, Mandel and Semyonov 2003). For instance, an extensive maternity leave policy can induce employers not to hire female workers because they have to bear the cost of maternity leave rather than the state (indirect form of sex discrimination).[35]

Furthermore, measures of family policy, such as generous childcare facilities, can have long-term consequences because they signal younger women future possibilities or difficulties of reconciling work and family. The interplay of family policies and labour market legislation is of particular interest: while family policies may support women's labour market entry, labour market legislation can prevent them from certain types of work. As a consequence, the effects of welfare state policy on occupational sex segregation are complex. Legislation aiming to increase 'gender equality' may even increase segregation

[34] For example, women may be prohibited from night work (ILO's Night Work (Women) Convention, 1919 (No.4)); from working underground in mines (Underground Work (Women) Convention, 1935 (No.45) from carrying heavy loads (Maximum Weight Convention, 1967 (No.127)).

[35] Maternity leave policies could also encourage more gender egalitarian attitudes in the formal economy as employers and employees come to expect women's labour force participation to be decoupled from their fertility. An ideal of gender egalitarian women should therefore seek access to atypical occupations and employers should be more willing to employ them (Chang 2004: 119).

processes. Nevertheless, it seems worthwhile to examine the interrelation because welfare states shape conditions and regulations in which institutions and structures are developed, and the way in which employment is distributed, organised and rewarded.

Limitations

Segmentation theories, without doubt, are conductive to a general understanding of sex inequalities in the labour market. They help to understand why men are more likely to have higher positions in the same occupation than women (vertical dimension). However, as the same occupations can be found in the primary and secondary labour segment, these theories are less appropriate to explain why occupations are segmented by sex (horizontal dimension). A further shortcoming is their inability to explain varying degrees of occupational segregation in different industrial structures and the underlying dynamics (Milkman 1987). However, this is mostly solved by the discussed 'queue model' which acknowledges that changing job positions within the occupational hierarchy over time are related to changes in the composition of the workforce.[36] Finally, as segmentation theories are more concerned with the explanation of complex mechanisms producing different labour market segments, they are less appropriate to explain cross-national variations in occupational sex segregation. This shortcoming is, at least to some extent, compensated by the described macro-oriented approaches studying the influence of labour market structures and welfare states on cross-national differences.

Nevertheless, recent studies underline that, besides welfare policies dealing with the situation of women, additional factors have to be taken into account. For instance, Charles et al. (2001), as well as Rubery and Fagan (1993), suggest that the presence of vocational education might intensify occupational sex segregation. This argument is further developed by Estevéz-Abe et al. (2003) who emphasise the gendering effect of labour markets focusing on the development of firm-specific skills.

2.4. The importance of education for occupational sex segregation

The previous section indicates that, for the explanation of occupational sex segregation from a cross-national perspective, further factors, like education, have to be analysed in more detail. To study the interrelation between educa-

[36] However, it must be pointed out that sex segregation cannot be explained entirely because not all women are confined to jobs at the very bottom of the pay and skill hierarchy.

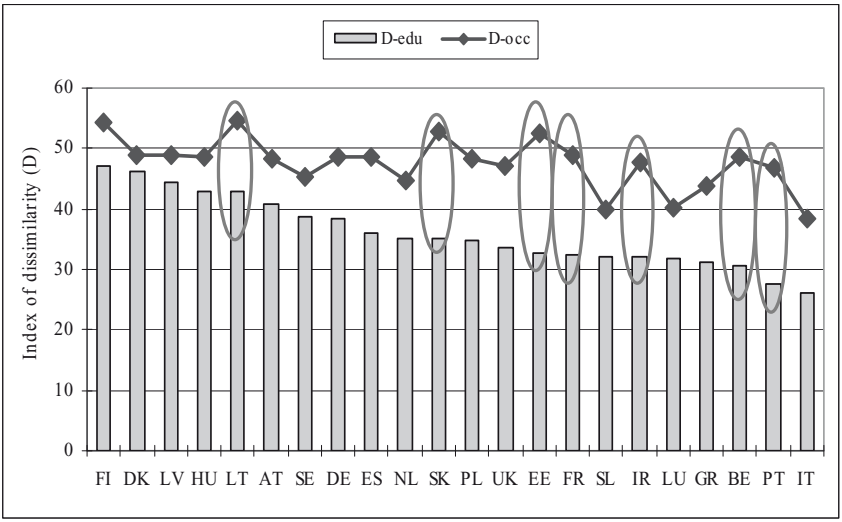
tional and occupational sex segregation seems plausible because, although women have increasingly gained access to higher education during the last decades, sex segregation persists within educational domains (Bradley 2000, Charles and Bradley 2002, Charles and Grusky 2004). In this context, it can be assumed that not only the level of education (degree) but also the selected field of study (specialisation) are central to segregation processes. Furthermore, the organisation of the educational system has to be considered. Educational institutions direct students to different educational levels and fields, thereby influencing labour market entry processes.

It is surprising that less attention has been devoted to the extent to which educational sex segregation (particularly the horizontal differentiation across fields of study) is translated into occupational sex segregation, and the extent to which different institutional contexts (interrelation between the educational system and the labour market) strengthen the translation process. Research (Frehill 1997, Dryler 1999, Jonsson 1999, Thompson 2003) frequently contents itself with the clarification *why* women and men choose sex-typical fields of study or occupations.[37] However, only some researchers (Borghans and Groot 1999, Smyth 2005, Smyth and Steinmetz 2008) have demonstrated the importance of linking these two forms of sex segregation by showing that gender differences in field of study play an important role in channelling people towards gender-typical careers. Moreover, high levels of educational segregation tend to result in higher levels of occupational sex segregation.

To demonstrate the aforementioned potential interrelation, figure 2.1 reveals that there is a relatively high correlation (r^2=0.34) at the country level between educational and occupational sex segregation (measured with the index of dissimilarity, see appendix figure A2.1). While most of the Nordic countries are characterised by high levels of educational and occupations sex segregation, the Southern European countries, like Italy and Greece, show very low values. However, in some EU Member States divergent patterns can be observed: particularly in Lithuania, Slovakia, Estonia, France, Ireland, Belgium and Portugal, low educational segregation is not automatically accompanied by low occupational segregation.

[37] Particularly socialisation theories made an important contribution to the understanding of educational decisions and choices trying to understand how gender roles and stereotypes are learned and internalised, and which factors influence the choice of educational routes and achievements in different subject areas (Colley et al. 1994: 18, Colley and Comber 2003). For example, the perceptions of what males and females are good at, educational factors, including school environment, teacher beliefs and behaviours, styles of course delivery, syllabus, contents, assessment procedures, and individual differences, such as patterns of achievement, gender stereotyping, educational experiences and family background.

Figure 2.1: Index of dissimilarity for educational and occupational sex segregation, 21 EU Member States (ISCO88 2-digit, 8 fields of study, persons aged 15-65, tertiary degree holders), 2004



Source: EULFS 2004/05, own calculations

In this regard, institutional settings might be able to explain differences between countries. However, it should be emphasised that, even though the choice of field of study is framed in the context of sex-segregated labour markets, the issue of whether sex-specific subject choice is a cause and/or a consequence of occupational segregation is open to debate.

As the underlying mechanisms of the transition from educational to occupational sex segregation received little attention in literature, some researchers (Borghas and Groot 1999) seek to clarify the relationship by defining three components: the first one, called *'pre-sorting'*, is shaped by differences in educational choices of boys and girls. It will be the stronger, the stronger the link between the educational system and the labour market. The second component is defined as *'post-sorting'*. It describes the extent to which, given educational segregation by gender, men and women finally choose different occupations. *'Post-sorting'* can be seen as a result of differing occupational choices and promotion opportunities between men and women during their careers. If men and women with the same educational background are directed towards different occupations, then post-sorting may additionally enhance the level of occupational segregation, reached through earlier educational segregation. This kind of

post-sorting strengthens the cumulative effect of occupational and educational segregation. On the other side, occupational sex segregation can be reduced by recruiting and training women or men with a gender-typical educational background in a gender-atypical occupation. The third component, *'reintegration'*, is also a form of post-sorting. Women with a 'female' educational background might find jobs in the same occupation as men who followed a typical 'male' type of education (Borhans and Groot 1999: 376).

As a consequence, educational sex segregation is translated into occupational sex segregation to a lesser extent. The described processes show that the trend in both fields of sex segregation can be similar. Educational segregation, however, need not necessarily 'cause' occupational segregation. This is particularly true when it comes to reintegration processes.

2.5. The rationale for an integrated approach to occupational sex segregation

The described theoretical approaches demonstrate that individual selection processes concerning either occupations or employees are rarely 'independent'. In fact, they are influenced by structural and institutional constraints, like economic conditions, welfare policies and cultural gender beliefs within a single country (Buchman and Charles 1995, Orloff 1993, 1996). This has been suggested by several researchers underlining that for a most reliable explanation of gender inequality, theories should be regarded as integrated or complementary (Chafetz 1990, Molm 1993, Charles and Grusky 2004).

For the understanding of causes, consequences and cross-national variations of occupational sex segregation, one single approach hardly explains the phenomenon in an adequate way. While 'macro' structural explanations may provide insights into the variability of occupational sex segregation by painting the broad global picture of gender inequality in different societies, micro theories give valuable insights into mechanisms underlying individual selection processes. Hence, considering macro- and micro- theoretical approaches, the interplay between the contextual conditions in which occupational decisions are made, and the mechanisms that guide individual decisions, may be clarified in more detail.

Against this background, the present study rests on an integrated approach to the explanation of cross-national variations in occupational sex segregation. As underlined above, it is assumed that country differences in segregation processes are the result of the interplay between nation-specific institutional arrangements and individual selection processes of employees and employers. The

following figure 2.2 visualises the complexity of underlying segregation mechanisms in society taking into account micro- and macro-factors and, more importantly, their interrelation. Starting with the employee's point of view, preferences as to a specific occupation are developed early in life. As mentioned above, socialisation and parental role models can be influencing factors. Preferences are further developed in the educational system with the selection of a specific school and specific subjects or courses. They might be intensified or modified by teachers, peers and anticipated future career options. With the graduation in a specific field of study or vocational course, the developed individual 'resources' are 'officially' certificated. They serve as an entry ticket into employment signalling the potential and productivity of applicants (Breen 2005).[38] However, during education, particularly women are confronted with questions concerning future family responsibilities. This might influence the decision on a gender-typical or atypical occupation.

In consequence, individuals are already gendered by educational degrees and educational specialisation before they enter the labour market.[39] Employers searching for the best staff, on the other side, also rely on preferences and experiences developed during their life course and professional career. Moreover, the demand for specific labour is constrained by labour market structures and regulations influencing employers' preferences as well as the available resources.

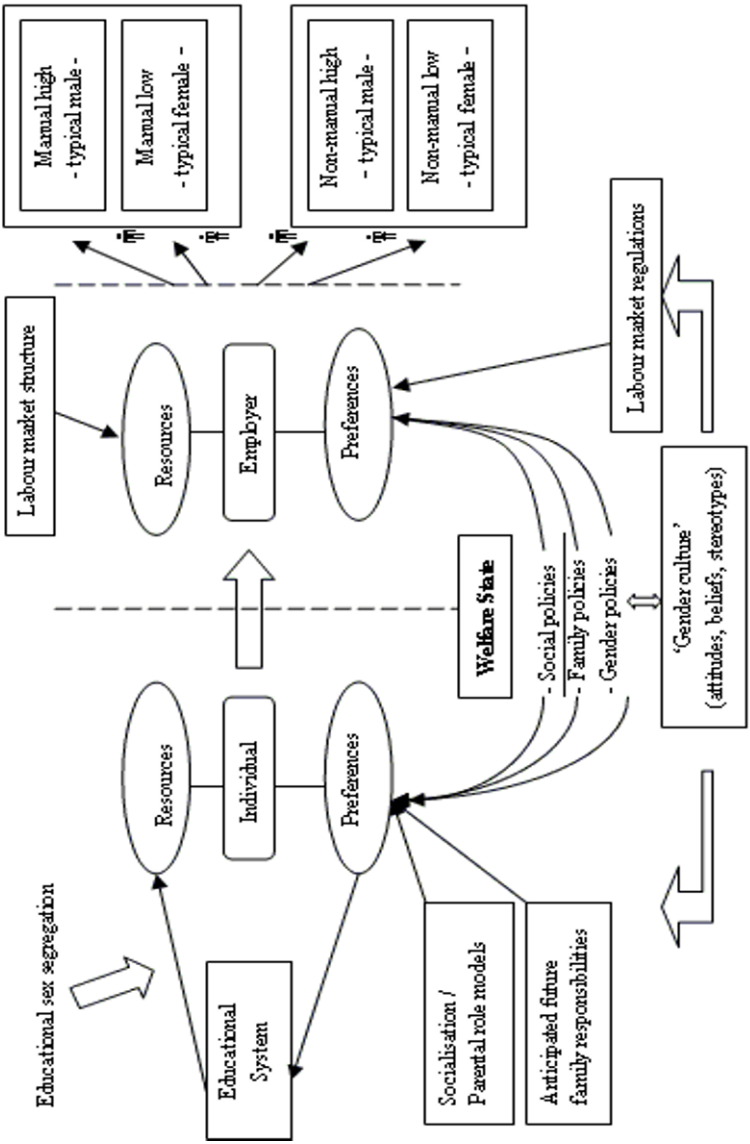
Mechanisms affecting the labour market entry process of men and women are diverse: they can reflect the described 'discrimination' practices of employers in favour of men. On the other side, they may relate to 'self-discrimination' of women 'choosing' particular occupations.[40] As already pointed out, individual action as well as the 'gender sensitivity of the policy environment' of countries are shaped by social norms and gender beliefs. As Ellingsæter (2000: 337) underlines "Gender divisions in the labour market are generated in interplay of economic structures, welfare state policies, cultural ideas and historical traditions." In this respect, all described causal individual and institutional factors are intertwined and produce the universal phenomenon of occupational sex segregation.

[38] In this context, educational systems that provide their graduates with clear signals generally show a tighter linkage between the education and training systems and the labour market because the assessment of applicant's potential is easier.

[39] In this respect, it is often argued by employers' that there is a lack of adequate female applicants particularly in male-dominated occupations.

[40] As Anker et al. (2003: 3) point out, "…it must always be kept in mind that women often decide not to apply for a particular post because they anticipate discrimination or are socialised into believing that traditional divisions of work are correct."

Figure 2.2: Interplay of micro- and macro-level determinants on occupational sex segregation



The figure, for instance, demonstrates that norms establishing a 'gender culture' have an impact on different areas in society, such as the family, the educational system and the labour market. In these areas, however, they are reflected differently: in socialisation processes and sex stereotypes, in employment structures and policy making.

Turning to the question why the described segregation processes differ between countries, the complexity of the issue becomes obvious. Differences between countries might partly be explained by the discussed nation-specific structural conditions and institutional arrangements of the labour market and the welfare state. However, the question whether countries with similar institutional settings also have similar levels of occupational sex segregation cannot be answered by recent welfare regime approaches, like Esping-Andersen's welfare typology (1990, 1999). While the typology is quite successful in explaining class-based stratification, it is not readily applicable to systems of gender stratification or conductive to the explanation of cross-national differences in occupational sex segregation (Quadagno 1988, Lewis 1992, O'Conner 1993, Orloff 1993). In this context, gender researchers have recently sought to create typologies pertaining to gender stratification more specifically (Sainsbury 1996, Gardiner 1997, Walby 1997, 2005, Daly and Rake 2003). The first serious approach to the explanation of cross-national variability in occupational sex segregation was developed by Chang (2000, see for more detail chapter 5).

When searching for common *'sex segregation regimes'* it must not be overlooked that different structural conditions and institutional arrangements may lead to a similar level of occupational segregation. This would refer to the already discussed 'black box problem' (see chapter 1) which is a fundamental drawback of most comparative approaches. The core critique might be that countries with very different welfare regimes (like the UK and France) are grouped together without elucidating and considering the underlying mechanisms at the micro level (Crompton 2006). For this reason, it is of particular importance to combine micro- and macro-approaches: only if underlying interactions between cultural beliefs, institutional manifestations and individual preferences are disentangled, reasons for differences or similarities of segregation patterns across countries will become clear and understandable.

This finally leads to another difficulty in explaining cross-national variation in occupational sex segregation: the multi-dimensionality of the phenomenon (see chapter 1 where at least two dimensions have been identified). Although segregation scholars distinguish between two dimensions of occupational sex segregation, most theoretical approaches focus mainly on the explanation of the vertical dimension (Hakim 1996, Semyonov and Jones 1999, Blackburn et al. 2001). Consequently, horizontal segregation is not conceptualised

independently when multiple segregation dimensions are distinguished empirically.[41]

However, Charles and Grusky (2004) underline the importance of examining both dimensions of occupational sex segregation independently for the explanation of cross-national variability. They argue that horizontal and vertical segregation corresponds to two deeply-rooted ideological principles of *'gender essentialism'* and *'male primacy'*. The former is reflected in widely-shared beliefs that women and men are better suited for different tasks on the labour market. These beliefs foster horizontal segregation. The latter ideological principle assumes that men are more status worthy than women which particularly shapes vertical segregation. The authors, furthermore, argue that both dimensions are affected differently by the described basic principles and, more importantly, that they could have opposite effects on occupational sex segregation within a country. While an increase in modern universalistic egalitarian forces, for instance, might lead to a decline in vertical segregation, horizontal segregation may be exacerbated at the same time by processes of post-industrial restructuring, like the service sector expansion.[42] Good and often-cited examples are the Nordic countries. Although being characterised by high egalitarian principles pushing the whole labour market and the welfare state towards a high female participation, and an optimal framework for combining motherhood with work, they show the highest levels of horizontal sex segregation. Southern European countries, like Italy and Greece - with more traditional gender beliefs and a lower commitment towards the female working population - by contrast, have the lowest amount of occupational sex segregation.

Also at the level of European politics, the divergent effects of the dimensions of occupational sex segregation within a country can be demonstrated. On the one hand, the EU develops and supports desegregation and gender equality measures within EU Member States. On the other hand, however, the liberalisation of European labour markets - even though perceived as an effective way to stimulate economic growth and enhance gender equality - rather increases women's employment in 'precarious' and low-paid jobs. In this vein, several theorists point to the fact that integration into the global economy significantly expands opportunities for women in the workplace, but does not necessarily remove barriers to women's advancement or ameliorate the predominance of low paying jobs held by women (Joekes and Weston 1994, Meyer 2003, 2006).

[41] It has been rather defined as the residual association between occupation and sex once gender differences in occupational income (vertical dimension) are taken into account.

[42] The expansion of the service sector contributes to the evolvement of horizontal sex segregation, because such activities often demand emotional labour or interpersonal skills that are labelled female (such as retail sales, banking, communication industries).

2.6. Conclusion

In sum, various studies have examined how individual level constraints affect individuals' labour force participation and their distribution across occupations (Roos 1985, Okamoto and England 1999). However, most scholars agree that substantial gender gaps in market behaviour remain even after considering individual factors. These gaps are largely attributable to cultural, organisational and institutional constraints on women's employment. The importance of contextual factors in determining women's market role is confirmed by analyses on a highly aggregated level showing striking cross-national differences in female employment rates and occupational distributions (Charles 1992, Meulders et al. 1993).

Against this background, it seems obvious that cross-national variations in occupational sex segregation are not easy to tackle. For their understanding, scholars must consider how the above-described contextual factors structure labour markets and educational systems, and to which extent these systems interact with individual preferences and choices as well as cultural gender beliefs. Moreover, it must be recognised that new dividing lines are emerging which need to be addressed in the context of occupational sex segregation. For instance, there is an evolving polarisation of high and low educated women with regard to labour market opportunities.

Without denying the merit of existing research, the present work aims at a refined and enhanced understanding of processes underlying occupational sex segregation in a comparative perspective. It expands the discussion on institutional influence factors by examining the institutional setting in all European countries. Moreover, the aspect of education will be included to achieve a better understanding of cross-national variations. Finally, recent research often examines the influence of the described institutional factors by employing mainly descriptive and bivariate analyses. The present work goes beyond this current state of research in that it applies an empirical model seeking to explain the variation of occupational sex segregation processes with reference to the social structure of European societies.

3 The problem of the measurement of sex segregation revisited

As pointed out in the introduction, one core aspect in the scientific literature on occupational sex segregation has been the question of how to measure this phenomenon adequately. As there is a variety of different single number indices, results of relevant studies (see Anker 1998, Blau and Hendricks 1979, Hakim 1979, 1993, Jacobs 1989b, Siltanen 1990) vary widely. Sometimes, even the use of the same index leads to different results (see for example Gross (1968) or Jacobs (1989a) for occupational sex segregation in the US-labour market). This is due to the fact that empirical results of segregation research are widely determined by methodological considerations, research preferences and the quality of data sets (Hakim 1992). In consequence, the question arises whether the amount of segregation has really been recorded in an adequate empirical and theoretical manner, or whether it would rather be necessary to modify existing theories and develop 'new' concepts and methods for a better understanding of the phenomenon.

To clarify these questions, particularly for a cross-national comparison, the following section first introduces common approaches to the measurement of occupational sex segregation. In this context, advantages and disadvantages of traditional as well as new segregation indices will be discussed with a focus on problems related to different definitions, classifications and data sets. In a second step, arguments for the hypothesis are presented that the methodological discussion in segregation research could profit substantially from solutions applied in social mobility research, where similar problems have arisen. Finally, it will be made clear that a clarification of the term segregation is necessary because it is used with different connotations and for different aspects of gender inequality.

3.1. The different approaches to the measurement of occupational sex segregation

A good starting point for the presentation of gender distributions across occupations and the understanding of segregation indices seems to be a cross-tabulation

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which is typically used in empirical segregation research. The following cross-tabulation, showing an exemplary distribution of men and women across different occupations, presents possible topics on which an empirical analysis of segregation could focus.

Table 3.1: Constructed cross-tabulation of broad occupational groups by sex

sex	**occupational groups**			**total**
	1	2	3	
	OCCUPATIONAL CHANCES →			
male	50	150	50	700
	SEX TYPING ↓			
female	50	150	100	300
total	550	300	150	1000
	occupational structure			female share in employment

Even though the analysis could concentrate on four topics, only the last two of the following summary are of interest in segregation research:

- The share of females in all employed persons (column marginal)
- The size of occupational groups (row marginal)
- The share of females in the total number of employed persons in each occupation ('column percentages'/sex typing)
- The 'chances' of male and female employees to work in one of the occupational groups ('row percentages'/occupational chances)

Similar tables, based on 'real observed data', can be quite large and complex (depending on the number of occupations). A first extension of the cross-tabulation approach, therefore, are segregation indices trying to summarise the observable amount of segregation into *one* single number.

This raises the most important methodological problem, namely the question of the adequate measurement of occupational sex segregation. In this respect, various techniques and indices of inequality have been proposed by several researchers which all claim to measure 'pure' segregation. As a consequence, there has been a long and very disparate debate on how an index of segregation should be constructed.

3.1.1. The traditional indices

In spite of the discussion about the 'best' index, there is no doubt that in most macro-sociological work, the index of dissimilarity (D) - proposed 1955 by Duncan and Duncan - is most frequently used but also most frequently criticised.[43] This index has not only been used extensively in the analysis of occupational segregation by sex but also in various other types of inequality analyses such as poverty, schooling and housing (Gibbs 1965). The index is based on an understanding of sex segregation as a different distribution of women and men across occupational categories; the more equal the distribution, the less the segregation. In this respect, D measures the sum of the absolute differences in women's and men's distribution across occupations. From the mathematical formula (see below), it is evident that D equals 0 in the case of complete equality (where women's employment is distributed similarly to men's across occupational categories) and 1 in the case of complete dissimilarity (where women and men are in totally different occupational groups). Following Anker's definition, it can moreover be interpreted as the proportion of women and men who would need to change jobs in order to remove segregation.

$$D = \frac{1}{2}\sum_{j=1}^{J}\left|\frac{F_j}{F} - \frac{M_j}{M}\right|$$

with
F total number of females in employment;
M total number of males in employment;
F_j number of employed females in occupation j;
M_j number of employed males in occupation j;
J number of occupations.

Irrespective of the widespread use and the easy interpretation of D, the index has come under criticism very soon as inappropriate for measuring occupational segregation by sex, especially over time (e.g. Hakim 1979, 1993, Watts 1990, 1995, Siltanen et al. 1995). The common critique is D's dependence on the size of categories of the classification used. As a consequence, both changes in the occupational structure of the labour force, and the extent to which occupations are feminised, influence D. From a purely methodological perspective, however, a measure that is only sensitive to the sex composition of occupational groups and its changes would be more appropriate.

[43] Gross 1968, Blau and Hendricks 1979, Blossfeld 1984, Jonung 1984, James and Taeuber 1985, Watts 1990, 1992, 1994, Blackburn et al. 1993, Jacobs 1993.

The first attempt to avoid the marginal dependence of D and, consequently, control for changes over time in the relative size of an occupational group has been made by Gibbs (1965) who proposed the standardised index of dissimilarity (D_{st}).

$$D_{st} = \frac{1}{2}\sum_{j=1}^{J}\left|\frac{\frac{F_j}{T_j}}{\sum_{j=1}^{J}\frac{F_j}{T_j}} - \frac{\frac{M_j}{T_j}}{\sum_{j=1}^{J}\frac{M_j}{T_j}}\right|$$

with

T_j total number of males and females in the jth occupation ($T_j = M_j + F_j$) and all other parameters defined as before

The basic principle of D_{st} is to treat all occupations as equal in size. In this way the occupational structure is held constant, such that changes in D_{st} over time or between countries can only be due to differences in the sex composition of occupations. Hence D_{st} is not affected by occupational size effects and should measure 'pure' sex typing (England 1981). An often undesired consequence of this procedure is that it gives the same weight to changes in the percentage of female workers in all occupations - small and large occupations alike. As Kalter (2000: 7) underlines, this side effect should be questioned because changes in very small occupations have the same impact on the index as those with noticeable shares in the total population. Moreover, Charles and Grusky (1995) have shown that the standardisation procedure used for the construction of D_{st} is not successful in achieving the goal of 'marginal independence'.

Due to the presented critique of D and D_{st}, several other segregation indices have been proposed in recent years. To mention only well-known indices: there are the WE index, proposed by the OECD for a report on women and employment (OECD 1980), and the sex-ratio index (SR) developed by Hakim for the United Kingdom's Department of Employment (Hakim 1979). Both are based on D and thus give rise to similar problems.

Another example of a 'new index' is the IP index by Karmel and MacLachlan (1988) that, as Watts (1992) has shown, could also be seen as a weighted form of D.

$$IP = \frac{1}{T}\sum_{j=1}^{J}\left|\frac{M}{T}F_j - \frac{F}{T}M_j\right|$$

with

T total number of employed persons and all other parameters defined as before

In contrast to D, the IP index reflects the relative size of both sexes and takes into account the male and female share of all employed persons. As a consequence, the index should not be sensitive to variations in the female share in the labour force which is an important aspect of cross-national comparisons and changes over time. The interpretation of IP differs slightly from D: while D can be interpreted as the relative share of women plus men which would need to change jobs in order to remove segregation, the IP Index shows the percentage of all employed persons who would have to change occupations to reach an identical distribution of both sexes in the occupational structure.[44]

As all presented measures are based on the logic of D, they share the dependency on the occupational structure of a given economy and the female share in employment. Blackburn et al. (1993, 1995) introduced an alternative inequality index. The Marginal Matching (MM) Index (later the Index of Segregation (IS)) was developed to measure changes over time in occupational sex segregation that result exclusively from changes in the sex composition of occupations. This approach involves a new definition of gendered occupations: "The female occupations are defined as those with the highest proportion of female workers for which the total number of workers equals the number of women in the labour force, and similarly the number of workers in male occupations equals the total number of men." (see for detail Blackburn et al. 1993: 342-348 or Anker 1998: 78).[45] Accordingly, the MM-index treats the aforementioned dependence of segregation measures on the occupational structure and the female share of employment as an advantage rather than a disadvantage. Moreover, it bypasses the problem that D is affected by shifts in the occupational structure over time.

In sum, it has often been underlined in segregation research that the presented indices have the advantage of simplicity. They condense into one number all variations in the distribution of jobs between men and women. At the same time, the simplicity may be also a disadvantage. Single number indices often hide changes in inequality over time and may be difficult to understand and explain in common sense terms. A further weakness is that they, in fact, capture the overall amount of occupational sex segregation without allowing for a differentiation between the horizontal and the vertical dimension. In this respect,

[44] The IP index has also been used for the decomposition of changes in segregation into three basic elements: gender, occupation and interaction effects (Karmel and MacLachlan 1988, Watts 1992).

[45] The calculation is done by ordering occupations according to their female concentration: calculating the cumulative distribution of the employed labour force along this ordering starting at the 'female' end of the occupational ordering and moving along the cumulative distribution until the cumulative number of workers equals the number of women in employment. The level of female concentration at this point is the dividing point between 'male' and 'female' occupations. By doing so, marginal totals N_m and N_f are respectively 'matched' to M and F (i.e. $N_m = M$ and $N_f = F$).

international studies have shown that, within country-specific institutional contexts, high occupational sex segregation can be accompanied by a high gender inequality but also with more gender egalitarian wages (McCall 2001, Dolado et al. 2002).

Against this background, Jacobs (1999) proposed to take more than one index into account for getting a broad picture of the amount and pattern of occupational sex segregation on the labour market. In this vein, new studies supplement the analysis with measures of vertical aspects of occupational sex segregation (Seibert et al. 1997, Baunach 2002). They are based on socio-economic aspects, like status differentials or status and prestige scales, and capture the vertical aspect with an additional single number index (Fossett and South 1983, Fossett and Kiecolt 1991, Fossett 1991). Consequently, they are able to show which of the sexes can be found in a higher ranking occupational group. A further alternative is the so-called association index 'Somers D', where occupations are ordered on a 'vertical' dimension (status, income) and the 'independent' variable is gender with only two categories (Blackburn et al. 2001, 2002, Bridges 2003).

3.1.2. The log-linear approach

The most promising approach to the twin problem of measuring and explaining levels of occupational sex segregation across countries or over time is based on log-linear techniques (see Handl 1984, Charles and Grusky 1995, 2004, Xie 1997, Kalter 2000). In particular, Charles and Grusky (2004) are precursors in applying this method in the framework of occupational sex segregation. In their opinion, former research has been limited by three methodological weaknesses: first, the lack of scalar indices to capture the multidimensionality and the different patterns of sex segregation. Second the discussed sensitivity of most indices to temporal or inter-country differences. Third, they also criticise that most of the indices are relying on highly aggregated occupational categories and data, so that the appearance of cross-national variability in segregation regimes may merely be an artefact of differences in the composition of categories.

Log-linear modelling has for a long time been a standard procedure in stratification research, like social mobility analysis (Müller 1990, Erikson and Goldthorpe 1992, Ishida et al. 1995, Müller and Pollack 2004). The biggest advantage of log-linear approaches is that, while building up on odds and odds ratios, they are independent of the marginal distributions of a segregation table.

In consequence, they are perspective invariant, which means that they focus on both dimensions of the cross classification.

In earlier research by Handl (1984), log-linear techniques have been used to carry out a decomposition of changes in segregation, measured by D, into two parts: changes caused by variations in the size of occupational structures and changes caused by a reduction or a growth of the female share in occupations. Later, Charles (1992) and Charles and Grusky (1995) adopted ANOAS-models, originally developed for the analysis of social mobility tables, for the analysis of so-called 'segregation regimes'. These techniques which, in the meantime, have been applied in a series of international comparative studies (Nermo 1999, Chang 2000, 2004, Charles and Grusky 2004), allow not only for a description of patterns of 'segregation' but also for a thorough statistical analysis of changes in occupational sex segregation. Charles and Grusky (1995) underline that the purpose of using log-linear modelling in the field of sex segregation research is not the construction of a scalar index. As there seems to be a demand for summary measures in this research context, they nevertheless propose a scalar index (A) derived from a log-multiplicative model. A is defined as follows:

$$A = \exp\left(\frac{1}{J} \sum_{j=1}^{J} \left\{ \ln\left(\frac{F_j}{M_j} \right) - \left[\frac{1}{J} \sum_{j=1}^{J} \ln\left(\frac{F_j}{M_j} \right) \right] \right\}^2 \right)^{1/2}$$

With all parameters defined as before

A equals zero and exp(A) equals one when the labour market is perfectly integrated. One disadvantage of the index may be the less clear interpretation. A represents the standard deviation in the logged sex ratio, and can be interpreted as the multiplicative factor by which men or women are, on average, overrepresented in the occupational categories in question. Although the application of A does not seem to change the results and trends of traditional indices substantially, it might affect the understanding of the magnitude of change in a cross country comparison (Weeden 1998). Moreover, Nermo (2000) argues that log-linear modelling offers better possibilities to explain trends or cross-national variations in the association between sex and occupation.

Along the lines of the log-linear approach, another research strand has been developed on the basis of the common critique that segregation is not completely conterminous with inequality. Researchers (for example Semyonov et al. 2000) applying this strategy used separate measures of overall segregation and vertical differentiation, distinguishing between 'nominal' segregation (measured with D and the A-index) and 'ordinal' occupational differentiation (inequality

measured by the Index of net difference). The consideration of the two different measures (taking into account the ranking of occupations) is of utmost importance because they reflect these different aspects. As Bridges (2003: 546) underlines, "…every measure of 'nominal' segregation, like D, is a necessary, but not sufficient, condition for a high level of occupational inequality between the sexes. Therefore, approaches that allow for an explicit decomposition of 'total' segregation into its components need to be considered."

In this vein, researchers advocate a paradigm that distinguishes the vertical and horizontal dimensions of occupational sex segregation (see in more detail Hakim 1981, Blackburn and Jarman 1997, Blackburn et al. 2001, also chapter 1). They assume that overall segregation consists of two components (horizontal and vertical) that ought to be identified separately. Their suggestion for measuring these two dimensions is to compute 'Somer's D of association' under two varying circumstances: capturing the total and vertical segregation and assuming that horizontal segregation is the difference between both. The advantage of this approach is that the horizontal dimension can be assessed in its own right. However, it is limited because occupations can only be ordered by a single dimension at one point in time which may lead to an overestimation of the horizontal dimension. Charles and Grusky (2004) also point out the multidimensionality of segregation. They propose to identify inequality and horizontal dimensions by using a log-multiplicative model with two dimensions of association. This provides a measure of the relative sizes of 'vertical' and 'horizontal' segregation.

On the basis of these insights, Bridges (2003: 548) introduces a new log-likelihood ratio statistics called 'normed' G^2 which combines both methods presented above.[46] This approach is based on log-linear, but not log-multiplicative methods which characterise both the overall dependence of occupations on gender and the amount of that dependence that is associated with various hierarchical features of the occupation (earning, prestige etc.). Moreover, the overall measure is decomposed into different components. This ratio also varies between 0 (independence of gender and occupation) and 1 (extreme segregation).

Somewhat earlier, and apart from the discussion on how to capture horizontal and vertical segregation aspects, Kalter (2000) proposed a new 'adjusted index of dissimilarity' which combines the traditional concept of D with the log-linear approach. He avoids the serious problem that D is affected by structural conditions and, simultaneously, preserves its advantages. The index mainly focuses on structural changes by taking into account independent variables rather than changes in the variable of interest (dependent variable). Hence, Kal-

[46] $G^2=2 \sum f_i * \log f_i/m_i$ with, m_i= frequencies expected under the model of row and column independence and f_i= observed frequencies.

ter (2000: 18) is able to "…analyse (macro) inequality structures, taking into account contextual and temporal differences in relevant (micro) determinants."

3.1.3. Further determinants on segregation indices

Even though the methodological weakness of single number indices seemed to have been solved by indices based on log-linear methods, there are further problems which particularly evolve in a comparative research design. These problems are, for example, related to the quality of data, the used classifications and the comparability of variables and definitions (see Charles and Grusky 1995, Anker 1998). It is beyond the scope of the present inquiry to survey all possible issues. Several major problems, however, need to be discussed in more detail: occupational classifications and concepts of 'occupations', the definitions of working-time and employment, and the sectoral sensibility of indices.

As to the first of these issues, it is to be considered that a first group of influencing factors is related to occupational classifications. In general, some sort of occupational or sectoral classification of employees constitutes the backbone of segregation research. However, the measurement of positions held by employees in the labour market raises difficult questions because the concept of 'occupation' may be country-specific and hard to compare across different nations. In order to solve this problem and to obtain the best basis for comparable international research, an International Standard Classification of Occupations (ISCO) has been developed by the International Labour Office in Geneva (ILO 1968 and 1988). The objective of this classification is to provide an instrument for a theoretically guided, very detailed arrangement of jobs and occupations in the labour force, i.e. to present a method for grouping all jobs into successively broader occupational categories.[47] The ISCO88 was designed along the lines of two main concepts: job (kind of work performed) and skill (complexity and specialisation), meaning that a 'lower' code implicates a higher skill which is defined as "the ability to carry out the tasks and duties of a particular job" (ILO 1990: 2). The classification distinguishes 390 unit groups on the most detailed level (4-digit level) and a set of 116 'minor group' categories on the 3-digit level which can be aggregated into 28 'sub-major' categories and nine 'major' categories (Ganzeboom and Treiman 1992, 1996).

[47] While a job comprises a set of tasks performed, or designed to be performed by one individual, an occupation contains similar jobs, i.e. similar according to skill level, skill specialisation and main tasks (Bakker 1993).

Although the creation and implementation of the classification has been improved, not all problems have been solved yet. The above-described logic, for example, looses consistency when changing from the 1-digit level to a more disaggregated 2- or 3-digit level: here some occupations in major group 7 (craft and related trade workers) obviously require higher degrees of skill and longer training than some of the occupations classified in group 5 (service workers). As a consequence, research results seem also influenced by the availability of detailed occupational classifications. Solutions for this problem are diverse. While Ganzeboom and Treiman (1996), for example, suggest the use of the most detailed 4-digit level, Elias (1997: 3) pointed out that "[…] coding/recoding studies indicate that the sub-major group [2 digit] level of ISCO-88 represents a useful level at which to undertake comparative analyses of occupational data."

Table 3.2: Major categories of ISCO88 (1-digit):

High skills	1	Legislators, Senior Officials and Managers
↓	2	Professionals
	3	Technicians and Associate Professionals
	4	Clerks
	5	Service Workers and Shop and Market Sales Workers
	6	Skilled Agricultural and Fishery Workers
	7	Craft and Related Trade Workers
	8	Plant and Machine Operators and Assemblers
Low skills	9	Elementary Occupations

The aggregation of occupations in broader categories is optional. It can be done by using the ISCO88 2-digit or 1-digit, or by classifying occupations into female-dominated, male-dominated and integrated occupations. The main problem arises from the inconsistency of the selected threshold for 'typical' occupations. For example, some authors define the limit for integrated occupations based on the assumption that men and women are equally represented in society. Consequently, they set the limit at 40% (Jacobs 1989b, Reskin and Roos 1990) and 50% ignoring the fact that the female employment rate is often below 50% (Hakim 1993). Other scholars use the female employment rate as a starting point and relate the threshold to this mean.[48] However, theoretical arguments for a 'specific' threshold are still missing.

[48] Also here the definitions are very inconsistent: some researchers use a threshold between +-10% (like Blau et al. 1998a) or +/- 15% (see Hakim 1993, 1998). A good overview of this discussion is provided by Anker 1998.

A further problem, related to occupational classifications, refers to the concept of 'occupation'. Different national and cultural contexts might create country-specific occupational classifications which follow quite different principles of construction and have to be transferred into the ISCO88. In this context, Elias (1997) argues that the transformation of national classifications into the ISCO88 improves the opportunities for a country comparison. However, he also underlines that in some countries, like France and the United Kingdom, the comparison is not guaranteed. Therefore, it should always be considered whether in a specific country, at a certain point in time, the data based on the ISCO88 code fulfil minimum standards of reliability and comparability.

Moreover, it should be underlined that some researchers hold the view that occupational classifications are 'gender blind' (Beckman 1996, Tijdens 1996). As classifications devote attention to developments on the labour market only with some delay, important changes, like the dramatic increase in the service sector, are not captured adequately. In this often female-dominated sector, many new occupations evolve which, by most classifications, are allocated to few and heterogeneous occupational groups. The rigidity of statistical classifications has been pointed out appropriately by Rubery et al. (2002a: 47): "New classifications tend only to be brought in when replacement has become absolutely essential. As the EU Member States, despite efforts towards harmonisation are still developing at different speed and directions, the conservatism of the classification system means that the classification of occupations and sectors may be more satisfactory for some countries than for others."

As a consequence, changing labour market conditions of women are not necessarily represented adequately by traditional classifications. This problem is intensified in an international comparison where jobs, included in occupational categories, could differ from country to country.

A further group of determinants relates to general definitions of terms like employment and working time, which can be defined differently across countries. This is especially a problem when focusing on female workers who are often incompletely enumerated (and therefore often invisible) in official statistics. Furthermore, the clarification of these terms is more important for certain occupations (e.g. agriculture) and certain types of jobs (e.g. informal sector jobs). To solve the problem and increase the comparability across countries, some authors (Anker 1998, Rubery et al. 2002a) recommended, for example, excluding the agricultural sector from the analysis. This seems plausible because reasons for gender segregation in non-agricultural and agricultural occupations can be quite different. A large proportion of agricultural employment is family labour which does not enter the labour market (Anker 1998: 59). The high aggregation of the agricultural sector and its gender blindness can also be demon-

strated by the sensibility of segregation indices for sectoral compositions (see Rubery et al 2002a: 61, 72). This is confirmed by own calculations comparing results for D and D_{st} with and without the agricultural sector for the year 2004. Some of the EU Member States, particularly in Southern and Eastern Europe, are changing their position (see table A3.1 in the appendix). The change is not very large at an overall level but more significant for individual Member States. As agriculture is a sector with only few defined occupational categories, the exclusion can have an increasing or decreasing effect on the index. If a decrease comes to the fore it reflects the importance of the sector in the countries but also the predominance of men (Rubery and Fagan 1993).

Finally, it can be stated that none of the presented approaches provides an entirely satisfactory method of measuring occupational sex segregation over time or between countries. Changes in the distribution of women and men across occupations are unlikely to happen in a context where either the occupational structure remains stable or the female share of the labour force remains constant. Furthermore, a comparison of occupational sex segregation across EU countries will always suffer from further problems, like the identification of an adequate classification of occupations/sectors which allows a country comparison and includes not only differences in the occupational structure but also differences in the scale of women's employment.

3.2. Learning from advances in mobility research - the multi-dimensionality of occupational sex segregation

Besides the debate about an appropriate index and the described related determinants, a central ambiguity in segregation research has not been tackled so far. A thorough review of the literature shows that the essential problem of the traditional index-based approach is not so much the decision for the 'one right' index. Instead, the presented methodological discussion, especially with respect to an international and historical comparison, concentrates too much on the aspect of a 'marginal free' measurement but fails to define the concept of 'segregation' precisely. Most of the indices have been proposed with varying connotations.

Consequently, a clarification of the concept of segregation, like in mobility research, is necessary to avoid further misunderstandings in the interpretation of research results. On this basis, also the deviant indices would probably be very helpful - especially in the context of more politically-oriented research. To develop this argument, this section briefly summarises the theoretical and methodological developments in social mobility research and tries to relate them to the difficulties in sex segregation research. Moreover, it will be argued that the

methodological discussion in segregation research could profit substantially from solutions applied in social mobility research.

Social mobility and segregation research are based on data of a similar structure. In both areas, very simple cross-tabulations are the starting point of a more elaborate analysis. In social mobility, it is a cross classification of the current class position (using occupations and social status as a backbone) of sons or daughters by social class origin (e.g. social class position of the father). In segregation research, a similar occupational variable (mostly based on the ISCO88) is used, but split only by a dichotomous variable, namely 'sex' (see table 3.1).

At the beginning, mobility research focused on the measurement of the 'amount of mobility', summing up the number of persons outside of the main diagonal of the mobility table (upward and downward mobility). Very soon it was detected that, in international or historical comparisons, this indicator of the 'amount of openness in a society' was heavily influenced by the strength of changes in the occupational distribution between father and son/daughter generation. To solve the problem, a decomposition of 'total mobility' into 'structural' mobility, forced by changes in the social structure, and the so-called 'pure' or 'exchange' mobility has been proposed (Yasuda 1964, Rogoff 1966). This decomposition (similarly to the differentiation between upward and downward mobility) was obviously only a very rough analysis of the huge amount of information included in a detailed mobility table.

One strategy has been the summation of differences in the mobility chances of children with differing social origin into one single number (usually the index of dissimilarity). As a mobility table allows for k(k-1)/2 independent comparisons and the basis of the comparison remains arbitrary, this strategy has been rarely used.[49] More common has been a detailed inspection of the mobility patterns across the cells of the mobility table using different indices.

Also in mobility research, a long methodological discussion started because it was realised soon that not only the highly aggregated mobility rates, but also the indices used for the detailed comparisons are dependent on structural changes in the marginals of a mobility table (Yasuda 1964, Tyree 1973). Particularly, the so-called 'association-index' (Rogoff 1953, Glass 1954, Carlsson 1958) did not achieve the goals of marginal independence. This problem was finally solved by Goodman (1965, 1969, 1979) and Hauser (1978), who introduced log-linear modelling into mobility research which, subsequently, has been expanded by the development of log-multiplicative models (Hout 1983). However, only Goldthorpe (1987) and Erikson and Goldthorpe (1992) applied this

[49] In the analysis of a segregation table only one single comparison (between women and men) exhausts all the available information.

new advanced technique for intensive comparative research and introduced a clear theoretical distinction between 'social mobility' (absolute mobility) and 'social fluidity' (relative mobility). According to this theoretical refinement, 'social fluidity' means the degree of relative inequality, according to class origins, in a person's chances of acquiring a better, rather than a poorer, class position. It is conceived as a measure of the permeability of a class system, independent of how many persons are found in each of the classes.[50] In consequence, 'social mobility' has been defined as the amount of directly observable mobility resulting from 'patterns of fluidity' and the size of different classes. In sum, the realised advantages in mobility research have two bases: one is the methodologically driven progress in statistical modelling; the other is the theoretical refinement of the term 'mobility' which now combines different measurement and modelling procedures with different theoretical concepts.

With respect to occupational sex segregation, central methodological improvements have been introduced, particularly by Charles and Grusky (2004) who propose a marginal free A-Index as well as the application of advanced log-multiplicative modelling. Nevertheless, a convincing conceptual clarification is still missing. This is an unsatisfactory situation for at least two reasons: first, it remains unclear which aspects are covered by the term segregation: Is the expression used for differences in the observed distributions between the sexes? Or for the description of the underlying structure of unequal treatment (which results in differences in sex typing of occupations)? Second, not only the marginal free but also the marginal dependent measures of changes and differences in the distribution between two groups could be of outmost importance, particularly in a politically driven analysis of occupational sex segregation in different countries. For political recommendations, it makes a difference whether the share of females rises in a very small or a large occupational group. Despite the fact that scholars have called for a marginal free measure, it has therefore to be asked whether this is always the adequate method. As Weeden (1998: 486) underlines, "…research should be aware of the central research question and the 'best' measurement before preferring 'any' index."

As pointed out above, the term 'segregation' is used with very different connotations: some authors restrict their understanding of the term to the amount of *'sex typing'* of occupations (mostly measured with D_{st})[51]. This aspect identifies the gender composition of an occupation or a sector, i.e. in how far it is typically male or female. Other researchers, however, focus on the unequal distribution of men and women over the whole occupational structure. This

[50] Analyses of this aspect are based on the marginal free parameters of log-linear or log-multiplicative models using odds ratios as the basic measure of social fluidity.
[51] Nevertheless, there are several alternative proposals (e.g. Sex Ratio Index SR, MM-Index).

aspect studies the degree of *'sex-specific occupational chances'* (mostly measured with D) of male and female employees, taking into account the 'size'-aspect (or the weight) of each occupational category.[52]

Hence, it becomes clear that the term 'segregation' is imprecise, and should be regarded as a generic term covering different aspects of sex-specific differences. Furthermore, a theoretical refinement can be derived from a comparison of the described aspects of occupational sex segregation with the different aspects of social mobility. As mentioned above, the terms 'social mobility' and 'social fluidity' are reserved for different theoretical and methodological perspectives and procedures. In segregation research, a comparable distinction could be drawn, differentiating between 'patterns of sex typing across occupations' (similar to social fluidity) and 'sex-specific differences in occupational chances' (similar to the concept of 'social mobility'). The measurement of these dimensions does not necessarily require the use of sophisticated log-linear procedures. The proposed approach could also be followed by using different indices. However, it should be critically underlined that before presenting results on the basis of indices, the selection should be based on the aforementioned specific dimensions of segregation.

Finally, there is a term that is not included in the concept of social mobility: *'sex-specific occupational inequalities'*. This aspect is restricted to the vertical dimension of occupational sex segregation and concerns the unequal distribution of men and women over occupations at different hierarchical levels. In this context, the ranking of occupations is assessed with the socio-economic status and the mean income by using indices like the status differential, the status and prestige scales or 'Somers D'. To provide a better overview of the different dimensions and measurements, the following table 3.3. sums up these considerations.

Table 3.3: Theoretical dimensions of occupational sex segregation

Theoretical Concept	**Measured by**	**Used Classification**
'Segregation': generic term which includes the aspects of		
Sex-typing of occupations	Standardised index of dissimilarity (D_{ST})	ISCO88 2-digit
Sex-specific occupational **chances**	Index of dissimilarity (D)	ISCO88 2-digit
Sex-specific **inequalities**	Mean-differential, Somer's D, Variance	ISEI 2-digit

Source: The theoretical classification was developed in the European Commission funded project Female Employment and Family Formation in National Institutional Contexts (FENICs)

[52] To perform this weighting process, the percentage of males and females, working in a specific occupation or sector, could be calculated.

A comparison of correlations between different index families and their associated aspects of segregation (i.e. sex-typing of occupations, occupational chances and sex-specific inequalities) confirms that a theoretical clarification of the concept of 'segregation' might overcome the long-lasting search for the 'best' single-number index. It could be assumed that the correlation between various segregation indices depends on the aspect of interest. Therefore, correlations are subsequently calculated on the basis of a series of different indices (see figure 3.1). They are selected according to the principle that they sum up rather 'differences in chances' or 'differences in sex typing'.

To verify the measurement of D, the frequently used IP-index has been calculated. This index has not only become widespread in scientific literature, but is also used in the statistical monitoring system of the EU.[53] The measurement of the standardised index of dissimilarity (D_{st}) is compared with results for indices based on log-linear modelling. In this respect the A-Index would be one alternative log-linear based index which avoids the problem of marginal dependency.

However, in the framework of this inquiry, a newly developed so-called L-index[54] is used which is defined as follows:

$$L = \frac{1}{k} \sum_{i=1}^{k} \left| \lambda_{ij}^{OS} \right| \cdot 100$$

with

j 1 and 2 for sex

i 1,...,k (k = numer of occupational categories) and

λ_{ij}^{OS} as the interaction effect between occupation and sex

The advantage of the L-index in comparison to the A-index is that the calculation is directly based on effect parameters of a saturated, effect-coded log-linear model of a segregation table. The obtained lambda-interaction parameters λ_{ij}^{OS} (sex*occupation) correspond to the characteristics of the percentage differ-

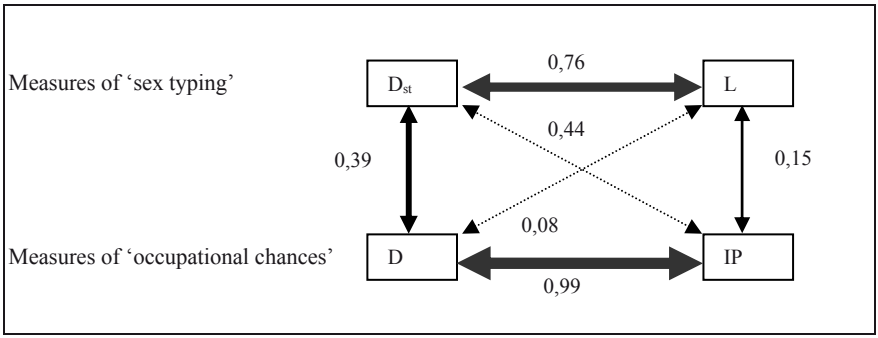
[53] It might be interesting that the European Commission (the EMCO indicators group) uses two indicators for measuring segregation. These are IP-indices: the EO3 (Index of gender segregation in occupations) and the EO4 (Index of gender segregation in sectors). However, it must be emphasised that, due to the above-discussed difficulties and insecurities of segregation indices, many practical and policy-related aspects could not be addressed by such an aggregated statistic.

[54] The L-index was developed by the research group of Prof. Handl in which the author worked in the framework of the European Commission funded project Female Employment and Family Formation in National Institutional Contexts (FENICs). The factor 100 has been additionally implemented to make the results of L clearer. Moreover, there is a slight positive correlation between A and L (0.114). See table A3.2 in the appendix.

ences used in calculating D_{st}.[55] Hence it is possible to handle the effect parameters in a similar way as the percentage differences. This is realised by simply adding all positive and negative interaction effects (without signs) for one selected sex and divide the sum by the number of categories of the used variable.

The following figure 3.1 illustrates correlations of the four selected indices on the basis of the ICO88 2-digit for EU Member States for the year 2004. As expected, the correlation coefficients for the four selected indices show a high and significant association between the values of D and IP (0,99) both measuring the differences in 'occupational chances', as well as between D_{st} and L (0,76) both measuring the amount of 'sex typing'. All other correlations (D_{st} and D or L and IP), which measure different aspects of segregation, are much lower (for more details, see tables A3.2 and A3.3 in the appendix).[56] These findings confirm that the theoretically driven differentiation between 'sex-typing' and 'occupational chances' as distinct but correlated dimensions of segregation is justified. The distinction is not only supported by the traditional indices of dissimilarity, but also by the use of alternative indices of segregation. Taking this result into account, it should be possible to systematise previous and sometimes divergent findings concerning the development of sex segregation more adequately.

Figure 3.1: Correlation between different measures of occupational sex segregation (ISCO88 2-digit), 2004



Source: EULFS 2004/5, own calculations

[55] They sum up to zero. However, it is also possible to modify the index (L) by taking, for example, only the significant parameters into the summation.

[56] The correlations show that different indices are measuring the same aspect of occupational sex segregation.

3.3. Conclusion

The application of an index-based approach to analyse occupational sex segregation across countries or over time gives rise to various problems. The theoretical and methodological clarification of 'occupational sex segregation' along the lines of experiences in mobility research is conducive to addressing these problems adequately.

It has been demonstrated that social mobility and segregation research have comparable starting points. In both research strands, the focus is on social inequality between different groups in society. Also from a methodological point of view, parallels can be drawn: the aspects of 'sex-typing' and 'occupational chances' can be distinguished as distinct but correlated aspects of segregation, in analogy to 'social fluidity' and 'social mobility'. The benefit of this theoretical clarification is that some of the disadvantages of traditional indices, particularly their marginal dependency, are no longer important. Instead, it becomes clear that the search for the 'right' measurement (i.e. the selection of the adequate index) largely depends on the focus of interest. Furthermore, in a political context, a marginal dependent approach seems to be more suitable to consider the multi-dimensionality of sex segregation and evaluate improvements in gender equality. Specifically, it has been argued that the size of the occupations or sectors in which gender inequality evolves, is not taken into account when focusing, for example, only on a comparison between the structure of 'sex-typing profiles' between countries. To obtain an estimate of the number of persons who are privileged by or suffer from the inequality relation, however, it also seems important to capture the size of occupational categories by examining the 'occupational chances'. Nevertheless, 'final' certainty on whether this result has 'empirical' evidence or is an artefact of the methods used cannot be achieved with an index-based analysis. Here, thorough in-depth case studies using advanced multivariate methods are necessary which are better suited for a detailed examination of the relation between sex typing and occupational chances.[57]

Finally, this chapter has shown that an index-based analysis of occupational sex segregation can be a useful starting point for the understanding of sex segregation patterns. However, as Charles and Grusky (2004) point out "…it is only rarely an appropriate end point". This is of crucial importance, particularly when policy makers classify countries, using only one single number index to assess the 'advantaged' or 'disadvantaged' situation of women and base recommendations on such - often short-sighted - measures.

[57] It would be possible to summarise detailed occupational categories under specific themes, like female- and male-dominated occupations (Hakim 1993) or manual vs. non-manual occupations (Charles and Grusky 2004).

4 Female labour force participation and patterns of occupational sex segregation in Europe

As already pointed, one of the profound labour market developments has been the continuous progress made by women during the last decades. These developments have been driven by a variety of forces. In particular, the outsourcing of traditional female household activities has eased women's transition from the home to the labour market and led to diversified employment and working-time arrangements.

In this context, the question arises which impact these continuous processes of social change have on the development of occupational sex segregation. What are the key factors influencing patterns of sex segregation in a country? To which extent do they differ across EU Member States?

Based on various comparable data sets, this chapter first provides an overview of trends in female labour force participation. It shortly discusses determinants of the observed employment patterns which cause differences between EU Member States. In a second step, the analysis will be extended to patterns of occupational sex segregation across countries. In this regard, the aim is threefold: first, empirical results concerning occupational differences between men and women will be presented by identifying trends for 23 EU Member States between 1995 and 2004.[58] As occupational sex segregation is a multidimensional phenomenon, the horizontal and vertical dimensions will be taken into account. Second, the usefulness of the theoretical differentiation between sex typing and occupational chances which has been proposed in chapter 3 will be assessed particularly with regard to changes over time. Finally the question will be addressed in how far the described patterns are related to the national context and the development of institutional characteristics as well as cultural and social attitudes concerning women's and men's role in society.

[58] Unfortunately, sometimes the data were not available for all 23 EU Member States or not for all points in time.

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4.1. Female employment in the EU - developments and characteristics

4.1.1. Development of female employment

During the last 20 years a growing proportion of women in the European Union has been engaged in paid work. As the following table 4.1 shows, particularly the Nordic countries have taken a leading position in 2004, with female employment rates[59] between 71.6% in Denmark and 70.5% in Sweden. By contrast, Southern European countries, like Greece (45.2%) and Italy (45.2%), are still characterised by very low female employment rates. Women have made progress in the total employment rate between 1985 and 2004 in almost all countries. However, the timing of growth varies across countries. The Nordic countries (Sweden[60] and Denmark) started very early and had the highest female participation rate throughout the whole time period, followed by the United Kingdom. During the last decade (1990-2004), the largest increase could be observed in Spain (+17.4%), Ireland (+19%) and in some continental European countries, like the Netherlands (+17.2%). It is remarkable that, above all, the female participation rate in the Netherlands has increased by 25% (from 40.9% to 65.8%) during 1985 and 2004.[61] In the case of Germany, the rise of female employment between 1985 and 1990 can be explained by the German reunification (1989) and the higher labour market commitment of East German women.

In Eastern European countries, the development was different. As the communist ideology forced maximum utilisation of the labour force potential, female full-time employment was nearly as high as male's during the communist regime. The high integration of women into paid employment was institutionally supported through well-developed childcare facilities and generous social programs offered by public enterprises (e.g. Łobodzińska 1995, Pascall and Kwak 2005).[62]

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[59] The employment rate is based on the definition of Eurostat where it is defined as the share of employed persons aged 15 to 64 in the total population of the same age group). Unemployed persons are not taken into account. By contrast, the activity rate or labour force participation rate refers to the number of employed *and* unemployed persons (as a percentage of working age population). In general these values are higher.

[60] A closer inspection of Sweden brings to light that, together with Finland, it is a country that had a fundamental collapse in female participation rates between 1990 and 1995.

[61] This development is particularly related to the gradual improvement of childcare facilities and changing values regarding women's roles (Visser and Hemerijck 1997). Moreover, the steep increase in female labour participation and thus in employment consists mostly of part-time jobs. Freeman (1998) depicts the Netherlands as having 'the first part-time economy in the world'.

[62] Nevertheless, female labour potential was primarily regarded as a means to fulfil the needs of the production system in a period of rapid industrialisation. Hence, the apparent gender equality observed in the labour market did not translate into equality in household-related tasks. Women, in

Table 4.1: Development of female employment rates[b] (%, age 15-64), 23 EU Member States, 1985-2004

	1985	1990	1995	2000	2004	Gender gap[c]	EU-60% target[d]
Nordic countries							
Denmark	68.3	70.2	66.7	71.6	71.6	-8.1	11.6
Finland	73.1	71.3	59.0[e]	64.2	65.6	-4.1	5.6
Sweden	75.6	78.7	68.8	70.9	70.5	-3.1	10.5
Anglo-Saxon countries							
United Kingdom	54.8	62.0	61.7	64.7	65.6	-12.2	5.6
Ireland	33.3	35.6	41.6	53.9	56.5	-19.4	-3.5
Mediterranean countries							
Greece	35.8	37.1	38.1	41.7	45.2	-28.5	-14.8
Italy	32.5	35.6	35.4	39.6	45.2	-24.9	-14.8
Spain	25.2	30.7	31.7	41.3	48.3	-25.5	-11.7
Portugal	48.8	54.3	54.4	60.5	61.7	-12.5	1.7
Continental countries							
Austria	52.1	55.9	59.0	59.6	60.7	-14.2	0.7
Belgium	39.1	40.9	45.0	51.5	52.6	-15.3	-7.4
France	49.3	51.1	52.1	55.2	57.4	-11.5	-2.6
Germany	48.9	54.2	55.3	58.1	59.2	-11.6	-0.8
Netherlands	40.9	47.1	53.8	63.5	65.8	-14.4	5.8
Luxembourg	39.7	41.8	42.6	50.1	50.6	-21.8	-9.4
Eastern countries							
Hungary	50.2*	46.3*	40.3*	49.7	50.7	-12.4	-9.3
Poland	-	-	51.1*	48.9	46.2	-11.0	-13.8
Estonia	-	60.6*	53.6*	56.9	60.0	-6.4	0.0
Czech Republic	-	60.8*	52.3*	56.9	56.0	-16.3	-4.0
Lithuania	-	60.2*	55.1*	57.7	57.8	-6.9	-2.2
Latvia	-	64.1*	-	53.8	58.5	-7.9	-1.5
Slovenia	-	54.1*	52.1*	58.4	60.5	-9.5	0.5
Slovakia	-	59.7*	51.2*	51.5	50.9	-12.3	-9.1

Notes: a) The organisation of the table follows Boeri et al. (2005: 13); b) Definition of the employment rate = employed persons aged 15-64 as a share of the total population aged 15-64;the definition of the employment rate for the Eastern EU Member States refers to people aged +15; c) The gender gap refers to the difference between the male and the female employment rate (a minus means the differences of women's employment rate to men's; d) The EU 60% target refers to decisions at the Lisbon summit 2000 to increase women's employment from 51% to 60% by 2010 (see for more detail, chapter 1); e) The huge difference for Finland between the years 1990 and 1995 might be explained by one of the deepest recessions Finland experienced during 1990 and 1995. At the same time the unemployment rate of women increased from 2.7 to 15.1%.
Sources: European Commission: Employment in Europe 2002, 2004, 2005 and 2006,
** For Eastern European countries, 1990-1995: http://w3.unece.org/pxweb/Dialog/statfile1_new.asp*

spite of their professional duties, were expected to perform housework and provide care (e.g. Pascall and Manning 2000, Geisler and Kreyenfeld 2005).

These patterns have changed considerably after the breakdown of the communist system. Economic transition and a rapid development of the service sector caused a significant change in the structure of labour demand. The situation of men worsened substantially. For women, however, it was even more difficult to compete successfully in the labour market (Pollert 2003: 337). The table clearly shows that female employment rates dropped between 1990 and 2004 in nearly all Eastern European countries. It is particularly low in Poland (46.2%), while the highest figure is reached in Estonia (60%) and Slovenia (60.5%). Furthermore, the declining role of the state in the economy in many CEE countries, accompanied by rapidly diminishing financial resources, resulted in reduced public support for families, both in terms of income and provision of services (Stropnik 2003). As a consequence, the reconciliation of work and family has become more difficult - a development which has finally led to the observed drop in female employment. In spite of the described difficulties in the labour market, the gender employment gap in post-socialist countries is still much lower than in the majority of the 15 'old' EU Member States, particularly when measured in full-time equivalent (European Commission 2004a).

The described developments in female employment have a certain corollary, particularly for men. Between 1985 and 2004, the male participation rate diminished in almost all countries (except of the Netherlands and Portugal), but not to the same extent as the female participation rate increased. The reasons for the decline of male employment in the 'old' EU Member States can be seen in a longer qualification period of young men and the possibility of an early retirement offered to older men (Rubery et al. 1998). In Eastern Europe, however, the drop was probably caused by cuts in the industrial sector and further structural changes which affect men to a greater extent than women (Ruminska-Zimny 2002: 3). Nevertheless, there are still significant gender differences in Europe: even though the employment gap between women and men[63] has decreased, on average, from 18.1% to 15.2% over the last few years, it remains significant. Moreover, it varies considerably across countries: in 2004 the gender employment gap ranged from -28.5% in Greece to -3.1% in Sweden. The European employment target of a 60% female employment rate, which is to be realised by 2010, could only be reached by nine out of 23 countries in 2004.[64] Although the gap has decreased over the last decade, it is still substantial in the Mediterranean countries as well as Poland, Luxembourg, Hungary, Slovakia and Belgium.

[63] The gender gap is defined as the difference in the employment rate between men and women.
[64] These countries are Denmark, Sweden, the Netherlands, the United Kingdom, Finland, Portugal, Austria, Slovenia and Estonia.

4.1.2. Characteristics of female employment in the EU

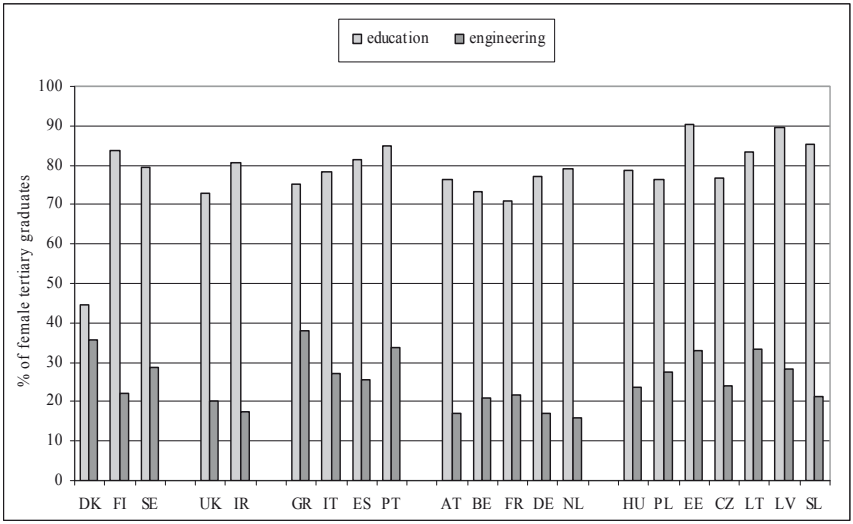
Different processes are responsible for the increasing involvement of women in paid employment. Individual working preferences are influenced by an accumulation of various individual as well as demand side factors. For instance, the increasing educational attainment of women and their growing preference for non-domestic roles as well as structural changes of economy, like the extension of the service sector and the increase of part-time work, can be seen as important factors causing a higher attachment of women towards the labour market (Jonung and Persson 1993, Blossfeld and Hakim 1997).

With respect to educational expansion, there has been a steady increase of women's educational attainment in most European countries (Müller and Wolbers 1999, Strack 2003, OECD 2004b). Nowadays, they reach parity with men in nearly all countries: According to Eurostat (2007), almost 80% women aged 20-24 had completed at least upper secondary education on average of the EU-25 in 2004, while around 74% of men had done so. However, there are still country differences: while 93.7% of female graduates in this age group have completed at least upper secondary education in Slovenia, only 58.8% have done so in Portugal. In tertiary education, it appears that more women (59%) than men complete first-level degrees[65]. However, their shares decrease to 43% in higher tertiary degrees, like PhDs.

The increasing gender equality in educational attainment suggests that women are now better equipped for the labour market. However, a core problem is the persistent unequal distribution of men and women across fields of study. As figure 4.1 demonstrates, women still tend to choose gender-typical fields of study. The comparison of the share of female tertiary graduates in 'education' (a typical female field of study) and 'engineering' (a typical male field of study) shows that women are obviously underrepresented in 'engineering' in all selected EU Member States. The share varies between 15.9% in the Netherlands and 38% in Greece. In education, by contrast, the share of female graduates differs from 90.5% in Estonia and 44.7% in Denmark (see table A4.1 in the appendix).

[65] The first-degree level refers to ISCED5a graduates and higher tertiary degrees refer to ISCED6 graduates.

Figure 4.1: Percentage of female tertiary graduates out of all graduates in education and engineering, 2004

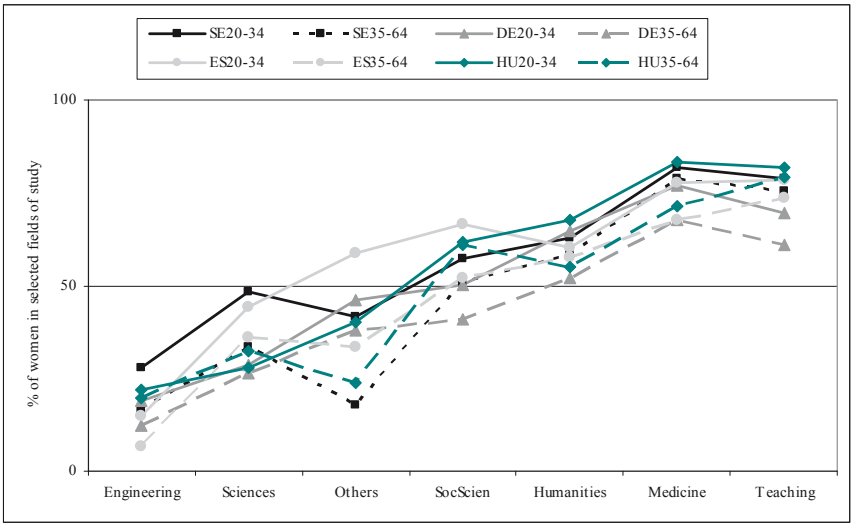


Source: UNESCO 2006; http://stats.uis.unesco.org/ReportFolders/reportfolders.aspx

Even though the observed patterns may be related to a strong association of masculinity with 'technical' skills and of femininity with 'nurturing' skills, it is worth noting that some 'scientific' or 'technical' fields of study, such as medicine, have experienced a strong tendency towards feminisation over time. To demonstrate such developments, figure 4.2 shows remarkable changes in educational sex typing over time for selected countries. A distinction between younger (20-34) and older age cohorts (35-64) reveals different processes: For the youngest age cohort, in almost all selected countries a tendency towards a slight integration is observable in typical 'male' fields of study, like engineering and sciences. In these fields of study the share of women has increased from cohort to cohort. On the other hand, feminisation tendencies come to the fore particularly in integrated and typically female fields, like medicine and teaching. As already underlined, this also demonstrates the limitations of aggregate measures of segregation indices. Even though most indices indicate persistent educational and occupational segregation, fundamental changes can occur within specific fields or occupations. The described developments in the unequal distribution of men and women across fields of study would not be so dramatic, if particular fields of study, like education and humanities, did not provide women with potentially lower labour market chances in terms of income and career

prospects (Götzfried 2004, European Communities 2006, Reimer and Steinmetz 2007). Therefore, it can be expected that the gender-specific distribution across fields of study also reinforces occupational sex segregation.

Figure 4.2: Patterns of sex typing of fields of study for selected EU Member States and different age cohorts, 2004 (tertiary degree holders)



Source: EULFS 2004, own calculations

Turning to economic structures and their relation with occupational sex segregation, it is argued that structural changes in economy and demographic shifts influence the demand for and supply of female workers. Oppenheimer (1970), for example, attributes the growth in women's employment in the US-labour market after Word War II to shifts from the agricultural to the service sector and a resulting increased demand for labour within female-typed occupations. Other researchers (England and Farkas 1986, Goldin 1990) underline that, besides the increasing demand in female-typed jobs, factors like reduced working hours and increased real wages encouraged women's labour force participation. However, each EU Member State has faced more or less similar processes of change over the last decades: declining employment in the agricultural and industrial sector and a growth of employment in the service sector (European Commission 2005c). Particularly the rapid growth of the service sector offers more and diverse possibilities for women to find work and combine it

with family life. Table 4.2 confirms that, during 1995 and 2004, most of the expansion of female employment took place in services.

Table 4.2: Development of female employment rates (%) in different economic sectors, 1995-2004

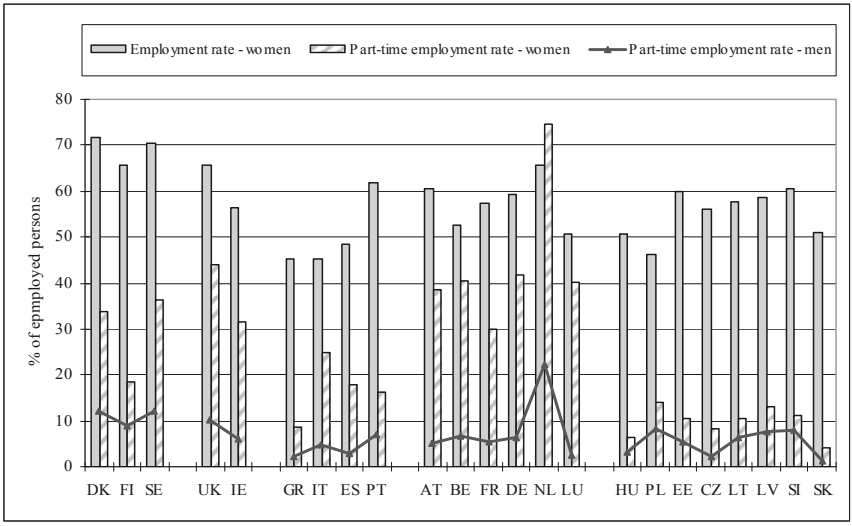
	Agriculture			Industry			Service		
	1995	**2000**	**2004**	**1995**	**2000**	**2004**	**1995**	**2000**	**2004**
Nordic countries									
Denmark	2.6	1.9	1.7	13.4	12.4	11.0	84.0	85.7	87.3
Finland	5.6	3.8	3.0	14.0	13.8	12.2	80.4	82.4	84.8
Sweden	1.2	1.2	1.0	11.4	10.9	9.8	87.4	87.9	89.2
Anglo-Saxon countries									
UK	0.7	0.6	0.4	11.6	10.0	7.9	87.7	89.4	91.6
Ireland	3.1	2.1	1.4	17.2	15.5	12.7	79.6	82.4	86.0
Mediterranean countries									
Greece	21.8	18.6	15.3	15.6	13.5	11.0	62.6	67.9	73.6
Italy	5.9	4.1	3.4	20.8	19.4	17.0	73.3	76.5	79.6
Spain	5.7	4.4	3.8	12.3	13.6	12.3	82.0	82.0	83.9
Portugal	12.3	12.0	12.7*	23.6	20.3	19.7*	64.1	67.8	67.6*
Continental countries									
Austria*	8.2	6.2	5.8	17.6	14.1	13.0	74.3	79.8	81.2
Belgium	2.1	1.5	1.6	11.6	10.0	9.0	86.2	88.5	89.4
France	3.4	2.7	2.5	12.8	11.2	10.3	83.8	86.1	87.2
Germany	2.7	1.9	1.6	17.9	15.4	14.1	79.5	82.7	84.3
Netherlands	2.3	2.4	1.9*	9.1	8.7	8.0*	88.6	88.9	85.3*
Luxembourg	1.7	1.1	1.1	8.5	6.2	7.6	89.7	92.7	91.4
Eastern countries									
Hungary	4.7*	3.3*	2.6	24.8*	25.0*	22.6	70.6*	71.7*	74.9
Poland	22.5*	18.3*	17.2	21.0*	19.0*	17.1	56.6*	62.7*	65.6
Estonia	7.8*	4.6*	3.6	26.6	23.9*	25.4	65.7	71.6*	71.1
Czech Rep.	5.5*	3.7*	2.8	30.8*	27.5*	25.7	63.7*	68.7*	71.6
Lithuania	17.9*	15.8*	13.3	21.5*	20.0*	20.2	60.6*	64.2*	66.5
Latvia	13.5	12.1*	9.6	20.2	18.4*	17.5	66.3*	69.5*	72.9
Slovenia	10.8*	9.7*	10.5	33.7*	28.1*	24.6	55.5*	61.5*	64.9
Slovakia	6.4*	4.0*	2.1	28.6*	25.5*	23.2	65.0*	70.5*	74.6

Note: For those countries and years the source is http://w3.unece.org*
Sources: European Commission: Employment in Europe 2002, 2004, 2005 and 2006.

The biggest increase can be observed in Greece, Slovakia, Slovenia, Poland, Austria, Ireland and Italy, whereas nearly no changes can be identified in the Netherlands, Sweden and Spain. A further reason for women's growing

labour market attachment is related to increasing non-standard employment, like part-time work (ILO 1992, European Commission 2005c). In this regard, huge country differences can be observed with respect to female participation rates (see the following figure 4.3).[66] In 2004 three types of countries can be distinguished: first, countries with a high share of female part-timers, like the Netherlands (74.7%), the United Kingdom (43.9%) and Germany (41.6%) where part-time employment is a significant component of the national employment system.

Figure 4.3: Cross-national comparison of part-time work (%), 2004



Note: The part-time employment rate is based on all employed women / men.
Source: European Commission: Employment in Europe 2005.

Second, countries like Sweden (36.3%) and France (30.1%) with rates around 30%. Greece (8.5%) and Portugal (16.3%) form the third group with the lowest incidence of female part-time employment among the 'old' EU Member States. In Eastern Europe, part-time employment of women has not become common. Rates are very low in these countries (between 4.1% in Slovakia and

[66] In Britain, for example, part-time work emerged soon after the Second World War when the marriage barn was abolished. Italy, by contrast, has very small part-time workforce and very slow growth of part-time employment even at the end of the century (Addabbo 1997: 113).

14% in Poland)[67]. Furthermore, it is obvious that part-time work plays a secondary role in the male employment biography. However, existing part-time employment disparities between men and women are much lower in CEE countries than in Western countries with rates between 22.3% in the Netherlands and 1.4% in Slovakia. Even though more than half of the female employment growth followed from the expansion of part-time work in countries like the Netherlands and Germany, it cannot be stated that rapid employment growth generally depends on the creation of part-time jobs. For example, Spain achieved one of the fastest female employment growths with only an insignificant increase in part-time employment (European Commission 2006, Fagan and Rubery 1996). Figure 4.3 also demonstrates that, in general, high female participation rates are not necessarily connected with high rates of part-time employment. Denmark has only a moderate level of female part-time employment (33.8%) but the highest female employment rate.

In literature, reasons for the increase in part-time work, and the question of the extent to which women have benefited from this process, are discussed extensively (Hakim 1991, Meulders et al. 1993, OECD 1994a, Rosenfeld and Birkelund 1996, Blossfeld and Hakim 1997, Drobnic 1997, Klein 1997). On the political side, a line is frequently drawn between the expansion of part-time employment, the growing integration of women in the labour force, and improvements in gender equality. It is assumed that part-time work, due to a reduced conflict between the labour market and family responsibilities, is not just a helpful but also an essential element in the mobilisation and integration of the female labour force. These optimistic statements focus on the positive side of part-time work. The drawback is that it is usually associated with low-skilled, low-paid and precarious or insecure employment (Hakim 1987, Birkelund and Rosenfeld 1995). Female part-timers often remain in a dependent position in respect of their husband, and the 'flexibilisation' does not necessarily facilitate the combination of family and employment, as revealed by the emergence of non-standard working time schemes (Evans et al. 2001: 11, Bollè 2001).

The greater involvement of women in paid employment may also be accompanied by other flexible employment forms, like temporary work.[68] In general, fixed-term employment does not display gender differences comparable to part-time employment, with the average share for the EU being 14.9% for

[67] This can also be explained by very small part-time labour markets in these countries. Women's preferences for choosing part-time may be more constrained, forcing them either in full-time work or non-work.

[68] In 2004, the share of total employees within the EU on contracts of fixed duration was 13.7%, ranging from 32.5% in Spain to below 5% in Estonia, Ireland, and Luxembourg.

women and 13.9% for men (see for more detail table A4.2 in the appendix).[69] Nevertheless, the difference is substantial in some Member States, such as Belgium, Italy and Spain[70], where the share of fixed-term employment for women is around 5% higher than that for men, and Finland where the gap amounts to 8%. By contrast, in many of the new Member States, as well as Austria and Germany, larger shares of men were employed on a fixed-term basis than women in 2004/5. The political arguments advanced in favour of temporary work resemble those presented for part-time work: temporary work is seen as a good solution for a better balance between public and private responsibilities or a bridge to permanent employment and jobs of better quality (European Commission 2002, Korpi and Levin 2001, Franco and Winqvist 2002). However, studies show that temporary workers suffer from less control over their working hours, have less autonomy, perform less skilful tasks, receive less training and often work on an involuntary basis (Paoli and Merllié 2001).[71]

In the context of the debate on increasing part-time opportunities and a higher labour market flexibilisation, the lack of a work-life balance is very often cited as a factor explaining the persistence of gender gaps in the labour market. Even though there has been a changing attitude towards working mothers, and women start to question their domestic role (Duane et al. 1992, Crompton et al. 1996, Albrecht et al. 2000, Knudsen and Waerness 2001), they appear more often affected by the tension arising from the combination of labour market participation and family responsibilities. Relevant studies show that labour market participation and the amount of working hours are strongly linked to parenthood. The effect, however, is negative for women while it is positive for men. In almost all EU Member States, women (aged 20-49) with children have lower employment rates than those without. For the EU-25, the employment rate falls from 75.4% in the case of women without children to 61.1% for women with children. Moreover, 23.3% of women having children worked part-time, while this is only the case for 15.9% of women without children (European Communities 2006: 11).

Finally, female employment is also associated with a change in inactivity patterns. In most European countries, women experience a higher risk of

[69] Furthermore, the share of both women and men employed in fixed-terms jobs (voluntarily and involuntarily) increased between 2000 and 2005. In 2005, 7.5% of all women employees and 6.7% of men were employed in fixed-term jobs.

[70] Particularly in Spain labour market flexibilisation and the reduction of high youth unemployment was combated with temporary contracts. As a consequence, the net-increase in full-time employment was more associated with temporary contracts instead of part-time work (Rubery et al. 1999a).

[71] In countries like Belgium, Spain and Greece over 70% were working involuntary on fixed term contracts, while many temporary workers in Ireland were doing so by choice (European Commission 2001).

unemployment than men although there are large country differences[72]: in 2004, high unemployment rates existed in Greece (16.2%), Spain (14.3%) and France (10.6%), whereas the lowest rates could be found in Ireland (4.1%), the United Kingdom (4.2%) and the Netherlands (4.8%). With respect to Eastern European countries, Poland (19.9%) and Slovakia (19.2%) had the highest, and Hungary (6.1%) and Slovenia (6.8%) the lowest female unemployment rate (see appendix table A4.3). However, no straightforward relationship can be found between trends in unemployment and an increasing female employment rate. This is mainly caused by the problem that women, who leave the labour market, do not necessarily consider themselves unemployed. Vice versa it is often not clear whether a woman who enters employment was inactive (often called the 'silent labour market reserve') or registered as unemployed.[73]

The on average higher unemployment risk of women in comparison to men has various reasons. First, women generally have lower employment rates, increasing the potential for a female labour reserve which may or may not be mobilised to seek work actively and be counted as unemployed. Moreover, unemployed women have to compete with non-employed women. Hence, the risk of remaining unemployed may be high despite new job opportunities for women simply because of the overall size of the available female reserve. A second argument is connected with higher transition rates for women between economic activity statuses. This fluidity and the greater insecurity attached to women's employment positions can result in a relatively high female stock of unemployment (Rubery et al. 1998: 148). However, the extent of these female unemployment risks is influenced by national labour market regulations as well as national patterns of female labour market participation.[74]

[72] It has to be underlined that there is a heated debate on whether applied unemployment measures are not itself 'gender blind' and therefore inadequate to really measure the extent of female unemployment (see Rubery et al. 2002a, Plantenga and Remery 2006a).

[73] Against this background it seems problematic to capture women's exclusion from the labour market because the distinction between inactive and unemployed seems less effective in the case of women.

[74] For example, there has been a focus on the importance of youth unemployment in the EU during the last decades. As young people constitute a higher share of the female labour force than the male labour force in most countries, high youth unemployment tends to boost the female unemployment rate disproportionately. This effect could be confirmed when looking at countries with high female unemployment rates, like Greece, Spain and France where also very high female youth unemployment can be found (Greece 36.6%, Spain 26.5% and France 23.3%). This tendency holds much more in the case of Eastern European Countries, for example in Poland (41.9 %) and Slovakia (33.7 %), see Eurostat 2007.

4.2. The development of occupational sex segregation throughout the 90s

The presentation of trends in female employment during the last decades raises the question in how far these changes are also influencing the extent of occupational sex segregation. For instance, it may be expected that the increasing number of women entering the labour market, as well as changes in the economic and occupational structure, also affect the distribution of men and women across occupations.

To answer this question, the common index-approach will first be taken in order to give a brief overview of main trends in occupational sex segregation taking into account horizontal as well as vertical aspects. The analysis is based on the second quarter of the European Labour Force Survey (EULFS) for the time period of 1995-2004 covering 23 EU Member States. As already discussed in chapter 3, the results are calculated for the ISCO88 1- and 2-digit level. Furthermore, agricultural occupations are excluded from the analysis and only persons in employment are considered.[75]

4.2.1. Which countries are most segregated? - Some descriptive results

To start with the conventional practice of an index-based analysis of occupational sex segregation, table 4.3 presents the results of selected sex segregation indices (D, D_{st}, and L) for the year 2004.[76] D and D_{st} are selected because they are most commonly used in literature which also ensures the comparability of the results with prior findings.

As discussed in chapter 3, it seems plausible to look at results for different indices as they refer to different aspects of occupational sex segregation.[77] In line with previous studies, counterintuitive patterns of cross-national variability can be observed. Focusing first on the 'old' EU Member States, values for the occupational chances (measured through D) are the lowest for countries like Italy (38.5%) and Greece (43.7%) and highest for countries like Finland (54.3%) and Denmark (49%). Similar results can be observed for sex typing

[75] Some authors' underline that agriculture should be excluded from the analysis because of its 'gender blindness' (many women are only counting as helping family members and therefore not registered adequately in the occupational classifications, see for more detail chapter 3).

[76] Values for Luxembourg are included in the table but not interpreted due to data irregularities.

[77] As examined in chapter 3, D is implicitly weighted, so that ‚big' occupations contribute more, whereas D_{st} treats occupations as if they had the same size. The methodological interpretation of both is, however, the same. By contrast, log-linear indices like L are invariant to changes in the proportion of women and men in the overall occupational population *and* to changes in the relative size of occupations.

(measured through D_{st}): Southern European countries (Italy and Greece) have very low values, whereas Denmark, Finland and Belgium show the highest results for sex typing. These findings indicate that, particularly in the latter countries, women and men are distributed unequally across occupations. More than 50% of women and men would have to change occupations to be equally distributed.

Table 4.3: Different segregation indices (ISCO88 2-digit, without agriculture), 2004

	D	***D_{st}***	***L***
Denmark	48.96	52.02	80.09
Finland	54.34	53.89	81.22
Sweden	45.20	49.16	75.41
United Kingdom	46.97	44.79	70.07
Ireland	47.60	46.23	77.84
Greece	43.69	42.65	80.03
Italy	38.45	40.37	57.16
Spain	48.54	45.14	74.35
Portugal	46.77	44.48	80.08
Austria	48.35	47.58	82.10
Belgium	48.50	51.77	82.58
France	48.89	44.99	66.72
Germany	48.67	47.13	64.54
Netherlands	44.75	48.02	76.83
(Luxembourg)	40.28	56.92	103.51
Hungary	48.69	44.71	73.93
Poland	48.43	46.43	78.10
Estonia	52.48	55.98	88.22
Czech Republic	52.03	46.19	73.29
Lithuania	54.54	55.48	85.30
Latvia	48.97	47.52	78.17
Slovenia	40.05	46.55	81.53
Slovakia	52.79	48.80	79.91

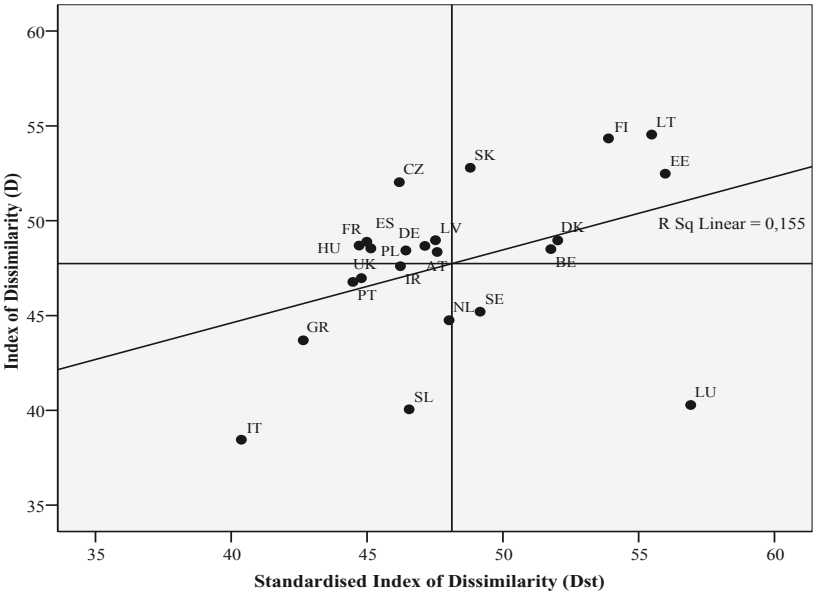
Notes: D=Index of Dissimilarity, D_{st}=Standardised Index of Dissimilarity, L=Lambda, see chapter 3 for index definitions.
Source: EULFS 2004/5, own calculations

In Southern European countries, only around 40% of women and men would have to do so. In case of Eastern European countries, Estonia and Lithuania show values for both perspectives (sex typing and occupational chances)

which are among the highest in Europe. In Slovenia, by contrast, the lowest values can be observed for both perspectives.

On the basis of these results, it is possible to visualise the positioning of EU Member States with respect to the different aspects of occupational sex segregation (occupational chances and sex typing) in a scatter plot. The vertical line in the following figure 4.4 represents the average degree of sex typing, and the horizontal line the average degree of the dissimilarity of occupational chances for all countries.

Figure 4.4: Positioning of 23 EU Member States for both sex segregation aspects (ISCO88 2-digit, without agriculture), 2004



Source: EULFS 2004/5, own calculations

First of all, a moderate positive correlation can be observed between the two aspects of segregation (r^2=0.16), justifying the theoretically-driven differentiation between 'sex-typing' and 'occupational chances' as distinct but correlated dimensions of segregation. Furthermore, the graph yields two clusters which compose the extreme poles: Italy, Greece and Slovenia which are characterised by very low levels of sex-specific occupational chances and sex typing (particularly Italy), and Estonia, Finland and Lithuania which are located fairly

high in both dimensions of segregation. Finally, a third cluster is formed by a big group of countries centred on the averages of both dimensions. In this case, it is possible to distinguish between countries with above-average levels of occupational chances and fairly low levels of sex typing (Czech Republic, Hungary, France, Spain, Poland, Germany, Austria, and Latvia) and countries with below-average levels of occupational chances as well as low levels of sex typing (the United Kingdom, Portugal and Ireland). However, there are also countries like Denmark and Belgium with an above-average level of occupational chances and also fairly high values of sex typing, or with a below-average level of sex typing (the Netherlands and Sweden). With respect to the positioning of Eastern European countries, the common history of communism and a high integration of women into the labour market may suggest that labour markets, even after fifteen years of 'capitalisation', are less segregated than in the 'old' Member States, and that the countries group together. However, the opposite result comes to the fore: while Estonia and Lithuania were characterised by high values of occupational sex segregation in 2004, countries like Poland and Hungary were more comparable with continental European countries. This may be due to the fact that countries like Estonia, which have been more Western-oriented during communist times, have adapted somewhat faster to the capitalist economy. A growing service sector in these countries and a high share of women in services accompanied by 'typical' female occupations reflects this process.

As traditional indices have been criticised for marginal dependency (see chapter 3), results of log-linear approaches (L) are also discussed in this chapter. However, when comparing the results with D_{st}[78], the positioning of countries is only slightly different. It varies between +/-3 positions in 11 countries, while the ranking of Italy, Spain, Luxembourg, Estonia and Lithuania remains constant. More fundamental differences can be observed in six countries: while Sweden, Germany, and the Netherlands are shifting towards a lower level of occupational sex segregation, the increasing values for Greece, Portugal, Austria, and Slovenia indicate a greater amount of occupational sex segregation. In sum, the comparison of L and D_{st} reveals that, even though L is a marginal free measure, the results do not vary much across indices.

Although indices are often used to give an overview of the positioning of countries with respect to occupational sex segregation, they provide little insight into potentially important country-specific patterns. Therefore, the next section will describe in more detail the structure of the different aspects and dimensions for selected European countries.

[78] As argued in chapter 3, L and D_{st} are comparable with respect to the measured perspective of occupational sex segregation.

4.2.2. Where do women and men work? Dimensions of occupational sex segregation in 2004

The sex typing of the labour market

As to the question of 'typical' male or female occupations, the simplest way to assess the level of occupational sex typing is to assess the distribution of women and men in different occupations. The following figure 4.5 is an example of the 'sex typing profiles' of ten selected EU-countries (see the profiles of the rest of countries in the appendix, figure A4.1) at the level of nine major occupational groups (ISCO88 1-digit).[79] The interpretation is straightforward: the more even the country curve, the more equal the distribution of men and women in the different occupations (50% constitutes the equal share of women and men in society). By contrast, the steeper the curve, the more segregated are women and men in the different occupational categories.

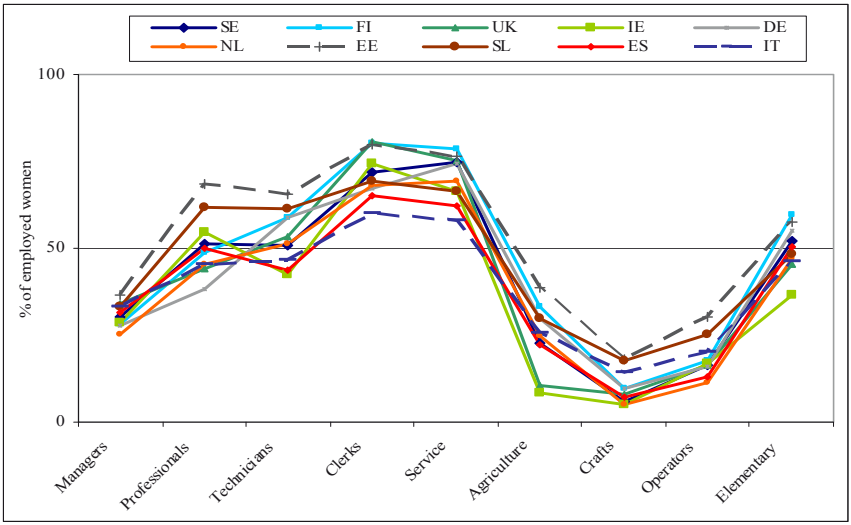
First of all, it is interesting that the patterns of 'sex typing' are very similar in all selected countries. For example, clerks (group 4) and service-orientated occupations (group 5) are highly feminised, with a share of women between 80.5% (Finland and the UK) and 60% (Italy) for clerks and 78.6% (Finland) and 58.1% (Italy) for services. The mostly male-dominated occupations are those of the producing industry (crafts (group 7), and machine operators (group 8)) and agriculture (group 6). This confirms results of earlier studies indicating that feminised occupations are often associated with attributes of 'serving' and 'caring', whereas men's occupations are associated with attributes of 'physical strength' and 'power'. As Anker et al. (2003) pointed out, it is especially striking how sex stereotypes in society about appropriate roles for women and men are replicated in the labour market. He examined that, in 1990, approximately 50% of all workers were in gender-dominated occupations. Also Charles (1992, 2005) underlines that this phenomenon of sexual composition of occupations is typical for developed industrial countries. As the presented results show, there are nevertheless some occupations (like professional, technical and elementary occupations) that can be classified as 'integrated' in almost all countries.

Besides the discussed similarities, there are also country differences: for example, the occupational groups 'professionals' and 'technicians' are typical female occupations with a female share of 68.6% and 61.6% in Estonia (similar to Slovenia). In the case of Southern European countries, service and clerical occupations are rather integrated than female-typed. In general, the results of prior studies are confirmed: the grade of sex typing of occupations is highest in

[79] For the purpose of a better presentation, this figure is based on the ISCO88 1-digit. At the level of the ISCO88 2- or 3-digit it would be too complex to be shown.

the selected Nordic countries (Finland and Sweden) which are supposed to be gender-egalitarian regimes, whereas it is lowest in the so-called traditional countries like Italy and Spain. In the case of Estonia and Slovenia, the patterns seem somewhat different.

Figure 4.5: Patterns of occupational sex typing for selected EU Member States (share of employed women, ISCO88 1-digit), 2004



Source: EULFS 2004/5, own calculations

While high values (a high feminisation) can be found in non-manual occupations (groups 1 to 5), sex typing is lower in the case of manual occupations (groups 6 to 9). This may be explained, on the one side, by the economic changes in former CCE countries and the rapid growth of the service sector that strongly supports the creation of typical female occupations. On the other side, the low sex typing of manual occupations might be a heritage of the communist system where women were represented strongly also in 'typical' male occupations.

The dissimilarity of occupational chances

The above-presented figure gives an impression of the sex composition of occupational groups. A second possibility to address occupational sex segregation is

to examine the occupational chances of women and men across occupations.[80] This perspective takes the size of each occupation into account, so that it can be explored how 'evenly' women or men are spread across all occupations and to which extent they are 'ghettoised' into specific occupational groups.

To illustrate this aspect, the well-known age-pyramid used in demography can be applied. Figure 4.6 exemplarily presents the structure of the sex-specific occupational chances for Germany, Italy, the United Kingdom, Finland and Estonia in 2004 on the basis of the ISCO88 1-digit. The hatched fields mark the differences in occupational chances between the two sexes, i.e. the degree of relative overrepresentation of one sex in the specific occupation. The sum of the hatched fields on the left (male) side is equal to the sum on the right (female) side and corresponds to the value of the index of dissimilarity D[81]. For each country, the figure yields a detailed insight into the structure of sex-specific occupational chances, showing the chances of males (dark grey) and females (light grey) to access the nine major occupational groups. Even though this graphical presentation is intricate and more difficult to compare across countries, a comparison between Germany, Italy, the United Kingdom, Finland and Estonia shows similarities as well as country-specific patterns.

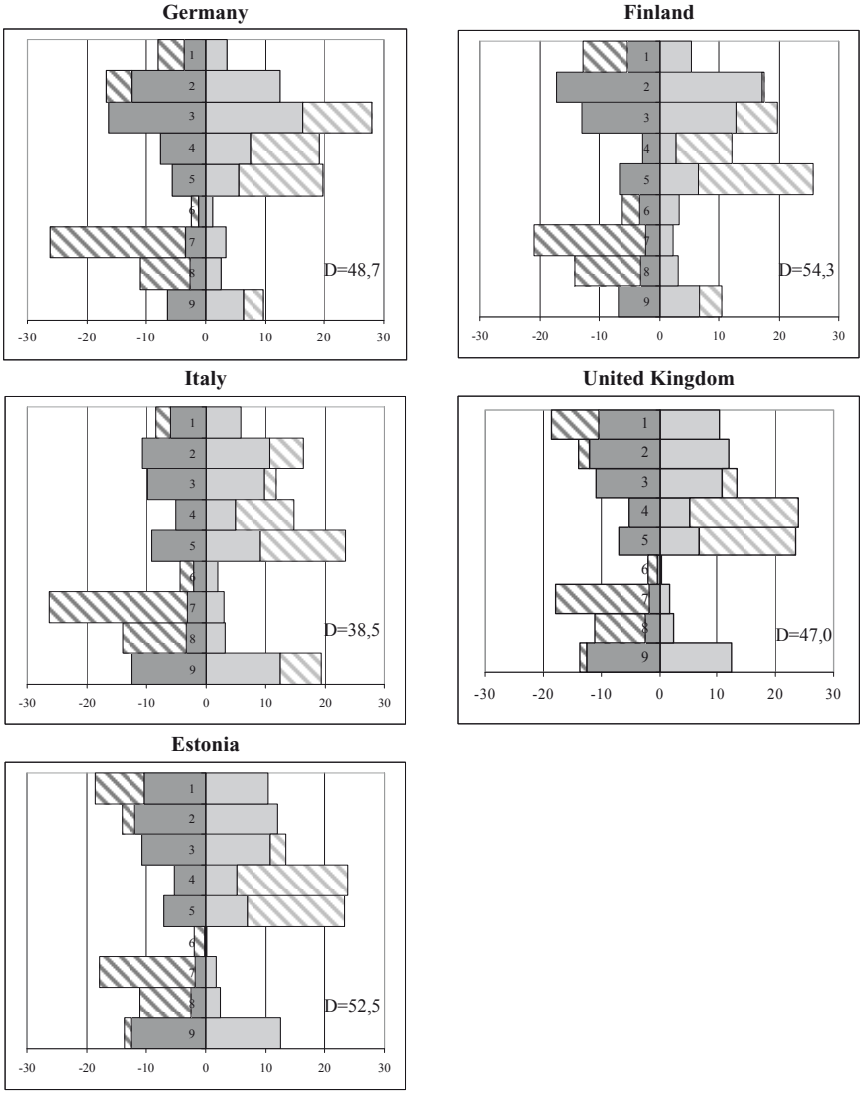
Starting with similarities, it can be observed that, in all countries, women have especially high chances to work in the group of professionals (3), clerks (4), and services (5). By contrast, men are likely to be found in occupations necessitating a 'high qualification'[82], such as legislators, senior officials and managers (1). Furthermore, occupations regarding a lower qualification (mostly in the manual sector), like those of major group 6 (agriculture), 7 (craft and related trades workers) and 8 (plant and machine operators and assemblers) show a predominance of men. Moreover the figures show that, in all selected countries, more than 50% of the female workforce (53.2% in Estonia and 66.9% in Germany) is concentrated in only a few occupational groups: 'clerks' (group 5), 'technicians' (group 3) and 'professionals' (group 2) or 'services' (group 4). Men, by contrast, are concentrated in 'crafts' occupations (group 7 around 20%) in all selected countries.

[80] For this analysis, percentages are calculated across occupational groups for each sex separately.

[81] Hence, D may be interpreted as the proportion of male workers plus the proportion of female workers who would need to change occupations in order to have the same proportion of women in every occupation (Anker 1998: 90). D ranges from 0 (i.e. no segregation) to 1 (resp. 100%, i.e. total segregation).

[82] It is noteworthy that the hierarchy of the ISCO88 is problematic. For example, the seventh group of the ISCO88 also contains highly-qualified occupations, like master craftsmen.

Figure 4.6: Percentage of employed men and women by occupations and selected countries (ISCO88 1-digit), 2004

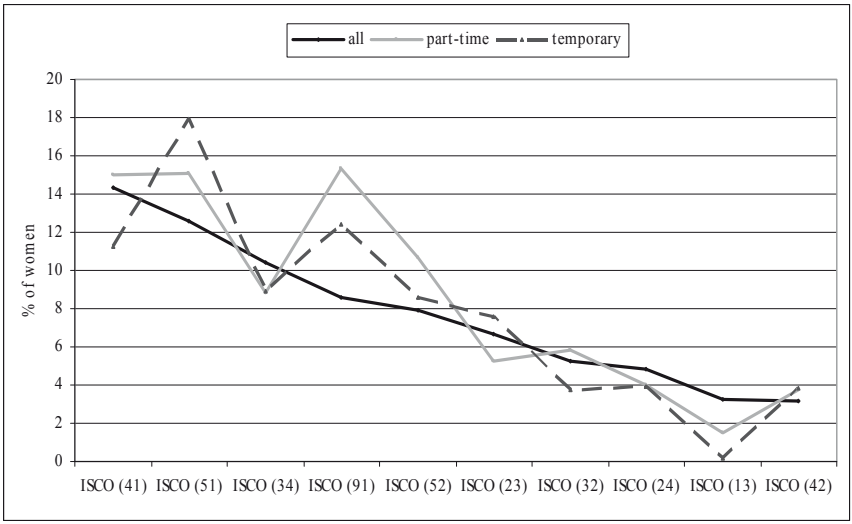


Source: EULFS 2004/5, own calculations

However, certain countries show a specific labour market structure. As to professional occupations (2), an overrepresentation of women can be found in Italy and Estonia, while in Germany and the United Kingdom men are more often employed in this occupational group. In Finland, this group is rather equally shared by men and women. With respect to the occupational group of elementary workers (9), women are overrepresented in four of the selected countries whereas, in the United Kingdom, this occupation is more male-dominated.

A further difference among countries concerns the extent of participation in individual occupational groups. For example, men are generally overrepresented in the first occupational category. The percentage of women employed in this group, however, is highest in the United Kingdom and lowest in Germany.

Figure 4.7: Female participation rate (out of all female employed persons) in the 10 most common occupations (ISCO88 2-digit), 2004



Notes: ISCO 41=office clerks, 51=personal and protective service workers, 34=other associate professionals, 91= sales and services elementary occupations, 52=models, salespersons and demonstrators, 23= teaching professionals, 32=life science and health associate professionals, 24=other professionals, 13=general managers, 42=customer service clerks
Source: EULFS 2004/5, own calculations

Turning to the most common female occupations, on average around 77% of all employed women in the 23 EU Member States are working in 10 out of 26 occupations (ISCO 2-digit). As figure 4.7 shows, the highest share of women

can be found in the occupational groups 'office clerks' (41) and 'personal and protective services workers' (51) which include occupations like travel attendants, housekeepers and restaurant service workers. These occupations are also characterised by highly flexible work arrangements, like part-time or temporary work.

4.2.3. The development of occupational sex segregation over the 90s[83]

For a political evaluation of gender equality, changes in the unequal distribution of male and female employees and changes in the amount of sex typing of occupations are important. It would thus be necessary to analyse changes in both aspects of segregation in parallel. This could be achieved in different ways: first, by using D and performing a decomposition of changes in this measure (Blau and Hendricks 1979, Handl 1984). This procedure, however, cannot be applied in a simple way when taking more than two points in time into account. Another possibility is to include both aspects of segregation using different indices and to compare the directions of changes for the different measures over a time period. For the present analysis, the latter strategy will be pursued, looking at changes in the aspects of 'segregation' of EU Member States for the years 1995, 2000 and 2004.[84] As D and D_{st} are most commonly used in literature, and their correlation with more complicated indices is high (see chapter 3), subsequent results are only presented for these simple, well-known indices. This decision also ensures the comparability of results with prior findings.

Starting with measures for 'sex-specific chances', it is possible to differentiate between:

1. countries where the occupational chances for men and women have become more and more unequal (Ireland, Italy, Spain, Portugal, Austria and Belgium);
2. countries which show almost constant degrees in occupational chances (Greece, Hungary and Lithuania); and
3. countries where the distribution of male and female employees (i.e. the occupational chances) has become more and more similar (Denmark, Finland, Sweden, the United Kingdom, France, Germany, the Netherlands, Luxembourg, Poland, Estonia, the Czech Republic, Latvia, Slovenia and Slovakia).

[83] A similar analysis for 1995 and 2000 has been published 2007, see Handl and Steinmetz (2007: 265-268).

[84] To fulfil minimum standards of validity and reliability, and include all EU Member States, the analyses of the EULFS start with the year 1995.

The main trends with respect to 'sex typing' are less clear. In most of the examined countries, more or less oscillating values can be found. Only in two countries (the United Kingdom and France), the sex typing of occupations has constantly decreased over the whole time period. In four countries (Belgium, Hungary, Estonia, and Lithuania), the sex typing of occupations has constantly increased. In the Czech Republic no significant chances occurred.

As to a correlation between changes in both aspects, sex-specific changes and sex typing, the following table 4.4 (see for more detail table A4.4 in the appendix) shows that, only in twelve countries, coherent trends can be observed[85]: in the case of the United Kingdom, France, Germany, Latvia (and Finland), a decrease over the whole period of time took place with regard to both aspects, while the values increased in Ireland, Italy, Spain, Portugal, Austria and Belgium. In Greece, no substantial changes occurred.

Table 4.4: Direction of change for both aspects of sex segregation (ISCO88 2-digit, without agriculture), 1995/2004

	Direction of change in differences in occupational chances			
		decrease (–)	**constant (=)**	**increase (+)**
Direction of change in sex typing	–	FI*, UK, FR, DE, LV*		
	=	SE*, PL*, CZ*, SL*	GR	
	+	DK, NL, (LU), EE*, SK*	HU, LT	IE, IT, ES, PT, AT, BE

*Notes: *Trends for FI and SE as well as for the Eastern European countries are only measured between 1997/98 and 2004/5 due to missing data for the year 1995.*
Source: EULFS 95/05, own calculations, only categories with N>10 are included.

Based on these findings, it is hard to identify of a consistent trend of 'segregation patterns' in Europe during the 90ies. Even though it is difficult to compare actual results with results of other studies[86], it is interesting that this 'inconsistency' in the ten-year period, in many respects, is comparable with patterns found by Jacobs and Lim (1992) for the period 1960-1980. They compute D for 39 countries over seven occupational categories and show a slight decline in levels of segregation between the years 1960 and 1980. However, many countries fail to demonstrate consistent trends towards either increasing or decreasing levels of segregation across this time period. Anker (1998: 110) also conducted a study on trends in occupational sex segregation for seven selected countries, focusing on the influence of different levels of the ISCO88 classification. When using at least the 2-digit level, he found in nearly all countries a slight decline

[85] A change is defined as an approximately 1% increase or decrease in the values of the segregation indices.
[86] This is due to the fact that different indices and occupational classifications have been used.

between 1970 and 1990. Nevertheless, the stability of occupational segregation over time has always been underlined in studies focusing on long-term trends of sex segregation.

Even though the results reveal no clear trend of changes of occupational sex segregation between 1995 and 2004, sex segregation has decreased in some countries at least in one dimension during that period. This development might be related to fundamental changes of gender-related politics during the 90ies and the progressive demand of the EU to reduce high levels of occupational sex segregation by implementing specific measures in National Action Plans (see Sweden and Denmark).[87] However, the presented findings also indicate that the rising proportion of employed women have not altered automatically the pattern of occupational sex segregation. It has been argued that an increase of occupational sex segregation is related to the inflow of women into expanding areas, such as clerical, sales, nursing and teaching jobs, where they already had an established foothold. Consequently, sex segregation remained high within clerical work or manual work, and sex typing became even more rigid (Rubery and Fagan 1993, Rubery et al. 1999a, Leitner 2000, Charles and Grusky 2004).

In general, however, the persistence and extension of female dominance in specific occupational groups should not overshadow the already-mentioned fact that some change has taken place, although it is less visible when looking at broad occupational categories. Such integrating forces can be due to several factors: the aforementioned increase in the educational attainment of women (Crompton and Sanderson 1990), a rapid expansion of occupations in specific areas and sectors which are more easily accessible for women, and a decline or stagnation of men in specific professional areas.[88] One such example is the deteriorating conditions in some parts of the public sector and the high rewards offered by 'IT' and other 'knowledge economy' activities in the private sector.

Furthermore, a growing number of jobs require social or personal skills to ensure satisfactory 'customer service'. These skills are often perceived as a particular competence of women. Finally, equal treatment legislation, corresponding developments in case law and progress made in collective arrangements have also played an important role.

[87] In this respect, particularly the National Action Plans (NAPs) of the European Commission should be mentioned which give country-specific recommendations as to the reduction of gender gaps.

[88] This can be associated with men exiting or avoiding professions where wages and other conditions are declining relative to opportunities elsewhere in the economy.

4.3. The vertical dimension of occupational sex segregation - gender stratification throughout the labour market

In modern societies, living conditions are linked to a great extent with the revenues from regular employment so that categories like 'occupation' and 'status position' have become main determinants of social inequality. In this context, social inequality still persists in all EU Member States. The hierarchy of occupational status and prestige is seen as functionally necessary and tolerated as long as social mobility, in principle, is possible. As a consequence, the so-called vertical dimension of occupational sex segregation (the sex-specific occupational inequalities) is an important aspect when analysing gender inequalities in society. It should be recognised that the unequal distribution of men and women across occupations as such need not necessarily have negative consequences. Inequality becomes serious, however, when it is combined with the vertical aspect penalising women with respect to income, occupational status and career prospects. Against this background, the question arises whether the increasing labour market attainment of women is accompanied by a higher representation of women in high status positions or a lower gender wage gap.

4.3.1. Reaching management and high-status positions

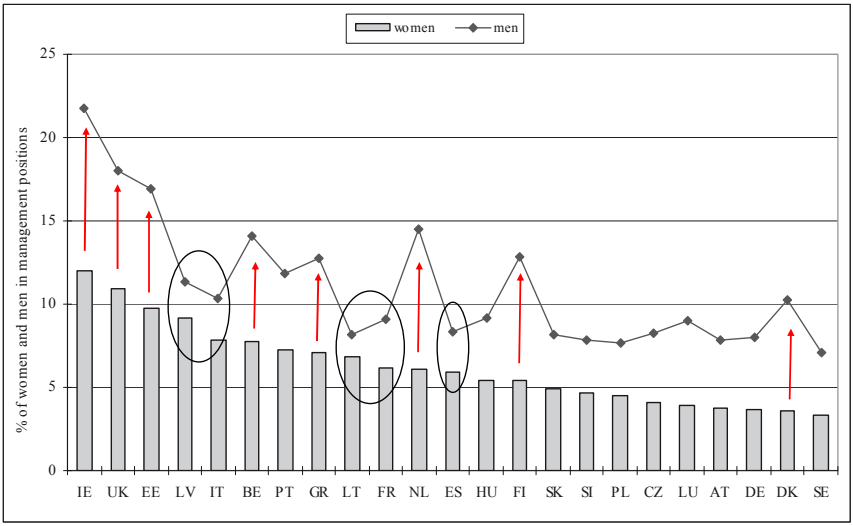
Even though the EU attaches much importance to achieving gender balance in decision-making across Europe, only one out of five government ministers is a woman, and the ratio is only slightly higher among members of national parliaments. Also in business, women still continue to represent only 3% of presidents of boards in top companies (Müller 1995, Davidson and Burke 2000, European Commission 2005a/b, 2008, EIRO 2005). As Vinnicombe (2000: 9) pointed out "Years after the EU adopted equal opportunity laws, European management itself is still a man's enclave."

These findings are partly confirmed by the following figure 4.8 presenting the percentage of women and men in managerial positions (out of all occupations) on the basis of the ISCO88 1-digit for the year 2004. In general, women are underrepresented in managerial positions in all countries. This holds, particularly, for countries like Denmark and Sweden[89] with female rates of 3.6% and 3.4%. The opposite can be found in liberal countries as well as in Eastern European countries, where women have the best chances to work in a managerial position. In Ireland and the United Kingdom, 12% and 10.5% of all em-

[89] In Sweden also men have the lowest share in managerial occupations (7.1%) in comparison to the other EU Member States.

ployed women are working in managerial positions, while in Estonia and Latvia, women reach shares of 9.8% and 9%.

Figure 4.8: Male and female participation rates (%) in management positions out of all occupations (ISCO88 1-digit, group 1), 2004



Source: EULFS 2004/5, own calculations

Nevertheless, when looking at the gender gap in these managerial positions, countries like Latvia and Lithuania or Italy, France and Spain show the lowest values, while the high female participation rates in Ireland and the United Kingdom are accompanied by the biggest gender gap. When differentiating the management positions on the basis of the ISCO88 2-digit into groups 11 (legislators and senior officials (ISEI score 70), 12 (corporate managers (ISEI score 68) and 13 (general managers (ISEI score 51)), it becomes obvious that the largest gender gaps exist in group 12 and group 13 (see appendix figure A4.2.).

There are two hypotheses why women are underrepresented in higher job hierarchies relative to men. The 'glass ceiling' argument (Baxter and Wright 2000, Cotter et al. 2001, Maume 1999, 2004) is that women have less chances of being promoted to higher positions than men even if both are in jobs that offer promotion opportunities. Social attitudes and cultural biases are regarded as major factors discriminating against women and holding them back from higher-level jobs. Actual discussions also refer to the fact that men much more than women are likely to be involved in informal networking practices (Brass

1985, Coe 1992, Kanter 1977a, Linehan et al. 2001, Rutherford 2001). Davidson and Cooper (1992) discuss how problematic it is for women to penetrate the 'old boy's network'. As a consequence they are denied contacts, opportunities and excluded from information and resources that networks provide. A further constraint, especially if high-level positions involve long working hours, frequent travel and relocation, is the disproportionate responsibility women still have for raising children and performing household tasks.[90] The second argument is called the 'dead-end' explanation (Polacheck 1981, Lazear and Rosen 1990). It states that women are promoted to higher hierarchical levels less frequently because they are in jobs that offer fewer opportunities for promotion.

Besides the fact that women, to a lesser extent, are represented in top-positions of the labour market, it is also interesting to examine the socio-economic status and prestige women and men attain in employment. In this context, the average occupational status of a country could be used as an indicator of the level of modernisation of national economies and the corresponding employment structure.[91] For this purpose, the international comparable status scale ISEI can be used which helps to quantify sex-specific inequalities in terms of occupational status (Ganzeboom and Treiman 1992). When applied to the ISCO88 2-digit, the ISEI-scale ranges from a minimum of 16 points (assigned to low-skilled and low-income elementary occupations like domestic helpers and cleaners) up to a maximum of 80 (for example attained by professional occupations). For a country comparison of sex-specific inequalities, however, it seems useful to calculate gender gaps to control the different overall status levels of the countries instead of focusing on absolute differences. As men and women have the same status points in each occupational group, it is not possible to capture gender differences in occupations exactly. To explore gender differences, it is therefore advisable to look not only at the overall status attainment of women and men, but also at the status positioning of the sexes when distinguishing between, for example, the manual and the non-manual sector as one option to include the horizontal aspect of occupational sex segregation (see Charles and Grusky 2004).[92]

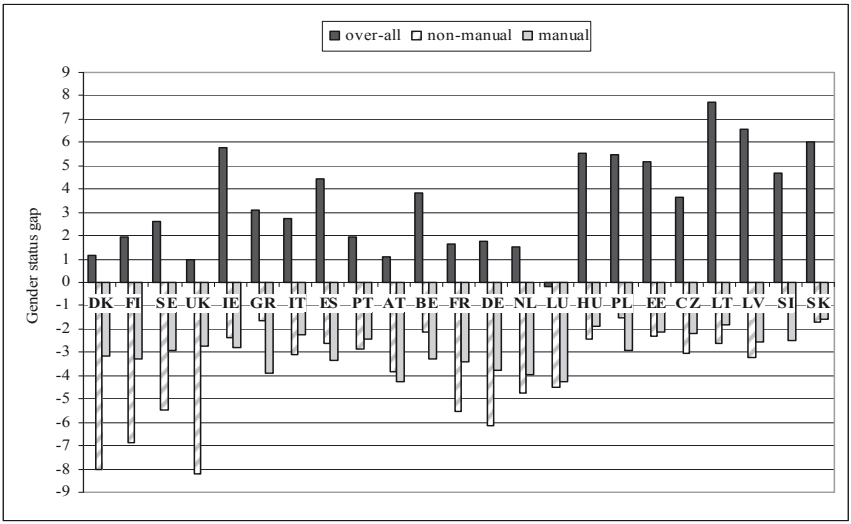
[90] A study of the OECD underlines that the difference is not so much between women with and without children, whereas the differences can be found when comparing men and women. A closer analysis suggests that the hypothesis of a punishment attached to motherhood in terms of career mobility cannot be ruled out. In fact, if fathers display more career mobility than childless men because promotions are more likely to occur during the child-rearing ages, the fact that mothers are no more likely than childless women to step up to jobs with greater supervisory role implies that they are actually penalised.

[91] In this context, countries where the agricultural and industrial sector still plays a major role for regular employment are expected to show significantly lower levels of overall occupational status.

[92] This refers more or less to a differentiation between 'typical' male and female occupations, like as proposed by Hakim (1993)

The following figure 4.9 illustrates the gender-specific status differences for the year 2004 over all occupations (dark grey) as well as for the non-manual (hatched grey) and manual sector (grey). A value higher than 0 means that women's status is higher than men's and vice versa. As to the overall status gap in all countries (except Luxembourg), women in general reach a higher occupational status in comparison to men.

Figure 4.9: Sex-specific occupational status gaps, 23 EU Member States (ISEI2 without agriculture), 2004



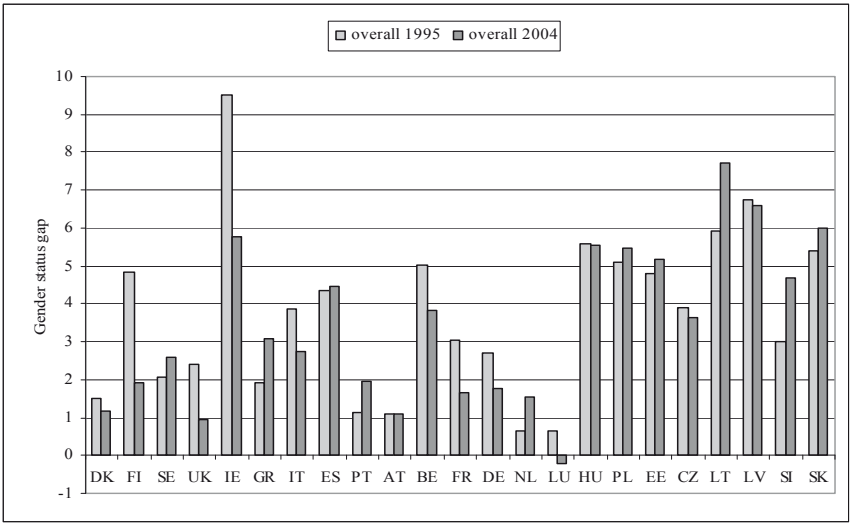
Note: The gap is calculated by subtracting the mean status value of women from that of men for each country and differentiated for the non-manual and manual sector (see table A4.5 appendix).
Source: EULFS 2004/5

This result seems plausible because section 4.2.2. has demonstrated that women are overrepresented in occupational groups, like professionals, with a relatively high status, whereas men are more polarised between occupations with a very high and a very low status. In a country comparison these gender gaps vary considerably: the lowest status gap (more gender equality) can be found in countries like Denmark, the United Kingdom, Austria and the Netherlands. Countries like Spain and Ireland, as well as Eastern European countries, by contrast show remarkable gender inequalities in favour of women (see also results for section 4.2.2.: women in these countries are also overrepresented in the occupational group 2 (professionals)).

As to the distribution of men and women in manual and non-manual occupations, the results are surprisingly different and reflect the fundamental vertical gender differentiation.[93] Particularly in non-manual occupations where women are generally overrepresented, the gender status gap is high in nearly all countries, while the difference seems less pronounced in manual occupations. However, as mentioned above, these results indicate that women, generally, reach positions with a relatively good occupational status, whereas men are distributed between very high and low status positions. In Eastern European countries, once again, the segregation along these lines is less pronounced than in the 'old' Member States - an indication that the distribution of men and women over all occupational groups is more even than, for example, in the Nordic countries.

Turning to the development of the gender status gap, the following figure 4.10 presents changes between 1995 and 2004.

Figure 4.10: Development of the overall sex status gap, 23 EU Member States (ISEI without agriculture), 1995/2004



Note: For the Eastern European countries the information was only available from 1998.
Source: EULFS 1995, 1998 and 2004/5

[93] The above described results are also observable when restricting the sample only to women and men with a tertiary degree (see appendix, figure A4.6).

In sum, it is to be noted critically that the described results for management as well as high status positions need to be interpreted with caution, as cross-national comparability of occupations in major group 1 of the ISCO88 is particularly susceptible to national differences in definitions. Particularly in Ireland and the United Kingdom, the definition is looser than in other countries (Elias and McKnight 2001). Furthermore, occupations with a supervisory role may not only be found in management occupations (group 1) but also be within other groups of occupations, like professional occupations (group 2). The available level of occupational disaggregation, however, does not reveal such underlying vertical gender segregation.

4.3.2. The gender wage gap

A further way of assessing the vertical dimension of occupational sex segregation is the analysis of the gender wage gap[94] - not least because the reward attached to any job may change with the sex composition of the workforce. Another advantage of the analysis of the gender wage gap is that it overcomes the above-discussed problem that status values are equal for men and women in the same occupational group and cannot be differentiated.

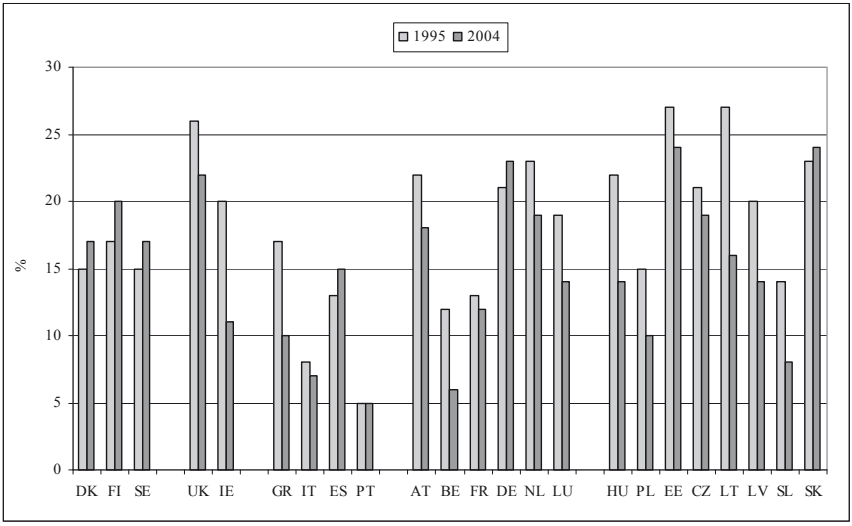
The following figure 4.11 shows the gap between the gross hourly earnings of women relative to men for 1995 and 2004. Starting with results for 2004, the gender-specific wage gap is lowest in Southern European countries, whereas the highest values can be found in the United Kingdom, Estonia, Slovakia and Germany. With respect to the development between 1995 and 2004, it proves to be difficult to analyse trends in the gender pay gap. There is a wide variation in results over time, between countries and even within a particular country.

The presented figure, based on data of Eurostat, indicates that the wage gap decreased in nearly all countries, except Denmark, Sweden, Spain, Germany and Slovakia where the gender differences in payment increased over the time period. However, the cross-country comparability is limited by the fact that hourly earnings are calculated on the basis of slightly different definitions of wages and hours worked across countries. Overtime pay, for instance, is

[94] The gender pay gap refers to the difference between the wages earned by women and men. In order to take into account differences in working hours and the impact of the income tax system, most estimates are based on differences in gross hourly wages. The most common method is to calculate the gender pay gap as the ratio of women's average gross hourly wage to men's average gross hourly wage, or as the difference between men's and women's gross hourly wage as a percentage of men's average gross hourly wage. In the present analysis, the gender pay gap indicates how many percentage points the earnings of men would have to decrease in order to equal those of women.

included only in some cases. These differences affect the gender pay gap only to the extent that they are gender-biased.

Figure 4.11: Development of the gender wage gap (gross hourly earnings), 23 EU Member States, 1995 and 2004



Notes: According to the definition of Eurostat the gender pay gap is the difference between average gross hourly earnings of male paid employees and female paid employees as a percentage of average gross hourly earnings of male paid employees; the population consists of all paid employees aged 16-64 that are at work 15+ hours per week.
Source: Eurostat 2007

Furthermore, estimates about the differences between male and female wages depend on the data available, the specific sample, and the method used. As a consequence, there is a higher risk of measurement errors because most of the information comes from national household surveys where the risk of miss- or under-reporting by interviewers is quite high (Barry et al. 2001, Grimshaw and Rubery 1997, Rubery et al. 2002b). Possible explanations of the gender wage gap, traditionally, refer to differences in individual characteristics, like age, education, and experience (Blau and Kahn 1994, Groshen 1991, Mincer and Polachek 1974, Petersen and Morgan 1995, Polachek 1987, Treiman and Hartman 1981). However, new empirical studies (OECD 2002, Rice 1999, Rubery et al. 2002b) suggest that these differences only play a minor role in the persistence of the gender pay gap. The improved educational situation and the increased female participation rate have strongly diminished gender specific

differences in individual characteristics. Nevertheless, gender differences in experience still play a role in some countries.

In general, however, the gender pay gap seems more related to the level of occupational segregation (Collinson et al. 1990, Millward and Woodland 1995, Rubery 1992, Reskin and Roos 1990) and the impact of the wage structure, the wage dispersion and the specific system of wage determination (Bernhardt et al. 1995, Blau and Kahn 1992, Boeri et al. 2005, Figart et al. 2002, Grimshsaw and Rubery 1997, OECD 2002). Women tend to work in different occupations and industries than men, and may be penalised because of this decision. The extent of the penalty, though, may differ in accordance with the wage structure. A more compressed wage structure is likely to diminish the gender pay gap.

Furthermore, union density as well as the bargaining coverage seems to go hand in hand with a lower overall wage inequality (OECD 2004c, Rowthorn 1992, Rubery et al. 2005). It seems clear that general trends in wage structures may influence trends in the degree of gender wage differences to the same extent as specific efforts to implement equal pay at an organisational or sectoral level. Recent developments seem to enhance labour market inequality in the EU. Relevant factors include, for instance, the declining real and relative pay levels at the bottom of the labour market accompanied by rising wage dispersion in many countries, the limits on public sector pay imposed by tighter monetary policies, and finally shift towards de-centralised and more individualised systems of wage setting (Blau and Kahn 2003, Grimshaw and Rubery 2001) .

4.4. The national institutional context

The extent to which men and women participate in the labour market, and the type of job they do, is not only influenced by the above-discussed supply and demand side characteristics. Studies in this area (Charles 1998, Fagan and O'Reilly 1998, Charles et al. 2001, Meulders and Gustaffson 2002) show that institutional arrangements, like specific labour market, social, tax and education policies[95], as well as socio-cultural norms can contribute to the explanation of gender-specific differences on the labour market. In this respect, the national institutional variations reflect historical and contemporary differences in political debate as well as compromise settlements between social actors (Alwin et al. 1992, Pfau-Effinger 1998a).

[95] These include policies promoting the flexibility of working time arrangements, the system of family taxation, and the support of families through childcare subsidies, child benefits and paid parental leave.

4.4.1. The role of education and training systems

As already emphasised, several researchers (Borghans and Groot 1999, Smyth 2005, Smyth and Steinmetz 2008) have demonstrated the interrelation between educational and occupational sex segregation, even though educational segregation need not necessarily 'cause' occupational segregation. Nevertheless, it can be assumed that institutional arrangements in education systems, particularly the extent of 'openness' of the systems, affect the integration process of young people into the labour market, and also determine the extent to which educational sex segregation is translated into the labour market.

So far, a large number of sociological studies have established that countries follow different strategies to match the output of the educational system (secondary and tertiary) to the demands of the labour market (Allmendinger 1989, Breen 2005, Maurice et al. 1986, Müller and Gangl 2003, Shavit and Müller 1998). Explanations of this situation refer to country variations concerning the 'qualificational' and 'organisational space' (Maurice. et al. 1986)[96], their level of 'stratification' and 'standardisation' (Allmendinger 1989), the system of vocational training (Shavit and Müller 1998), or the 'exclusiveness' of a degree (Kim and Kim 2003). Breen (2005) synthesizes this research under the term 'educational signalling'. Educational systems with clear signals for their graduates generally show a tighter linkage between the education system and the labour market because employers can assess an applicant's productivity more easily.

However, the aforementioned literature has not devoted attention to the question how educational institutions or structures influence sex-specific labour market outcomes and particularly occupational sex segregation. This issue is central to certain explanatory frameworks which will be discussed in more detail in chapter 5 and 6. It seems that educational system characteristics, like the vocational orientation (Charles et al. 2001, Estévez-Abe 2005), the share of female tertiary graduates (Charles and Bradley 2002), the share of female graduates in atypical fields of study (see also Bourque and Conway 1993, Bradley and Ramirez 1996; Davis and Guppy 1997) and the share of women graduating in short-term programmes (for example, Oechsel and Zoll 1992, Rubery et al. 1996), play a crucial role for the translation of educational into occupational sex segregation.

As table 4.5 shows, educational systems differ fundamentally with respect to the aforementioned characteristics. Considering the degree of vocational specification of educational systems, for instance, the share of persons enrolled

[96] Germany, for example, is a typical 'qualification space' where skills are learned in a vocationally-oriented schooling system and employers select employees based on these assets.

in more vocational and technical education varies from 8.9% in Lithuania to 51.9% in the Netherlands. In this regard, particularly continental and Northern European systems seem to be more stratified than educational systems in Southern and Eastern Europe which might be a first indicator for stronger segregation processes within these countries.

Table 4.5: Overview of relevant educational system characteristics for 21 EU Member States

Country	Enrol. of students (%) in voc./tec.edu (ISCED 2/3)	Fem. share (%) of tertiary degree holders (overall)	Ratio between women and men in ISCED 5B[a]	Fem. share (%) of grad. in male-dom. fields of study[b]
Denmark	27.4	58.8	0.7	26.9
Finland	28.2	62.0	1.3	23.7
Sweden	27.1	61.0	1.3	27.6
UK	22.8	57.7	1.1	22.1
Ireland	15.5	57.0	1.2	34.8
Greece	17.9	60.9	1.0	21.8
Italy	37.6	59.1	1.1	33.3
Spain	13.9	57.7	0.8	20.1
Portugal	14.1	65.9	1.2	37.3
Austria	37.9	50.6	1.0	13.3
Belgium	40.5	57.1	1.4	20.8
France	26.2	56.6	1.1	27.4
Germany	21.4	52.7	1.0	15.7
Netherlands	51.9	56.1	0.9	14.6
Hungary	13.5	63.5	2.0	29.5
Estonia	14.0	71.6	1.8	51.3
Poland	25.2	65.5	1.8	38.5
Lithuania	8.9	66.5	1.1	16.7
Latvia	14.6	69.2	0.9	40.9
Slovenia	33.8	60.4	1.1	27.0
Slovakia	33.7	56.7	2.6	30.5

Notes: a) The ratio is calculated by the share of women in ISCED 5B out of all women through the share of men in ISCED 5B out of all men; b) Engineering, mathematics and informatics are defined as typically male fields of study.
Sources: The data refer to 2004, UNESCO (2007): Key Data on Higher Education 2007: 206 and from the EULFS 2004/05.

Focusing on the tertiary system, particularly in countries like Austria, Germany and the Netherlands female involvement is quite low in comparison to Southern or Northern European countries. This might be explained by the fact, that in these systems, the educational expansion mainly has taken place in the secondary system, which in turn, might lead to higher segregation outcomes. In contrast, the former Eastern European countries (especially Estonia, Latvia and Lithuania) hold top positions with female participation rates above 66%. From a

human capital perspective, it can be argued that a higher female participation and graduation rate should also improve female labour market outcomes. However, research in this field demonstrates that this assumption heavily depends on segregation processes within the tertiary system. For instance, it has been assumed that women, even though they are increasingly gaining tertiary degrees, are more often enrolled in short term courses (ISCED 5B) which are less rewarded on the labour market and, therefore, support vertical segregation processes. Also here cross-national differences can be observed with respect to the selected indicator. Some of the aforementioned Eastern European countries (except Latvia) which are characterised by high female tertiary graduation rates seem to have the highest share of women graduation in short-term courses in comparison to men (ratio between 1.8 and 2.6). Countries like Spain and Denmark with a rather moderate share of female tertiary graduates, by contrast, have very low ratios between 0.7 and 0.8. In consequence, the principally 'positive' effect of a high female tertiary participation rate might be neutralised or even reversed and, thus, lead to higher vertical occupational sex segregation.

Besides the fact that tertiary systems can be segregated vertically (by level of degree), research demonstrates that there is also a horizontal dimension (by field of study). In this respect it is argued, that even though women are increasingly awarding tertiary degrees this is determined by an over-proportion of them graduating in 'typically' female fields. As a consequence horizontal segregation processes could be supported by selecting women into typically female occupations.[97]Therefore, the selected indicator showing the share of women in atypical fields of study implies how much this horizontal component is pronounced within the educational system. Furthermore, it might also indicate in how far the chances of women to gain access into typically male occupations are increased. There are cross-national differences observable: in Austria, the Netherlands and Germany, only around 15% of women graduate in a typically male field of study, while in Eastern European countries, like Latvia and Estonia, the share varies between 41% and 51%.

In sum, it can be stated that even within the educational system segregation processes are complex and depend on different dynamics. The positive effect of a high graduation rate of women can be 'negatively' influenced by the type of tertiary degree women are gaining (ISCED 5B). However, besides the level of the degree also the specialisation is important. For instance, a degree in a short-term course might be better for women when it is in a typically male field of study (as it might be better in terms of earning and career prospects). In this respect two segregation effects could also 'neutralise' each other to some extent.

[97] Due to this there is also a vertical component, as typically female occupations are often associated with lower pay and less career options.

4.4.2. The role of welfare states: gender legislation and social policies

Without doubt, national policy makers have various options to support and enhance gender equality on the labour market and reduce occupational sex segregation. One of the most direct ways is legislation and affirmative action which guarantees women mainly 'equal access' to occupations and high status positions (anti-discrimination legislation). As already pointed out in chapter 1, the EU gender equality legislation concerning the labour market has a long tradition (see table 4.6). However, it mainly aims to reduce vertical discrepancies, e.g. the gender wage gap or women's underrepresentation in positions with decision power.

Horizontal discrepancies seem to be difficult to tackle because they are embedded in different areas of society (see chapter 2). The gender mainstreaming approach - even though aiming to include the gender dimension also horizontally into all fields of policy making - only led to less successful soft law measures with respect to horizontal occupational sex segregation (see chapter 1).

Against this background, EU equality law seems to have reached its limits. However, gender equality arises not only from EU-driven anti-discrimination policy, but also from national state intervention focusing on three policy areas: childcare, parental leave and family taxation systems. Jaumotte (2003: 54), for example, shows that policies stimulating female employment include a more neutral tax treatment of the second earner, tax incentives to share market work between spouses, childcare subsidies and paid parental leave.

Table 4.6: Selected EU policy measures concerning gender equality in employment since 1957

Treaty of Rome (1957)	
Article 119	Men and women should receive equal pay for equal work
Treaty of Amsterdam (1997)	
Article 3	The EC shall aim to eliminate inequalities, and to promote equality between men and women.
Article 141	Each Member State shall ensure that the principle of equal pay for male and female workers for equal work of equal value is applied. The principle of equal treatment shall not prevent any Member State from maintaining or adopting measures providing for specific advantages in order to make it easier for the underrepresented sex to pursue a vocational activity or to prevent or compensate for disadvantages in professional careers (positive action).

Source: The table follows Le Feuvre and Andriocc (2003: 48-49).

Table 4.6 (continued): Selected EU policy measures concerning gender equality in employment since 1957

Council Directives	
Directive 75/117/EEC of 10 February 1975	Approximation of laws in the Member States relating to the application of the principle of equal pay for men and women which has been enshrined in the Treaty of Rome [JO L45, 19.2.1975].
Directive 76/207/EEC of 9 February 1976	Implementation of the principle of equal treatment for men and women as regards access to employment, vocational training and promotion and working conditions [JO L39/40, 14.2.1976]
Directive 92/85/EEC of 19 October 1992	Introduction of measures to improve the safety and health at work of pregnant workers who have recently given birth or are breast-feeding.
Directive 96/34/EC of 3 June 1996	Framework agreement on parental leave concluded with UNICE (The Union of Industries in the European Community), the ETUC (European Trade Union Confederation) and the CEEP (European Centre of Public Enterprises)
Directive 2000/78/EC of 27 November 2000	Establishes a general framework to combat all kinds of discrimination on grounds of religion or belief, disability, age or sexual orientation in employment and occupation.
Directive 2002/73/EC of 23 September 2002	This Directive amends Directive 76/207/EEC of 9 February 1976. It provides a Community definition of direct and indirect discrimination, harassment and sexual harassment. It also encourages employers to take preventive measures to combat sexual harassment, reinforces the sanctions for discrimination and provides for the setting up within the Member States of bodies responsible for promoting equal treatment between women and men.
Directive 2004/113/EC of 13 December 2004	Implementing the principle of equal treatment between women and men in the access to and supply of goods and services.
Council Recommendations and Resolutions	
Resolution/12.07.1982	Promotion of equal opportunities for women - approval of Action Programme 1
Recommendation 84/635EEC/13.12.1984	Promotion of positive action for women.
Resolution/ 03.06.1985	Equal opportunities for girls and boys in education.
Resolution/24.07.1986	Promotion of equal opportunities for women - approval of Action Programme 2
Resolution/22.06.1994	Promotion of equal opportunities for men and women through action by the European Structural Funds
Resolution/27.03.1995	Participation of women in decision making
Recommendation 96/694/02.12.1996	Recommendation on the balanced participation of women and men in decision-making processes

Source: The table follows Le Feuvre and Andriocc (2003: 48-49).

Gornick et al. (1997), however, argue that generous tax benefits and tax credits for families can also encourage women to stay at home.[98] At the European level, particularly the issue of childcare has extensively been discussed.[99] Although there are still major shortfalls in availability and affordability of childcare facilities in Europe, universal improvements in care provisions have been achieved particularly in the old EU Member States (Rubery et al. 2002a). As table 4.7 shows, six countries (Denmark, Sweden, Ireland, France and the Netherlands) already reached the EU target of 33% for children under the age of three in 2004, while particularly in Southern European countries and Germany (West Germany) the availability of childcare facilities for the youngest age group is below 10%. For children between three and six, the situation is more favourable, because more countries almost reach the coverage target of 90% (except the United Kingdom, Ireland and Greece with coverage rates between 58% and 66%).[100]

Besides childcare, leave facilities are also an important element of reconciliation policy. Mainly when children are young, time-related provisions like leave arrangements, career breaks and the reduction of working time are crucial to combining work and family life. Table 4.7 shows that maternity leave provisions are relatively uniform among EU Member States: most of them provide for a break of 14-20 weeks. The United Kingdom is an exception with a recently-introduced extension to 26 weeks maternity leave.

An important factor influencing the amount of leave taken is the replacement rate of earnings. Only in nine countries (Denmark, Greece, Spain, Portugal, Austria, France, Germany, the Netherlands and Luxembourg), statutory maternity leave is compensated at 100%. It is calculated at 80% of earnings in Sweden and Italy, while in the other countries there are various sliding scales. In the new Member States, maternity leave provisions vary, between 28 weeks in Slovakia and the Czech Republic to 16 weeks in Latvia and Poland. Payment levels are replaced mostly at 100%, except in the Czech Republic and Hungary (70%) and in Slovakia (55%).

[98] It has to be recognised that in labour markets where women are 'protected' by regulations and legislations, employers might be reluctant to hire them for lucrative jobs or to promote them to managerial positions. Consequently, social policies intending to facilitate women's economic activity could also have the unintended detrimental consequence of limiting women's economic opportunities (Mandel and Semyonov 2003).

[99] As one result of the Barcelona summit 2002, Member States are asked to remove disincentives to female labour force participation by providing more childcare services. Concrete targets have been set: until 2010 at least 90% of children between 3 and 6, and at least 33% of children under the age of 3 should be in childcare.

[100] The New Member States, formerly accustomed to a generous provision from both the state and employers, have faced a fundamental decline in available childcare services with the breakdown of the communist system.

Table 4.7: Maternity leave, parental leave, provision of childcare and taxation systems in EU Member States, 2003/4

	Pub. funded childcare, children <3	Pub. funded childcare, children> 3	Maternity leave (weeks)	Maternity leave (payment %)	Effective* parental leave (weeks)	Taxation
Denmark	56%	93%	18	100	47	I
Finland	21%	70%	17,5	66 (average)	99	I
Sweden	41%	90%	12	80	119	I
UK	28%	58%	26	90	25	I
Ireland	40%	66%	18	70 (only 14 weeks)	11	OI (splitting)
Greece	7%	60%	17	100	12	J
Italy	6%	93%	22	80	24	I
Spain	10%	98%	16	100	48	OI (joint)
Portugal	19%	75%	17	100	20	J (splitting)
Austria**	9%	82%	16	100	71	I
Belgium	28%	100%	15	82 (first 30 days rest 75)	18	OI (splitting)
France	43%	100%	16	100	48	J (family quotient)
Germany	7%	89%	14	100	64	J (splitting)
Netherlands	35%	100%	16	100	11	I
Hungary	6%	86%	24	100	114	I
Poland	2%	60%	16	100	53	OI (joint)
Estonia	22%	79%	18	100	38	I
Lithuania	18%	60%	18	100	148	J
Latvia	16%	75%	16	100	22	I
Slovenia***	27%	59%	21	100	38	I
Slovakia	18%*	70%	28	55	52	I

*Notes: *Effective parental leave = total parental leave in weeks ** % payment benefit, I=Individual, OI= Optional individual, J= Joint*
*Sources: Eurostat 2004, Plantenga and Siegel 2004, ***value for Slovenia Gauthier 2005: 51, Gandullia 2004.*

Parental leave has complex effects on women's labour supply: while it can strengthen women's labour force attachment where the alternative would be to quit the jobs, it may also delay women's return to employment if introduced as a substitute for childcare services. Where leave policies are not backed up by childcare facilities, the system may serve merely to postpone labour market quits rather than providing a genuine bridge back to employment.

Among EU Member States, entitlements differ in relation to length and level of financial compensation. For example, the duration of parental leave ranges from 156 weeks (three years) in Spain, Germany, France, Poland,

Lithuania and Latvia to 13 weeks in the United Kingdom, the Netherlands and Ireland. It is unpaid in Greece, Spain, Ireland, the Netherlands, Portugal and the United Kingdom, while in other countries leave takers are compensated to some extent for their loss of earnings (note given in the table, for more information see Plantenga and Siegel 2004). However, given the differences in payment level it is not possible to rank the countries simply on the length of the consecutive weeks of parental leave. As Plantenga and Siegel (2004) argue, country differences may be overestimated, as formal regulations say little about the actual impact. As a consequence, they recommend to us information on the take-up rate (the actual use of leave facilities). Taking this consideration into account, the 'effective leave' (see table 4.7.) varies from 119 weeks in Sweden to less than 20 weeks for Belgium, Greece, Ireland and the Netherlands. In this context, also the choice of the tax unit (separate, joint, optional) is important. In addition, the question arises whether single-earner or dual-earner couples are favoured. While individual taxation provides greater incentives for employed partners to continue working, joint taxation encourages women to give up their jobs and rely financially on the income of their husbands. Most Western European countries have adopted separate systems of taxation. However, Scandinavian countries, the Netherlands, and the UK particularly support equal employment opportunities by a family taxation system, while several continental countries (Belgium, France, Germany, Italy and Luxembourg) maintain a joint taxation of families, at least as an option.

Against this background, it becomes evident that women's and men's occupational allocation is embedded in a complex interplay of personal as well as national-specific institutional factors. Besides the above-discussed determinants, further economic and organisational features of employment may affect sex-specific job allocation processes. For example, the average gender pay gap is smallest in countries where the wage system has an effective national minimum, and shows narrow differentials between low and high paid income (Blau and Kahn 1992, Rubery and Fagan 1995). Moreover, internal customs and practice concerning the organisation of work in firms affect occupational sex segregation. While male-dominated sectors (like transport) acquire flexibility through full-time shift patterns, part-time arrangements are more often used in female-dominated sectors (hotels and catering) with similar operational demands (see Fagan and O'Reilly 1998: 4).

4.4.3. 'Gender culture' - the role of social-cultural norms and attitudes

Apart from the institutional framework, occupational decisions are also affected by socio-cultural norms and attitudes. As underlined in chapter 2, these norms and attitudes are developed early in life and influenced by individual characteristics like age and education, as well as characteristics of the family of origin. Importantly, such norms and attitudes define responsibilities of women and men towards family and work, and determine socially-accepted work-care arrangements (Alwin et al. 1992, Pfau-Effinger 1998a). A study by Lück and Hofäcker (2003), for example, shows that countries with more liberal attitudes towards gender roles, a higher work orientation of women and a higher acceptance of female labour in the presence of young children have generally higher female employment rates. Countries with more traditional gender attitudes, a higher family orientation of women and a low acceptance of working women, by contrast, show lower female employment. Post-socialist countries seem to be an interesting case because a high family orientation and a relatively low acceptance of working mothers with young children coexist with a relatively high labour market attachment of women.[101]

Norms and attitudes about the 'adequate' role of women and men in society have also an influence on occupational sex segregation. Due to the increasing awareness of egalitarian principles, it can be expected that, ultimately, more egalitarian norms and attitudes will also lead to more universal hiring practices and promotion procedures, and gender neutral pay scales (like in the public sector). When trying to capture the 'gender culture' of societies, it seems important to consider different aspects of the role of men and women, such as 'equality of access to the labour market' and 'care and motherhood'. The following figure 4.12 shows that attitudes towards the aforementioned aspects vary across countries.

As to the statement that *'men should have more right to a job than women when jobs are scare' (access aspect)*, a relatively high share of individuals, particularly in Northern European countries, disagree (except Italy, Austria, and Poland). A similar result can be seen with respect to the statement that '*a men's job is to earn money, a women's job is to look after the home and family*' *(traditional division of work-aspect)*. While agreement is quite high in the 'old' Members States (between 42% in Greece and 78% in Sweden), they are rela-

[101] Lück and Hofäcker (2003) explained this phenomenon by the high economic necessity of households.

tively low in Eastern European countries (between 21% in Lithuania and 35% in Poland, except Slovenia with a share of 54%).[102]

Figure 4.12: Share of persons disagreeing with selected statements concerning gender equality, 2002/3

Notes: The graph presents the share of persons who disagree with the following statements:
a) When jobs are scarce, men should have more right to a job than women (ESS, second round)
b) A men's job is to earn money, a women's job is to look after the home and family (ISSP 2002)
c) A pre-school child is likely to suffer if his or her mother works (ISSP 2002, R1)
d) Men should do more childcare (ISSP 2002, R1)
Sources: European Social Survey (ESS) 2003, International Social Survey (ISSP) 2002

Turning to questions of 'care and motherhood' a different picture emerges: generally, the share of persons who disagree with the statement that '*a pre-school child suffers if the mother works'* is fairly low in all EU-Member States. Particularly in Southern Europe and Austria, Hungary, Lithuania and Latvia, people seem to have a more 'traditional' attitude towards women's childcare responsibility.[103] Interestingly, the 'egalitarian mood' with regard to this is reduced in the Northern countries. Even though the share of disagreeing people is

[102] The result supports the argument that women in former communist countries faced a 'double burden'. In spite of their professional duties, they were also expected to perform housework and provide care (Geisler and Kreyenfeld 2005, Pascall and Manning 2000).
[103] A possible explanation might be the lack of available and affordable childcare facilities for youngest children in these countries.

still lower in comparison to other EU Member States, this finding demonstrates that, regardless of the support of equal access to the labour market, a 'traditional' family model still exists.[104]

With respect to the involvement of men into childcare, the share of persons who agree that *'men should do more childcare'* increases in comparison to the former statement. The high share of persons agreeing with this statement in almost all countries indicates that independently of well-organised public or private childcare facilities, the involvement of men is still perceived as lacking behind.

As demonstrated above, the 'gender culture' and the 'egalitarianism' of countries can vary substantially. Even in countries like Sweden and Denmark with relatively strong egalitarian attitudes towards gender and work, the opinions can be divergent with respect to the question of motherhood. When trying to include such aspects into the analysis of occupational sex segregation, one should be aware that one single indicator is incapable of capturing all different aspects.[105] Moreover, it is questionable that principles of egalitarianism will weaken all forms of segregation to the same extent. The definition of female and male roles in modern society is still linked with standard essentialist visions of masculinity and femininity. Hence, cultural stereotypes about gender differences will maintain their influence on family as well as educational and occupational preferences and choices. This is also manifest in the preferences of employers and employees, the persistent horizontal segregation of men and women across occupations and their concentration in the manual and non-manual sector.

4.5. Conclusion

This chapter yields two important findings: first, it has been shown that the extent and patterns of occupational sex segregation vary across countries. The developments are divergent particularly when taking the multidimensionality of the phenomenon into account. In this respect, the use of single number indices seems to be misleading because they measure the *degree* rather than the actual pattern of occupational sex segregation (Charles and Grusky 1995, Goode 1963, Jackson 1998, Ramirez 1987). This is problematic because cross-national differences, in consequence, are mainly viewed from the perspective of the extent to which egalitarian practice has been institutionalised. Moreover, it is assumed

[104] This might also indicate that in Northern European countries, women are more bound to employment due to the tax system and generous childcare services (Ellingstæter and Rønsen 1996, Ellingstæter 1998, Siim 1993)

[105] Nevertheless, only one indicator has been applied in the work of Charles and Grusky (2004).

that universal and integrative forces are capable of changing occupational sex segregation as a whole. Therefore, only a multi-dimensional approach can be appropriate to demonstrate that mechanisms, underlying cross-national variety and change, function differently with respect to the horizontal and the vertical dimension of occupational sex segregation.

The second finding is that, besides individual determinants, institutional factors, like the organisation of educational systems, post-industrial developments, social policies and the national 'gender culture', play a decisive role in explaining cross-national variations in occupational sex segregation. Only when they are included in the analysis, a complete picture of segregation processes can be drawn for a single country or across countries (Pfau-Effinger 2000). However, a multi-dimensional approach seems to be appropriate also in this context because macro-level factors affect the aforementioned two dimensions of occupational sex segregation differently.

In sum, the argument advanced by segregation scholars can been confirmed that occupational sex segregation is a universal phenomenon that varies in complex and multi-dimensional ways.[106] Cross-national differences in the patterns of occupational sex segregation, identified in this chapter, can be summarised according to three inequality components refined in the work of Charles and Grusky (2004): a *horizontal* differentiation that segregates women and men across the non-manual and the manual sector[107], and a *vertical* division allocating men to the most desirable occupations a) within the non-manual and b) within the manual sector (see figure 4.13).[108]

Furthermore, it is important to be aware of the described factors which determine female and male employment patterns. They can have different effects on the distinguished dimensions. For example, the expansion of professional employment gives women better access to higher-level (and previously male-dominated) jobs. Therefore, it supports the desegregation of the labour market. Other parts of the labour market, however, may become more segregated at the same time. As Charles and Grusky (2004) emphasise, the manual part of the labour market facing most of the job losses during the last decades, shows signs of increased sex segregation. Women entering this sector concentrated on fe-

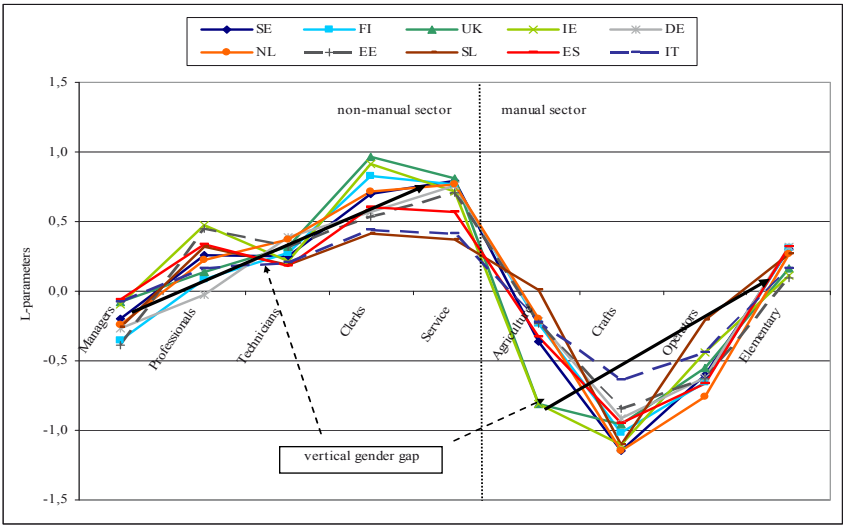
[106] As already mentioned in chapter 1, researchers have distinguished between horizontal and vertical dimension of occupational sex segregation theoretically. However in Charles' and Grusky's opinion the core problem is that in most empirical and methodological debates this has been forgotten or not implemented adequately and convincingly.

[107] Other researchers make the division between typical male and female occupations, see for instance Hakim 1996.

[108] This characterisation accords with early comparative work of Roos (1985) as well as with contemporary analyses drawing on more recent surveys (Anker 1998, Nermo 2000, UN 2001).

male-dominated areas (like elementary workers) where they have not been exposed to unemployment which occurred mostly in male-dominated manual jobs.

Figure 4.13: Dimensions of occupational sex segregation (L-parameters, ISCO88 1-digit), 2004



Note: The figure follows Charles and Grusky's distinction between gender gaps in the non-manual and manual sector.
Source: EULFS 2004/5, own calculations

For the understanding of occupational sex segregation, it should be considered how the above-described contextual factors structure labour markets, and in how far these systems interact with individual preferences, choices and particularly the fact that women are not a 'coherent' category (Hakim 2000). Moreover, it must be recognised that new divisions are emerging which need to be addressed in the context of occupational sex segregation. There is an evolving polarisation in labour market opportunities and experiences between highly educated and low educated women. As already mentioned, while young women are now matching or even exceeding the qualification levels attained by men, marked horizontal segregation persists in specialism: for instance, at graduate level women are underrepresented in engineering and sciences, although their involvement in these subject areas has increased in recent years in some countries. As a consequence, gender differences in specialism rather than accreditation of higher education may become more important in the future.

5 Variations in occupational sex segregation across EU Member States - creating a typology of 'sex segregation regimes'

One core finding of chapter 4 has been the insight that, besides individual determinants, institutional factors, like the organization of educational systems, post-industrial developments, social policies and the national 'gender culture', seem to play a crucial role in explaining cross-national variations in occupational sex segregation. In this context, it seems interesting in how far countries can be classified more systematically with regard to occupational sex segregation when such institutional factors are considered. So far, little effort has been made in this regard. Hardly any comparative research ever drew an entire picture of institutional and structural inequalities in the enlarged European Union.

This chapter aims to bridge this gap by identifying distinct country clusters which can be defined as 'sex segregation regimes'. For this purpose, hierarchical cluster analysis is applied for 21 EU Member States[109] based on selected structural macro indicators. Using comparable data from different European sources mainly for the year 2004, the chapter begins with an overview of existing typologies of occupational sex segregation. Section two provides a description of selected indicators and their relation with occupational sex segregation. In section three, the method is introduced. In section four, results of the cluster analysis are presented and the emerging 'segregation regimes' are characterised. Moreover the robustness of the found clusters is evaluated through a sensitivity analyses. Finally, section five discusses the findings and formulates expectations as to the extent to which these 'regimes' can be used to explain cross-national variations in horizontal and vertical occupational sex segregation.

5.1. Previous typologies of occupational sex segregation

When trying to classify countries more systematically according to occupational sex segregation, well-known welfare typologies, like the typology by Esping-

[109] Luxembourg and the Czech Republic have been excluded from the analysis because of a lack of information on important educational factors, like the share of women in different fields of study.

S. Steinmetz, *The Contextual Challenges of Occupational Sex Segregation,*
DOI 10.1007/978-3-531-93056-5_5,

Andersen (1990, 1999) with its concept of 'defamilisation'[110], or feminist approaches addressing gender stratification more specifically (Quadagno 1988, Walby 1990, Lewis 1993, 1997, 1999, O'Conner 1993, Orloff 1993, Gardiner 1997, Ostner and Lewis 1998), are less helpful as they do not focus on occupational sex segregation.

The first (serious and) systematic attempt to group countries according to their sex segregation regime was made by Chang (2000). She assumes that, for the understanding of cross-national variability of occupational sex segregation, the potential role of the state in mediating the effects of market and family relations on women's economic status are essential. In this respect, two ways of state intervention are important: first, the guarantee of *equal access* for men and women to all occupations (through anti-discrimination legislation and affirmative action) and, second, the *provision of substantive benefits* to working mothers aiming to alleviate work-family conflicts. On the basis of this theoretical approach, Chang distinguishes four segregation regimes: the *formal-egalitarian* regime (for instance, in the United States) shows a formal commitment to gender equality in the labour market which is evidenced by legislation but limited because of insufficient state-sponsored services, such as childcare. The *substantive-egalitarian* regime (like in Sweden) is characterised by both a formal commitment to gender equality and a strong commitment to providing substantive support services. The *traditional family-centred* regime (like in Japan) shows very few or no formal-legal commitments or substantive services for working women. Finally, the *economy-centred* regime (like in Hungary) provides many services for working women but has no or only little formal commitment to gender equality. Chang employs this typology as a basis for the analysis of 14 industrialised countries and an evaluation of how levels and patterns of segregation evolved over time. Her results show that cross-national diversity of sex segregation is declining and that the remaining diversity is increasingly patterned to one of the four segregation regimes. However, Chang assumes that the future viability of these regimes will depend on the extent to which the progress towards gender equality is defined and developed in the different regimes (Chang 2000: 1694).

A further approach by Estévez-Abe (1999, 2005) considers how international differences in labour market skills (so-called skill regimes) and social

[110] This refers to the concept of social entitlements. Feminist scholars, who criticised Esping-Andersen's typology because of its 'gender blindness' underline the importance of social entitlements based on citizenship instead of work for women (Sainsbury 1994, 1996). In consequence, the concept of decommodification is not adequate for describing women's situation. It needs to be completed by the concept of defamilisation, i.e. the extent to which the welfare state makes individuals less dependent on the family.

policy provisions generate cross-national variability of occupational sex segregation. Combining arguments of the 'varieties of capitalism' and the 'gendering welfare' literature, her 'skill-based' theory claims that '*specific skill regimes'* discriminate against women, whereas *'general skill regimes'* are more gender neutral and perform better in terms of gender equality at work.[111] The logic of the theory follows Becker's (1964) distinction between *firm-specific skills* and *general skills*: while firm-specific skills are acquired through on-the-job training and characterised by a low transferability to other employers[112], general skills are acquired through general education and characterised by a high portability resulting from their usefulness for a large number of employers across firms and industries.[113] Although both skill types can be found in a country, national labour markets tend to prefer certain types of skills over others. For example, liberal market economies (United States or the United Kingdom) strongly stress general skills, while specific skills are more important in coordinated market economies (like Germany).

To mediate the lower investment of women in specific skills, the welfare state is of utmost importance (Estévez-Abe et al. 2003, Mares 2003). Particular attention should be devoted to measures facilitating the reconciliation of work and family responsibilities, such as the payment of maternity and parental leave and/or the provision of extensive and affordable childcare facilities. Estévez-Abe hypothesises that women will be less likely than men to invest in firm-specific skills and more likely to pursue general skill strategies if this kind of protections are unavailable. Moreover, a long, generously paid leave hampers the acquisition of firm-specific skills by women. Only a combination of paid leave with adequate childcare provision, and legislative initiatives forcing men to take time off, is capable of narrowing the skill gap. Based on these considerations, her mostly bivariate analyses show that 'skill-regimes' can explain cross-national differences in both dimensions of occupational sex segregation: *'skill-specific regimes'* have a higher level of vertical segregation and tend to have more male-dominated private sectors. This is accompanied by public sector expansion which exacerbates horizontal sex segregation through the creation of a female-dominated public sector. *'General skill regimes'*, by contrast, are more gender neutral, although the provision of apprenticeships by employers can

[111] With respect to occupational sex segregation, it is assumed that *'general skills'* in contrast to *'specific skills'* are more 'gender neutral' because the limited portability of firm-specific skills makes such an investment unattractive for women who anticipate career breaks due to child rearing responsibilities. This holds even when individual women are more career oriented because employers may fear that women are more likely than men to quit.

[112] This is reflected in the difficulties of outside employers to evaluate them.

[113] Estévez-Abe et al. (2003: 188) underline that general skills are particularly portable when they are certified for example by 'objectively' school diplomas or other forms of vocational certification.

create typically male occupations (Estévez-Abe 2005: 205). With respect to strong employment protection in *'skill-specific regimes'*, Estévez-Abe shows that a weakening of these mechanisms is likely to reduce occupational sex segregation.

While Chang and Estévez-Abe rather seem micro-oriented, institutional approaches, such as the work by Charles and Grusky (2004), try to answer the question of cross-national variability by developing a macro-level, universalistic model of occupational sex segregation which is built upon two core factors (see section 4.5.): *egalitarianism* and *post-industrial economic restructuring*. The principles underlying this model are two ideological terms which are discussed as possible explanations of occupational sex segregation. The first principle, *gender essentialism*, is based on widely shared beliefs that men and women are different by their very nature, and that women are better suited than men for tasks involving service, nurturance, and social interaction (Beck-Gernsheim and Ostner 1978, Chodorow 1978). The second principle, *male primacy*, can be traced back to cultural beliefs that men are more status worthy than women and, accordingly, more appropriate for positions of authority and domination (Hartman 1976, Walby 1986, 1990, Deaux and Kite 1987, Reskin and Roos 1990, Bourdieu 1997, Ridgeway 1997).[114] Preferences, behaviours, self-evaluations and choices of men, women, employers and workers, are influenced by these norms (Reskin and McBrier 2000, Correll 2004). Moreover, in the modern context, the two cultural tenets coexist, thereby generating a hybrid character of segregation regimes (see Charles and Grusky 2004: 298).

Turning to the question why countries differ with respect to the common sex segregation profile, Charles and Grusky (2004) show that the described ideological principles interact with structural shifts of industrial economies. In particular, the expansion of the *service sector* seems to affect the structure of occupational sex segregation by creating 'new' occupations which involve tasks that are functionally similar to women's traditional domestic activities (*'compositional effect'*). Furthermore, the increasing necessity to fill positions with wives and mothers results in a pressure for adaptive changes in the structure and culture of the workplace ('*adaptive effect'*).[115]

Besides the service sector, *'economic rationalisation'* seems to be important which is represented by the ongoing functional specialisation and associated

[114] Although physical differences between the sexes (e.g. women's reproductive role, men's greater physical strength) may have contributed to the initial development of these beliefs, they have transformed into *cultural forces*, which, to a different degree, have been internalised as gender stereotypes by all individuals.

[115] This includes the provision of part-time work, flexible scheduling, and reduced penalties for intermittency.

routinisation of job tasks and personnel practices in some economic sectors (Thurow 1975, Tienda et al. 1987).[116] *'Rationalisation'* can also generate new opportunities for women striving for a career in the managerial sector. On the basis of this theoretical classification, Charles and Grusky analyse data from ten industrialised countries for the early 1990s using log-linear modelling. Findings concerning the influence of egalitarianism and post-industrialism show that, while egalitarianism reduces vertical segregation in the non-manual sector, rising post-industrialism increases horizontal segregation and counterbalances the egalitarian forces in the field of non-manual vertical segregation.

5.2. A refined typology of cross-national occupational sex segregation

Based on the presented findings, the following analysis combines the insights of previous studies that can be deemed central to the explanation of cross-national differences in occupational sex segregation. As already indicated in the previous chapters, four groups of indicators can be differentiated:

a. organisation of the educational system;
b. post-industrial restructuring;
c. social policies;
d. gender culture.

The first group of indicators includes measures related to the *'organisation of educational systems'*. This has rarely been done in the context of a cross-national analysis of occupational sex segregation (Estévez-Abe 2005, Smyth 2005). However, as emphasised in chapter 2 and 4, the institutional structure of education and training systems can be seen as a 'sorting machine' (Spring 1976) that serves to stratify people. For instance, educational institutions sort students into different educational levels and fields, thereby influencing labour market entry and/or occupational selection processes. To factor this argument into equation, firstly, the share of persons involved in vocational education is taken into account. As Estévez-Abe (2005) argues, segregation processes might have a higher probability to be translated into the labour market in countries where people specialise earlier than in countries where the educational system rather seeks to provide general educational courses. Furthermore, the share of female tertiary graduates is considered as a vertical component. An increasing share of female tertiary graduates might be positively related to labour market chances of women, particularly with respect to career options and wages. However, with a

[116] An example of such a process is the feminisation of the lower non-manual sector, which in turn increases the vertical segregation within that sector.

growing number of women reaching tertiary degrees, women's labour market success is no longer guaranteed. For instance, if women are more often graduating in fields of study which are lower rewarded on the labour market (often typically female fields), a tertiary degree itself is less helpful. Therefore, the share of female graduates in typically male fields, like mathematics, informatics and engineering, is included as a horizontal component (Jacobs 1995, Bradley 2000, Charles und Bradley 2002). It is assumed that a higher share of women graduating in an atypical field of study indicates better access to typically male occupations and, consequently, better chances on the labour market. With respect to the question in how far educational institutions affect the distribution of men and women across hierarchical positions, the argumentation is somehow different. Even though it can be assumed that a higher share of tertiary graduates, particularly among women, enhances career prospects, it may also lead to a higher, heavily gendered institutional specification. Oechsel and Zoll (1992), for instance, show that women tend to choose more often non-university institutions or short-cycle programmes (two-year programmes) which are generally lower rewarded on the labour market. Such institutions may be of particular interest to women because they are less competitive and can more easily be reconciled with anticipated family responsibilities. As a consequence, in the following analysis a gender ratio is used as a vertical component representing the relation between women with an ISCED 5B degree (compared to all women with a tertiary degree) and men with an ISCED 5B degree (compared to all men with a tertiary degree).

The group *'post-industrial restructuring'* comprises four indicators. First, the female employment rate is considered which is related to future anticipated employment opportunities (Waite and Berryman 1985, Morgan 1992). In this context, it can be assumed that a higher rate indicates better female employment opportunities. The second indicator refers to the share of persons employed in the service sector. As mentioned above, higher levels of horizontal sex segregation are often associated with a growing service sector and the corresponding extension of typically female occupations. To represent the facets of post-industrialism more precisely, the share of part-timers[117] (third indicator) and the share of persons staying more than 20 years with their employer (fourth indicator) are additionally taken into account. These indicators reflect the needs of flexible economies. It can be hypothesised that high shares of part-timers and/or a high labour market 'rigidity' increase occupational sex segregation because they lead to female over-representation in a 'secondary' labour market with worse working conditions.

[117] Empirically the association between part-time employment and high labour market sex segregation has not been confirmed (Nermo 1999, Kim and Levanon 2004).

The third group of '*social policies'* may also influence occupational sex segregation. As argued above, the reconciliation of work and family life can be of particular importance. In the subsequent analysis, relevant family and gender policies are measured by four indicators. The first three indicators focus on the extent to which the national state supports the reconciliation of work and family by providing childcare facilities (indicator 1 and 2) and parental leave options (indicator 3). According to arguments presented by Estévez-Abe (2005), these factors influence occupational sex segregation because they might affect educational decisions early in life that are based on anticipated possibilities of combining family and work. The fourth indicator, the Gender Empowerment Measure (GEM)[118], concerns the gender empowerment[119] within a society. This vertical measure, developed by the United Nations (2001), refers to anti-discrimination legislation and the extent to which national states succeed in protecting women against wage discrimination and unequal access to occupations and career paths (UNDP 2004). With regard to occupational sex segregation, particularly Chang (2000) pointed out that equal opportunity legislation may work in two ways: it increases horizontal segregation by excluding women from specific, typically male occupations which, for instance, require night shifts. However, it may also allow more women to enter traditionally male and 'higher status' occupations which reduces vertical segregation. As a consequence, countries with stricter anti-discrimination laws should have more integrated labour markets than those without. Furthermore, Blackburn et al. (2000) suggested that in countries where women have a higher empowerment, i.e. earning and political power, 'gender equality' has also been institutionalised legally.

Finally, besides the structure of the welfare state, the analysis also considers a group of factors concerning the *'gender culture'* of national states. As demonstrated in chapter 4, attitudes towards women's adequate role in society seem to be crucial to cross-national variations in occupational sex segregation. It can be assumed, for instance, that occupational sex segregation is stronger in countries where women are primarily seen as carers and potential additional earners, while men are associated with the classical role of a breadwinner. In

[118] GEM is an index including the percentage of parliamentary seats held by women, the percentage of female administrators and managers, the percentage of female professional and technical workers, and women's share of earned income compared to that of men. GEM is one of the few measures providing data on gender inequality in economic and political power across countries. It ranges from 0 to 1 with higher values representing greater gender equality (see for more detail about the calculation etc., UNDP 2004: 221-224, 263).

[119] The expression specifically refers to improving the situation of women in power and decision making - firstly to ensure equal access to and full participation in power structures and decision-making, but equally to increase women's capacity to participate in decision making and leadership in the areas of political, economic, social and cultural life.

such countries, women will more frequently choose career paths leading to occupations which permit a combination of family and work, and offer flexible working times - characteristics of typically female and less career-oriented jobs. The four selected indicators correspond to the results described in section 4.4.2. Table 5.1 gives an overview of the selected indicators and the used data sources (for more detail, see table A5.1 in the appendix).

Table 5.1: Description of selected macro-level indices

Educational system
1. Enrolment of students (%) in vocational/technical education (ISCED 2 and 3 out of overall enrolment) 2. Female share (%) of tertiary degree holders (compared to men) 3. Female share (%) of graduates in male-dominated fields[120] of study (compared to men) 4. Gender ratio for graduates in short-term programmes (ISCED 5B)[121]
Post industrialism
5. Female employment rate (%) 6. Share of employed persons (%) in the service sector 7. Share of persons (%) who stay more than 20 years with the same employer 8. Share of persons (%) who are in part-time employment (as a percentage of all employed persons)
Social policies
9. Childcare provision for children under the age of 3 (%) 10. Childcare provision for children aged 3-6 (%) 11. Effective parental leave (weeks) 12. GEM (%)**
Gender culture[d]
Share of persons (%)… 13. …who disagree that men should have more right to work if jobs are scare 14. …who disagree that it is men's job to work and women's job to look after the home and children 15. …who disagree that a pre-school child suffers if the mother works 16. …who *agree* that men should do more childcare

*Sources: a) All data refer to 2004, UNESCO (2007), EULFS 2004/05 and 'Statistik kurz gefasst 19/2005; b) All data refer to 2004, 'Employment in Europe' 2002, 2005, 2006 and EULFS 2004/05; c) See table 4.7, *GEM indicator: from UNDP 200: 221-224, 263; d) Most of the data come from the ISSP 2002; data for indicator 14 are from the World Value Survey 1999, for some countries the data stem from the Population Policy Acceptance Survey 2003 and the Eurobarometer 1994 (question 42).*

[120] The definition of typical male fields of study refers here to fields which are generally perceived as typically male, like engineering, mathematics and informatics.

[121] It is rather difficult to draw general conclusions on preferences of female graduates when choosing between 5A and 5B programmes. There are several countries in which female graduates in 5B programmes significantly outnumber those in 5A and vice versa. One of the problems in analysing female choices between type 5A and 5B programmes is the national classifications of study programmes (e.g. study programmes in nursing and teaching are classified differently). This can contribute to disparity between the numbers of female graduates in those two types of programmes.

5.3. Data and methods

To assess the positioning of countries in the enlarged European Union, a hierarchical cluster analysis seems to be the most appropriate method. It allows classifying cases into relatively homogenous groups based on their similarity on a number of variables as the criterion for the clustering (Rapkin and Luke 1993, Saint-Arnaud and Bernard 2003). This method is suitable whenever it is hypothesised that a sample consists of a number of different (similar) 'types' but the nature of these types is not known. It is called hierarchical because it divides a set of cases (here countries) into ever more numerous and specific subsets, according to the distance measured among all pairs of cases, taking into account their position across the whole set of variables under analysis. Although a cluster analysis can serve a number of different purposes (Everitt 1979), in this chapter it is primarily a method for exploring data and acquiring a preliminary understanding of groups of countries in which similar contextual factors seem to create similar patterns of occupational sex segregation. Consequently, the aim is not necessarily to test subject-specific hypotheses. However, depending upon the outcome of the clustering, some hypotheses and assumptions may turn out to be testable.[122]

The hierarchical cluster analysis is drawn upon the above-described indicators selected from various data sources (see table 5.1). Most of these indicators refer to the year 2004 and capture information for 21 EU Member States. Before utilising hierarchical cluster analysis, a number of technical decisions has to be made: first, all variables have to be standardised to prevent a skewed analysis that might result from a different scale of variables. Secondly, the cluster analysis is carried out by the Ward algorithm[123], using squared Euclidean distance matrix as the classical measure of distance. The ward algorithm belongs to the broad class of hierarchical clustering algorithms. It has been selected because of its capacity of producing a small number of rather homogenous clusters which is achieved via a sequential fusion of least deviant cases (Gordon 1999, Bacher 2002). Results of the cluster analysis reported below appear fairly robust for appropriate alternative clustering algorithms. However, it should not be concealed that the cluster solution depends heavily on the choice of indicators as

[122] There is no presumption that a similar analysis of data drawn from other resources would give rise to the same types of segregation regimes.

[123] There are various distance measures and ways of defining inter-cluster distances: the ward method is distinct from methods like 'single linkage' (nearest neighbour) and 'complete linkage' (furthest neighbour), because it uses an analysis of variance approach to evaluate the distances between clusters. This method minimises the variance within groups and thus maximises their homogeneity (see Ward 1963). In general, this method is deemed very efficient. However, it tends to create clusters of small size.

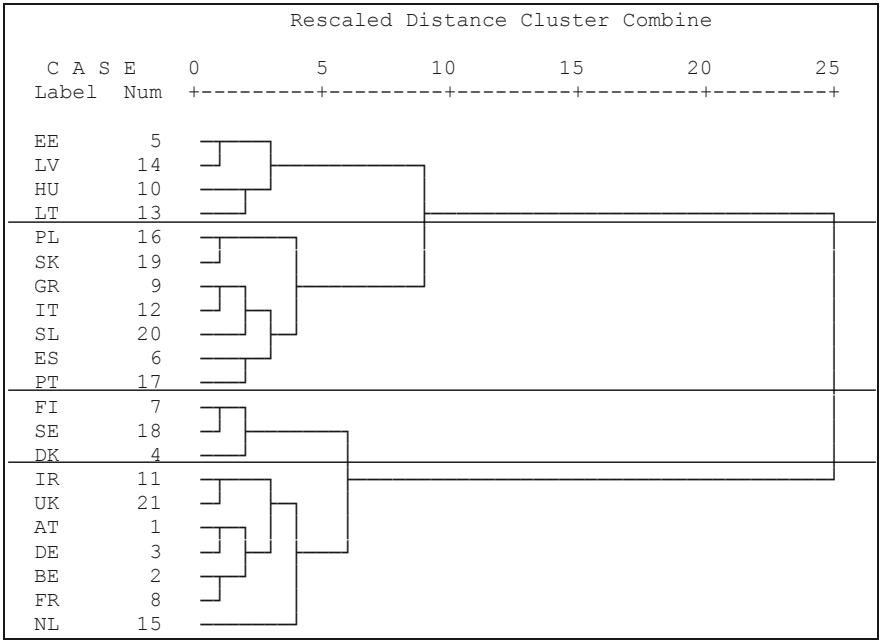
well as on the presence of influential factors, rather than on the sheer number of indicators (see section 5.4.2.). The cluster analysis is conducted using the program SPSS 16.

5.4. Characteristics of sex segregation regimes

5.4.1. Presentation of findings

A hierarchical clustering model can be represented graphically by a dendogram which reaches from the partition where all the elements are separated in different clusters or classes (singletons) at the first level, to the partition where all the elements are in the same cluster, at the last level (see figure 5.1).

Figure 5.1: Dendogram (hierarchical cluster analysis) using 16 indices, 21 EU Member States



Note: Clustering is carried out by the Ward algorithm using squared Euclidean distance matrix based on z-standardised transformations of the selected indicators.
Sources: See table 5.1 for the used indicators, own calculations

At each level, the clustering algorithm aggregates the two (or more) most similar clusters. Cases with a low distance/high similarity are indicated by drawing a line between them starting from the left of the dendogram. The more the linking line goes to the right of the dendogram, the greater the distance between the cases concerned and the clearer the indication that clusters were agglomerated that are less and less similar.

In the applied analysis the dendogram, for instance, reveals that within a cluster Estonia (EE) and Latvia (LT) are combined firstly as a pair of most similar countries. The next higher combination is between this group and Hungary (HU) and Lithuania (LT) indicating that they are most similar among all other countries. However, the distances between these country-groups are longer.

Coming to a description of the resulted country clustering four clusters can be distinguished (see also table A5.3 and figure A5.1 in the appendix). The first cluster comprises a mix of European countries: the Netherlands, France, Belgium, Germany, Austria, the United Kingdom and Ireland. The second cluster includes the 'Northern' European countries: Denmark, Sweden and Finland. The third cluster mainly consists of the 'Southern' European countries Portugal, Spain, Italy and Greece as well as Slovenia, Slovakia and Poland, while the last cluster contains, as already mentioned, a set of 'Eastern' European countries: Lithuania, Hungary, Latvia, and Estonia.

Differentiating more clusters would only lead to the isolation of a single or a pair of countries. For instance, in a five-cluster solution Poland and Slovakia would be in a separate cluster, without any other shifts in the grouping of countries, whereas in a six-cluster solution, additionally, the Netherlands is separated into an individual cluster (see table 5.2. and appendix, table A5.3).

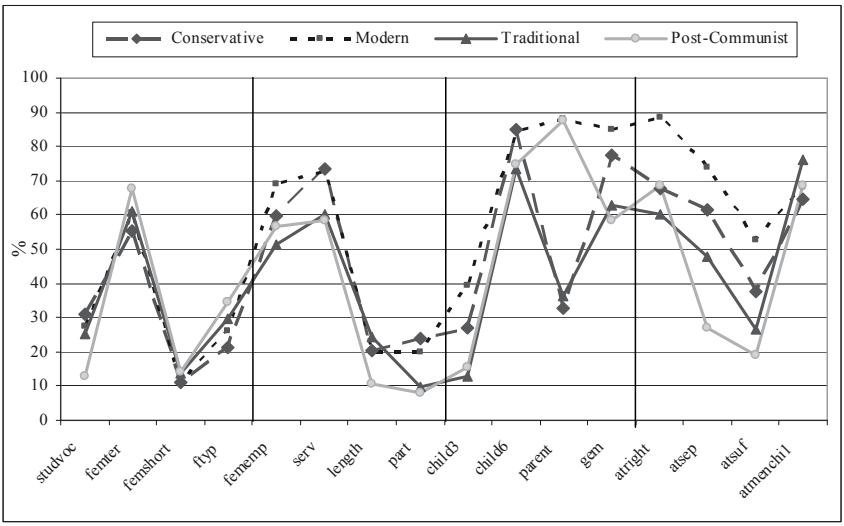
Table 5.2: Results for the different cluster solutions

Four-cluster solution				**Five-cluster solution**	**Six-cluster solution**
Cluster 1	**Cluster 2**	**Cluster 3**	**Cluster 4**		
Belgium (BE)	Finland (FI)	Spain (ES)	Estonia (EE)	PL	**C5**
France (FR)	Sweden (SE)	Portugal (PT)	Latvia (LV)	SK	NL
Netherlands (NL)	Denmark (DK)	Greece (GR)	Hungary (HU)		
Austria (AT)		Slovenia (SL)	Lithuania (LT)		
Germany (DE)		Poland (PL)			**C6**
Ireland (IR)		Slovakia (SK)			PL
United Kingdom (UK)		Italy (IT)			SK

Note: Clustering is carried out by the Ward algorithm using squared Euclidean distance matrix based on z-standardised transformations of the selected indicators.
Sources: see table 5.1

Although a dendogram provides detailed cluster solutions for the different countries, 'lineplots' (see figure 5.2) are helpful tools to identify 'average profiles' for each cluster, and to characterise the country groupings more precisely (see appendix, table A5.4).[124] Based on the selected indicators, cluster one can be classified as a *'conservative segregation regime'* representing a heterogeneous group of continental and liberal countries. Starting with characteristics of the educational system, these countries show, on average, a strongly differentiated educational system with a high share of persons involved in vocational education.

Figure 5.2: 'Lineplots' (average scores) of the four cluster solutions



Source: Macro-level indicators of the cluster analysis see table 5.2, own calculations

As pointed out at the beginning of this chapter, this relatively early specialisation might indicate that segregation processes also start early. With respect to the tertiary system, the countries in this cluster have a relatively low share of female tertiary graduates showing that the educational expansion of the last decades has been mainly compensated by developments within the secondary system. However, within the tertiary system, different developments can be observed: First, women are less often involved in short-term courses than men. According to the aforementioned theoretical considerations, this can be per-

[124] Averages scores of each variable are computed for the different clusters.

ceived as indicating a lower vertical differentiation by sex within tertiary education and, in a long-term perspective, also on the labour market. Second, women are less often holding a degree in a typically male field of study which indicates a higher tendency towards horizontal sex segregation. This might also have a negative effect on the vertical dimension because typically female fields of study are often less rewarded on the labour market. However, the standard deviation of 7.8 indicates a higher cross-national differentiation within the cluster (see appendix, tables A5.2 and A5.4). This field effect, therefore, does not apply to all countries to the same extent.

Furthermore it should be underlined that the effect of participation in short-term courses and the effect of graduation in a typically female field might operate differently across countries. For instance, it can be expected that both dimensions of educational sex segregation are pronounced in countries, like Finland and Belgium, where women, on the one hand, graduate over-proportionally in short-term courses and typically female fields of study ('addition' of negative factors). On the other hand segregation processes might be levelled out in countries like Estonia and Poland which are characterised by high levels of women with a degree in a short-term course and a typically male field of study ('neutralisation' of divergent effects). Turning to post-industrial developments, the cluster is characterised by a relatively high female labour market employment mostly due to a well-developed service sector and a high share of part-time options. In combination with a relatively high level of labour market rigidity, this might indicate a higher tendency towards horizontal and vertical sex segregation. Women are more often represented on the so-called 'secondary labour market' with higher flexibility, lower security and fewer career options. With respect to family policies, it may be stated that these countries, on average, favour the male-breadwinner model, where women are mainly seen as caregivers and part-time income earners. In this regard, Germany and Austria may serve as prototypes. These countries offer the lowest support for child caring, particularly for the youngest age groups. A relatively generous parental leave system, however, supports a withdrawal of mothers from work for the care period and a subsequent return to the labour market mostly on a part-time basis. The male-breadwinner orientation of the remaining continental countries (Belgium, France and the Netherlands) has increasingly been eroded during the last decades which is also reflected in relatively high standard deviations (S.D. 14.2/17.3/21.5, see appendix, table A5.4). Considering recent developments in the latter countries, the variation becomes understandable. For example, France shows clear modernisation signs with an increase in childcare institutions enabling women to return early to the labour market mostly on a full-time basis. The Netherlands rather follows the 'Nordic model' by increasing

women's labour market involvement particularly through part-time work and enhanced state support for childcare facilities. These evolving 'egalitarian' principles are also reflected in a high gender empowerment measure indicating, on average, a higher gender equality within these countries (Belgium, France and the Netherlands) due to a lower gender wage gap and women's entry into powerful management and political positions. In liberal welfare states, like the United Kingdom and Ireland, women's relatively high labour market participation is also supported by a highly developed service sector, low labour market rigidity and good part-time opportunities. However, in contrast to the continental countries, the development of work-family arrangements is left to the market. Therefore, women are, in principle, 'free' to participate in the labour market but they face the double burden of paid work and household tasks. As there is no statutory parental leave and almost no public childcare[125], the development of work-family arrangements depends on collective agreements or the policy of individual firms.[126] With respect to gender empowerment, the UK and Ireland are countries with divergent findings. While a high proportion of women reach influential positions within politics and economy, the gender wage gap remains at a very high level, especially in the UK. Finally, 'modernisation' tendencies within the first cluster can be observed with respect to positive attitudes regarding women's equal access to employment. However, the cross-national variation within the group is relatively high (S.D. 10.4; see appendix, table A5.4) and the above-described national tendencies are supported. Moreover, it is interesting that in these countries, on average, men's involvement in childcare is perceived as sufficient. This finding might indicate the survival of rather 'conservative' attitudes towards motherhood in the case of Austria and Germany, while in countries like the Netherlands, the perceived 'conservative' attitude results from the already high involvement of men into childrearing.

Cluster two - the *'modernised sex segregation regime'* represents the Nordic countries. The countries within this regime are less heterogeneous than the *'conservative segregation regime'*. With respect to the educational system and post-industrial developments, however, similarities can be revealed to the sex segregation regime of the first cluster. In all countries, the relatively high involvement of students into vocational education indicates a quite early educational differentiation. Moreover, women's representation among tertiary degree holders is moderate. Within the tertiary system of these countries, women are less often involved in short-term courses which might point towards a lower vertical differentiation in the educational system as well as in the labour market.

[125] In all EU Member States private childcare arrangements are widely used.
[126] Although individual companies and social partners are working on different arrangements, there are substantial differences between sectors and organisations.

The moderate share of women with a tertiary degree in a sex-atypical field of study also indicates a somehow reduced horizontal gender differentiation in comparison to the conservative sex segregation regime. On the labour market, women, in principle, have a high labour market participation in all these countries which is supported by a highly-developed service sector, a medium level of labour market rigidity and relatively good part-time options. However, as already pointed out in chapter 1, this might also be an indicator of stronger horizontal differentiation. With respect to family policies, differences can be observed to the conservative sex segregation regime. The well-developed benefit system in terms of childcare and parental leave options actively supports work-family reconciliation. Such differences are also visible in the long tradition of 'egalitarian' principles reflected in the high societal gender empowerment that is due to a relatively small wage gap and the higher share of women in leading positions. This egalitarianism is also supported by positive attitudes regarding women's equal access to employment and 'relatively' modern attitudes towards motherhood. Altogether this might imply fewer vertical differences between men and women.[127]

Cluster three can be classified as a *'traditional sex segregation regime'*, mostly represented by Southern European countries (e.g. Spain, Italy, Greece, and Portugal) but also by some Eastern European neighbours (Slovenia, Slovakia and Poland). In all these countries, educational systems are in general less differentiated which is also reflected in the moderate share of persons involved in vocational education. This might also indicate a delay in segregation processes. Moreover, educational expansion has mainly taken place in the tertiary system, particularly due to an increase in female participation rates (see also chapter 4). However, within the tertiary system two developments can be observed with respect to gender differentiation processes: first, women graduate more often in short-cycle courses than men. Second, they have a relative high graduation rate in male-dominated fields of study. Both developments have a different effect on segregation processes. While participation in short-cycle courses might enforce segregation processes, the graduation in typically male fields might level out particularly horizontal segregation tendencies in tertiary education and on the labour market. However, a high share of women with a sex atypical specialisation might also reduce vertical sex segregation, especially if typically male fields of study are more often organised in short-term courses. As regards the labour market, neither the state (only rudimentary reconciliation policies) nor the labour market support female integration into employment. As

[127] The low share of persons who agree with the statement that men should do more childcare might be due to the already high share of men involved in childcare as a result of parental leave regulations, like the well-known Norwegian 'daddy days'.

a consequence, women's labour attachment has remained on a very low level. This is strengthened by a limited service sector expansion and highly rigid labour markets. Accordingly, women's life course revolves, to a larger extent, around the family. The low rate of available childcare facilities, a very short parental leave (with a low wage replacement rate) and nearly no part-time opportunities contribute to women's focus on family tasks. In this context, it should be underlined that the cluster is diverse with respect to childcare facilities and parental leave (see S.D. 16.2/17.2, see appendix, table A5.4). This mirrors the different developments in Southern and Eastern European countries that have already been described in chapter 4. It is apparent that these differences might also lead to different segregation outcomes among these countries. Furthermore, the low societal empowerment of women indicates that they face difficulties in wage equality and entry into influential positions within politics and the economy. These findings, finally, are supported by still 'traditional' attitudes towards gender equality: a relatively low share of persons disagrees that men should have more rights to jobs and that women are mainly responsible for household and child related tasks. Nevertheless, moderate modernisation tendencies are reflected by the higher share of persons who agree that men should be involved into childcare activities to a greater extent.

Finally, a fourth cluster can be identified as the *'post-communist sex segregation regime'*. It contains several Eastern European countries (Estonia, Hungary, Lithuania and Latvia). Similar to the *'traditional sex segregation regime'*, the educational system is less differentiated and vocational specialisation is less common. Moreover, the share of female tertiary graduates is very high, even though it seems that within the tertiary system, segregation trends can be observed that are similar to the *'traditional sex segregation regime'*. On the one side, women are more often graduating from short-cycle courses which implies a higher vertical segregation. On the other side, the share of women in atypical fields of study is high which might reduce horizontal segregation tendencies. However, as indicated, these phenomena might also positively affect vertical segregation processes, particularly if typically male fields of study are more often organised in short-term courses. Additionally it should be pointed out that the standard deviations of the two indicators show a relatively high heterogeneity within the cluster (0.5/ 14.9, see appendix, table A5.4) which indicates that the above-described developments do not apply to the same extent to all countries in the cluster. For instance, educational sex segregation should be less pronounced in Estonia than in Hungary because the higher vertical segregation effect of women graduating in short-cycle courses is neutralised by the strong integrative effect of a high female share of women graduating in an atypical field of study.

With respect to the labour market, it has already been underlined in chapter 4 that in these countries, the economic transition has lead to dramatic drops in employment rates for both men and women.[128] In comparison to However, with a move towards enhanced service sector employment, new employment opportunities emerge particularly for women.[129] Nevertheless, in comparison to the other EC Member States, the service sector is still underdeveloped. Labour markets, however, are generally less rigid but part-time opportunities are rare. Even though women face difficulties in successful labour market participation, the attachment to the labour market is high. Furthermore, the less developed service sector and the lower rigidity might be pointing towards a less sex-segregated labour market. As regards the underlying *'gender culture'*, these countries are still oriented towards the 'dual-earner female-double burden model' (Geisler and Kreyenfeld 2005, Matysiak and Steinmetz 2008). Women are expected to combine work and childcare. However, with the reduction of available childcare facilities and nearly no opportunities of part-time work, it becomes difficult for women to combine family and work. In consequence, women are more likely to withdraw from employment for the care period which is also supported by very long parental leave in some of the countries.[130] The attitudes towards gender equality are also diverse: on the one hand, a relatively high share of persons disagrees that men should have more rights to jobs than women while agreeing that there is a need for stronger involvement of men into childcare. On the other hand, women are still perceived as mainly responsible for household and child-related tasks.

5.4.2. Sensitivity analysis of the cluster solutions

As already mentioned above, the preferred cluster solution might depend on particular indicators, rather than representing a relatively robust outcome across various dimensions considered.

Therefore, table A5.5 (see appendix) finally presents results of a sensitivity analysis, based on the deletion of single indicators from the calculation of the

[128] With the reduction of public-funded family support, both in terms of income and provision of services, female employment decreased after the breakdown of the communist system (Stropnik, 2003).

[129] As pointed out in chapter 4, the gender employment gap (difference between the male and female employment rate) in post-socialist countries is currently much lower than in the majority of the 'old' 15 EU Member States (see chapter 4, table 4.1).

[130] The standard deviation (S.D.52.3, see appendix table A5.3) shows a variety within the cluster indicating that the countries have taken different approaches after the breakdown with respect to some family policies (Łobodzińska 1995, Pollert 2003).

distance matrix. On balance, the preferred substantive cluster solution also shows a substantial degree of stability. As follows from the results given in table A5.4, five out of sixteen indicators under study deserve particular attention as probably the most influential aspects in the analyses. These are first the issues of vocational specification and female labour market participation. Removing one of these factors from the analyses actually leads to the same major reallocation of countries: namely a combination of Austria, Germany and Spain as a single cluster standing now for the '*conservative sex segregation regime'*. Particularly the combination of Germany and Austria seems reasonable as these countries - besides quite comparable educational and labour market systems - share traditional attitudes concerning gender equality and female employment. Spain seems to fit quite well into the described cluster as it shows a high comparability with Austria and Germany with regard to the remaining indicators. Furthermore, the '*modern sex segregation regime'* is combined with Belgium, France, the Netherlands, Ireland and the United Kingdom, which also seems logic. As already elaborated above, these countries are already showing modernisation tendencies. Finally, Poland and Slovakia are allocated into the *'post-communist sex segregation regime'.* Also here the conversion might be explained with the regional embeddedness and the common communist history of these countries. Second, the overall share of part-time employment and the effective parental leave also seem to be influential. Removing one of these indicators changes the clustering of countries in a comparable way. Spain is clustered together with the *'conservative sex segregation regime'*, whereas Ireland and the United Kingdom are combined with the *'modern sex segregation regime'*.[131] Nevertheless, it can be argued that the clustering outcome of the first sensitivity analysis presented above follows from the simultaneous consideration of the full range of indicators. Deleting single indicators has little impact on the results.

An additional sensitivity analysis is to look whether the preferred four-cluster solution is an artefact of specific time-related conditions. In order to test this, the analysis has been carried out combining data of 2000 and 2004. In this context, it should be underlined that the set of social policy and cultural indicators refers to the same time points as it was not possible to obtain data for different time points. In case of childcare facilities and parental leave options, the available data is from 2002/3 while the gender culture measures even refer to a broader time range. The assumed constancy of these indicators is justifiable

[131] Besides the described country re-clustering, there are also some indicator specificities: for the indicator 'overall part-time employment' Poland and Slovakia are combined with the post-communist sex segregation regime. For the second indicator 'effective parental leave' the Netherlands are included in the 'modern sex segregation regime', whereas Portugal, surprisingly, is combined with the 'post-communist sex segregation regime.

since there have been only minor changes in social policy indicators as well as attitudes and opinions about gender from (1999) 2000 to 2004. With respect to the other selected indicators, there is room for some within-country variation. However, the fusion process very clearly identifies country clusters from country year cases first before proceeding to cluster country cases (see appendix, figure A5.2).[132] This confirms that the four-cluster solution is relatively stable over time, and that a variation in the chosen indicators has little impact and occurs only within national settings.

In sum, it can be stated that the results from the different sensitivity analyses support the preferred four-cluster solution.

5.5. Conclusion and further expectations with respect to occupational sex segregation

The empirical results of this chapter show that distinct sex segregation regimes can be distinguished according to several institutional macro indicators. The grouping of countries partly confirms formerly applied typologies (for example Chang 2000). However, with the inclusion of the educational and cultural dimension as well as more countries, some challenges come to the fore. In particular, the presented study clarifies the positioning of former CCE countries. The results demonstrate that a joint clustering of these countries is unrealistic. The grouping of some former CCE countries within one cluster, however, becomes understandable when their regional embedding (the influence of neighbouring countries) as well as the development of their specific institutional setting is taken into account. For instance, it seems logical that countries like Estonia, Latvia, Lithuania and Hungary are grouped together - not only from a geographically perspective but also with respect to the institutional development after the breakdown of the communist area. In this respect, Poland, Slovenia and Slovakia are much closer to developments in Southern European countries which justifies their grouping with the traditional segregation regime.

Testing the validity of the observed regimes, a further result became evident: the clusters seem quite stable over time, even though patterns, particularly in the more heterogeneous conservative segregation regime, indicate that the countries are in different development stages. When excluding dominant indicators like the vocational specification or the female employment rate, it becomes

[132] It should be pointed out that only in the traditional sex segregation regime this pattern deviates as different countries are clustered together first (this holds for Italy, Greece, Hungary and Latvia). This indicates that these countries have undergone fundamental changes with respect to the selected indicators. Nevertheless it does not change the confirmation of a four cluster solution.

clear that countries like Germany, Austria and Spain are more bound to a 'conservative sex segregation regime', while countries like the UK and the Netherlands rather are on the way towards a 'modernised segregation regime'. Nevertheless, the suggested four sex segregation regimes can be confirmed.

Finally, the question arises which expectations can be formulated with regard to the specific patterns of occupational sex segregation (horizontally and vertically) in the distinct segregation regimes. Taking into account the recent finings and the more descriptive ones from chapter 4, it can be expected that in the *'conservative sex segregation regime'*, both dimensions of occupational sex segregation form part of the economic and social life. As mentioned above, segregation processes are rooted in attitudes towards the division of paid and unpaid work and the role of women in society. This is manifested in different ways: in general, the educational system is characterised by a relatively early specialisation. Even in the tertiary system, moderate segregation processes can be observed. Accordingly, it can be expected that young people are already stratified by gender when entering the labour market, and that labour markets are therefore highly sensible towards the 'signals' of graduates. In addition, the labour market, in combination with welfare policies, encourages a more discontinuous working career of women and a rather traditional work division between men and women. In consequence, both dimensions of segregation should generally be pronounced in these countries. However, as this regime is rather heterogeneous, the extent and patterns of occupational sex segregation can vary, particularly with respect to the vertical dimension (entry into management positions and a lower gender wage gap): for instance, in some continental countries (like France), the increasing consideration of 'egalitarian' principles might lower vertical inequalities, while in liberal welfare states (like the United Kingdom) the dominance of market principles accompanied by a lack of generous welfare support, might increase the vertical dimension of occupational sex segregation.

A somewhat different picture emerges in a *'modernised sex segregation regime'*. With respect to horizontal occupational sex segregation, a relatively early educational specialisation in most of the countries, a tertiary system where women predominantly graduate in typically female fields of study, and an advanced post-industrial development should generally enhance gender typical spheres in society (in both the educational and the labour market system). Therefore horizontal segregation should be pronounced. With respect to the vertical segregation the expectations are less straight forward. On the one side, fewer career barriers and wage discrimination, as well as the dominance of 'egalitarian' principles, should increase women's representation within management positions. On the other side, the influence of the horizontal aspect might be fundamental when creating 'female spheres' within the labour market

which offer good opportunities for combining family and work, but fewer career prospects. The *'traditional sex segregation regime'* is characterised by 'traditional' attitudes towards female employment and motherhood. Even though changes are visible in the increasing share of persons favouring men's greater involvement in childcare activities, the institutional setting is still lacking behind. Women's main problem is (re-)entering the labour market, in particular after graduation and after childbirth, and the combination of work and family responsibilities. However, comparing the findings with the other sex segregation regimes, it appears that this very lack of services for families as well as missing flexibility measures, like part-time work[133], might have a 'positive' effect on horizontal sex segregation. As important areas of the labour market, like the 'female' service sector (mainly childcare facilities) in the sex segregation regimes discussed above, are still the main duty of the family, and educational attainment, particularly of women, has increased also in male-dominated fields, the differentiation between male and female dominated occupations should as in the other sex segregation regimes not be as significant. In the framework of this study, it is of course not underestimated that the main hurdle of women in this regime is to manage to enter the 'internal labour market'. However, if women surmount this barrier, discriminating forces might be less common, and therefore also vertical sex segregation should be less pronounced. This expectation is also supported by a relatively high share of women in management positions, and a relatively low status and gender wage gap (see section 4.3.).

Finally, in the *'post-socialist sex segregation regime'* divergent trends might evolve with respect to occupational sex segregation as these systems are still in a process of change. Formerly, a high share of female (tertiary) graduates, particularly in typically male fields of study, and a relatively low level of post-industrial development, might have led to lower levels of horizontal and vertical sex segregation. However, this seems to change with the introduction of market-based economies. With the creation of new jobs, particularly in the service sector, female employment increases, thereby affecting the extent of horizontal segregation. Even though the labour attachment of these women is still quite high, an eroded system of family support and the difficulty of combining family and work as well as a still 'traditional' view on motherhood,[134] might therefore increase horizontal sex segregation. Also with respect to vertical inequalities, an accentuation can be expected due to the changing economic condi-

[133] However, it has to be underlined that women in these countries, for example in Spain, very often hold temporary contracts which lead to new forms of segregation.

[134] Only in case of the attitude towards more rights for men to work if jobs are scare, the values for disagreement are high in this regime, underlining the still high labour market attachment of women from former CCE countries.

tions and the changing possibilities to combine work and family obligations. This is also reflected in the reported results of chapter 4: while they still indicate lower gender gaps in managerial and high status positions, particularly the gender wage gap is increasing.

Even though the assumption of a direct causal effect of a particular institution on the basis of macro indicators requires caution[135], this study elucidates the variety of segregation regimes in the enlarged Europe more systematically than previous studies. The following table 5.3 provides an overview of expectations as to the emergence of occupational sex segregation in the different segregation regimes.

Table 5.3: Expectations regarding differences of horizontal and vertical sex segregation for the different sex segregation regimes

Sex segregation regimes	**Horizontal segregation**	**Vertical segregation**
Conservative sex segregation regime	+	+
Modernised sex segregation regime	+	-/+
Traditional sex segregation regime	-	-
Post-socialist sex segregation regime	-/+	-/+

These rough conclusions constitute a useful starting point for a more detailed analysis of the influence of selected macro-level indicators on cross-national differences in occupational sex segregation in the following chapter.

[135] Alternative driving forces behind the observed patterns cannot be completely rejected.

6 Institutional constraints on cross-national differences in occupational sex segregation[136]

As underlined in previous chapters, the distribution of women and men across occupations and hierarchical positions will differ across countries, as these vary with respect to educational, economic, political and cultural factors. These different institutional arrangements may shape resources, and influence preferences of individuals for a specific occupation or position as well as of employers for a specific applicant (Chafetz 1990, Molm 1993, Charles and Grusky 2004). Even though the above described interdependence between individual occupational choices and the institutional context is obvious, it has rarely been examined empirically. Prior comparative studies, frequently, content themselves with descriptive analyses of the relation between sex segregation indices and selected macro-level factors (see, for example Estévez-Abe 2005).[137]

In this chapter, however, the issue is addressed using advanced techniques of empirical analysis. Applying multi-level analysis, attention is devoted to both individual attributes, such as key demographic and human capital characteristics, as well as institutional factors that potentially influence gender-specific occupational allocation processes horizontally and vertically. This mode of analysis seems to be appropriate because it takes into account the nested sources of variability and allows for the combination of different levels of analysis in a single framework (Snijders and Bosker 1999, Luke 2004). If either of these sources of complex variability is not correctly assessed, as often occurs when employing, for example, OLS-regression techniques, there is a considerable likelihood of drawing inaccurate conclusions.

Using the European Union Labour Force Survey for 2004 and 2005 for 21 EU Member States and comparable macro data from different European sources (see for more detail chapter 5), the analyses focus on the horizontal (division

[136] Parts of this chapter have been developed for an article (together with Emer Smyth) in the framework of the Field-of-Study Group of the EUQALSOC network. I would like to thank particularly Emer Smyth, Herman van de Werfhorst, Luis-André Vallé and David Reimer for their helpful and inspiring ideas and comments on this work.

[137] Exceptions to the rule are, for example, studies by Charles and Grusky (1995, 1998, 2004) and Nermo (1999, 2000) where log-linear modelling is applied to show the influence of post-industrial developments and egalitarian forces on the level of occupational sex segregation.

S. Steinmetz, *The Contextual Challenges of Occupational Sex Segregation,*
DOI 10.1007/978-3-531-93056-5_6,

between typically female, male and integrated occupations) and the vertical dimension (division of men and women between management and non-management positions) of occupational sex segregation. The hypotheses put forward in line with the analyses largely concern the already discussed macro-level factors (see chapters 2, 4 and 5) that might have an effect on segregation patterns: the organisation of the educational system, post-industrial developments, family policies and society's gender culture.

The chapter is organised as follows: the next section describes the theoretical background and a set of hypotheses concerning the impact of the aforementioned institutional macro-level factors on cross-national variation in occupational sex segregation. In section two, the research design and relevant variables are described. The formulated hypotheses are then empirically tested in section three. The chapter ends with a concluding section discussing the main findings.

6.1. Theoretical background and hypotheses

As already emphasised, there are various theories which attempt to explain in terms of supply as well as demand side factors why women choose certain occupations and hierarchical positions.[138] Even though individual-level constraints affect individuals' distribution across occupations, most scholars agree that substantial gender gaps in market behaviour remain (Roos 1985, Breen and Goldthorpe 1997, Jonsson 1999, Okamoto and England 1999). These gaps are in part attributable to structural and institutional constraints which are central to answering the question why countries differ with regard to the extent of occupational sex segregation.

In this study, it is generally assumed that the institutional characteristics of individual countries might have a different effect on the distribution of men and women across occupations (horizontal dimension) and hierarchical positions (vertical dimension). Furthermore, the chapter seeks to assess the explanation power of the developed sex segregation regimes. On the other hand, it also seeks to assess the influence of the above-selected macro-level factors on the cross-national variation in occupational sex segregation.

[138] As already pointed out in chapter 2, supply-side factors relate the different allocation of women and men across occupations to anticipated future market roles and opportunities, gender specific role socialisation, cultural values about the appropriate role of women in society, etc. (Becker 1964, Mincer and Polachek 1974, Polachek 1978, Marini and Brinton 1984, Morgan 1992, Perlman and Pike 1994). Important demand side processes, like statistical discrimination, internal labour markets and the gendering of labour queues, are also used by sociologists to explain gender segregation in the labour market.

6.1.1. The organisation of the educational system

Even though several researchers (Borghans and Groot 1999, Smyth 2005) have underlined that educational and occupational sex segregation are interrelated, educational segregation need not necessarily 'cause' occupational segregation (see chapter 4). In respect of cross-national variation in occupational sex segregation, however, it can be assumed that the institutional arrangements of educational and training systems may be an important factor determining the extent to which educational segregation is translated into the labour market (Treiman and Roos 1983, Roos 1985, Rubery and Fagan 1995). It is certainly true that institutional arrangements in education systems are of fundamental importance to labour market outcomes as they channel, constrain or enable the acquisition of a sufficient individual level of qualification. Furthermore, Charles et al. (2001: 376) underline that "…the impact of any gender-specific educational aspiration or investments on women's market opportunities is likely to be contextually variable."

Only few educational institutional factors have been discussed in relation to occupational sex segregation. Buchmann and Charles (1995), for example, assume that educational choices are more likely to be gender-typical when they are made at an early stage. However, the question central to occupational sex segregation would be in how far such gender-typical decisions are translated into the labour market. In this context, the authors assume that strong linkages between the educational system and the labour market are important. Particularly in countries with highly differentiated vocationally-oriented systems and a strong labour market linkage, occupational sex segregation is likely to be more pronounced.[139] This is supported by Estévez-Abe (1999, 2005)[140] who argues that educational segregation processes have a higher probability to be translated into the labour market in countries where people specialise earlier than in countries where the educational system rather seeks to provide general educational courses. In her opinion, this is due to the fact that women, in general, tend to invest less in 'skill-specific' (often typically-male and vocationally organised)

[139] Germany can serve as an example: in 2001/2002 around 63% of young people leaving general education schools continued to gain vocational qualifications in vocational training programmes in the dual system. In this regard, the share of men is somewhat higher than that of women (EURYDICE 2006). Typically male vocational trainings are mechanics, craftsman painter and varnisher, electrician, carpenter. Typically female trainings are office clerk, trained retail saleswoman, hairdresser, physician assistant (see: http://www.bmbf.de/pub/ berufsausbildung_sichtbar_gemacht.pdf).

[140] Estévez-Abe's (2005) argumentation can be related to the 'vocational specificity' (way in which the link between the educational and labour market system is institutionalised) and the 'stratification' of educational systems (see Allmendinger 1989, Müller and Shavit 1998, Hannan et al. 1999).

education because they anticipate higher labour market risks (see also chapter 5). Accordingly, it can be assumed that

H1a: In countries where a high proportion of persons is enrolled in vocational education, horizontal sex segregation should be more pronounced. Therefore, women should be more often in typically female and integrated instead of typically male occupations.

Also the organisation of tertiary education should influence occupational sex segregation. For instance, it has been assumed that, particularly for women, higher education (higher attained human capital) is positively related to better labour market outcomes (Semyonov 1980, Becker 1981, Clark 1991, Jacobs and Lim 1992, Semyonov and Jones 1999).[141] However, critics have underlined that this may also increase gender-specific stratification processes due to field-specific and institutional-specific differentiation. In this line of reasoning Charles and Bradley (2002: 578) argue that with an increase in women's tertiary participation rates the willingness of female students to attend courses in typically female fields increases. It has been asserted against this argument that an increasing share of women in tertiary education might also cause a 'spill-over' effect opening new and formerly male-dominated fields and institutions (Bradley and Ramirez 1996, Davis and Guppy 1997). It can be expected that both developments, depending on the interrelation between the educational system and the labour market, may affect the horizontal dimension of occupational sex segregation and particularly the distribution of women across occupations (Jacobs 1989b, Kelly and Slaughter 1991). Therefore, two hypotheses can be formulated. On the one side it might be that

H1b: In countries with a high share of female tertiary graduates horizontal sex segregation should be more pronounced. Women should be more often in typically female and integrated instead of typically male occupations.

On the other side, it may also be possible that

H1c: In countries with a high share of female tertiary graduates in atypical fields of study, horizontal sex segregation should be reduced. Women should have a higher likelihood to be employed in typically male or integrated instead of typically female occupations.

[141] Studies of segregation across the occupational structure yielded inconsistent results as to the relationship between levels of segregation and women's educational attainment (for example Anker 1998).

With respect to the question in how far educational institutions affect the distribution of men and women across hierarchical positions, the argumentation is somehow different. Even though it can be assumed that a higher share of tertiary graduates enhances career prospects particularly among women, it may also lead to a higher, heavily gendered institutional specification. As already mentioned in chapter 5, Oechsel and Zoll (1992) indicate that women tend to choose more often short-cycle programmes which are generally rewarded lower on the labour market. Such institutions may be of particular interest to women because they are less competitive and can more easily be reconciled with anticipated family responsibilities. As a result it can be assumed that

H1d: In countries with a high proportion of women in short-term programs, vertical segregation should be pronounced. Women should be less likely to be employed in management positions.

Furthermore, Charles and Bradley (2002: 578) pointed out that a higher gender-specific distribution across fields of study may also strengthen vertical stratification processes. Several studies demonstrated that typically female fields not only lead more often to typically female occupations, but that these occupations are also less rewarded on the labour market in terms of status, income and career prospects (Meyer 2003, Smyth 2005). In this context a debate has started on the extent to which an increasing number of women graduating in atypical fields of study might lead to better career chances on the labour market. While some scholars (e.g. Hayes 1986, 1989) assume that women, by choosing male-dominated occupations, increase their opportunities for higher pay and career advancement, others (Blalock 1967, Kanter 1977a) indicate that women in typically male occupations face labour market difficulties (Reskin and Roos 1990, Hultin 2003).[142] On this basis two contrary hypotheses can be formulated.

H1e: In countries with a high share of female graduates in atypical fields of study, women should be more likely to reach management positions (1). However, it may also be possible that women have a lower likelihood to reach such positions (2).

[142] It is argued that, especially at the stage where jobs are allocated to men and women, beliefs or prejudices regarding the performance of women might be prevalent and discrimination relatively easy to implement (e.g. Petersen and Saporta 2004).

6.1.2. Post-industrialism - the situation of women on the labour market

With regard to the interrelation between post-industrial developments and occupational sex segregation, several aspects have been discussed in literature. The first aspect is women's increasing labour force participation. Charles (1992), for instance, assumes that higher levels of female labour force participation may have an integrative effect, as women spend more of their lives working and therefore gain levels of human capital more similar to those of men. In contrast, it has been pointed out that higher levels of female labour market participation may be realised in specific areas of the labour market and in typically 'female' jobs rather than resulting in more integration within occupational niches (see Semyonov and Shenav 1988, Hansen 1997, Rubery et al. 2001b). However, the empirical results have been diverse and there is conflicting evidence regarding the nature of the relationship for both dimensions of occupational sex segregation. While Charles (1992) found neither a segregative nor an integrative effect of the female employment rate on occupational sex segregation, others brought to light a significant negative (Jacobs and Lim 1992) as well as a positive relationship (Nermo 1996, Anker 1998, Jones 1999, Semyonov and Jones 1999, Rubery 2002b).[143] Accordingly it can be hypothesised that

H2a: In countries with a high female employment rate horizontal sex segregation is enforced and women are more likely to be employed in typically female and integrated instead of typically male occupations (1).
However, also the opposite development might be possible: horizontal segregation may be reduced and women may more often be employed in typically male and integrated instead of typically female occupations (2).

The size of the service sector is closely related to the growing female employment rate (Boje and Nielsen 1993, Boyd et al. 1995, Nermo 1999). As the industrial mix of some occupations becomes more and more service-based, it may be assumed that not only the female labour market participation (Bell 1973) but also occupational sex segregation increases by shifting responsibilities for services, such as childcare, cleaning, and meal preparation, to the marketpla-

[143] A further result has been that with an increase in women's labour force participation, overall segregation decreases. At the same time, women's likelihood to work in higher status occupations declines. Possible explanations refer to the fact that with an increase of women's employment, the composition of the female workforce becomes more diverse. While formerly the few employed women were characterised by a higher educational level and career-orientation or the necessity to work, they are now more equally distributed across the occupational structure. As a result horizontal sex segregation declines, while the vertical gender inequality increases.

ce where they are fulfilled primarily by women (Chang 2000, Hakim 2000).[144] This assumption is supported by other researchers (Charles 1992, 1998, Charles and Grusky 2004) underlining the close relation of many service-sector jobs, especially in the rapidly-expanding routine non-manual sector, with the expansion of the welfare state and its public and family services. In this area of the labour market, jobs are particularly attractive to women with care-giving responsibilities because they allow for more flexible scheduling and intermittence on the labour market (Roos 1985, Esping Anderson 1990, Alestalo et al. 1991, Draper 2000, Lee and Hirata 2001). As a consequence, it can be assumed that

H2b: In countries with a high service sector employment, horizontal sex segregation should be high. Women should increasingly be employed in typically female and integrated instead of typically male occupations.

However, a further argument underlines that besides a growing service sector, particularly the expansion of the public sector should be associated with higher horizontal sex segregation. Therefore, the analyses will additionally test whether

H2c: In countries with a high female public sector employment, horizontal sex segregation is more pronounced. Women should be more likely to be employed in typically female and integrated instead of typically male occupations.

Besides the fact that higher levels of female employment are related to service sector expansion and women's employment in public services, a positive relation to higher levels of part-time work is also conceivable. These developments are related to the growing necessity of flexibilisation. With a higher demand for non-employed wives and mothers, the adaptation to flexible working times becomes ineluctable. Most studies focusing on part-time work and sex segregation suggest that there is an overall positive association between high levels of part-time work and high levels of sex segregation (Birkelund 1992, Birkelund and Rosenfeld 1995, Schmid 1991).[145]

[144] As already emphasised, this trend can particularly be observed in the Nordic countries (see Hansen 1995, 1997, Melkas and Anker 1997).

[145] However, there are also studies, like the one presented by Kim and Levanon (2004), which deny any relation between occupational sex segregation and part-time work.

In accordance, it is hypothesised that

H2d: In countries with a high share of persons working part-time, horizontal sex segregation increases. Women should be more often employed in typically female or integrated instead of typically male occupations.

In this context, a further argument has been advanced by Estévez-Abe (2005). In her opinion countries that institutionally support high levels of employment security, sustain internal labour markets.[146] Therefore, gender gaps are created through to 'firm-specific' (male-specific) skill acquisition. Women investing less in those skills are underrepresented in the primary/internal and overrepresented in the secondary/external labour market segment with greater flexibility, lower employment security and lower career perspectives. As a consequence it can be expected that

H2e: In countries with a high share of persons staying a longer period of time with their employer, horizontal sex segregation should be more pronounced. Women should be more often directed to the secondary 'typically' female labour market.

The rapid changes in the economic and occupational structure as well as in common female employment patterns should also markedly affect the vertical dimension of occupational sex segregation. The described research, for instance, indicates that with service sector expansion and a corresponding increase in typically female occupations, women's representation in the already male-dominated production and managerial occupations decreases. Therefore, it may be possible that

H2f: In countries with a high female employment rate and high level of service sector employment, vertical sex segregation is higher. Women should be less likely to work in management positions.

Also for the vertical dimension of occupational sex segregation the aspects of 'flexibility' and 'rigidity' should be influential as they banish women to the 'secondary/external' labour market segment with greater flexibility, lower employment security and lower career prospects.

[146] A similar argument has been developed earlier by Charles and Grusky (1995).

Against this background it can be hypothesised that

H2g: In countries with a high share of persons being in part-time positions and/or staying a longer period of time with their employer, vertical sex segregation should be more pronounced. In particular, women should be more often banished to the secondary labour market which reduces their chance to work in a management position.

Another more aggregated measure of labour market rigidity is the Employment Protection Legislation index (EPL)[147] developed by the OCED (1994b, 1999: 50-51). As employment protection regulations are a key factor in generating labour market rigidity, they are often cited as one cause for the large cross-country differences in labour market performance. Furthermore, there are reasons to assume that women with intermittent participation spells will primarily be affected by any reduced hiring caused by employment protection legislation, while being less likely to benefit from enhanced employment stability than other groups. Hence, employment protection would damage their employment opportunities, while men who are already in the core labour market would primarily benefit from any greater job stability induced by EPL. Due to that it can be hypothesised that

H2h: In countries with high labour market protection legislation vertical sex segregation is pronounced. Women should have difficulties to gain skill-specific acquisitions which decrease their chances to reach managerial positions.

6.1.3. Family Policies

Besides the fact that labour market conditions, like the female employment rate, might serve as an indicator of better labour market opportunities for women, Estévez-Abe (2005) argues that welfare states can support female investment in specific or general skills by making skill-specific ('male-specific') investments safer (see also Mares 2003). In this respect, special attention has to be devoted to the situation of women who particularly need institutional support to reduce difficulties in combining work and family responsibilities. Even though work-family reconciliation policies appear to have been instrumental in raising female

[147] The EPL-Index is a summary index of the strictness of employment protection. It ranges from 0 to 4, where higher scores imply stricter employment protection and stricter regulation.

employment rates[148], there is less consensus on their effect on occupational sex segregation. While they might enable women to enter a wider range of occupations (including typically male occupations), concerns have been expressed that they might also encourage and perpetuate working patterns associated with both dimensions of occupational segregation.

Several studies (Chang 2000, 2004, Mandel and Semyonov 2003, Estévez-Abe 2005) have pointed out that cross-national differences in the occupational distribution of women and men may be related to available childcare facilities. If women are less often represented in typically male occupations and management positions because of small children, then generous childcare options may support women's entry into these occupations and positions. Even though this hypothesis seems plausible at first glance, such developments may also have opposite effects. An outsourcing of former family services may support an increase in typically female occupations on the labour market (particularly in the public service sector) (OECD 1998, Hakim 2000, Rubery et al. 2001b). As a consequence, horizontal sex segregation and particularly a feminisation of the labour market should be observable.

H3a: Countries with generous childcare facilities support horizontal sex segregation by increasing the proportion of typically female jobs on the labour market (increasing feminisation of the labour market). Therefore, women should be more likely to work in typically female or integrated instead of typically male occupations.

A further important aspect is related to parental leave options. If such options are relatively long and well-paid (Moss and Deven 1999), they may foster horizontal segregation by encouraging women to choose occupations in which patterns of intermittent employment are less likely to harm their career. Furthermore, employers will have an incentive to allocate young women to occupations in which work interruptions are less problematic. In this rein, Hakim (2000), for instance, argues that women are concentrated in the education and health sector because intermittent patterns of work are tolerated in many occupations of this segment.[149]

[148] This should be particularly reflected by the expansion of personal, social and community services.

[149] Even though this argumentation seems plausible, it should be emphasised that the underlying causality of women choosing such occupations is questionable and cannot be adequately answered with this analysis. Intermittent patterns may also be tolerated in these occupations just because many women work in this segment.

Therefore it can be assumed that

H3b: In countries with long parental leave, feminisation tendencies should be pronounced, and women should be more likely to work in typically female occupations. Longer parental leave should therefore increase the likelihood of women to work in an integrated rather than a typically male occupation.

As to the vertical dimension of occupational sex segregation, a somewhat different development can be expected. It may be possible that a higher share of childcare facilities improves women's access to managerial positions because it helps to reconcile work and family life and reduces labour market discontinuity (Cartmill 1999, chapter 4). In this respect an increase in childcare would reduce vertical segregation.

H3c: Countries with generous childcare facilities, particularly for the youngest age group, should have lower levels of vertical sex segregation. Women should have a higher chance of reaching managerial positions.

Long parental leave options may encourage longish absence from work during years that are central to career development. It may also encourage the reduction of working hours for family reasons that again is likely to slow career advancement in a competitive labour market environment (Estévez-Abe 2005). Consequently, these factors may be central to the lower representation of women in management positions. Hence, it can be hypothesised that

H3d: In countries with long parental leave options the vertical dimension of occupational sex segregation is strengthened. As women are expected to have lower incentives and prospects of developing a career, they should be less likely to work in management positions.

Finally, as argued in chapter 4 and 5, gender discrimination in pay and promotion opportunities reduces the return of the female labour force to the market and tends to depress female labour supply. Irrefutable empirical evidence on the existence of gender discrimination is difficult to obtain. Theoretically, gender differences in pay and promotion could result from gender differences in unobserved characteristics (OECD 2002). It has also been argued that women may be underrepresented at higher job levels because they voluntarily choose jobs with fewer promotion opportunities, and not because they are discriminated.

However, it is equally impossible to demonstrate that there is no discrimination against women. Most countries have introduced gender-specific anti-discrimination laws which have been relatively effective in lowering, for exam-

ple, the gender pay gap (Blau and Kahn 1996, Manning 1996). For the issue of occupational sex segregation, particularly Chang (2000) has pointed out that laws aiming at equal job opportunities may work in two ways: first they increase horizontal segregation by excluding women from specific, typically male occupations which, for instance, require night shifts. On the other side, equality legislation may also direct more women into traditionally male and 'higher status' occupations which reduces vertical segregation. As a consequence, countries with stricter anti-discrimination laws should have a more integrated labour market than those without. Furthermore, Blackburn et al. (2000) have suggested that in countries where women have a higher empowerment[150], i.e. earning and political power, 'gender equality' has also been legally institutionalised. In sum, it may be hypothesised that

H3e: In countries with a high 'empowerment' of women, horizontal and vertical sex segregation should be reduced. However, the effect can be expected to be particularly strong with respect to the vertical dimension. Therefore, women should be more likely to be employed in management positions.

6.1.4.'Gender culture'

As demonstrated, in spite of more and more insights into reasons and underlying mechanisms for the emergence of egalitarian norms and institutions[151], important national and regional differences persist in the degree to which egalitarian norms and institutions have been accepted and institutionalised in society (Charles 1992, Orloff 1993, Evans and Mason 1996, Sainsbury 1996, Berkovitch 1999, Lamont 2000, Bradley and Charles 2003, Inglehart and Norris 2003).

The present analysis gives rise to the question in how far such developments influence the different dimensions of occupational sex segregation. On the one side, some authors contend that countries characterised by an ideology that emphasises gender equality have more egalitarian occupational structures (Ramirez 1987). As the costs of sex discrimination are high in these societies, the gender typing of occupations should be less pronounced.

[150] For a definition of gender empowerment see chapter 5, p. 111.
[151] For different lines of argumentation, see Kerr et al. 1960, Treiman 1970 (functionalist tradition) and Ramirez 1987, Meyer et al. 1997 (neo-institutional tradition).

As a consequence, it may be assumed that

H4a: In countries where the aspects of 'access' and 'motherhood' indicate high 'egalitarian principles', both forms of occupational sex segregation should be reduced. Women should be more often employed in integrated or typically male instead of typically female occupations. Moreover, they should also have a higher likelihood to be employed in management positions.

However, Charles and Grusky (2004: 25) demonstrate that the rise of egalitarian values does not weaken all forms of segregation equally and automatically. One reason lies in the fact that 'egalitarianism' directly refers to the concept of 'male primacy' (see chapter 2) and that egalitarian mandates are rather understood as norms against ascriptive discrimination on the basis of class, race or gender. Consequently, women's role in society is culturally redefined, and organisational barriers to women's full participation in education and the labour market should be weakened, particularly with respect to management occupations. Nevertheless, such developments have no direct impact on horizontal forms of segregation because the modern form of egalitarianism allows men and women to understand their roles and competencies in ways that are consistent with standard essentialist visions of 'masculinity' and 'femininity' (Bourdieu 2001).

As a result, cultural gender stereotypes maintain their influence on family, educational and occupational preferences, and also support residual forms of discrimination by employers.[152] This development is confirmed by the fact that, despite the increase in gender equality norms, gender-typical occupational distinctions are still persistent. Charles and Grusky (2004) point out that even the restricted form of 'egalitarian values' has not spread uniformly throughout the occupational structure. It seems that the manual sector shows a higher vertical segregation. Men continue to dominate the most desirable skilled craft positions, while women are allocated to less desirable semi-skilled labouring or service positions (see chapter 4, figure 4.17).[153]

Taking these considerations into account, two different aspects of 'egalitarian principles' ('access' and 'motherhood') have been differentiated in this study (see chapter 4 and 5). Only if a country's 'gender culture' supports equali-

[152] As Charles and Grusky (2004) point out, even though the norm of procedural equality may be gradually institutionalised in the workplace delegitimising discrimination by employers, more subtle forms of discrimination arising from essentialist prejudices (such as the presumption that women are more nurturant) can and do live on.

[153] The authors assume that the difference arises partly because the non-manual sector is subject to closer public scrutiny. Hence, employers who continue to segregate face substantial social costs. The public visibility of elite professional and managerial positions, moreover, heightens political pressure to conform to equal opportunity laws.

ty with respect to both aspects, the above-formulated hypothesis (4a) should apply. If there is an imbalance of both aspects, the consequences for both dimensions of occupational sex segregation might be different. If persons have divergent opinions with regard to the aspect of 'access' and 'motherhood'- if they agree, for instance, that women should have equal access to occupations like men, but should also be mainly responsible for childcare - particularly horizontal forms of occupational sex segregation should be pronounced. However, it is obvious that this may at least indirectly affect the vertical dimension as typically female occupations are often less rewarded on the labour market. Therefore, it is expected that

H4b: In countries where the aspects of 'access' and 'motherhood' are not equally supported, particularly horizontal sex segregation should increase. In consequence, women should be more often employed in integrated or typically female instead of typically male occupations. It can also be expected that the imbalance of both aspects affects reduces the chance of women to be employed in a management position.

6.2. Data and research methodology

6.2.1. Data

As mentioned in chapter 1, data for the present analyses were obtained from the European Union Labour Force Survey (EULFS) 2004 and 2005[154] (second quarter) that provides standardised, cross-sectional information on labour force participation and employment. It offers core demographic and educational background information (see chapter 1, section 1.4. for more information). The sample used differs for the selected segregation outcomes. For the analyses of both dimensions of occupational sex segregation, the sample is restricted to employed persons aged 20-64 with a tertiary degree. The educational level is divided between a lower and a higher tertiary degree. The restriction to tertiary degree owners seems reasonable for two reasons. With regard to the horizontal aspect, it is advisable to keep the educational level constant because the underlying micro-mechanism of field of study for the gender-specific distribution across occupations might be different. As to the vertical aspect of segregation, the focus on persons with a tertiary degree is plausible because the highest 'human capital' is reached in this group. Accordingly, the chance of attaining a career position should be higher. As a consequence, the unequal distribution of

[154] For the UK only data for 2005 were available.

women and men across management positions might be attributable to other forces, like individual preferences but also institutional barriers.

Finally, in all samples, the definition of employment follows the standard international ILO definition (ILO, 1988)[155], while occupations are classified according to the ISCO88 scheme at the 1- and 2-digit level (see appendix, general part, table B). Moreover, the analysis is limited to 21 countries providing detailed information on educational, employment and basic demographic variables as well as information on relevant macro indicators. These countries are Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, the Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom. This leads to a sample of 196,033 for the analysis of the distribution of graduates across typically female vs. integrated occupations, and of 224,107 adults for the analysis of the distribution of graduates across typically male vs. integrated occupations, while the vertical analysis contains 250,237 adults for the selected European countries.

6.2.2. Variables

The application of a multi-level research design implies a need for information on both individual (level-1) and country level variables (level-2). As mentioned above, three 'segregation outcomes' - the dependent variables - are examined at level-1 in this chapter. They refer to

a. the *'horizontal dimension'* of occupational segregation measured by two dichotomous variables. The first outcome captures the distribution of persons who are employed in typically female versus integrated occupations ('feminisation'). The second variable refers to the distribution of persons across typically male versus integrated occupations ('masculinisation').

The division into typically male, female and integrated occupations is based on the ISCO88 on the 2-digit level. The definition of gender-typical occupations is country-specific. Nonetheless, it follows the same logic in all countries. Occupations are gender typical if the share of women/men equals or exceeds 75%, while integrated occupations range from 26% to 74%.[156]

[155] Thus 'inactive' persons, i.e., those studying, looking after the home, the retired, disabled etc., are excluded from the analyses.

[156] For a detailed discussion of appropriate thresholds for typically male and female occupations, see Anker 1998: 82.

b. the *'vertical dimension'* is measured by a dichotomous variable capturing employed persons in management and non-management positions.

Defining management positions cross-nationally is delicate as there are varying definitions and classifications of managerial positions and inconsistencies with regard to the survey bases. Political reports (ILO 2004, European Commission 2008) are mainly referring to management positions based on the ISCO88 group 1 and additional data including detailed information on the share of women in decision-making positions in politics, economy and public administration. On the basis of this additional information they mainly seek to reflect that management and supervisory roles may not only be found in ISCO88 group 1 but also within other occupational groups. Considering these difficulties, two strategies underlie the following analyses.

In line with the first and principal strategy, management positions are defined on the basis of the ISCO88 group 1 because the EULFS data only contain information about occupations. The ISCO88 group 1 distinguishes between (a) legislators, senior government officials and senior officials of special interest organizations (11), (b) corporate managers, including directors and chief executives, production and operating managers as well as other specialist managers (12), and (c) managers of small enterprises (13) (see for more detail appendix, general part table B as well as figures A4.2 and A4.4). In consequence, the analysis rather focuses on the question which contextual factors explain cross-national variation in the unequal access of highly educated men and women to a specific occupational group characterised by a high share of management positions.

As management and supervisory roles may also be found within other occupational groups, like the professionals (group 2), the second strategy, serving as a sensitivity analysis, seeks to test the reliability of findings on the basis of a broader definition of management position by applying the concept of class. For this purpose, the EGP class scheme is used that constitutes a useful attempt to empirically categorise hierarchical occupational outcomes, since it relies not only on the actual occupation, but also on further information about employment relations (see for more detail Erikson and Goldthorpe 1992, Ganzeboom and Treiman 1996, and appendix, general part table C). As the scheme is designed to capture *qualitative* differences in employment relationships, the classes are not consistently ordered according to some inherent hierarchical principle. However, insofar as the overall economic status is concerned, the high service class I is privileged. Therefore, the broader definition of management positions underlying the second strategy widens the perspective by referring to this class. It addresses the question which macro-level factors explain the cross-

national variation in the unequal access of women and men to management positions including managerial and professional occupations.

Independent variables at the individual level

The log odds of being in a sex-typical, atypical or integrated occupation and management or non-management position are predicted by a number of individual and macro level variables. At the individual level (see table 6.1), the following dummy-coded variables are included in the analysis:

Table 6.1: Micro-level variables and descriptions

Variable	Description
Gender	Men (0) women (1)
Age cohort	Dummy-coded variable distinguishing persons at the age of 20-34 (0) and persons aged 35-64 (=1).
Level of higher education	Dummy-coded variable distinguishing between tertiary education (ISCED 5A and 5B) (0) and higher tertiary education (ISCED 6) (1).
Field of study	Dummy-coded variable with three categories: typically female fields, typically male fields and integrated fields (0).
Marital status	Dummy-coded variable distinguishing between married (1) and unmarried (0) persons.

Independent variables at the country level

According to the theoretical framework developed in the previous chapters, certain macro-level variables are included in the analyses of horizontal and vertical occupational segregation (see for more details chapter 5, and tables A6.1-A6.4 in the appendix).

To capture the discussed dimensions of educational systems, the following proxies are included in the analyses:

1. Percentage of students (%) enrolled in vocational and technical education
2. Share of female tertiary graduates (%)
3. Share (%) of female tertiary graduates in typically male fields of study.[157]

[157] The indicator reflects the share of women in mathematics, informatics and engineering which are generally defined as typically male.

As to the vertical aspect of segregation, the time of selection seems less important. The indicator of vocational involvement is thus replaced by the following indicator:

4. Gender ratio of persons with a tertiary degree in short-term programs (ISCED 5B) compared to all persons with a tertiary degree.

With respect to possible indicators for the measurement of a country's 'post-industrial' development, Charles and Grusky (2004) as well as Estévez-Abe (2005) apply several factors. Based on their findings, the following indicators have been selected for the analyses:

5. Female employment rate (%)
6. Share of employed persons (%) in the service sector
7. Share of persons (%) who stay more than 20 years with the same employer
8. Share of persons (%) who are in part-time employment (as a percentage of all employed persons)

Instead of service sector employment, the analysis will additionally test in how far the public sector employment of women is a better indicator for the explanation of occupational sex segregation (Mandel and Seynonw 2003).

9. Share of women employed (%) in the public service sector

Furthermore the EPL-index is also examined to measure the rigidity of labour markets (replacing indicators 7 and 8).

10. Summary index of the strictness of employment protection (EPL)[158]

For the aspect of family and gender policies, four indicators are used which have also been discussed and applied in studies by Blackburn and Jarman (1997), Mandel and Semyonov (2003), and Chang (2004).

11. Childcare provision for children aged 0-3
12. Childcare provision for children aged 3-6
13. Effective parental leave (weeks)
14. Gender empowerment index (GEM)

The first two indicators refer to the extent to which the national state supports the reconciliation of work and family by providing childcare facilities. The

[158] The EPL-Index ranges from 0 to 4. Higher scores imply stricter employment protection and regulation than considered by the Employment Protection Legislation Index (EPL) (see OECD 1994b).

third represents the effective parental leave of a country as a measure of time allowed and payment benefits[159], while the fourth indicator, the Gender Empowerment Measure (GEM)[160] tries to capture gender equality legislation indirectly by referring to the 'empowerment' of women in the public across countries. As the GEM indicator is a quite aggregated measure, two additional indicators (replacing GEM) will be tested that refer to the theoretical considerations by Chang (2004):

15. Access legislation (ratification of ILO convention 111 and the UN convention CEDAW)
16. Protective legislation (ratification of ILO conventions 89, 45 and 127)[161]

In this context, Chang argues that besides state policy legislation focusing on the reconciliation of work and family, two further types of legislation are important. The first refers to 'anti-discrimination legislation' which reduces occupation-based sex discrimination by providing a legal justification for women to seek employment in all occupations. 'Protective legislation', by contrast, might increase segregation by excluding women from certain types of work (like underground work, night work etc.). Accordingly, it constitutes an opposite body of legislative measures.

Finally, the gender culture of countries is measured by four indicators capturing the already-discussed aspects of 'access' (indicators 17 and 18) and 'motherhood' (indicators 19 and 20). They refer to the share of persons (%)…

17. …who disagree that men should have more right to work if jobs are scarce;
18. …who disagree that it is men's job to work and women's job to look after the home and children;
19. …who disagree that a pre-school child suffers if the mother works;
20. …who agree that men should do more childcare.

As the high correlation between macro-level variables is a potential problem of the contextual analysis, tables A6.1 to A6.4 in the appendix present bivariate Pearson correlations at the setting level. As most of the correlations do not exceed a value of 0.56, there is no reason to doubt the results on grounds of multi-co-linearity between the macro variables.[162] Furthermore, it can be re-

[159] For more details, see Gauthier (2005) and chapter 4, table 4.7.
[160] For more information see footnote 118 in chapter 5: 129.
[161] For a detailed description see Chang 2004: 124-125.
[162] Three coefficients are highly correlated: the share of women with a tertiary degree with the share of women with an atypical field degree (0.72), the share of employed persons in services with the share of persons in part-time (0.76), and the share of persons, who disagree that it is men's job to work and women's job to look after the home and children with the share who disagree that a pre-

vealed that a high share of persons involved in vocational education at the upper secondary level is related with a lower share of women in tertiary education. A high share of women within tertiary education, moreover, is related with a high share of women with an atypical field of study degree.

The bivariate correlation coefficients for the post-industrial indicators show that a higher female employment participation is connected with a higher overall share of part-time and service sector employment. With respect to family policies, better childcare supply, particularly for smallest children, also enhances the gender empowerment. For the gender culture indicators, a positive correlation can be observed between a high disagreement that men should have more right to work if jobs are scarce and the disagreement that women should look after the home and children, and that a pre-school child suffers if the mother works. Finally, a particularly strong correlation appears between the two latter statements of disagreement.

6.2.3. Method of analyses

For the purpose of examining cross-national variation in the distribution of men and women across occupations and hierarchical positions, multi-level analysis seems appropriate (Bryk and Raudenbush 1992, Longford 1993, Goldstein 1995, Snijders and Bosker 1999, Langer 2004, Luke 2004). The basic idea of a multi-level design is to explain a phenomenon on the individual level, like the unequal distribution of women and men across occupations and positions, through effects of different levels. As pointed out in the previous chapters, occupational sex segregation, on the one hand, might be due to individual characteristics like age, gender, children, education etc. (individual level). On the other hand, different national institutional contexts, like the education system or family policies, also affect segregation processes on the labour market (country level).

From a theoretical and statistical perspective, this mode of analysis is an appropriate means of combining different levels of analysis (micro and macro) into a single framework. In particular, multi-level analysis takes into account nested sources of variability - in the present analysis individuals (level 1) nested in countries (level 2). In this case of complex variability, there is variability not only between individuals but also between countries. As a consequence, it would be incorrect to use regular logistic or ordinary least square regression

school child suffers if the mother works (0.76). Therefore, models have been applied which exclude these indicators. As there is no difference in the results, they have not been described explicitly.

techniques since the error terms at the macro-level are neglected and the standard errors of parameters are underestimated (Snijders and Bosker 1999).

The two-level contextual analysis has certain advantages: firstly, it allows the effect of gender to vary between countries; secondly, it enables an estimation of the effect of country-level attributes on gender inequality (cross-level interactions) from a horizontal and vertical perspective. Furthermore, it becomes possible to estimate the influence of the different levels on the dependent variable explicitly, i.e. to evaluate the share of explained variance of the dependent variable for the different levels. For the estimation of the models, STATA (Release 10.0, Stata Corporation, College Station, TX) is used.[163]

For the modelling of the horizontal segregation outcome, the dependent variable is constructed as a dichotomous one so that binary hierarchical logistic regression models can be applied. Even though a multinomial logit model seems to be more appropriate, there is no real advantage of using such a model because the results would not differ much. Furthermore, as multi-level modelling is already complex, the results of binary logit models are easier to interpret.

According to these considerations, a simple random intercept multi-level equation with one explanatory variable at the individual level *(women)* predicting the log odds of being in a typically female vs. an integrated occupation takes the following form (for further model specifications, see the analyses of typically male vs. integrated occupations as well as management vs. non-management position in the appendix, 6A and B):[164]

$$(6.1.) \qquad \ln\left[\frac{P_{typfemocc}}{P_{ingocc}}\right] = \beta_{0j} + \beta_{1j}(women)_{ij} + \beta_{ij}X_{ij}$$ [165]

Where

β_{01} intercept (log odds of being in a typically female occupation for unmarried working men aged 20-34 with a lower tertiary degree in an integrated field of study in country j)

β_{1j} difference in log odds of being in a typically female occupation between men and women in country j)

β_{ij} slopes for i control variables X in country j (including marital status, age cohort, higher tertiary degree and field of study).

[163] See for more details for model specification Rabe-Hesketh and Skrondal (2005).

[164] All multi-level models start with a so-called null model where no explanatory variable is included into the model $Y_{ij}=\beta_{0j}+(\varepsilon_{ij})$ (individual level), $\beta_{0j}=\gamma_{00}+u_{0j}$ (country level).

[165] It has to be noted that there is no term for level-1 error variance (ε_{ij}). For binary logit models, the variance is completely determined by the mean. Accordingly, it does not constitute a separate term to be estimated (see Luke 2004: 55).

For the country-level the following formulas can be specified:

(6.2.)
$$\beta_{0j} = \gamma_{00} + u_{0j}$$
$$\beta_{1j} = \gamma_{10}$$
$$\beta_{ij} = \gamma_{ij}$$

Where

γ_{00}, γ_{10} *and* γ_{ij} 2-level intercepts of the intercept and the slopes for unmarried men aged 20-34 with a tertiary degree in an integrated field of study in country j

u_{0j} country-specific error terms or residual corresponding to the variation of the intercept at the country level.

Combining formula (6.1) with (6.2.) the following model-specification describes the complete random intercept model:

(6.3.)
$$\ln\left[\frac{P_{typfemocc}}{P_{ingocc}}\right] = \underbrace{\gamma_{00} + \gamma_{10}(women)_{ij} + \gamma_{ij}X_{ij}}_{\text{Fixed effects}} + \underbrace{u_{0j}}_{\text{Random effect}}$$

With all parameters as defined previously in formulas 6.1. and 6.2.

With respect to the above-described modelling strategy, this hierarchical model, first and foremost, implies a variation between countries in the general distribution of men and women across occupations and hierarchical positions. This means that the slopes of all individual level and control variables were constrained to be equal across countries. In case of this modelling, only the intercept is allowed to vary across countries, whereas the remaining micro and macro indicators are fixed to indicate that the effects do not vary across countries.

However, as the analyses mainly aim at assessing the country variation with regard to the individual level effect of *'gender'* and selected outcomes, the model specificity has to be enhanced by a random slope model. In this respect, it is assumed that the *'gender'* slope at the individual level is random.

(6.4.)
$$\ln\left[\frac{P_{typfemocc}}{P_{ingocc}}\right] = \gamma_{00} + \gamma_{10}(women)_{ij} + \gamma_{ij}X_{ij} + u_{0j} + u_{1j}(women)_{ij}$$

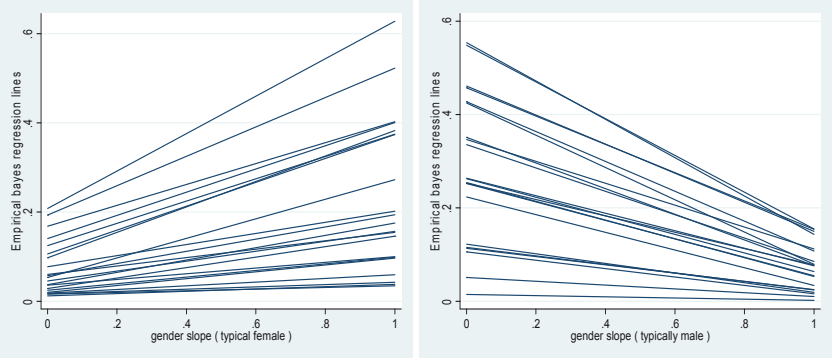
Where

u_{1j} country-specific error terms corresponding to the variation of the intercept and the slopes for women at the country level.

All other parameters are defined as previously in formulas 6.1. and 6.2.

The following figure 6.1 shows the empirical bayes predictions of country-specific regression lines for random slope models of being either in a typically male or female instead of an integrated occupation.[166] In case of no variation in the gender effect between countries, the lines should be parallel with a possible variation in the intercept (as in case of a random-intercept model). However, the graphs clearly show that the occupational distribution of men and women varies across countries as to both the intercept and the slope.

Figure 6.1: Empirical Bayes Predictions of country-specific regression lines for random slope models to be in a typically female vs., male vs. integrated occupation



Source: EULFS 2004/2005, own calculations

Furthermore, to determine whether the above-demonstrated country-level variation in the gender slope is contingent upon country-level factors (for instance *Vocational*), the inclusion of terms to predict the slopes is also referred to as a cross-level interaction (see exemplarily equation (6.5.) and (6.6.) for one educational context variable). The latter constitutes a distinct feature of the combined models of a multilevel analysis (Raudenbush and Bryk 2002). Furthermore, these models shed light on the influence of pertinent institutional characteristics on gender inequalities.

[166] For detailed information about Empirical Bayes Prediction see Rabe-Hesketh and Skrondall 2005: 19-23.

While the individual level formula is the same as in equation (6.1.), the following formula can be specified for the country-level:

(6.5.)
$$\beta_{0j} = \gamma_{00} + \gamma_{01}(Vocational)_j + u_{0j}$$
$$\beta_{1j} = \gamma_{10} + \gamma_{11}(Vocational)_j + u_{1j}$$
$$\beta_{ij} = \gamma_{ij}$$

Including equation (6.6.) into (6.1.) the final model can be specified as follows:

(6.6.) $$\ln\left[\frac{P_{typfemocc}}{P_{ingocc}}\right] = \gamma_{00} + \gamma_{01}(Vocational)_j + \gamma_{10}(women)_{ij} + \gamma_{11}(Vocational_j * women_{ij}) + \gamma_{ij}X_{ij} + u_{0j} + u_{1j}(women)_{ij}$$

Finally, for all models, the residuals are assumed to be drawn from normally distributed populations, to be mutually independent and to have zero means given the values of the explanatory variables. None of the individual level dummy variables is centred in any of the models. By contrast, the selected macro-level variables have been centred around the grand mean. This seems plausible for two reasons: first in models with cross-level interaction effects it is highly recommended to use centred variables to avoid conditioning problems (Aiken and West 1991). Second, the interpretation of multi-level results suffers when predictors are incorporated in a raw form, particularly when a zero score is not a feasible outcome in the sample for any of the level-2 predictors (Kreft et al. 1995).

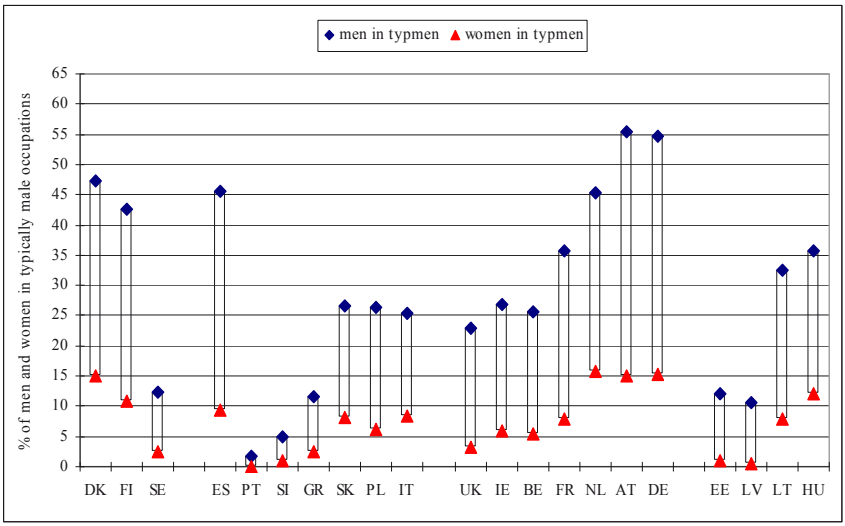
6.3. Results for being in a typically female, male or integrated occupation

6.3.1. Descriptive results

As a first step of the empirical analyses, figures 6.2 and 6.3 show the variation of men's (dark blue quadrates) and women's (red triangles) distribution across typically male and female occupations at the national and, more importantly, at the cross-national level. Hence, they provide an insight into the 'feminisation', 'masculinisation' and 'integration' tendencies of European labour markets for tertiary graduates. Two important findings can be deduced from the figures: firstly, the amount of persons employed in typically female or male instead of integrated occupations varies considerably across countries. Secondly, it is obvious that the gender gaps within a single country and between typically male and female occupations differ cross-nationally. Considering both figures, there are only a couple of countries, Sweden, Portugal, Slovenia, Greece, Estonia and Latvia, where most of the tertiary graduates, irrespective of sex, work in integra-

ted rather than gender-typical occupations (around 15% of all employed men and women).

Figure 6.2: Percentage of men and women in typically male occupations (tertiary degree, age 20-64), 21 EU Member States, 2004



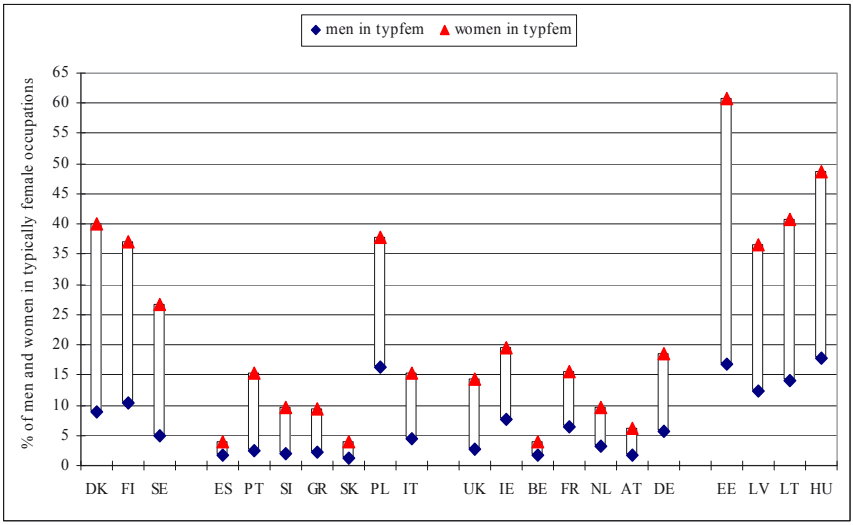
Source: EULFS 2004/2005, own calculations

With respect to the distribution of graduates across typically male occupations (see figure 6.2), the gender gaps are particularly pronounced in countries like Austria, Germany, the Netherlands, Spain, Finland and Denmark. Here, around 40-50% of all employed men are working in typically male occupations, while women more often tend to work in integrated occupations. A similar but slightly reduced trend towards masculinisation can be observed in France, Hungary and Lithuania. When compared with the aforementioned countries, the gender gaps in these countries are smaller, and a higher proportion of men is also employed in integrated occupations.

A somehow different picture emerges when focusing on 'feminisation' trends in European labour markets (see figure 6.3). Particularly countries belonging to the traditional (except Poland) and the conservative sex segregation regime have, on average and irrespectively of sex, a smaller share of persons who work in typically female occupations. In these countries gender differences are less pronounced and most of the tertiary graduates rather work in integrated

or typically male occupations. The opposite, however, holds for countries belonging to the modern and post-communist sex segregation regime which are characterised by high levels of 'feminisation' and a greater difference in the distribution of men and women across these occupations.

Figure 6.3: Percentage of men and women in typically female occupations (tertiary degree, age 20-64), 21 EU Member States, 2004



Source: EULFS 2004/2005, own calculations

In sum, the descriptive results confirm the findings of chapter 4. The mostly segregated labour markets with respect to 'feminisation' and 'masculinisation' can be found in the Nordic countries (except Sweden), and in Eastern European countries, like Latvia, Poland and Hungary. In the remaining countries one of these aspects, but mostly the 'masculinisation' trend, features prominently.

Although offering a general idea of the magnitude of the horizontal dimension of occupational sex segregation, the figures might be somewhat misleading because they conceal differences in human capital and demographic characteristics. The next section, therefore, presents the results of multivariate analyses which take into account both individual characteristics of the analysed individuals and institutional factors of the different European Union countries.

6.3.2. Odds of being in a typically female, male vs. an integrated occupation - testing the hypotheses

In keeping with the descriptive analyses, the following table presents the results of two binary logistic multi-level analyses concerning the odds of being in a typically male vs. an integrated occupation, and the odds of being in a typically female vs. an integrated occupation.

Table 6.2a: Individual-level coefficients (two random intercept and random slope models) being in typically male vs. integrated ('male') and in typically female vs. integrated ('fem.') occupations

	M0		**M1**	
	male	**fem.**	**male**	**fem.**
Intercept	-1.76*** *(0.24)*	-1.91*** *(0.23)*	-1.16*** *(0.24)*	-2.91*** *(0.23)*
Fixed effects				
Individual level				
Women *(ref. men)*			-1.78*** *(0.01)*	1.43*** *(0.02)*
Random effects				
Var *(intercept u_{0j})*	1.16 *(0.36)*	1.11 *(0.34)*	1.16 *(0.36)*	1.10 *(0.34)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$;***, standard errors are in parenthesis, N (individual level) = 196,033 for typically female vs. integrated occupation and 224,107 for typically male vs. integrated occupation), N (country level) = 21*
Source: EULFS 2004/2005, own calculations

Model 0 (variance component model) estimates the systematic gross-variation between countries. The random coefficients indicate that there is a significant between-country variation in the gender-typing of occupations when no individual-level variable is included into the model. The largest extent of country variation comes to the fore in relation to the concentration in male vs. integrated occupations. Model M1 shows the results of two random intercept models where the macro units (countries) are permitted to have different intercepts while being constrained to have the same slopes. Introducing 'gender' as a first individual level variable, the results are in line with the expectations. Women are, on average, more likely to enter female instead of integrated occupations ($=e^{1.43}$) and less likely to enter male instead of integrated occupations ($=e^{-1.78}$). Both results are significant at the 1% level.

As the main focus of this chapter is to analyse in how far macro-level factors contribute to the explanation of the cross-national variation in the gender

slope, model M2 includes a random slope allowing the observed gender effect to vary across countries (while all other individual level variables are fixed).

Table 6.2b: Individual-level coefficients (two random intercept and random slope models) being in typically male vs. integrated ('male') and in typically female vs. integrated ('fem.') occupations

	M2		M3	
	male	**fem.**	**male**	**fem.**
Intercept	-1.16***	-2.89***	-1.98***	-3.25***
	(0.23)	*(0.21)*	*(0.24)*	*(0.20)*
Fixed effects				
Individual level				
Women	-1.77***	1.41***	-1.09***	1.06***
(ref. men)	*(0.07)*	*(0.07)*	*(0.07)*	*(0.07)*
High. tert. degree			-0.48***	-1.48***
(ref. sec. degree)			*(0.04)*	*(0.08)*
Male field			1.91***	-0.21***
(ref. integrated field)			*(0.01)*	*(0.03)*
Female field			-1.10***	1.33***
			(0.03)	*(0.02)*
Young age cohort			0.20***	0.12***
(ref. old age cohort)			*(0.02)*	*(0.02)*
Married			-0.03*	0.02
(ref. not married)			*(0.01)*	*(0.02)*
Random effects				
Var *(intercept u_{0j})*	1.15	0.89	1.19	0.82
	(0.36)	*(0.28)*	*(0.37)*	*(0.26)*
Var *($women_j$)*	0.06	0.10	0.07	0.08
	(0.03)	*(0.04)*	*(0.03)*	*(0.03)*
Covar *(u_{0j}, $women_j$)*	0.03	0.09	-0.11	0.08
	(0.09)	*(0.07)*	*(0.09)*	*(0.06)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$;***, standard errors are in parenthesis, N (individual level) = 196,033 for typically female vs. integrated occupation and 224,107 for typically male vs. integrated occupation), N (country level) = 21*
Source: EULFS 2004/2005, own calculations

The random effects indicate that the average gender slope coefficient (0.06 / 0.10) varies significantly between countries. In case of typically male occupations this leads to a standard deviation of 0.24 ($\sqrt{0.06}$) which shows that the gender effect for typically male occupations varies in 95% of the cases in the countries between -1.28 to - 2.26.[167]

[167] The calculation is (-1.77-(2*0.24) and -1.77+(2*0.24)). For typically female occupations the gender variation is 0.77 to 2.05.

With the inclusion of the individual level variables[168] in model M3, the gender effects are slightly reduced but still significant. Moreover, results for additional individual characteristics confirm the expectations. With respect to education, persons with a higher tertiary degree are more likely to be in integrated than in gender-typical occupations. Also field of study is significantly associated with a gender-typical occupational allocation. Those who have chosen a male field of study, on average, are more likely to enter a male instead of an integrated job to a significant extent ($=e^{1.91}$). Those who have opted for female field are more likely to enter a female job ($=e^{1.33}$) than those who have studied in an integrated field. As predicted, the effect of gender is partially mediated through the gender-typing of field of study; in other words, male and female graduates enter sex-typical jobs partly because they have chosen gendered courses during higher education. However, a directly significant gender effect is still apparent when the level of education as well as field of study is taken into account. Significant differences in occupational allocation can also be observed between younger and older cohorts. Younger people are more likely to be in male or female instead of integrated occupations. Accordingly, there is no apparent tendency towards a decline in occupational gender-typing among young cohorts. Finally, married persons seem to be more frequently employed in typically female (insignificant) and integrated (significant) instead of typically male occupations.

In the next model M4 (see table 6.3) the defined occupational segregation regimes are included (as macro-level factors) to determine their association with patterns of occupational outcomes. As expected, a reduced between-country variance can be observed when these clusters are factored into the model; this result is particularly clear with regard to access to female occupations. The calculations show that, in comparison to the conservative segregation regime (base category), persons in the modern and post-communist segregation regime are, on average, more likely to be employed in a typically female occupation, even though only the effect for the post-communist segregation regime is significant. An opposite effect can be observed for the traditional segregation regime where persons tend to be more often employed in integrated rather than typically female occupations. However, this effect is not significantly different from the conservative sex segregation regime.

[168] The individual level effects (which are fixed in all models) are only shown once because they do not differ for the random intercept models. They can be interpreted as average for the European Union. As the gender variable is set random, this did not apply and the effect for each model is presented in the tables.

Table 6.3: Results (two binary hierarchical logistic regressions) for the division between typically male vs. integrated ('male') and typically female vs. integrated ('fem.') occupations - defined segregation regimes

	M4	
	male	**fem.**
Intercept	-1.26***	-3.55***
	(0.34)	*(0.26)*
Fixed effects		
Individual level		
Women	-1.26***	0.94***
(ref. men)	*(0.08)*	*(0.09)*
Country level		
Conservative seg. regime	*Ref.*	*Ref.*
Modern seg. regime	-0.53	0.71
	(0.62)	*(0.47)*
Traditional seg. regime	**-1.48****	-0.18
	(0.48)	*(0.37)*
Post-com. seg. regime	-0.78	**1.39****
	(0.57)	*(0.43)*
Cross level		
Modern*women	**0.35***	**0.46****
	(0.14)	*(0.17)*
Traditional*women	**0.25***	0.06
	(0.13)	*(0.14)*
Post-com.*women	0.28	0.19
	(0.17)	*(0.16)*
Random effects		
Var *(intercept u_{0j})*	0.82	0.47
	(0.26)	*(0.15)*
Var *($women_j$)*	0.04	0.05
	(0.02)	*(0.02)*
Covar *(u_{0j}, $women_j$)*	-0.05	0.02
	(0.06)	*(0.04)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (individual level) = 196,033 for typically female vs. integrated occupation and 224,107 for typically male vs. integrated occupation), N (country level) = 21*
Source: EULFS 2004/2005, own calculations

With respect to the cross-level interaction effects and the question in how far the segregation regimes and their institutional settings are able to explain the cross-national variance in the gender slope, only the positive and significant effect for the modernised segregation regime indicates that within this set of countries, the average positive gender effect increases and women tend to be more often employed in typically female occupations. This is also confirmed by the fact that the standard deviation of 0.224 ($\sqrt{0.05}$) is reduced which shows that

the gender effect for typically female occupations, in 95% of the cases, now varies only between 0.49 and 1.39. Furthermore, the findings support the assumption made in chapter 5 that a relatively early educational specialisation, a tertiary system where women pre-dominantly graduate in typically female fields of study, and an advanced post-industrial development, enhance at least the feminisation of the labour market. For all other regimes, no significant effects can be observed in comparison to the conservative regime.

In case of the 'masculinisation' of the labour market, however, a different picture emerges. In comparison to the conservative sex segregation regime, persons in the remaining regimes are, on average, more likely to be employed in an integrated rather than a typically male occupation. This negative effect is, however, only significant in the case of the traditional sex segregation regime. Nevertheless, the cross-level interaction effects reveal that, in particular, women in the modernised and traditional segregation regimes have a significantly higher likelihood of being employed in typically male instead of integrated occupations. Also in this case the standard deviation is reduced from 0.24 to 0.20.

As the above-described analyses are quite aggregated, it seems advisable to examine the influence of the selected macro-level factors. In this way it should become possible to draw a more detailed picture of the institutional features of countries which enhance or reduce horizontal sex segregation. Therefore, in the next models (see table 6.4-6.7), the intercept and the slope of 'gender' are modelled as a function of macro-level characteristics, namely countries' educational systems (M5a-M8a), post-industrial developments (M5b-M9b), family policies (M5c-M8c) and gender cultures (M5d-M7d). The modelling always follows the same logic: firstly single indicators and their cross-level interactions with 'gender' are introduced stepwise, while the final models include all relevant indicators and interactions per group. Since the effects of macro-level predictors upon the gender slope are of primary interest to this study, the focus of the discussion will be on the cross-level interaction effects.

Starting with the results for the distribution across typically female and integrated occupations (see table 6.4a and b, models M5a - M8a (fem.)), the first educational indicator (M5a) shows that persons with a tertiary degree, on average, are more often channelled into integrated jobs in countries with a higher share of students in vocational education. The opposite effect can be observed for the female participation rate in tertiary education which serves as a proxy for the selectivity and openness of tertiary systems (M5a). Accordingly, persons, on average, have a significantly higher likelihood to be in a typically female occupation in countries with a higher share of women in tertiary education. The last-examined educational indicator measuring the extent of horizontal sex segrega-

tion within the tertiary system shows that persons, on average, are more often employed in a typically female occupation in countries where a higher share of women graduates in atypical fields of study. This might be supported by the descriptions in chapter 4 (see section 4.1.2, figure 4.2) where it has been demonstrated that integrative tendencies with respect to typically male fields of study also increase feminisation processes within the educational system. Such a development might also be expected with respect to the labour market.

Table 6.4a: Results (two binary hierarchical logistic regressions) for the division between typically male vs. integrated ('male') and typically female vs. integrated ('fem.') occupations - educational system indices

	M5a		**M6a**	
	male	**fem.**	**male**	**fem.**
Intercept	-1.98***	-3.25***	-1.98***	-3.25***
	(0.23)	*(0.18)*	*(0.21)*	*(0.16)*
Fixed effects				
Individual level				
Women	-1.09***	1.06***	-1.09***	1.06***
(ref. men)	*(0.07)*	*(0.07)*	*(0.07)*	*(0.07)*
Country level				
Vocational[a]	0.026	**-0.04***		
	(0.02)	*(0.02)*		
Tertiary[b]			**-0.10***	**0.10****
			(0.04)	*(0.03)*
Cross level				
Vocational*women	0.003	-0.003		
	(0.006)	*(0.006)*		
Tertiary *women			0.007	0.02
			(0.02)	*(0.01)*
Random effects				
Var *(intercept u_{0j})*	1.11	0.68	0.91	0.54
	(0.35)	*(0.21)*	*(0.29)*	*(0.17)*
Var *($women_j$)*	0.07	0.08	0.07	0.07
	(0.03)	*(0.03)*	*(0.03)*	*(0.03)*
Covar *(u_{0j}, $women_j$)*	-0.12	0.07	-0.09	0.03
	(0.09)	*(0.06)*	*(0.08)*	*(0.05)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$;***, standard errors are in parenthesis, N (individual level) = 196,033 for typically female vs. integrated occupation and 224,107 for typically male vs. integrated occupation), N (country level) = 21*
Notes: a) Share of students involved in ISCED 2 and 3, b) Share of women in tertiary education
Source: EULFS 2004/2005, own calculations

Turning to the question in how far these indicators influence the observed cross-national variation in the gender slope, it appears that none of the educational indicators significantly affects gender-specific differences in the occupational

distribution across countries. Neither the share of persons graduating from vocational streams nor the degree of the feminisation of the tertiary system seems to matter when explaining cross-national differences in the unequal distribution of women and men across occupations. This also holds for the share of women in atypical fields of study.

Table 6.4b: Results (two binary hierarchical logistic regressions) for the division between typically male vs. integrated ('male') and typically female vs. integrated ('fem.') occupations - educational system indices

	M7a		**M8a**	
	male	**fem.**	**male**	**fem.**
Intercept	-1.98***	-3.25***	-1.98***	-3.25***
	(0.22)	*(0.18)*	*(0.21)*	*(0.17)*
Fixed effects				
Individual level				
Women	-1.10***	1.06***	-1.09***	1.06***
(ref. men)	*(0.07)*	*(0.07)*	*(0.06)*	*(0.07)*
Country level				
Vocational[a]			-0.001	-0.01
			(0.02)	*(0.02)*
Tertiary[b]			-0.08	0.08
			(0.07)	*(0.05)*
Atypical[c]	**-0.05***	**0.04***	-0.02	0.007
	(0.02)	*(0.02)*	*(0.03)*	*(0.02)*
Cross level				
Vocational*women			0.007	0.004
			(0.006)	*(0.007)*
Tertiary *women			0.02	0.03
			(0.02)	*(0.02)*
Atypical*women	0.001	0.007	-0.002	-0.002
	(0.009)	*(0.007)*	*(0.01)*	*(0.009)*
Random effects				
Var *(intercept u_{0j})*	0.98	0.65	0.89	0.53
	(0.31)	*(0.21)*	*(0.28)*	*(0.17)*
Var *($women_j$)*	0.07	0.07	0.06	0.07
	(0.03)	*(0.03)*	*(0.03)*	*(0.03)*
Covar *(u_{0j}, $women_j$)*	-0.10	0.06	-0.09	0.03
	(0.08)	*(0.06)*	*(0.08)*	*(0.05)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$;***, standard errors are in parenthesis, N (individual level) = 196,033 for typically female vs. integrated occupation and 224,107 for typically male vs. integrated occupation), N (country level) = 21*
Notes: a) Share of students involved in ISCED 2 and 3, b) Share of women in tertiary education, c) Share of women in atypical fields of study
Source: EULFS 2004/2005, own calculations

Proceeding with results for the distribution of persons across typically male vs. integrated occupations (M5a-8a (male)), the share of students in vocational

education proves to be an insignificant factor to explain people's occupational distribution. In countries with a high share of female tertiary graduates, however, the net risk of persons to be employed in typically male instead of integrated occupations is significantly reduced ($=e^{-0.10}$). A similar significant integrative effect can be observed in countries with a high share of women in atypical fields of study. However, again none of the selected educational indicators has a significant influence on the cross-national differences in the gender effect. In the final model M8a all educational indicators and cross-level interactions for both outcomes are included. The result for both analyses (M8a, fem. and male) show that the inclusion of all macro-level predictors removes the significance of the relevant indicators.

The second set of models focuses on the question whether post-industrial indicators are relevant predictors for cross-national differences in the distribution of men and women across occupations (see table 6.5a and b, M5b-9b and appendix table A6.5). Again separate analyses have been applied with regard to the distribution of employed persons across typically female vs. integrated and typically male vs. integrated occupations. Starting with a stepwise introduction of the selected post-industrial indicators, only the share of women in the public sector and the 'rigidity' of the labour market seem to be significant factors influencing the distribution of persons across occupations. The significant positive effect implies that in countries with a high female public sector employment, the net risk of persons to be employed in typically female instead of integrated occupations increases ($=e^{0.10}$). As the comparable factor for service sector employment is insignificant this indicator seems to be a better measure. The opposite effect can be observed in case of countries with a high share of employees staying more than 20 years with their employer. Here, persons with a tertiary degree, on average, are more often channelled into integrated occupations (controlling for the female employment rate). This effect is significant at a 5% level. In case of labour market flexibility, however, the negative but insignificant effect is somehow surprising because it indicates that in countries with a higher share of part-time workers, the likelihood of employed persons to work in integrated rather than typically female occupations, on average, increases.

Furthermore, only some of these indicators are capable to explain part of the cross-national differences in the gender slope. The average positive gender effect significantly increases in countries with a high female employment rate ($=e^{0.02}$) implying that women are more likely to enter typically female than integrated occupations in those countries. Moreover, the average gender effect is significantly reduced in countries with a high overall part-time employment

(=$e^{-0.01}$). As none of the remaining indicators is significant, they do not increase the understanding of cross-national variation in the gender slope.[169]

Table 6.5a: Results (two binary hierarchical logistic regressions) for the division between typically male vs. integrated ('male') and typically female vs. integrated ('fem.') occupations - post-industrial indices

	M5b		**M6b**		**M6b_alt**	
	male	**fem.**	**male**	**fem.**	**male**	**fem.**
Intercept	-1.98***	-3.25***	-1.98***	-3.26***	-1.98***	-3.24***
	(0.24)	*(0.20)*	*(0.20)*	*(0.19)*	*(0.23)*	*(0.17)*
Fixed effects						
Individual level						
Women	-1.09***	1.06***	-1.08***	1.06***	-1.08***	1.05***
(ref. men)	*(0.07)*	*(0.05)*	*(0.07)*	*(0.05)*	*(0.06)*	*(0.05)*
Country level						
FER[a]	0.003	0.01	-0.03	0.03	0.02	-0.03
	(0.03)	*(0.03)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.03)*
Service[b]			**0.08****	-0.04		
			(0.03)	*(0.03)*		
Public[c]					-0.05	**0.10***
					(0.05)	*(0.05)*
Cross level						
FER*women	-0.003	**0.02*****	0.002	**0.03*****	-0.009	**0.02****
	(0.008)	*(0.007)*	*(0.009)*	*(0.007)*	*(0.009)*	*(0.008)*
Service*women			-0.01	-0.009		
			(0.01)	*(0.007)*		
Public*women					0.02	-0.001
					(0.01)	*(0.01)*
Random effects						
Var *(intercept u_{0j})*	1.19	0.81	0.85	0.74	1.14	0.60
	(0.37)	*(0.25)*	*(0.27)*	*(0.23)*	*(0.36)*	*(0.19)*
Var *($women_j$)*	0.07	0.05	0.06	0.04	0.06	0.05
	(*0.03*)	(*0.02*)	(*0.03*)	(*0.02*)	(*0.02*)	(*0.02*)
Covar *(u_{0j}, $women_j$)*	-0.10	0.07	-0.07	0.05	-0.09	0.08
	(*0.09*)	(*0.05*)	(*0.07*)	(*0.05*)	(*0.08*)	(*0.05*)

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (individual level) = 196,033 for typical female vs. integrated occupation and 224,107 for typical male vs. integrated occupation), N (country level) = 21*

Notes: a) Female employment rate, b) Share of persons in the service sector, c) Female share in the public sector

Source: EULFS 2004/2005, own calculations

[169] The more aggregated measure for labour market rigidity (ELP) has a negative but insignificant effect on the average distribution of persons across typically female occupations. This holds also for the cross-level interactions even though the signs are varying (see appendix table A6.5 for more detail).

Table 6.5b: Results (two binary hierarchical logistic regressions) for the division between typically male vs. integrated ('male') and typically female vs. integrated ('fem.') occupations - post-industrial indices

	M7b		**M8b**		**M8b_alt**	
	male	**fem.**	**male**	**fem.**	**male**	**fem.**
Intercept	-1.98***	-3.25***	-1.98***	-3.25***	-1.98***	-3.25***
	(0.19)	*(0.18)*	*(0.17)*	*(0.18)*	*(0.19)*	*(0.17)*
Fixed effects						
Individual level						
Women	-1.09***	1.06***	-1.09***	1.06***	-1.09***	1.05***
(ref. men)	*(0.07)*	*(0.05)*	*(0.07)*	*(0.05)*	*(0.06)*	*(0.05)*
Country level						
FER[a]	**-0.06***	0.01	**-0.07***	0.01	-0.04	-0.03
	(0.03)	*(0.03)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.04)*
Service[b]			**0.08***	-0.01		
			(0.03)	*(0.03)*		
Public[c]					0.04	0.08
					(0.09)	*(0.05)*
Length[d]	**-0.07***	**-0.06***	**0.08****	-0.06	**-0.08***	-0.04
	(0.03)	*(0.03)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.03)*
Part-time[e]	**0.07****	-0.02	0.03	-0.01	**0.06***	-0.003
	(0.02)	*(0.02)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.02)*
Cross level						
FER*women	0.007	**0.03*****	0.008	**0.03*****	-0.003	**0.05*****
	(0.01)	*(0.008)*	*(0.01)*	*(0.03)*	*(0.01)*	*(0.01)*
Service*women			-0.007	-0.001		
			(0.01)	*(0.009)*		
Public*women					0.02	-0.02
					(0.02)	*(0.01)*
Length*women	0.01	0.008	0.01	0.008	0.02	0.002
	(0.01)	*(0.01)*	*(0.01)*	*(0.009)*	*(0.01)*	*(0.01)*
Part-time*women	-0.01	**-0.01***	-0.006	-0.01	-0.005	**-0.02*****
	(0.008)	*(0.006)*	*(0.010)*	*(0.008)*	*(0.009)*	*(0.007)*
Random effects						
Var *(intercept u_{0j})*	0.74	0.63	0.59	0.63	0.73	0.56
	(0.23)	*(0.20)*	*(0.19)*	*(0.20)*	*(0.23)*	*(0.18)*
Var *($women_j$)*	0.06	0.04	0.06	0.04	0.05	0.03
	(0.03)	*(0.02)*	*(0.03)*	*(0.01)*	*(0.02)*	*(0.01)*
Covar *(u_{0j}, $women_j$)*	-0.04	0.06	-0.03	0.06	-0.03	0.08
	(0.06)	*(0.04)*	*(0.05)*	*(0.04)*	*(0.06)*	*(0.04)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$, ***; standard errors are in parenthesis, N (individual level) = 196,033 for typical female vs. integrated occupation and 224,107 for typical male vs. integrated occupation), N (country level) = 21*
Notes: a) Female employment rate, b) Share of persons in the service sector, c) Female share in the public sector, d) Share of persons who stay longer than 20 years with the same employer; e) Share of part-time employment among all employed persons
Source: EULFS 2004/2005, own calculations

The models examining the distribution across typically male vs. integrated occupations yield different results. While there is no significant effect of the female employment rate, the inclusion of the indicator for service sector employment shows that in countries with a high share of persons working in the service sector, people with a tertiary degree are on average more often employed in a typically male occupation (=$e^{0.08}$). For these models, however, the replacing of the service sector variable with the indicator 'female public sector employment' reveals no new insights. The effect is insignificant, even though the negative sign implies an integrative tendency.

The measures for both labour market rigidity and flexibility are significantly influencing the distribution of persons across occupations (M7b). The negative sign for 'rigidity' shows that in countries with a high share of persons staying longer than 20 years with the same employer, individuals, on average, are more often employed in integrated than typically male occupations. The opposite effect can be observed for countries with a high share of part-timers, where the average effect indicates that persons are more often employed in a typically male occupation. Furthermore, the female employment rate has a significant negative effect in this model. None of the selected indicators has a significant effect on the gender slope implying that they are not capable to explain part of the cross-national variance in the unequal distribution of women and men across typically male vs. integrated occupations.

When finally combining all effects in one model M8b, only the interaction effect with the female employment rate keeps its significance for the analysis of typically female vs. integrated occupations.[170] At to typically male vs. integrated occupations (M8b, male), the cross-level interaction effects remain insignificant. In the alternative model M8_alt, the measure for service sector employment is replaced with female public sector employment. In this context, at least the interaction effects for typically female occupations show that besides a high female employment rate, also the share of overall-part-time employment significantly explains part of the cross-national variation in the gender slope.

In this chapter it has moreover been assumed that family and gender policies are important for the explanation of cross-national differences in the allocation of women and men across typically, atypical and integrated occupations. In the following models M5c to M8c (see table 6.6a and b), the relevant macro indicators and cross-level interactions are introduced.

As to the distribution of persons across typically female vs. integrated occupations (M5c-8c, fem.), none of the selected macro-level indicators significantly affects the distribution across these occupations. A similar picture

[170] Also for these models the ELP measure is negative but insignificant (see appendix table A6.5).

emerges with regard to the cross-level interactions and the central question whether the selected indicators effectively explain cross-national differences in the observed gender slope. All examined effects are insignificant, even though the signs, at least, indicate countries with a good support for youngest children are associated with a higher tendency of women to be employed in typically female occupations.

Table 6.6a: Results (two binary hierarchical logistic regressions) for the division between typically male vs. integrated ('male') and typically female vs. integrated ('fem.') occupations - family and gender policy indices

	M5c		**M6c**	
	male	**fem.**	**male**	**fem.**
Intercept	-1.98***	-3.25***	-1.98***	-3.25***
	(0.21)	*(0.20)*	*(0.21)*	*(0.19)*
Fixed effects				
Individual level				
Women	-1.09***	1.06***	-1.09***	1.06***
(ref. men)	*(0.07)*	*(0.06)*	*(0.06)*	*(0.06)*
Country level				
Child3[a]	-0.005	0.003	-0.005	0.004
	(0.02)	*(0.01)*	*(0.02)*	*(0.01)*
Child6[b]	**0.03***	-0.008	**0.04***	-0.007
	(0.02)	*(0.01)*	*(0.02)*	*(0.01)*
Parent[c]			0.004	0.008
			(0.006)	*(0.005)*
Cross level				
Child3*women	0.002	0.006	0.002	0.006
	(0.004)	*(0.004)*	*(0.004)*	*(0.004)*
Child6*women	-0.005	-0.006	-0.004	-0.005
	(0.004)	*(0.004)*	*(0.004)*	*(0.004)*
Parent*women			0.003	0.001
			(0.002)	*(0.002)*
Random effects				
Var *(intercept u_{0j})*	0.94	0.81	0.92	0.72
	(0.30)	*(0.26)*	*(0.29)*	*(0.23)*
Var *($women_j$)*	0.06	0.07	0.05	0.07
	(0.03)	*(0.03)*	*(0.02)*	*(0.03)*
Covar *(u_{0j}, $women_j$)*	-0.07	0.07	-0.08	0.06
	(0.08)	*(0.06)*	*(0.07)*	*(0.06)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$, ***; standard errors are in parenthesis, N (individual level) = 196,033 for typically female vs. integrated occupation and 224,107 for typically male vs. integrated occupation), N (country level) = 21*
Notes: a) Childcare facilities for children aged 0-3, b) Childcare facilities for children aged 3-6, c) Effective parental leave
Source: EULFS 2004/2005, own calculations

Table 6.6b: Results (two binary hierarchical logistic regressions) for the division between typically male vs. integrated ('male') and typically female vs. integrated ('fem.') occupations - family and gender policy indices

	M7c		**M8c**	
	male	**fem.**	**male**	**fem.**
Intercept	-1.98***	-3.25***	-1.98***	-3.25***
	(0.21)	*(0.20)*	*(0.20)*	*(0.18)*
Fixed effects				
Individual level				
Women	-1.08***	1.06***	-1.08***	1.06***
(ref. men)	*(0.06)*	*(0.07)*	*(0.05)*	*(0.06)*
Country level				
Child3[a]			-0.02	0.01
			(0.02)	*(0.02)*
Child6[b]			0.02	0.001
			(0.02)	*(0.01)*
Parent[c]			0.003	0.009
			(0.005)	*(0.005)*
GEM[d]	**4.59***	-1.86	4.64	-2.86
	(2.04)	*(1.85)*	*(2.52)*	*(2.32)*
Cross level				
Child3*women			0.006	0.006
			(0.004)	*(0.005)*
Child6*women			-0.001	-0.005
			(0.004)	*(0.005)*
Parent*women			**0.003***	0.001
			(0.001)	*(0.002)*
GEM*women	-0.80	-0.10	**-1.25***	-0.07
	(0.57)	*(0.63)*	*(0.61)*	*(0.79)*
Random effects				
Var *(intercept u_{0j})*	0.95	0.78	0.79	0.66
	(0.30)	*(0.25)*	*(0.25)*	*(0.21)*
Var *($women_j$)*	0.06	0.08	0.03	0.07
	(0.02)	*(0.03)*	*(0.02)*	*(0.03)*
Covar *(u_{0j}, $women_j$)*	-0.06	0.09	-0.04	0.06
	(0.08)	*(0.06)*	*(0.06)*	*(0.05)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (individual level) = 196,033 for typically female vs. integrated occupation and 224,107 for typically male vs. integrated occupation), N (country level) = 21*

Notes: a) Childcare facilities for children aged 0-3, b) Childcare facilities for children aged 3-6, c) Effective parental leave, d) Gender Empowerment Measure

Source: EULFS 2004/2005, own calculations

The opposite holds in case of a sufficient childcare support for children aged 3 to 6 years. In this case the observed strong gender effect is slightly reduced, and women are more often employed in integrated rather than typically female occupations. Moreover, a certain support can be found for the hypothesis

that segregation tendencies are strengthened by generous parental leave and weakened by a high gender empowerment.

In case of the distribution of persons across typically male vs. integrated occupations, the results for childcare show that generous childcare provision for pre-school children (aged 0-3) has an insignificant effect. The effect for children (aged 3 to 6), by contrast, has a significant positive effect ($=e^{0.03}$) which implies that the risk of persons to be employed in typically male occupations, on average, increases in countries with a high childcare provision for children in this age group. This effect becomes stronger when the parental leave indicator is included in the analyses, even though the positive effect for parental leave itself is insignificant. With respect to the aggregated gender empowerment measure, the strong positive and significant effect shows that in countries with a high gender empowerment, persons, on average, are more likely to be employed in typically male occupations. Replacing the GEM indicator with some detailed measures (see appendix table A6.6), the results are insignificant and divergent. However the signs indicate that in countries with a legislation offering women equal access to occupations, people are on average more often employed in typically male occupations, whereas legislation restricting women's access to specific, often typically male occupations increases the average chance of individuals to be employed in integrated rather than typically male occupations.

Also with regard to this horizontal outcome, the selected indicators do not offer sufficient explanation power for the observed cross-national variation in the gender slope. While none of the effects is significant, at least some of the signs are pointing in the assumed direction. With respect to childcare, for instance, the strong negative gender effect is reduced in countries with a high childcare coverage for children aged 0-3, while the opposite holds for the effect concerning children aged 3-6.

When finally including all indicators into one model M8c the picture changes in the field of typically male vs. integrated occupations. While the two main effects of childcare and gender empowerment are becoming insignificant, two cross-level interactions are significantly influencing the distribution of persons across typically male occupations. In countries with generous parental leave, the average negative gender effect is reduced and women tend to be more often employed in typically male occupations. However, in combination with a high gender empowerment, the opposite effect can be observed. In this case, and women more often employed in integrated occupations.

With regard to the final group of indicators measuring 'gender culture', a distinction has been made between women's 'equal access to the labour market' and the importance of 'motherhood'. Starting with the distribution of persons across typically female vs. integrated occupations, persons, on average, are

more likely to be employed in an integrated occupation in countries with a high share of persons disagreeing that men's sphere is work and women's home and children (=$e^{-0.02}$). The effect is significant at the 5%-level.

Table 6.7: Results (two binary hierarchical logistic regressions) for the division between typically male vs. integrated ('male') and typically female vs. integrated ('fem.') occupations – 'gender culture' indices

	M5d		**M6d**		**M7d**	
	male	**fem.**	**male**	**fem.**	**male**	**fem.**
Intercept	-1.98***	-3.25***	-1.98***	-3.25***	-1.98***	-3.24***
	(0.24)	*(0.18)*	*(0.22)*	*(0.20)*	*(0.22)*	*(0.18)*
Fixed effects						
Individual level						
Women	-1.07***	1.05***	-1.09***	1.06***	-1.07***	1.04***
(ref. men)	*(0.052)*	*(0.061)*	*(0.065)*	*(0.066)*	*(0.052)*	*(0.060)*
Country level						
Right	-0.006	0.03			-0.02	0.03
	(0.02)	*(0.02)*			*(0.02)*	*(0.02)*
Division	0.01	**-0.02***			-0.008	**-0.03***
	(0.02)	*(0.01)*			*(0.02)*	*(0.02)*
Suffer			0.03	-0.004	0.044	0.02
			(0.02)	*(0.02)*	*(0.03)*	*(0.02)*
Childcare			-0.02	-0.008	-0.02	0.006
			(0.02)	*(0.02)*	*(0.03)*	*(0.02)*
Cross level						
Right*women	**0.011***	**0.012***			0.009	**0.014***
	(0.005)	*(0.006)*			*(0.005)*	*(0.006)*
Division*women	**-0.009***	-0.001			**-0.011***	0.004
	(0.004)	*(0.004)*			*(0.005)*	*(0.006)*
Suffer*women			-0.001	0.001	0.005	-0.010
			(0.005)	*(0.005)*	*(0.007)*	*(0.008)*
Childcare*women			-0.006	-0.005	-0.003	-0.002
			(0.007)	*(0.007)*	*(0.005)*	*(0.007)*
Random effects						
Var *(intercept u_{0j})*	1.15	0.65	1.04	0.82	0.96	0.62
	(0.36)	*(0.21)*	*(0.33)*	*(0.26)*	*(0.30)*	*(0.20)*
Var *($women_j$)*	0.03	0.07	0.06	0.08	0.03	0.06
	(0.02)	*(0.02)*	*(0.03)*	*(0.03)*	*(0.02)*	*(0.02)*
Covar *(u_{0j}, $women_j$)*	-0.06	0.06	-0.11	0.08	-0.07	0.08
	(0.07)	*(0.05)*	*(0.08)*	*(0.06)*	*(0.06)*	*(0.05)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (individual level) = 196,033 for typically female vs. integrated occupation and 224,107 for typically male vs. integrated occupation), N (country level) = 21*
Notes: a) Right of women to work if jobs are scarce, b) Women=child and men=work, c) Child suffers if the mother works, d) Men should do more childcare
Source: EULFS 2004/2005, own calculations

However, there is no significant effect for the measure capturing the aspect of a 'right to work', even though the sign indicates that in countries with a high share of people disagreeing that men should have more rights to work when jobs are scarce, individuals, on average, are more often employed in typically female instead of integrated occupations.

With respect to the measures for the aspect of 'motherhood' (M5d) both effects are negative but insignificant. The cross-level interactions with gender yield a different picture. Part of the observed cross-national variation in the gender slope can be explained by one measure of 'access'. In countries where a high share of persons disagrees that men should have a better right to work if jobs are scarce, the average positive gender effect is reinforced, and women are more often employed in typically female occupations. The remaining cross-level interactions, however, are insignificant and not capable to explain the cross-national variation in the gender effect.

The findings resulting from the second outcome - the distribution across typically male vs. integrated occupations - are divergent: M5d shows that both measures of 'access' and 'motherhood' yield insignificant effects. Their different signs indicate that even within one aspect, different influences are possible. For the explanation of cross-national differences in the gender slope, however, particularly the aspect of 'access' seems to be important as both measures show significant but contrary effects. In countries where a high share of persons disagrees that men should have more right to work if jobs are scarce, the average negative gender effect is reduced, and women have a higher chance to be employed in typically male occupations. A high share of persons disagreeing that men's task is work and women's home and children, by contrast, increases the likelihood of women to be employed in an integrated occupation.

As to the aspects of 'motherhood', the negative but insignificant signs at least point towards the expected integrative forces. Including all indicators in one model (M7d), the results finally indicate that, in particular with regard to the observed differentiation of the gender slope, at least one measure of 'access' tends to increase feminisation and push women into typically female occupations, while the aspects of 'motherhood' have a rather integrative influence on the labour market. With regard to the findings for typically male vs. integrated occupations, however, the significant positive effect for one measure of 'access' disappears. Furthermore, the results show that within one aspect, the measures can have quite divergent effects on occupational sex segregation. Therefore, the interpretation of results is not as straightforward as expected.

6.3.3. Variance components - what does the institutional context explain?

Finally, the question arises to what extent the micro and macro variables included in the analyses are capable to explain the cross-national differences in the distribution of persons across occupations and the differences in the observed gender gap. Therefore, the variance[171] components are to be discussed (see table 6.8).

Table 6.8: Variance components of the random slope models

	1	2	3	4	5	6	7
Random Slope							
Var *(u_{0j})* / *typically female*	1.11 *(0.34)*	0.82 *(0.26)*	0.47 *(0.15)*	0.53 *(0.17)*	0.63 *(0.20)*	0.66 *(0.21)*	0.62 *(0.20)*
R^2	**25%**		**43%**	**35%**	**23%**	**20%**	**24%**
Var *($women_j$)*		0.08 *(0.03)*	0.05 *(0.02)*	0.07 *(0.03)*	0.04 *(0.01)*	0.07 *(0.03)*	0.06 *(0.02)*
R^2			**38%**	**13%**	**50%**	**13%**	**25%**
Covar *(u_{0j}, $women_j$)*		0.08 *(0.06)*	0.02 *(0.04)*	0.03 *(0.05)*	0.06 *(0.04)*	0.06 *(0.05)*	0.08 *(0.05)*
Var *(u_{0j})* / *typically male*	1.16 *(0.36)*	1.19 *(0.37)*	0.82 *(0.26)*	0.89 *(0.28)*	0.59 *(0.19)*	0.79 *(0.25)*	0.96 *(0.30)*
R^2	**26%**		**31%**	**25%**	**50%**	**34%**	**19%**
Var *($women_j$)*		0.07 *(0.03)*	0.04 *(0.02)*	0.06 *(0.03)*	0.06 *(0.03)*	0.04 *(0.02)*	0.03 *(0.02)*
R^2			**43%**	**14%**	**14%**	**43%**	**57%**
Covar *(u_{0j}, $women_j$)*		-0.11 *(0.09)*	-0.05 *(0.06)*	-0.09 *(0.08)*	-0.03 *(0.05)*	-0.04 *(0.06)*	-0.07 *(0.06)*

Notes: All calculations refer to the random slope model where all individual variables are included. 1=zero model, 2=only individual-level variables, 3= individual+segregation regime variables, 4=individual+educational variables, 5=individual+post-industrial variables, 6=individual +family policy variables, 7=individual+gender culture variables
Source: EULFS 2004/2005, own calculations

The variation at the macro-level for the distribution across typically female and integrated occupations is around 25% (M0). This indicates that 25% of the variance of the distribution of persons across the two occupational groups can be attributed to country-specific contextual factors. It seems logical that nearly half (43%) of the cross-national variance can be explained when including the quite aggregated measures of 'segregation regimes' as a proxy for the different institutional settings of countries. In these more sophisticated measures the inclusion of the educational system indicators proves to be central, at least, with

[171] It should be underlined that the logistic distribution for the level-one residuals implies a variance of $\pi^2/2=3.29$ (see Snijders and Bosker 1999: 224). The total variance is therefore composed of the variance between individuals $\sigma 2$ (fixed by 3.29) and the variance between countries τ_{b00}.

regard to the feminisation of the labour market. A comparison of the variances between the models with individual variables and those including educational system variables shows that 35%[172] of the 25% country-level variance can be explained. The remaining groups of indicators reach from 20% (family policy indicators) to 24% (gender culture indicators). With respect to the variance components of the random slope and cross-level interaction models, the picture is different. The results show that the inclusion of post-industrial indicators explains nearly 50% of the variance of the observed 'gender' effect across countries. Ranging from 13% to 38%, the other groups of indicators have less influence on the explanation of cross-national gender differences.

With respect to the distribution of persons across typically male and integrated occupations, around 26% (M0) of the variance can be explained by country-specific contextual factors. Again, the inclusion of post-industrial indicators explains half (50%) of the cross-national variance, even though this group of indicators is less efficient in explaining the cross-national variance of the 'gender' slope (14%). The other measures are varying between 19% (gender culture indicators) and 34% (family policy indicators). As already indicated above, the findings reveal that particularly the 'gender culture' measures are essential to the variance components of the random slope and cross-level interaction models. Including these indicators into the model, nearly 60% of the variance of the observed 'gender' effect across countries can be explained. The other measures are ranging from 14% to 43%.

6.3.4. Summary

The diverse findings indicate that no coherent trend can be found for the horizontal dimension of occupational segregation. It seems that depending on the focus of the analysis, different factors can be identified which impact on the distribution of employed persons across occupations. In explaining part of the observed cross-national differences in the unequal distribution of men and women across typically female occupations, education-related measures prove to be less helpful. Post-industrial measures, by contrast, are quite effective in terms of explained variance. Particularly countries with a higher female employment rate are positively associated with a higher likelihood of women to work in typically female occupations. Controlling for the female employment rate and the rigidity of the labour market, a higher overall share of part-timers on the labour market, surprisingly, seems to be related to female integration processes.

[172] Following Bryk and Raudenbusch (1992), the value is calculated on the basis of R^2 (level 2) = $[var_0(u_{0j}) - var_1(u_{0j})] / var_0(u_{0j})$

However, it should be underlined in this regard, that the causality cannot be disentangled from the used data. The observed association might be due to the fact that a high overall share of part-timers signals a generally higher flexibility of labour markets. Part-time options might be seen not only as a measure to bring more women into the labour market but also as a means to reduce, for instance, higher overall unemployment. From this perspective, part-time work can be perceived as a characteristic of typically female as well as integrated occupations.

As to factors that further the inclusion of women in typically male occupations, none of the selected educational and post-industrial indicators is able to explain cross-national variation in the gender slope. A similar result can be observed with regard to family and gender policies. Only when including all indicators, it becomes apparent that in countries with generous parental leave. the likelihood of women to work in a typically male occupation increases. A high gender empowerment, by contrast, has the contrary effect of strengthening a negative gender effect. This finding is surprising, as it has been hypothesised that a stronger gender empowerment might facilitate women's access to typically male occupations. However, it must be borne in mind that the GEM indicator is a rather vertical measure particularly including factors which refer to women's power in terms of income and high status positions.

The findings for 'gender culture' indicators show that the measures for the aspect of 'access to the labour market' are of particular importance to the explanation of the cross-national variation in the gender slope. Even though the already-mentioned problem of causality cannot be clarified, it seems that there is a positive correlation between women's employment in typically male occupations and countries where the majority disagrees that men should have more right to work if jobs are scarce. In countries where the majority disagrees that the division of work between men and women should follow the traditional route, women with a tertiary degree work in integrated rather than typically male occupations.

In sum, these findings testify to the multi-dimensionality and complexity of segregation processes. They show that the factors impacting on feminisation processes are different from those shaping integrative or masculinisation processes. Both developments may take place simultaneously. This might also indicate that even in quite 'gender-equal' countries, 'traditional' views of women's participation in the labour market subliminally persist. These attitudes might hinder women from entering typically male occupations.

6.4. Results for being in a management or non-management position

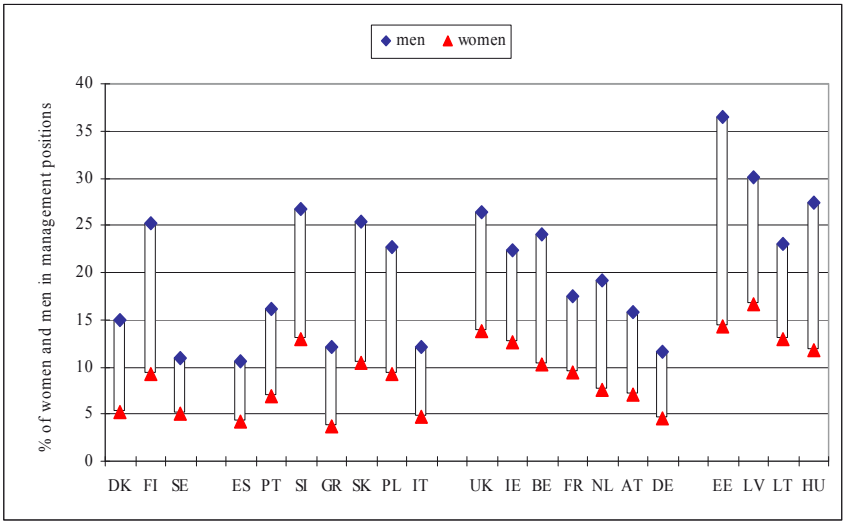
6.4.1. Descriptive results

As pointed out above, prejudices and stereotypical beliefs about the role of women in society often limit their chances of reaching top-leadership positions. Furthermore, women's traditional family responsibilities still are a major part of beliefs in many cultures. They make it difficult for women to achieve high-ranking positions with challenging time demands. One result is the already-described 'glass ceiling', an invisible barrier blocking the rise of women to top jobs (Wirth 2001, ILO 2004).

The persistent gender gap in high-level managerial positions clearly reflects a lack of gender equality in society. The size of this gap provides some insight into the extent to which women are accepted in non-traditional roles, and shows how power is distributed between women and men in different countries and societies. Seeing a woman in a management position is the exception rather than the rule. However, the degree of under-representation differs from country to country (Davidson and Burke 2004). This is confirmed by the following figure (see figure 6.4) showing results with regard to the distribution of men and women across management positions (ISCO88 group 1, 2004). It is evident that within the group of persons with a tertiary degree, men are more often employed in management positions than their female counterparts in all EU Member States. Even though the underlying trend seems to be similar across Member States, some variation in the magnitude of gender differences is apparent. It features prominently in Estonia, Finland, Hungary and Slovakia where the difference between men and women is around 15 to 20%. The smallest differences between men and women can be found in Sweden, Spain, Germany and Italy. Furthermore, it should be underlined that there is also a substantial cross-national variation in the overall share of persons in management positions: while only around 10% of all men reach management positions in Spain, Sweden, Greece and Germany, the percentage is around 30% in countries like Estonia, Latvia, and Hungary.[173]

[173] One possible reason for the observed country differences in the overall share of persons in management positions might also stem from the already mentioned methodological limitations concerning the measurement of high managerial positions and the varying definitions and classifications of managerial positions across countries (see also section 6.2.2).

Figure 6.4: Percentage of men and women in management positions (ISCO88 group 1, tertiary degree, age 20-64), 21 EU Member States 2004



Source: EULFS 2004/2005, own calculations

In this context, it seems difficult to identify common patterns within the defined segregation regimes. The most obvious patterns can be observed in the conservative segregation regime characterised by a high share of persons working in management positions and a substantial gender difference. In contrast, the traditional segregation regime has a generally lower share of persons in management positions and a lower gender gap indicating that women in these countries might have a higher chance to work in management positions.

6.4.2. Odds of being in a management or non-management position - testing the hypothesis

As demonstrated in chapter 4, even though women are concentrated in the non-manual sector, they are less likely to reach high management positions within this sector. Therefore, the question arises in how far cross-national differences in the distribution of women in management positions are attributable to the already-discussed macro-level factors.

Table 6.9 presents the results of a binary logistic multi-level analysis concerning the odds of being either in a management or a non-management position. Following the modelling strategy introduced in the previous sections, first a variance component model is estimated (M0) to show the systematic cross-country variation. The random coefficient indicates that there is a significant between-country variation in the distribution of employed persons across management positions when no individual level variable is included in the model. The second step involves the analysis of a random intercept model allowing only the intercepts to vary between countries (see M1). Introducing 'gender' as a first individual-level variable, the result confirms the expectation that women are less likely to enter a management position ($=e^{-0.95}$). This result is significant at the 1% level.

As the main purpose of this analysis is to examine whether the selected macro-level factors are able to explain the cross-national variance of the observed gender slope (see figure A6.1 in the appendix), model M2 includes a random slope allowing the gender effect to vary across countries (while all other individual level variables are fixed). The finding indicates that the average gender slope coefficient (0.02)[174] varies significantly between countries. Moreover, results for model M3 including all other individual level characteristics[175] (which are fixed) are in line with the expectations. With respect to education, persons with a higher tertiary degree are, on average, less likely to be in management positions than persons with a tertiary degree. This effect might also be related to the fact that for managerial positions based on group 1 of the ISCO88 a higher tertiary degree is not necessarily needed.

It is interesting to note that a gender-typical field of study (male and female) significantly decreases the chance of being in a management position. Particularly a typically female field of study decreases the chance by $e^{-0.90}$. Significant differences in the allocation to management positions are also evident for younger and older cohorts. Younger people are, on average, less likely to be in management positions which seems plausible as many management positions are also related to a principle of seniority. Finally, the results imply that married persons are more often in a management position than unmarried people.

[174] This is a standard deviation of 0.14 ($\sqrt{0.02}$) which shows that the gender effect for management positions varies in 95% of the cases in the countries between -1.24 (-0.96-(2*0.14)) and -0.67 (-0.96 + (2*0.14)).

[175] Also here the individual level effects (which are fixed in all models) are only shown once because they do not differ for the random intercept models. They can be interpreted as average for the European Union. As the gender variable is set random, this did not apply and the effect for each model is presented in the tables.

Table 6.9: Individual-level coefficients (random intercept and random slope models) to be in a management or non-management position

	M0	M1	M2	M3	M4
Intercept	-1.86***	-1.44***	-1.44***	-1.38***	-1.43***
	(0.10)	*(0.10)*	*(0.10)*	*(0.11)*	*(0.15)*
Fixed effects					
Individual level					
Women		-0.95***	-0.96***	-0.77***	-0.73***
(ref. men)		*(0.01)*	*(0.04)*	*(0.05)*	*(0.06)*
High. Tert. Degree				-0.29***	-0.29***
(ref. Sec. degree)				*(0.04)*	*(0.04)*
Male field				-0.10***	-0.10***
(ref. Integrated field)				*(0.02)*	*(0.02)*
Female field				-0.90***	-0.90***
				(0.02)	*(0.02)*
Young age cohort				-0.52***	-0.52***
(ref. old age cohort)				*(0.02)*	*(0.02*
Married				0.32***	0.32***
(ref. not married)				*(0.02)*	*(0.02)*
Country level					
Con. seg. regime					*Ref.*
Mod. seg. regime					-0.15
					(0.27)
Trad. seg. regime					-0.14
					(0.21)
PC. seg. regime					**0.66****
					(0.25)
Cross level					
Mod.*women					-0.10
					(0.12)
Trad. *women					-0.17
					(0.10)
PC.*women					0.13
					(0.12)
Random effects					
Var *(intercept u_{0j})*	0.17	0.20	0.19	0.24	0.16
	(0.05)	*(0.06)*	*(0.06)*	*(0.08)*	*(0.05)*
Var *($women_j$)*			0.02	0.04	0.03
			(0.009)	*(0.01)*	*(0.01)*
Covar *(u_{0j}, $women_j$)*			0.009	0.05	0.02
			(0.02)	*(0.03)*	*(0.02)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (individual level) = 250,237 for management vs. non-management positions, N (country level) = 21*
Source: EULFS 2004/2005, own calculations

In model M4 the defined occupational segregation regimes are included as a first set of macro-level factors to determine their association with the vertical aspect of occupational segregation. As expected, the size of the between-country

variance for the intercept as well as for 'gender' is reduced when these segregation regimes are entered into the model. The results show that in comparison to the conservative segregation regime, persons in the post-communist regime are, on average, more often employed in management positions. This effect is significant at the 5% level and confirms the already-described bivariate finding.

For the other segregation regimes no significant effect can be observed, even though the negative signs indicate a lower average likelihood of persons to be employed in a management position. With respect to the central question whether the defined segregation regimes and their institutional setting are able to explain part of the cross-national variance in the gender slope, none of the cross-level effects is significant.

Also for the vertical segregation outcome, macro-level factors are groupwise introduced in order to establish more precisely the institutional features of countries which enhance or reduce vertical sex segregation (see table 6.10-6.13). The intercept and slope of the variable 'gender' are modelled as a function of the established macro-level characteristics: educational systems (M5a-M9a), post-industrial developments (M5b-M8b), family policies (M5c-M8c) and gender cultures (M5d-M7d). The modelling follows the same logic applied previously: firstly single indicators and their cross-level interactions with the variable 'gender' are stepwise introduced, while the final model includes all relevant indicators and interactions per group.

Starting with the group of educational factors, the results show that all three indicators have a significant positive effect on the average distribution of employed persons into management positions. It can be inferred from the findings that in countries with a high share of women holding a degree in a short-term programme, persons with a tertiary degree tend to be, on average, more often employed in management positions. This tendency is also observable in countries with a higher share of highly educated women as well as with a higher share of women holding a degree in an atypical field of study.

Table 6.10: Results (hierarchical logistic regression) for the division between management and non-management positions - education indices

	M5a	M6a	M7a	M8a	M9a
Intercept	-1.35***	-1.35***	-1.35***	-1.35***	-1.35***
	(0.09)	*(0.10)*	*(0.10)*	*(0.08)*	*(0.08)*
Fixed effect					
Individual level					
Women	-0.78***	-0.78***	-0.78***	-0.78***	-0.78***
(ref. men)	*(0.05)*	*(0.05)*	*(0.05)*	*(0.05)*	*(0.05)*
Country level					
Short[a]	**0.61****			**0.51****	**0.53****
	(0.21)			*(0.19)*	*(0.20)*
Tertiary[b]		**0.05****		**0.04***	**0.05***
		(0.02)		*(0.02)*	*(0.02)*
Atypical[c]			**0.02***		-0.00
			(0.01)		*(0.01)*
Cross level					
Short*women	0.02			0.00	-0.02
	(0.11)			*(0.11)*	*(0.12)*
Tertiary *women		0.01		0.01	0.00
		(0.010)		*(0.01)*	*(0.01)*
Atypical*women			0.00		0.00
			(0.01)		*(0.007)*
Random effects					
Var *(intercept u_{0j})*	0.18	0.18	0.20	0.14	0.14
	(0.06)	*(0.06)*	*(0.06)*	*(0.04)*	*(0.04)*
Var *($women_j$)*	0.04	0.04	0.04	0.04	0.04
	(0.01)	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*
Covar *(u_{0j}, $women_j$)*	0.05	0.04	0.04	0.04	0.04
	(0.02)	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (individual level) = 250,237 for management vs. non-management positions, N (country level) = 21*
Notes: a) Share of women graduating from ISCED5B courses, b) Share of women in tertiary education, c) Share of women in atypical fields of study
Source: EULFS 2004/2005, own calculations

As to the question in how far these indicators also explain part of the observed cross-national variation in the gender slope, none of the aforementioned indicators is significant. However, the signs point towards a reduction in the average negative gender effect. Combining the set of indicators in a final model M9a, the significant average effects 'short term' and 'tertiary education' slightly decrease, whereas the effect 'atypical field' is rendered insignificant.

The second set of models focuses on the question whether post-industrial indicators are relevant predictors of cross-national differences in the distribution of men and women across management positions (see table 6.11).

Table 6.11: Results (hierarchical logistic regression) for the division between management and non-management positions - post-industrial indices

	M5b	M6b	M6b_alt	M7b	M8b	M8b_alt
Intercept	-1.35***	-1.35***	-1.35***	-1.35***	-1.37***	-1.38***
	(0.11)	*(0.10)*	*(0.09)*	*(0.09)*	*(0.09)*	*(0.08)*
Fixed effects						
Individual level						
Women	-0.78***	-0.78***	-0.78***	-0.78***	-0.77***	-0.77***
(ref. men)	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*
Country level						
FER[a]	0.01	0.02	-0.02	0.00	0.00	-0.02
	(0.014)	*(0.02)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.02)*
Service[b]		-0.02			-0.01	
		(0.01)			*(0.02)*	
Public[c]			**0.07*****			**0.05***
			(0.02)			*(0.02)*
Length[d]				**-0.05*****	**-0.05****	**-0.03***
				(0.02)	*(0.02)*	*(0.02)*
Part-time[e]				-0.01	-0.01	0.00
				(0.01)	*(0.01)*	*(0.01)*
Cross level						
FER* women	0.01	0.01	-0.00	0.01	0.01	-0.00
	(0.01)	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*
Ser.* women		-0.01			-0.00	
		(0.01)			*(0.01)*	
Pub.*women			**0.02****			0.02
			(0.01)			*(0.01)*
Len.*women				**-0.02***	**-0.02***	-0.01
				(0.01)	*(0.01)*	*(0.01)*
PT*women				-0.00	-0.00	0.00
				(0.01)	*(0.01)*	*(0.01)*
Random effects)						
Var *(intercept u_{0j})*	0.24	0.22	0.15	0.15	0.15	0.12
	(0.08)	*(0.07)*	*(0.05)*	*(0.05)*	*(0.05)*	*(0.04)*
Var *($women_j$)*	0.03	0.03	0.02	0.03	0.02	0.02
	(0.01)	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*
Covar *(u_{0j}, $women_j$)*	0.05	0.04	0.02	0.02	0.02	0.01
	(0.02)	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.01)*

*p < 0.05, * p <0.01, ** p <0.001,***; standard errors are in parenthesis, N (individual level) = 250,237 for management vs. non-management positions, N (country level) = 21*
Notes: a) Female employment rate, b) Share of persons in the service sector, c) Female share in the public sector, d) Share of persons who stay longer than 20 years with the same employer, e) Share of part-time employment among all employed persons
Source: EULFS 2004/2005, own calculations

In this respect, the findings reveal that the additional indicator of female public sector employment (M6b_alt) affects the average distribution of persons

across management and non-management positions significantly. The positive effect indicates that there is an association between a country's share of women working in the public sector and the average share of persons in management positions. This significant and positive effect can also be found with respect to the observed cross-national variation in the gender slope ($=e^{0.02}$). In countries with a high share of women in the public sector, the average negative gender effect is reduced. Hence, women are more likely to be employed in management positions in those countries. Furthermore, the 'rigidity' of the labour market, measured as the share of persons staying longer than 20 years with the same employer, seems to be important (M7b). The results show a significant negative association between the share of persons staying more than 20 years with the same employer and the average share of persons holding management positions. Such a negative and significant association can also be observed for the cross-level interaction with gender. It indicates that in countries with a high share of persons staying more than 20 years with the same employer, women have a lower chance to be employed in a management position ($=e^{-0.02}$). In this context, the additionally-tested EPL index which is a more aggregate measure of labour market rigidity reveals an insignificant but also negative effect (see appendix, table A6.7).

When finally including all indicators into one model M8b, only the aforementioned effects of 'rigidity' (length and women*length) remain significant. However, this picture changes once the indicator 'service sector employment' is replaced with 'female public sector employment' (M8b_alt). In this case, only the average effects of 'female public sector employment' and 'rigidity' are still significant, whereas the significance of the cross-level interactions diminishes.

With regard to cross-national differences in the allocation of women and men across management positions, family and gender policies might be important additional explanation factors. In this context it has been argued that anticipated family responsibilities and discontinued working patterns are mainly responsible for the underrepresentation of women. Actual findings (see models M5c to M8c, table 6.12) partly support this argument: countries with particularly high childcare coverage for children aged 3-6 are interrelated on an average lower employment of persons in management positions ($=e^{-0.02}$). This effect is significant at the 95% level.A high coverage for children aged 0-3, by contrast, has an insignificant but positive effect. Adding a parental leave measure to the following model M6c, the former results reappear. Moreover, as the effect for generous parental leave is insignificant, this does not seem to influence the distribution across management positions. The gender empowerment measure (GEM), however, has a significant negative effect on the average distribution of individuals across management positions ($=e^{-1.93}$).

Table 6.12: Results (hierarchical logistic regression) for the division between management and non-management positions - family and gender policy indices

	M5c	M6c	M7c	M8c
Intercept	-1.37***	-1.37***	-1.37***	-1.37***
	(0.10)	*(0.10)*	*(0.10)*	*(0.09)*
Fixed effects				
Individual level				
Women	-0.77***	-0.77***	-0.77***	-0.77***
(ref. men)	*(0.04)*	*(0.04)*	*(0.05)*	*(0.04)*
Country level				
Child3[a]	0.006	0.007		**0.015***
	((0.007)	*(0.007)*		*(0.007)*
Child6[b]	**-0.015***	**-0.014***		-0.007
	(0.007)	*(0.007)*		*(0.007)*
Parent[c]		0.002		0.002
		(0.003)		*(0.002)*
GEM[d]			**-1.93***	**-2.56***
			(0.947)	*(1.123)*
Cross level				
Child3*women	**0.006***	**0.007***		**0.009****
	(0.003)	*(0.003)*		*(0.003)*
Child6*women	-0.004	-0.004		-0.002
	(0.003)	*(0.003)*		*(0.003)*
Parent*women		0.002		**0.002***
		(0.001)		*(0.001)*
GEM*women			-0.231	-0.762
			(0.436)	*(0.440)*
Random effects				
Var *(intercept u_{0j})*	0.20	0.19	0.20	0.16
	(0.06)	*(0.06)*	*(0.06)*	*(0.05)*
Var *($women_j$)*	0.03	0.02	0.04	0.02
	(0.01)	*(0.01)*	*(0.01)*	*(0.008)*
Covar *(u_{0j}, $women_j$)*	0.03	0.03	0.04	0.01
	(0.02)	*(0.02)*	*(0.02)*	*(0.01)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (individual level) = 250,237 for management vs. non-management positions, N (country level) = 21*
Notes: a) Childcare facilities for children aged 0-3, b) childcare facilities for children aged 3-6, c) Effective parental leave, d) Gender Empowerment Measure
Source: EULFS 2004/2005, own calculations

This outcome is interesting: in countries with a high gender empowerment, persons with a tertiary degree, on average, are less often employed in management positions. This negative effect can also be observed for the more sophisticated measures of gender empowerment, even though these effects are insignificant (see appendix, table A.6.8).

Turning to the question whether the selected family policy measures are also capable to explain part of the observed cross-national variation in the gen-

der slope, the cross-level interactions confirm some of the prior assumptions: particularly in countries with generous childcare support for youngest children (0-3), the average negative gender effect is reduced and women have a higher likelihood to be employed in a management position.

This effect also remains significant with the inclusion of parental leave which has an insignificant effect. The cross-level interaction of the gender empowerment measure is negative but insignificant. In this context, the more sophisticated measures of 'gender equality' also confirm this negative but insignificant association (see appendix table A6.8). However, when combining finally all indicators in one model M8c, some changes occur: the negative average effect of high childcare support for children aged 3-6 is rendered insignificant, whereas the average distribution of persons across management positions is positively and significantly associated with countries providing a high childcare support for the youngest age group. A negative effect comes to the fore when at the same time, a high gender empowerment is observable. With respect to the cross-level interactions, the already-discussed positive effect of childcare support for the youngest age group is intensified. Furthermore, the positive effect for parental leave becomes significant. This indicates that in countries with a high childcare coverage for youngest children, and with a generous parental leave system, the average negative gender effect is significantly reduced.

This also becomes visible when comparing the standard deviations of model M3 with those of M8c. The reduction by 0.02 indicates that the cross-national variation in the gender slope for being in a management position varies in 95% of the cases only between -0.49 and -1.05 instead of -0.37 and -1.17.

The last group of indicators (see models M5d to M7d, table 6.13) measuring societies' 'gender culture' shows that only one measure of the aspect of 'access' has a significant negative influence on the average distribution of employed persons across management and non-management positions. In countries with a high share of persons disagreeing that men's domain is work and women's the home and children, persons are on average less often employed in management positions ($=e^{-0.02}$). As to the aspect of 'motherhood', none of the selected measures has a significant influence, even though the negative signs point towards a lower average distribution of persons across management positions. With respect to the cross-level interactions and the question whether these indicators are also important for the explanation of cross-national differences in the gender slope, neither the measures of 'access' nor of 'motherhood' contribute to the understanding of cross-national variation in the gender slope. This also holds when all indicators are included in one model M7d.

Table 6.13: Results (hierarchical logistic regression) for the division between management and non-management positions - 'gender culture' indices

	M5d	**M6d**	**M7d**
Intercept	-1.37***	-1.37***	-1.37***
	(0.09)	*(0.10)*	*(0.07)*
Fixed effects			
Individual level			
Women	-0.78***	-0.77***	-0.77***
(ref. men)	*(0.05)*	*(0.05)*	*(0.04)*
Country level			
Right[a]	0.02		0.01
	(0.008)		*(0.01)*
Division[b]	**-0.02*****|		**-0.03*****
	(0.006)		*(0.006)*
Suffer[c]		-0.008	**0.02***
		(0.008)	*(0.009)*
Childcare[d]		-0.02	-0.01
		(0.011)	*(0.008)*
Cross level			
Right*women	0.003		0.001
	(0.004)		*(0.005)*
Division*women	-0.003		-0.006
	(0.003)		*(0.004)*
Suffer*women		0.001	0.007
		(0.004)	*(0.005)*
Childcare*women		-0.002	-0.001
		(0.005)	*(0.005)*
Random effects			
Var *(intercept u_{0j})*	0.15	0.22	0.10
	(0.05)	*(0.07)*	*(0.03)*
Var *($women_j$)*	0.04	0.04	0.03
	(0.01)	*(0.01)*	*(0.01)*
Covar *(u_{0j}, $women_j$)*	0.04	0.05	0.02
	(0.02)	*(0.02)*	*(0.01)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (individual level) = 250,237 for management vs. non-management positions, N (country level) = 21*
Notes: a) Right of women to work if jobs are scarce, b) Women=child and men=work, c) Child suffers if the mother works, d) Men should do more childcare
Source: EULFS 2004/2005, own calculations

6.4.3. Variance components - what does the institutional context explain?

Also for this segregation outcome, finally, the question should be raised whether the micro- and macro-level variables included in the analyses are able to explain the cross-national differences in the distribution of persons across management and non-management positions and the differences in the observed gender gap (see table 6.14). The variation at the macro level for the distribution across management and non-management positions is at a low level of 5% (M0). This implies that only 5% of the variance of the distribution of persons across management positions can be attributed to country-specific contextual factors. Nevertheless, it seems interesting that the selected indicator groups have quite different explanation power varying between 33% (family policy indicators) and 58% (cultural indicators). In this respect, particularly the 'gender culture' of countries but also 'characteristics of the educational system' seem to be central to the understanding of the general distribution of persons across management and non-management positions.

Table 6.14: Variance components (random slope models) for holding a management or non-management position

	1	2	3	4	5	6	7
Random Slope							
Var *(u_{0j})*	0.17 *(0.05)*	0.24 *(0.08)*	0.16 *(0.05)*	0.14 *(0.04)*	0.15 *(0.05)*	0.16 *(0.05)*	0.10 *(0.03)*
R^2	**5%**		**33%**	**42%**	**40%**	**33%**	**58%**
Var *($women_j$)*		0.04 *(0.01)*	0.03 *(0.01)*	0.04 *(0.01)*	0.02 *(0.01)*	0.02 *(0.01)*	0.03 *(0.01)*
R^2			**25%**	**0%**	**50%**	**33%**	**25%**
Covar *(u_{0j}, $women_j$)*		0.05 *(0.03)*	0.02 *(0.02)*	0.04 *(0.02)*	0.02 *(0.02)*	0.01 *(0.01)*	0.02 *(0.01)*

Notes: 1=zero model, 2=only individual-level variables, 3= individual+segregation regime variables, 4=individual+educational variables, 5=individual+post-industrial variables, 6=individual +family policy variables, 7=individual+gender culture variables
Source: EULFS 2004/2005, own calculations

With respect to the variance components of the random slope and cross-level interaction models, a different picture can be drawn. The results indicate that educational factors are less important for the explanation of the observed cross-national variance in the gender slope, while post-industrial and family policy indicators explain around 50% and 33% of the aforementioned variation in the gender slope.

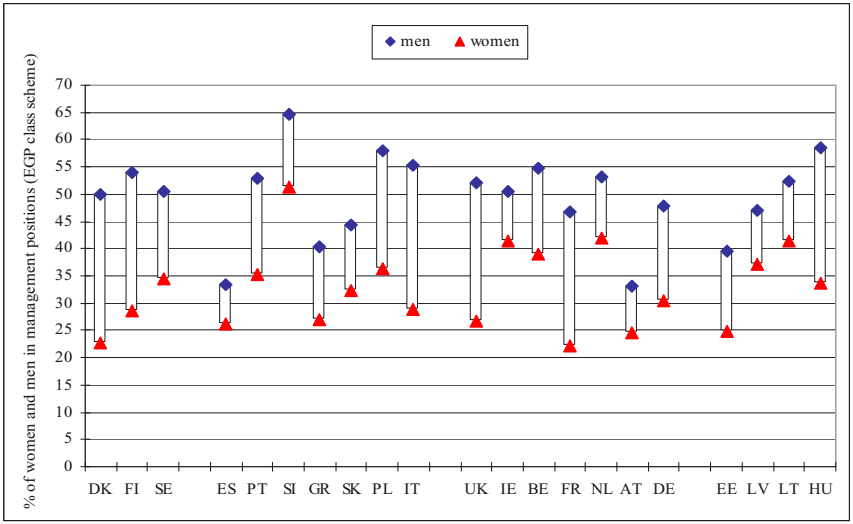
6.4.4. Sensitivity analyses applying a broader definition of management positions

As already indicated in this chapter, there is an ongoing debate on the level of comparability and standardisation of the classification of management positions across countries. On the basis of this debate, it may be argued that management and supervisory roles are not only to be found in occupations belonging to the ISCO88 group 1 but also in other occupations, like the professionals.[176] This seems of particular interest for the present analyses because it has been shown in chapter 4 that highly educated women are often represented in professional occupations. Therefore, it seems advisable to test whether the above-described findings can be confirmed on the basis of a broader definition of management positions. For this purpose, the EGP class scheme is used defining management/high-class positions as the so-called 'high service class I' (higher grade professionals, administrators, and officials; managers in large industrial establishments; large proprietors).

The bivariate descriptive results following from the broader concept of management positions reveal that, in comparison with the former definition (group 1 ISCO88), a higher overall share of men and women with a tertiary degree reaches management positions. Nevertheless, the differences between women and men remain. Only in some countries, like Estonia, Latvia and Slovakia, gender differences are reduced. In Ireland, Spain, Slovenia, Belgium, the Netherlands and Austria, however, the differences persist. In the rest of the countries, the distribution of men and women across management positions becomes more unequal.

[176] It should be pointed out that even official reports of the European Commission (2008) and the ILO (2007) concerning women's under-representation in management positions base their analyses on the ISCO88 group 1. However, as these institutions are also aware of the problem, they compensate the lack of comparable micro-data with additional, more detailed macro-data.

Figure 6.5: Percentage of women and men in management positions (EGP class scheme, tertiary degree, age 20-64), 21 EU Member States, 2004



Source: EULFS 2004/2005, own calculations

As the aim of the present sensitivity analysis is to test whether the already-described findings for the explanation of cross-national differences in the distribution of men and women across management positions can be confirmed also on the basis of a broader definition of management positions, only the results of cross-level interaction effects will be summarised and discussed in more detail (for a complete overview of the results, see tables A6.9-A6.14 in the appendix).

The modelling follows the same logic applied previously: the intercept and slope of the variable 'gender' are modelled as a function of the established macro-level characteristics: educational systems (table A6.10 in the appendix), post-industrial developments (table A6.11 in the appendix), family policies (table A6.12 in the appendix) and 'gender cultures' (table A6.13 in the appendix). The macro-level factors are group-wise introduced in order to identify the institutional features of countries which enhance or reduce vertical sex segregation.

Before turning to macro-level factors, the variance component (M0) and random slope (M2) models still confirm a systematic cross-country variation. However, the slightly reduced value (see table A6.14. in the appendix) indicates that only 3% of the country variation of the unequal distribution of persons

across management positions can be explained by contextual factors. With respect to individual level factors, most of the previous effects are confirmed. Only in the case of two effects - a higher tertiary degree and a male field of study - the signs change. Accordingly, persons with a higher tertiary degree and with a degree in a typically male field of study are more likely to be in management positions.

Turning to the defined sex segregation regimes, as a first set of macro-level factors, the findings for the cross-level interactions reveal that none of the defined sex segregation regimes is able to explain the cross-national variation in the gender slope (see table A6.9. in the appendix). This has already been observed in the previous analysis based on a narrow definition of management positions. With respect to the detailed analyses of selected macro-level factors, and the question in how far these factors are capable to explain part of the observed cross-national variation in the gender slope, the broader definition confirms the previous results that none of the selected educational and 'gender cultural' variables account for the cross-national gender variation in the distribution across management positions (see table A6.10 and A6.13 in the appendix). Also in the case of family policy measures, the selected variables are less relevant to the explanation of cross-national variation in the gender slope in comparison to the situation following from a more narrow management definition (see variance components table A6.14 in the appendix). This is additionally supported by the fact, that none of the previous effects (childcare, parent) remains significant (see table A6.12 in the appendix). Post-industrial measures indicate a similar development. The results for a broader definition of management positions show that the significance of the previous 'public' and 'rigidity' effects vanishes. However, including all post-industrial indicators in a final model (M8b, table A6.11 in the appendix), the previous insignificant and negative 'service sector' effect is strengthened. This indicates that countries with a growing service sector are significantly associated with a lower chance of women to be in a management position. Moreover, the previous 'rigidity' effect is rendered insignificant, while the insignificant effect of 'part-time' becomes significant. In this respect, however, the results seem to be driven by the high correlation between the indicators of 'service sector' and 'part-time' (see footnote 162 and appendix table A6.2). The significance cannot be confirmed when excluding one of the aforementioned indices from the analyses.

Against this backdrop, the sensitivity analyses indicate that only some of the results are also applicable to a broader definition of management positions. With regard to both definitions, educational and 'gender cultural' indicators are less meaningful for the explanation of cross-national variations in the vertical dimension of occupational sex segregation. However, with respect to the fin-

dings for post-industrial and family policy measures, the significant effects of the narrow definition are diminished.[177]

6.4.5. Summary

In sum, the findings for the vertical segregation outcome(s) reveal that part of the observed cross-national differences in the unequal distribution of men and women across management positions can be explained by the selected macro-level indicators. With respect to results for the narrow definition of management positions (first group of the ISCO88), neither educational nor cultural factors are influential, while family policies as well as post-industrial indicators are important. The findings for family policies reveal that the variation between countries in the distribution of women across management positions is significantly influenced by high childcare coverage for youngest children. It seems that countries offering generous childcare services for youngest children also tend to have more women in management positions. When including further indicators in the analysis, this effect is even strengthened in countries with generous parental leave schemes and a high gender empowerment. In this latter constellation, generous parental leave also contributes significantly to the explanation of the cross-national variation in the distribution of men and women across management positions.

As mentioned above, the cross-national variation in the gender slope is also significantly influenced by post-industrial measures. In particular, the 'rigidity' of labour markets seems to be crucial. In countries where a high share of persons stay longer than 20 years with the same employer, the average negative gender effect is strengthened. This mainly supports the assumption that a rigid labour market leads to a 'primary', predominantly male labour market segment that can hardly be accessed by women. A further significant factor is the female share in public sector employment. The result indicates that there is a positive association between a high share of women in public sector employment and a higher tendency of women to be employed in management positions. Even though no concrete assumptions have been expressed in this regard in the present study, this finding is in line with previous research (Blossfeld and Becker 1988, Becker 1993, Gornick and Jacobs 1998) suggesting that the public sector might serve as a comfortable female 'niche' where equal employment opportu-

[177] Very similar results can be observed when a concept is applied in the analysis that distinguishes between management (without ISCO88 group 2) vs. non-management positions on the one side, and professional vs. non-management positions (without ISCO88 group 1) on the other side.

nities are required by law. However, it is not surprising that the significance of this effect diminishes when 'flexibility' and 'rigidity' measures are included in the analysis. Part-time and/or temporary jobs are often assumed to be an obstacle to women's representation in management positions even in the public sector.

The sensitivity analysis has shown that the results for the vertical outcome have to be interpreted with caution. The observed results can only provide an answer to the question in how far contextual factors are able to explain the cross-national variation in women's and men's access to management positions in one specific occupational group. However, when 'management' is defined in a more functional and broader way (including, for instance, the occupational groups 1 and 2 of the ISCO88) the shortcomings of the used data, not allowing for an adequate operationalisation of management positions, come to the fore.

Even though the results do not confirm the conducted analyses of vertical sex segregation based on a narrow definition of management positions, it would be premature to conclude that the selected indicators are inappropriate for the explanation of cross-national gender variation. Instead, they should be tested on more detailed micro data offering detailed occupational variables as well as more variables measuring the work relation and the work context.

6.5. Discussion and conclusion

In this chapter, it has been investigated to what extent national institutional arrangements concerning the educational system, post-industrial developments, family policies and different 'gender cultures' affect the two dimensions of occupational sex segregation in 21 EU Member States. The central aim was to examine whether the cross-national variation in the distribution of women and men holding a tertiary degree across typically, atypically and integrated occupations as well as management and non-management positions, can systematically be related to the aforementioned contextual factors.

The descriptive overview reveals a strong significant gender effect for all analysed segregation outcomes: as expected, in comparison to men, women are over-represented in typically female occupations. Moreover, they are less often in management positions. The overview also shows that the extent to which women are distributed differently across occupations and management positions varies across countries. In other words, women's chances on the labour market in terms of occupational distribution and career prospects are determined by the institutional setting of a given national system. The challenge, therefore, is the identification of the reasons underlying these differences between countries.

Using multi-level analysis, three different segregation outcomes have been analysed: distribution across typically female occupations (feminisation), distribution across typically male occupations (masculinisation) and the distribution across management positions.

Horizontal inequalities - Feminisation of the labour market

As to the cross-national variation in the feminisation of the labour market, three institutional factors are of particular importance: the female labour force participation rate, the share of overall part-time employment and a high share of persons in society supporting the equal access of women to the labour market if jobs are scarce. With respect to the hypotheses drawn at the beginning of this chapter, H2a is confirmed insofar as the results show that in countries with a high female employment rate, women have a higher chance to be employed in typically female occupations (see following table 6.15).

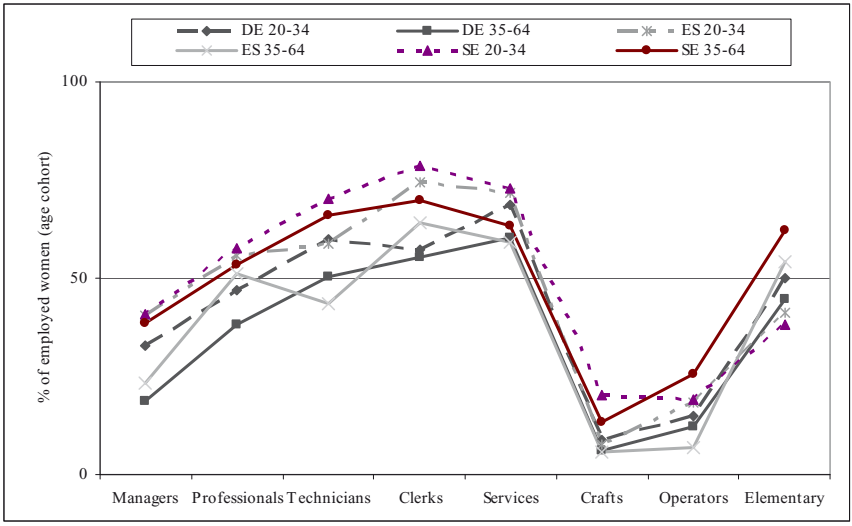
Table 6.15: Results for the hypotheses with regard to cross-level interactions

Hypotheses	**Feminisation**	**Masculinisation**	**Management narrow**
1a) Vocational	Positive / Negative	Negative / Positive	N.I.
1b) Tertiary	Positive / Positive	Negative / Positive	N.I. but Positive
1c/e) Atypial	Negative / Positive	Positive / Positive	Positive or Negative / Positive
1d) Short	N.I.	N.I.	Negative / Positive
2a) FER	Positive or Negative/ **Positive** ✓	Negative or Positive / Negative	Negative / Positive
2b/f) Service	Positive / Negative	Negative / Negative	Negative / Negative
2c) Public	Positive / Negative	Negative / Positive	N.I. but **Positive**
2d/g) Part	Positive / **Negative**	Negative / Positive	Negative / Negative
2e/g) Length	Positive / Positive	Negative / Negative	Negative / **Negative** ✓
2h) EPL	N.I.	N.I.	Negative / **Negative** ✓
3a/c) Child3	Positive / Positive	Negative / Positive	Positive / **Positive** ✓
3a/c) Child6	Positive / Negative	Negative / Negative	Positive / Negative
3b/d) Parent	Positive / Positive	Negative / **Positive**	Negative / **Positive**
3e) GEM	Negative / Negative	Positive / **Negative**	Positive / Negative
_add Prohi	Positive / Negative	Negative / Positive	Negative / Positive
_add Equal	Negative / Positive	Positive / Positive	Positive / Negative
4a) all aspects equal	Negative / not found	Positive / not found	Positive / not found
4b) all aspects vary	Positive / **Positive** and Negative	Negative / **Negative** and Positive	Negative / Positive and Negative

Note: The table can be read as follows: hypothesis/result (italic = insignificant, fat= significant, ✓ = hypothesis verified, N.I. no specific hypotheses has been indicated)

It is hard to determine in how far this process is driven by women increasingly entering already-existing typical female occupations (occupational niches), or a general increase in the feminisation of the labour market. However, the following figure 6.6 indicates that both factors might influence this development:

Figure 6.6: Patterns of occupational sex typing by age cohort, selected EU Member States (share of employed women, ISCO88 1-digit without agriculture), 2004



Source: EULFS 2004/2005, own calculations

Considering the occupational distribution of women in different age cohorts, integration and feminisation trends can be observed particularly in the non-manual labour market (managers, professionals, technicians, clerks and services). This is due to the fact that younger women are increasingly entering typically male occupations, thereby enhancing the integration of the labour market. They are also entering formerly 'integrated' occupations that are now tipping towards feminisation. Finally, they also choose already-existing female niches which become 'hyper-feminised'. However, the picture also shows that these trends apply to a lower extent to the manual sector of the labour market (crafts, operators and elementary occupations). Here processes of integration seem to be slower. For occupations like crafts and operators, a higher educational degree is not necessarily required. These considerations may additionally

indicate that, irrespective of the observed persistent level of horizontal sex segregation, there is constant occupational change in the labour market. The impression of stability might predominantly be due to the inadequate analysis of the phenomenon with an aggregated measure, such as the index of dissimilarity (see chapter 3 and 4).

With respect to a higher share of overall part-time employment, hypothesis H2c has to be rejected. The assumption that a high overall part-time employment also increases the feminisation of the labour market is not confirmed. Instead, the findings suggest that in countries with a higher overall share of part-timers, women are more often employed in integrated occupations. As already emphasised, this might be due to the fact that part-time is not so much stigmatised as 'typically female' in societies where part-time employment not only serves the inclusion of 'mothers' but also, for instance, the reduction of unemployment that would otherwise be higher.

As to the question in how far the 'gender culture' impacts on cross-national differences in the gender slope, it has been argued that various factors may be important. However, the results show that measures related to enhanced gender equality tend to have different effects on the feminisation and masculinisation of the labour market. Furthermore, the two aspects of 'access' and 'motherhood' which reflect a 'general' awareness of gender equality, point in different directions in both analyses of horizontal sex segregation. This contradicts hypothesis H4a, according to which countries with a high 'general' awareness of gender equality should distribute women and men more equally across occupations. In respect of the distribution of women across typically female occupations, particularly the indicator of 'equal' access has a positive significant effect. It seems that the feminisation of the labour market is associated with countries where a high share of persons disagrees that men have more right to work if jobs are scarce. Even though the result is not in line with the expectations, it seems plausible when critically assessing the indicator. Apparently, it captures an overall attitude of 'gender equality' in society rather than women's equal right to work in typically male occupations.

Horizontal inequalities - masculinisation of the labour market

With respect to institutional characteristics supporting desegregation tendencies and women's access to typically male occupations, different factors prove to be crucial. First, factors belonging to the area of family policy play a decisive role. When all family measures are considered, the results indicate that countries with a generous parental leave system are associated with a higher chance of women

to be employed in typically male occupations, whereas the opposite effect can be observed for the gender empowerment measure. This contradicts the expectations formulated in H3b and H3e. However, the result for the gender empowerment measure becomes understandable when considering that the empowerment of women often takes place in typically female areas of the labour market. Women's empowerment as such, therefore, does not necessarily open male occupational domains.

The second group of crucial factors concerns the 'gender culture'. In a highly 'equalised' nation, the different aspects of gender equality affect the distribution of women and men across occupations differently and sometimes with contradictory effects. With respect to the masculinisation of the labour market, the study has shown that a higher share of persons questioning the traditional division of working spheres of men and women (one 'access' indicator), is not automatically accompanied by a higher integration of women into typically male occupations. Again it becomes apparent that an attitude promoting the equal division of tasks between men and women need not necessarily facilitate women's access to typically male occupations. It may simply be the product of given individual circumstances and needs rather than a reflection of a general higher belief and awareness of gender equality.

Vertical inequalities - management positions

With respect to the vertical aspect of occupational sex segregation, post-industrial and family policy indicators are central to the question why countries differ with respect to the distribution of men and women across management positions. The analyses, for instance, show that the rigidity of the labour market is a crucial factor for the explanation of the observed cross-national variation in the unequal distribution of women and men across management positions. This supports H2g and the assumption that rigid labour markets are divided into a 'primary' and a 'secondary' segment. Women who have difficulty in entering the 'primary' market face lower career prospects. A further interesting finding is related to female public sector employment. It seems that countries with a high female participation rate in the public sector are likely to offer women an occupational career 'niche'. However, the inclusion of flexibility and rigidity measures renders this effect insignificant. This indicates that, even within such a 'niche', part-time employment and high job security are counteracting forces to female careers.

With respect to family policy measures, childcare provision for youngest pre-school children appears to be associated with a higher representation of

women in management positions which confirms H3c. However, when considering all family policy factors, also generous parental leave seems to have a positive association with a higher share of women in management positions. This contradicts the expectations expressed in H3d. However, the outcome might indicate that, in combination with appropriate childcare facilities, the option to stay longer out of the labour market loses its attractiveness for highly-educated women. Even though the underlying causality cannot be examined adequately with the available data, the findings suggest that countries with generous childcare facilities for youngest children have more success in offering career-oriented women the possibility of reconciling career development with a family. This is an important policy finding because it shows that systems which support female high potentials seeking to combine work and family are likely to have lower levels of vertical segregation.

Concluding remarks

In conclusion, the analysis has shown that the extent to which women and men focus on different occupations and positions on the labour market varies significantly across countries. In some national contexts, there is a much closer association between sex and occupation, while in other contexts this link is somewhat weaker. The strength of the association itself reflects the individual national setting. Key features of national institutional contexts are found to shape the distribution of women and men across occupations and management positions. In this respect the chapter confirms the importance of distinguishing between different dimensions of occupational sex segregation. For each dimension, a different set of macro-level factors is central to the explanation of cross-national differences with respect to sex. Feminisation tendencies are, for instance, associated with post-industrial developments, while family policies may facilitate women's access to male-dominated occupations. The situation of women in management positions is particularly shaped by post-industrial factors.

In this context, it is also important to recognise that, as in the case of 'gender cultural' factors, one measure might encourage the masculinisation and the feminisation of the labour market simultaneously. Furthermore, while some of the selected factors can be employed to reduce horizontal segregation, they might at the same time have the opposite effect on the vertical aspect. This interplay of factors has to be taken into account when policy makers are calling for a fundamental reduction of occupational sex segregation without distinguishing the different dimensions and influence factors underlying the phenomenon.

Finally, the limits of the analyses have to be mentioned. With respect to the findings concerning a country's 'gender culture', it remains unclear whether positive attitudes towards gender equality lead to a higher sensibility with regard to gender equality in society. These attitudes are measured by the two distinct aspects of 'access' and 'motherhood' in the current analyses. The observed divergent attitudes even within these two aspects might be the result of given realities which persons are facing in their work and family lives rather than the cause of a higher awareness of gender inequality. This might also be due to the fact that cultural beliefs about the appropriate role of women and men within society, as mentioned above, vary from person to person and can hardly be summarised in one common definition or notion of gender equality. While one person might regard women's labour market participation per se as an important step towards gender equality, a feminist may have more radical visions of a 'gendered' labour market.

A further problem arises with regard to the vertical analyses. It concerns the lack of comparable micro data enabling a standardised definition of management positions. The applied alternative operationalisation following the EGP class scheme is problematic because the EULFS data include occupational categories on an ISCO88 level that is less detailed than required. Furthermore, the EULFS lacks information on a number of important subordinates which are important for an appropriate application of the class scheme (for a detailed application, see Ganzeboom and Treiman 1996). As a consequence, the results of the vertical outcome have to be interpreted with caution. In this respect, detailed micro-level analysis on the basis of more detailed data would be needed.

Furthermore, it has to be underlined that the present study describes the aggregated results of rather complex personal selection processes which are embedded in an individual social context as well as a specific institutional framework. Therefore, the potential for disentangling the interplay of these factors and understanding cross-national differences is limited. With the analytical strategy adopted in this chapter, and the cross-national data used, it is not possible to scrutinise the complex processes occurring at the individual level that lead to the observed segregation patterns within a country. Such detailed micro-level analyses may be conducted in future research, especially including a wider variety of individual level variables devoting particular attention to the interrelation between educational choices and occupational segregation outcomes.

"It is the masculine values that prevail. Speaking rudely, football and sport are important; the worship of fashion, the buying of clothes 'trivial'... This is an important book, the critic assumes, because it deals with war. This is an insignificant book because it deals with feelings of women in a drawing-room ... everywhere and much more subtly the differences of values persists."
- Virginia Woolf -

7 Conclusion

As indicated at the beginning of this study, increasing egalitarian principles in society as well as the post-industrial restructuring of labour markets have offered women access to both the educational system and paid labour. Even though 'primary' sex segregation ceased to exist due to these developments, the phenomenon has survived in today's labour markets. In varying shapes, horizontal as well as vertical sex segregation can still be observed in EU Member States. The changing facets of the phenomenon seem still influenced by the two deeply-rooted ideological principles of *'gender essentialism'* and *'male primacy'* (Charles and Grusky 2004) which rest on women's 'exclusion' as an organising principle.

The 'exclusion' of women from specific domains in the labour market might often be less obvious and visible. Developments which, on the one hand, foster gender egalitarian principles on the labour market, may support new forms of occupational sex segregation on the other hand. As a consequence, even though occupational sex segregation proves to be a universal phenomenon, its multi-dimensionality frustrates attempts to capture it in a single parameter. For the understanding of different national patterns of occupational sex segregation, it is central to recognise that these patterns mirror individual preferences as well as nation-specific institutional constraints.

S. Steinmetz, *The Contextual Challenges of Occupational Sex Segregation,*
DOI 10.1007/978-3-531-93056-5_7,

7.1. Summary of the main findings

Against this background, the main purpose of this study has been twofold: First, it aimed to draw a detailed picture of the status quo and recent developments in horizontal and vertical occupational sex segregation during the time period from 1995 to 2004 for EU Member States. Second, it sought to explain cross-national differences by clarifying how factors related to educational systems, post-industrial restructuring, family policies and 'gender cultures' impact on sex segregation processes. The overarching objective, therefore, was to arrive at a more appropriate and comprehensive understanding of institutional determinants of sex-specific occupational allocation processes.

The assumption that institutional characteristics of societies steer sex segregation processes on the labour market is by no means new. However, most scholars focused either on a broad theoretical conceptualisation or on empirical evidence with regard to single institutional factors, such as family policies or post-industrial developments (Nermo 2000, Charles and Grusky 2004, Estévez-Abe 2005). A theoretical and empirical model combining various macro-level factors, while also considering individual characteristics, was lacking. To fill this gap, a refined picture of micro- and macro-level processes as well as their interrelation, shaping the occupational allocation of men and women, has been drawn in this study by examining the different theoretical explanations of occupational sex segregation (*chapter 2*). This exercise testified to the complexity and multi-dimensionality of the phenomenon, and furthered the understanding of underlying macro-level mechanisms that enhance cross-national differences.

Besides the development of a sound theoretical concept, the methodological problem of measuring occupational sex segregation has been addressed (*chapter 3*). As the use of single number indices can be an appropriate starting point for the understanding of sex segregation patterns, it has been emphasised that the concept of occupational sex segregation has to be clarified theoretically and methodologically. This has been demonstrated, along the lines of experiences in mobility research, by distinguishing between the aspects of 'sex-typing' and 'occupational chances' as distinct but correlated aspects of segregation. The resulting theoretical differentiation allowed the allocation of already-existing indices to the distinct aspects of occupational sex segregation. On the basis of this approach, it could be concluded that, in particular, the marginal dependency of traditional indices becomes irrelevant and that the search for the 'right' measurement (i.e. the selection of the adequate index) largely depends on the focus of interest (i.e. the horizontal or vertical dimension of occupational sex segregation).

Against this theoretical and methodological background, *chapter 4* provided a detailed overview of the developments in respect of both dimensions of occupational sex segregation in Europe until 2004. The overview was placed in the context of women's increasing access to higher education and paid work, and devoted attention to changing institutional contexts. Results of previous studies have been taken into account that concern similarities of sex segregation patterns across Europe and the persistence of occupational sex segregation over time. It has been shown that the traditional differentiation between typically female and male occupations continues to exist. Women still constitute the majority of clerical, service and sales workers, while men remain the dominant sex among skilled production workers and machine operators. This pattern can be found in all EU Member States to a varying extent. In addition, it has also been revealed that further aspects, like 'working time' and 'sector of employment' are strongly related to segregation processes by sex. Women are rather concentrated in the service and public sector, and strongly directed to typically female occupations if they work part-time.

With respect to changes over time, the use of single indicators gave evidence of the high stability of the phenomenon between 1995 and 2004 in most countries. However, as segregation indices are inherently limited, this does not imply that no changes occurred. By contrast, when assessing patterns of occupational sex segregation across age cohorts, two developments can be identified: women increasingly entered typically male occupations, thereby strengthening integration tendencies. At the same time, however, they supported feminisation tendencies by also continuing to enter typically female occupations (see section 6.6.). This trend can also be observed at an earlier stage with respect to educational sex segregation (see section 4.1.2.). In chapter 4, it has also been shown that the unequal distribution of men and women across occupations becomes more problematic when it is accompanied by vertical sex segregation disadvantaging women with respect to income, occupational status and career prospects. In fact, the examination of the vertical dimension of occupational sex segregation confirmed previous findings concerning women's underrepresentation in top positions of the labour market from a cross-national perspective. As management positions are only one side of the coin, women's access to high-status positions has been examined as well. The results revealed that, in general, women are overrepresented in high-status positions in all countries. However, this advantage diminishes when differentiating between manual and non-manual occupations showing that the gender status gap, particularly in non-manual occupations where women are generally overrepresented, is high in nearly all countries. These findings reflect the fundamental vertical gender differentiation and the fact that women, generally, reach positions with a relatively good occu-

pational status, whereas men are to be found particularly in very high and low status positions. Finally, the developments of important contextual factors and their interrelation with occupational sex segregation have been presented. The analysis shows that the selected institutional factors are central to the explanation of cross-national variations. In this vein, it has also been demonstrated that the application of a multi-dimensional approach, distinguishing between horizontal and vertical dimensions, is of crucial importance because macro-level factors seem to affect the two dimensions of occupational sex segregation differently.

To assess the potential of the selected factors for establishing country groupings, a refined sex segregation typology has been developed in *chapter 5*. Based on a cluster analysis, four distinct sex segregation regimes (modernised, conservative, traditional and post-communist) could be identified. Even though results of previous studies could be confirmed by and large, some deviations became apparent with regard to the placing of former CCE countries. A joint clustering of these countries proved to be unrealistic. It seems that the development with respect to occupational sex segregation is shaped by the regional embedment of theses countries. While, for instance, Slovenia, like Italy and Greece, belongs to the traditional sex segregation regime, Estonia clusters together with Latvia and Lithuania in the post-communist regime. Furthermore, it could be demonstrated that the newly-defined typology is quite stable over time, even though the exclusion of single indicators leads to the reallocation of some countries from the heterogeneous conservative sex segregation regime to another sex segregation regime.

Against this theoretical and descriptive backdrop, a number of hypotheses were formulated about the influence of educational system characteristics, post-industrial developments, family policies and gender cultures on cross-national variation in the distribution of women and men across occupations and positions. These hypotheses were then tested empirically in a large-scale analysis covering 21 EU Member States (*chapter 6*). A multi-level design applied for the purposes of this large-scale analysis offers a significant methodological improvement over the research that has been conducted in this field so far. By including variables capturing the micro- and macro-level characteristics of countries into a single empirical model, as undertaken in the present study, the hypothetical influence of these characteristics on segregation outcomes of women and men can be assessed directly by taking into account the nested sources of variability.

With regard to the results of individual analyses, reference is made to the respective summaries at the end of each section. In the following section, however, the findings are merged in order to draw a complete picture of gender ine-

qualities on the labour market and the impact of the structural and institutional set up of European countries. Above all, the contextual challenges will be brought into focus. These challenges concern the organisation of the educational system, the post-industrial development, family policy and the gender culture. EU Member States seeking to attain higher 'gender equality' on the labour market have to deal with these contextual challenges.

7.2. Contextual challenges of horizontal and vertical occupational sex segregation

7.2.1. The role of the educational system

As emphasised in chapter 2, the influence of educational system characteristics on occupational sex segregation has often been discussed theoretically. However, it has hardly ever been analysed in more detail. In the framework of this study, therefore, the attempt has been made to clarify whether education system characteristics, like vocational participation, short-term courses, tertiary participation and atypical fields, are able to explain cross-national variability in gender inequalities horizontally and vertically. In both cases, however, the results demonstrate that the selected educational indicators do not contribute to the understanding of cross-national variability in the field of gender inequalities. This finding might indicate that the cross-national variation of occupational sex segregation is much more attributable to individual choices with respect to field of study and level of tertiary degree than to system-related characteristics. This might particularly hold for the present analyses where the focus of interest has been on tertiary graduates.

Nevertheless, the role of the educational system as a stratification machine should not be underestimated. When considering the variance components of educational factors for the 'average distribution' of persons across occupations and positions, which was not the primary focus of this study, the results indicate that educational system characteristics may be an important factor for the explanation of cross-national variety in the average distribution of persons across occupations and positions. However, the findings also reveal that for the clarification of the interrelation between educational and occupational sex segregation, further research is needed.

7.2.2. The role of post-industrial developments

Based on previous findings (Nermo 2000, Charles 2005), it was assumed that post-industrial developments are important for the explanation of cross-national differences in both dimensions of occupational sex segregation. In this respect, the expectations have been confirmed that "…sex segregation far from being an ascriptive holdover, is actively advanced by dynamics that are integral to the functioning of contemporary labour markets" (Charles and Grusky 2004: 298).

The findings of the study have shown that cross-national differences in the distribution of women and men across typically female occupations and management positions is particularly shaped by post-industrial factors. Different factors strengthen the two dimensions of occupational sex segregation. Feminisation trends on the labour market seem to be strongly associated with an increase in female employment. As indicated in chapter 6, even though the driving forces are hard to disentangle, both an increase of women entering already-existing typical female occupations and a general increase in the feminisation of various occupations seem to be decisive. In this context, it is interesting that parallel observable flexibility trends, such as enhanced part-time options, are not necessarily related to the feminisation of the labour market. Therefore, the assumption could not be confirmed that a higher share of part-time options strengthens particularly horizontal inequalities. When considering recent developments in EU labour markets, this result might become understandable. Part-time options need not exclusively serve the purpose of bringing more women into paid work, but may also be offered to solve other labour market problems like, for instance, higher overall unemployment.

With respect to cross-national differences in the vertical dimension of occupational sex segregation, the rigidity of labour markets seems to be important. Countries where the labour force is divided between a 'stable' primary and a 'fluctuating' secondary segment seem to be associated with greater gender inequality in terms of career options. Furthermore, an interesting result came to the fore with regard to female public sector employment. Even though the effect vanishes with the inclusion of flexibility and rigidity measures, there is some evidence that at least in some countries, this area of the labour market offers women better career options. In sum, the study demonstrates growing evidence that the functioning of modern labour markets is associated with the erosion of some forms of sex segregation, while it simultaneously exacerbates others. Even with evolving egalitarian principles, it seems that both developments can coexist (Jackson 1998).

7.2.3. The role of family and gender policies

In the present study, it has been emphasised that national policy makers have various options to support and enhance gender equality on the labour market and reduce occupational sex segregation. Besides anti-discrimination legislation, various national state interventions related to childcare, parental leave and family taxation systems also influence segregation processes. The present study has also revealed that family policies are important to the explanation of cross-national differences in occupational sex segregation. Particularly in respect of the vertical dimension, the results imply that equalising processes are associated with childcare and parental leave policies. Even though these findings seem to be plausible, particularly for female tertiary graduates, it should be underlined that the causal mechanisms cannot be identified adequately.

With respect to the surprising finding that, against the expectations, a higher gender empowerment does not lead to the opening of typically male occupations for women, it can be criticised that the GEM indicator employed in this context constitutes a rather vertical measure. It includes particularly factors which refer to women's power in terms of income and high status positions. These outcomes, however, may also be realised in typically female or integrated domains. Gender empowerment in these domains need not necessarily contribute to the opening of male fields.

7.2.4. The role of the 'gender culture'

As the shape of the labour market mirrors cultural beliefs about appropriate gender roles, it has finally been assumed that the 'gender culture' of societies might also be crucial to the understanding of cross-national variability in occupational sex segregation (see also England et al. 1994, Crompton and Harris 1997, 1998). In this context, it has been argued that particularly the coherence of attitudes concerning different aspects of gender equality ('access' and 'motherhood') is important: it might indicate a 'common' perception of gender equality within society. The results of the variance component analyses confirm that the selected indicators (particularly those related to the aspect of 'access') contribute to the explanation of cross-national variability in occupational sex segregation. However, they also show that a high individual perception of 'gender equality' does not automatically guarantee reduced levels of occupational sex segregation. Furthermore, it seems that even within the different aspects of 'access' and 'motherhood', divergent segregation effects can occur. For instance, it became apparent that countries are more often associated with women's em-

ployment in typically male occupations if the majority in these countries disagrees that men should have more right to work if jobs are scarce. The same effect, however, also seems to be associated with feminisation trends. Hence it might be argued that a 'common' perception of gender equality within a given society does not really exist. It seems rather that even with a growing liberal state egalitarianism, individuals are not prevented "…from understanding their own competencies and those of others in terms of traditional visions of 'masculinity and femininity'." (Charles and Grusky 2004: 302). This means that individual choices with respect to occupations and career options are influenced by the direct 'social' surrounding, i.e. parents, friends, peers etc. who create a common frame of perceived possibilities. If this 'frame' still provides a traditional view of women and men's role in society, it becomes understandable that an abstract 'state-driven' definition of gender equality does not automatically lead to an acceptance of the phenomenon in society.

7.3. Open questions and future research

The clarification of one research topic often triggers new, still unanswered questions. In this respect, the present study is no exception. As emphasised at the outset, for a full understanding of segregation processes and cross-country differences, individual level factors impacting on occupational and career decisions have to be related to the broader social and economic context within a given society (Chafetz 1990, Molm 1993, Buchman and Charles 1995, Orloff 1996). The current study has mainly addressed the question in how far selected contextual factors produce specific gender stratification systems. It provided insights into the variability of occupational sex segregation by painting a global picture of gender inequality in different societies. However, less attention has been devoted to the question in how far these factors affect mechanisms underlying individual selection processes within countries. To enhance the understanding of the interaction between cultural beliefs, institutional manifestations and individual preferences, detailed country analyses with rich micro data are needed. With these instruments, country comparisons could also bring to light the reasons for differences or similarities in cross-national segregation patterns in more detail.

With respect to open questions that are closely linked with the current findings, there is a need to analyse more systematically the interrelation between education and occupational sex segregation (Smyth 2005, Reimer et al. 2008, Smyth and Steinmetz 2008, Reimer and Steinmetz 2009). So far, sociological studies have shown that countries differ in the way in which they match the output of the educational system to the demands of the labour market (Maurice,

et al. 1986, Allmendinger 1989; Shavit and Müller 1998). However, the aforementioned literature does not explore how, for instance, differences in the field of study or the type of degree influence horizontal and vertical segregation outcomes on the labour market. This link, moreover, is not explicitly addressed from a cross-national perspective that takes the characteristics of the educational system into account. In this context, it would be of particular interest to examine the extent to which the different mechanisms of '*pre-sorting', 'post-sorting'* and *'reintegration'* described by Borghas and Groot (1999) differ across countries.

As post-industrial developments turned out to be essential to the explanation of cross-national differences in the two dimensions of occupational sex segregation, it would be interesting to enhance the understanding of the influence of macro-level factors on individual occupational allocation processes within single countries. In this respect, particularly the (vertical) consequences of the interrelation between an increase in female labour market participation and feminisation trends needs further investigation. On this basis, it would become possible to test whether 'devaluation' trends of occupations occur if women enter them increasingly. A question that is closely related to this aspect concerns the role which different employment sectors play in enhancing or reducing occupational sex segregation. According to the present study, there is some evidence that the public sector may serve as a female 'niche' which is associated with better career prospects for women. Furthermore, as the study focused on tertiary graduates, mainly segregation patterns of the non-manual (service) sector have been clarified. However, it may be questioned whether, the results apply to the same extent when analysing the still male-dominated (manual) sector where higher education is not necessarily required. Finally, it should be underlined that, with post-industrial restructuring being essential for the understanding of cross-national differences in occupational sex segregation, future research should not only devote attention to the supply but also to the demand side of the labour market. In particular, there seems to be a need to explore in more detail whether, and to which extent, organisational structures and internationalisation processes of firms work for or against sex-segregated labour markets.

With respect to the findings related to the explanation power of family and gender policies, it seems important to analyse in more detail whether the 'childcare' effect holds also in case of a more precise measure of management positions. Furthermore, with more detailed data of the various types of childcare support, it might also be possible to study, at least for individual countries, how occupational allocation and career processes are influenced by the availability and quality of different childcare facilities. In this context, there is also a need to investigate in how far firm-intern gender equality programs are able to support

women not only in reconciling work and family matters but also in developing their career.

For societies' *'gender culture'*, the study confirmed that it is important to consider how gender ideologies and pre-existing systems of gender relations structure societal areas like the labour market, the educational system and the welfare state (Charles 2005). The analyses conducted in the framework of this study, however, could also give rise to further examinations. In particular, the relation of cultural beliefs about the adequate role of women and men in society with patterns of occupational sex segregation should be analysed in more detail. It would be worthwhile to clarify in how far gender beliefs restrict the individual choices of educational and occupational options of women and men. Furthermore, there is a need to analyse in which way and through which factors individual gender beliefs are created. In this respect, a country comparison could also shed light on the impact of different forms of state egalitarianism on individual gender beliefs and sex segregation outcomes. By the same token, it would be interesting to view demand side processes through a cultural lens. As indicated in chapter 2, employers may seek to reduce costs by favouring men (or women) for certain jobs. Research in this area suggests that such processes are often based on cultural beliefs concerning gender-appropriate roles. In this context, much attention has been devoted to 'discrimination' against women. However, there is a need for more research on the extent to which employers' prejudices may hinder men from taking over more family responsibilities.

Finally, questions evolving out of data and methodological limitations should be addressed. The European Labour Force Survey (EULFS) on which the principal large-scale descriptive and multivariate analyses of the present study were based, has been selected because it offers a comprehensive European coverage, large sample sizes and cross-country comparability. In consequence, it became possible to trace the main contours of sex-segregated labour markets in EU Member States - a task which could hardly have been fulfilled with any other data set. However, one important limitation of the EULFS is its restricted level of detail with regard to core variables.[178] In segregation research, scholars (see chapter 3) have underlined that for a proper analysis, at least information on the ISCO88 3-digit is required. Only on such a detailed level, gender inequalities can be identified adequately, particularly from a vertical perspective. A related, already addressed problem is the operationalisation of the vertical dimensions of occupational sex segregation (see chapter 6). In this respect, the application of the ISCO88 group 1 as an adequate representation of management positions is questionable because a standardised definition across countries is

[178] The limitation of the EULFS is largely due to the way in which the data have been delivered by Eurostat at the time of writing this study.

missing. The employment of the EGP class scheme as an alternative, however, also has its shortcomings. Due to the fact that the ISCO88 2-digit only allows for an aggregated application of the EGP class scheme, and information on central variables is incomplete, underlying facets of gender inequality might not have been brought to light by the current analyses.

A further weakness of the data results from their exclusively cross-sectional nature. In this regard, the analyses have provided only aggregated snap-shots of gendered labour market outcomes at a specific point in time. As emphasised above, it is not possible to empirically address the underlying individual career decisions or approach the outcomes from a dynamic perspective while using these data as a single source. Data sets like the European Community Household Panel (ECHP) or the European Union Statistics on Income and Living Conditions (EU-SILC) might allow a dynamic perspective. These sources, however, have the same or other limitations when it comes to the analyses of gender inequalities.

7.4. Political implications

As gender equality in society and the labour market is high on the agenda of European policy makers, the findings of this study should finally be placed in a broader political context. It seems that the European Union, striving for a growing and competing economy on the one hand, and a more 'gender equal' labour market on the other hand, is trapped in an inherent conflict of objectives that cannot be solved easily.

As this study has shown, while the EU develops and supports desegregation and gender equality measures within its Member States, the liberalisation of the labour market does not necessarily contribute to removing gender inequalities in terms of horizontal and vertical occupational sex segregation. Accordingly, it seems advisable to reflect on the extent to which the aforementioned divergent objectives mirror two underlying and interrelated problems of EU gender equality policy. The first problem arises from the vagueness of the term 'gender equality' and the absence of a definition that is shared by all EU Member States. It seems clear that changing the gender structure of the labour market and eliminating obstacles to individual free and informed choices in 27 EU Member States is an ambitious project that is likely to imply a very slow process. As the status of women in the labour market is in so many ways tied to nation-specific history and culture, the commitment of Member States to gender equality must be strong and consistent, and be based on a clear formulation of aims.

The way in which the issue has been addressed so far gives rise to the further problem that the topic of gender equality is mainly treated as a quantitative problem. During the last decades, political ambitions sought primarily to change the mere number of men and women in sex-segregated labour market areas by various policies, laws and state-financed projects. However, it is questionable whether 'equality in employment' can be reduced to the mere increase of the female employment rate and the equalisation of the number of men and women in a given workplace. Furthermore, it is doubtable whether these ambitions can really be taken as a guarantee of more gender-equal relations and practices.

When seriously addressing the topic of 'equal opportunities', it seems indispensable not to confine the term to the 'level of employment', but to attach the same importance to aspects of 'quality', 'intensity' and 'continuity' of employment. In this context, the term 'quality' is used as a synonym for different aspects of sex segregation, including the social standing of jobs which women typically attain during their life course, the status and prestige they acquire, and the income they receive. In this line of reasoning, changing the sex-segregated labour market is also a question of how 'women's and men's work' is valued and perceived in society. As long as typically female occupations are regarded as less worthy, and skills required by many typically female jobs are not perceived as skills but as 'natural' female characteristics, women's entry in male domains is accompanied by a devaluation of occupations (Reskin and Roos 1990, Cohen and Huffman 2003). Men crossing the gender border are either 'punished' in terms of salary and cultural prejudices or advantaged by riding the 'class escalator' (Williams 1992, Heintz et al. 1997). In consequence, the establishment of a more equal labour market seems out of reach.

Furthermore, it has been demonstrated that the kind of work and the positions available for women are often linked with the dimension of job 'intensity'. This refers to the increasing need for flexibility and deregulation of labour markets in a globalised world that is measured through the number of hours employees typically work and the contracts they hold. In this respect, part-time work has been regarded as a promising way of enhancing female labour market participation while allowing the reconciliation of work and family responsibilities. Even though this study has revealed that part-time work does not directly support the feminisation of the labour market, it is, nonetheless, obvious that part-time measures impact negatively on the vertical dimension of occupational sex segregation. They are likely to limit women's career options.

The third dimension concerning the 'continuity' of work is closely related to the previous aspect. It raises the question of employment interruptions during women's life-course, and the way in which their labour-market participation is affected by familial burdens. When aiming to fully realise the potential of Euro-

pean workforce productivity, it seems essential to promote women's long-term participation in the labour market. Therefore, it has to be ensured that women, as well as men combining work and family duties, are not directed to the 'secondary' labour market or specific female niches. In this context, the findings of the present study indicate that appropriate childcare facilities are an important factor, particularly with regard to the vertical dimension of occupational sex segregation. However, it should be pointed out that, besides allowing women to reconcile a career with family responsibilities, reforms seeking to shift care into the paid economy can also increase gender inequality when, because of unchallenged gender roles, resulting jobs in the care sector are predominantly taken by women and badly paid for this reason.

In sum, it should be pointed out that the interplay of these dimensions is of particular importance. Strategies of tackling gender inequalities must always be considered in a broader context. Isolated political attempts to cope with the phenomenon will hardly ever produce meaningful and lasting results. If, for instance, women are encouraged to choose occupations in technical fields, while considerable discrimination at the workplace continues with regard to career options, results are likely to have only partial success when the problem of unequal career prospects does not receive simultaneous attention. Hence, only a comprehensive consideration of the various aspects of inequality will guarantee the equal treatment of the future female workforce in the labour market, as envisioned by the EU.

Appendix

1. General:

A) The ISCED97 classification (for secondary and tertiary education)

The **International Standard Classification of Education (ISCED)** is designed to serve as an instrument suitable for assembling, compiling and presenting comparable indicators and statistics of education both within individual countries and internationally. It presents standard concepts, definitions and classifications. ISCED covers all organized and sustained learning opportunities for children, youth and adults including those with special needs education, irrespective of the institution or entity providing them or the form in which they are delivered. It provides an integrated and consistent statistical framework for the collection and reporting of internationally comparable education statistics (see http://www.unesco.org/education/information/nfsunesco/doc/isced_1997.htm.)

In this study the following categories of the ISCED97 classification are used:

Level 5 - First stage of tertiary education

This level consists of tertiary programmes having an educational content more advanced than those offered at levels 3 and 4. Entry to these programmes normally requires the successful completion of ISCED level 3A/B or a similar qualification at ISCED level 4A.

- **ISCED level 5A:** programmes that are largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programmes and profession with high skills requirements.
- **ISCED level 5B:** programmes are typically shorter than those in 5A and focus on occupationally specific skills geared for entry into the labour market, although some theoretical foundations may be covered in the respective programme. The content is practically oriented/occupationally specific and is mainly designed for participants to acquire the practical skills, and know-how needed for employment in a particular occupation or trade or class of occupations or trades - the successful completion of which usually provides the participants with a labour-market relevant qualification.

Level 6 - Second stage of tertiary education

This level is reserved for tertiary programmes which lead to the award of an advanced research qualification. The programmes are therefore devoted to advanced study and original research and are not based on course-work only. It typically requires the submission of a thesis or dissertation of publishable quality which is the product of original research and represents a significant contribution to knowledge. It prepares graduates for faculty posts in institutions offering ISCED 5A programmes, as well as research posts in government, industry, etc.

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B) ISCO88-classification (1- and 2-digit) and related ISEI and EGP-scores

ISEI-SCORE	*EGP-SCORE*	*ISCO88-classification*
55	***1***	***1. Legislators. senior officials and managers***
70	1	11. Legislators and senior officials
68	1	12. Corporate managers
51	2	13. General managers
70	***1***	***2. Professionals***
69	1	21. Physical, mathematical and engineering science professionals
80	1	22. Life science and health professional
69	2	23. Teaching professionals
68	1	24. Other professionals
54	***2***	***3. Technicians and associate professionals***
50	2	31. Physical and engineering science associate professionals
48	2	32. Life science and health associate professionals
38	3	33. Teaching associate professionals
55	2	34. Other associate professionals
45	***3***	***4. Clerks***
45	3	41. Office clerks
49	3	42. Customer service clerks
40	***3***	***5. Service workers and shop and market sales workers***
38	3	51. Personal and protective services workers
43	3	52. Models, salespersons and demonstrators
23	***10***	***6. Skilled agricultural and fishery workers***
23	10	61. Market-oriented skilled agricultural and fishery workers
16	10	62. Subsistence agricultural and fishery workers
34	***8***	***7. Craft and related trade workers***
31	9	71. Extraction and building trade workers
34	8	72. Metal. machinery and related trades workers
34	8	73. Precision, handicraft, printing and related trades workers
33	8	74. Other craft and related trades workers
31	***9***	***8. Plant and machine operators and assemblers***
30	9	81. Stationary plant and related operators
32	9	82. Machine operators and assemblers
32	9	83. Drivers and mobile plant operators
20	***9***	***9. Elementary occupations***
25	3	91. Sales and services elementary occupations
16	9	92. Agricultural, fishery and related labourers
23	9	93. Labourers in mining, construction, manufacturing and transport

Source: Ganzeboom and Treiman 1996: 221-237.

C) EGP class scheme summarised

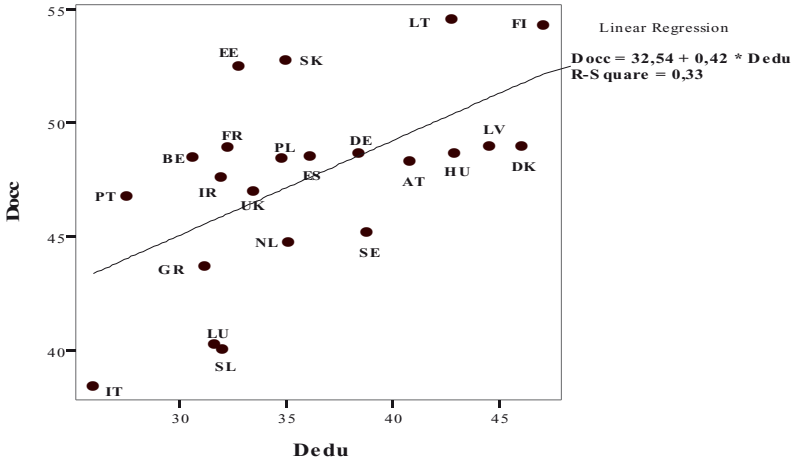
EGP Classes	Occupations included
I	Higher grade professionals, administrators, and officials; managers in large industrial establishments; large proprietors
II	Lower-grade professionals, administrators, and officials; higher grade technicians, managers in small industrial establishments, supervisors of non-manual employees
IIIa	Routine non-manual employees, higher grade (administration and commerce)
IIIb	Routine non-manual employees, lower grade (sales and services)
IVab	Small proprietors and artisans with or without employees
IVc	Farmers and smallholders, other self-employed in primary production
V	Lower-grade technicians, supervisors of manual workers
VI	Skilled manual workers
VIIa	Semi- and unskilled manual workers (not in agriculture)
VIIb	Agricultural and other workers in primary production

Source: Erikson and Goldthorpe 1992: 38.

2. By chapters:

Chapter 2

Figure A2.1: Bivariate correlation between educational (tertiary) and occupational sex segregation (Index of dissimilarity, ISCO88 2-digit, 8 fields of study), 22 EU Member States, 2004



Source: EULFS 2004/5, own calculations

Chapter 3

Table A3.1: Change in segregation indices with and without agriculture, 2004

	Difference between DoL-D	Difference between D_{st}oL-D_{st}
Nordic countries		
Denmark	2.37	-2.29
Finland	1.18	-4.15
Sweden	0.12	-3.11
Anglo-Saxon countries		
UK	0.31	0.56
Ireland	1.90	-2.06
Mediterranean countries		
Greece	0.66	-2.29
Italy	0.90	-1.49
Spain	2.19	-1.37
Portugal	1.82	-2.97
Continental countries		
Austria	1.12	-2.29
Belgium	2.26	-1.49
France	0.00	-1.37
Germany	0.54	-2.97
Netherlands	0.84	-2.32
Luxembourg	4.79	-1.39
Eastern countries		
Hungary	1.04	-1.32
Poland	0.77	-2.07
Estonia	1.45	-3.91
Czech Rep.	0.09	-2.82
Lithuania	0.17	-5.33
Latvia	-4.17	-3.07
Slovenia	5.53	-0.51
Slovakia	1.30	-2.10

Source: EULFS 2004/5, own calculations

Table A3.2: Correlations for D, D_{st}, IP, L and A without agriculture, 23 EU Member States, 2004

Pearson Correlation	D	D_{st}	IP	L	A
D	1				
D_{st}	.394	1			
IP	.390	.441(*)	1		
L	.081	.756(**)	.253	1	
A	.680(**)	.267	.488(*)	.114	1

*Notes: ** Correlation is significant at the 0.01 level (2-tailed), * Correlation is significant at the 0.05 level (2-tailed).*
Source: EULFS 2004/5, own calculations

Table A3.3: Correlations for IP without agriculture, 22 EU Member States, 2004 (excluding Estonia due to calculation problems for the IP Index)

Pearson Correlation	IP
D	.991(**)
D_{st}	.363
IP	1
L	.018
A	.636(**)

*Notes: ** Correlation is significant at the 0.01 level (2-tailed),* Correlation is significant at the 0.05 level (2-tailed).*
Source: EULFS 2004/5, own calculations

Chapter 4

Table A4.1: Share of female tertiary graduates (%) across different fields of study, 22 EU Member States, 2004

	Female tertiary graduates as percentage of all graduates in...							
	EDU	**HU/AR**	**SOSI**	**SCI**	**ENG**	**AGR**	**HEA**	**SER**
Denmark	44.7	61.2	46.7	28.1	35.6	36.9	61.2	26.3
Finland	83.6	75.1	69.5	48.9	21.9	48.5	86.3	65.8
Sweden	79.3	62.8	59.4	45.9	28.6	58.5	83.7	65.9
UK	72.9	63.3	56.4	37.4	20.1	59.8	80.4	67.9
Ireland	80.7	66.1	60.7	43.0	17.5	38.6	84.6	48.1
Greece	75.3	78.1	61.8	41.9	38.0	52.4	74.5	69.8
Italy	78.5	78.0	55.6	52.9	27.2	44.0	64.3	38.5
Spain	81.4	63.0	64.2	37.2	25.8	44.6	79.0	60.1
Portugal	84.7	69.3	64.5	50.8	33.9	61.7	79.8	61.0
Austria	76.2	62.4	54.2	35.7	17.2	39.8	67.8	70.6
Belgium	73.3	61.8	54.1	32.2	20.9	52.0	76.6	42.0
France	71.0	74.3	64.2	41.0	21.7	52.1	77.9	55.0
Germany	77.1	67.6	48.6	34.9	17.1	37.3	75.2	53.3
Netherlands	79.2	59.3	50.8	24.1	15.9	48.4	76.4	54.3
Hungary	78.5	70.5	67.8	37.6	23.7	45.9	78.6	48.4
Poland	76.4	75.3	69.5	41.1	27.6	58.0	73.1	56.5
Estonia	90.5	79.7	72.7	47.9	33.1	60.5	92.5	58.7
Czech Rep.	76.8	61.9	62.5	39.5	24.2	55.0	80.3	47.4
Lithuania	83.1	76.9	72.2	43.9	33.3	55.2	84.2	53.7
Latvia	89.5	82.3	71.1	39.3	28.2	48.8	85.1	45.4
Slovenia	85.4	71.7	66.8	40.0	21.2	57.9	81.9	40.8
Slovakia	74.2	55.6	60.1	41.1	31.6	43.6	81.3	33.8

Notes: EDU=Education, HU/AR=Humanities and Arts, SOSI=Social Sciences, Business and Law, SCI=Science, ENG=Engineering, Manufacturing and Construction, AGR=Agriculture, HEA=Health and Welfare, SER=Services
Source: UNESCO 2006; http://stats.uis.unesco.org/ReportFolders/reportfolders.aspx

Table A4.2: Involuntarily fixed-term contracts and total fixed-term contracts (% of women/men employees), 2000 and 2005

	Involuntarily fixed-term contracts				**Total fixed-term contracts**			
	women		**men**		**women**		**men**	
	2000	**2005**	**2000**	**2005**	**2000**	**2005**	**2000**	**2005**
Denmark	5.5	6.1	2.9	3.7	11.7	11	8.8	8.9
Finland	13.1	15.2	7.8	8.6	20.9	21.8	14.5	14.4
Sweden	9.5	11.5	6.2	8.0	16.9	17.9	12.3	14.6
UK	2.0	1.2	2.2	1.6	7.7	5.9	5.9	5.2
Ireland	1.7	0.6	1.2	0.8	6.6	2.7	4.3	2.4
Greece	12.4	10.7	9.3	7.3	17.3	14.7	13.3	10.2
Italy	9.3	9.9	5.6	6.5	15.3	14.8	10.5	10.6
Spain	25.4	24.4	22.5	21.9	34.6	35.5	30.8	31.6
Portugal	8.8	14.2	7.0	13.5	22.2	20.3	18.0	18.7
Austria	2.2	1.6	1.3	1.1	11.3	8.8	11.6	8.8
Belgium	8.6	8.6	4.6	4.1	12.1	12.0	6.6	6.7
France	9.5	9.2	6.4	6.7	14.1	14.2	11.4	12.5
Germany	2.2	2.2	1.8	2.0	14.5	13.6	13.9	14.0
Netherlands	4.3	4.3	3.3	4.2	17.2	16.7	11.5	13.8
Luxembourg	-	2.2	-	1.4	4.6	6.0	2.6	4.1
Hungary	2.5	3.0	3.7	3.9	6.4	6.5	7.3	7.8
Poland	5.5	12	6.4	13.7	11.4	24.6	12.4	26.3
Estonia	-	-	2.4	-	-	2.5	3.1	4.1
Czech Rep.	3.7	6.3	2.9	5.3	9.4	9.7	7.0	7.8
Lithuania	2.0	2.8	3.4	5.5	2.6	3.3	4.9	6.9
Latvia	3.7	2.1	6.6	4.8	4.6	6.0	8.9	11.4
Slovenia	6.0	8.2	5.3	8.0	13.5	18.1	12.4	16.0
Slovakia	2.6	3.0	3.0	3.9	4.3	4.9	3.8	5.1

Source: Statistic in focus, Population and social conditions 98/2007.
Available: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-098/EN/KS-SF-07-098-EN.PDF

Table A4.3: Female and male unemployment rates (%), 23 EU Member States, 1995, 2000 and 2004

	Women			Men		
	1995	**2000**	**2004**	**1995**	**2000**	**2004**
Denmark	8.1	4.8	6.0	5.6	3.9	5.1
Finland	15.1	10.6	8.9	15.7	9.1	8.7
Sweden	7.8	5.3	6.1	9.7	5.9	6.5
UK	6.8	4.8	4.2	9.9	5.8	5.0
Ireland	12.5	4.2	4.1	12.2	4.3	4.9
Greece	14.1	17.1	16.2	6.2	7.4	6.6
Italy	15.4	13.6	10.5	8.6	7.8	6.4
Spain	24.6	16.0	14.3	14.8	7.9	8.0
Portugal	8.2	4.9	7.6	6.5	3.2	5.8
Austria	5.0	4.3	5.3	3.1	3.1	4.4
Belgium	12.7	8.5	9.5	7.6	5.6	7.5
France	13.1	10.9	10.6	9.4	7.6	8.8
Germany	9.0	7.5	9.1	7.2	7.5	10.3
Netherlands	8.1	3.6	4.8	5.5	2.2	4.3
Luxembourg	4.3	3.1	7.1	2.0	1.8	3.7
Hungary	8.8	5.6	6.1	10.2	7.0	6.1
Poland	13.0	18.1	19.9	9.1	14.4	18.2
Estonia	8.9	11.8	8.9	10.3	13.8	10.4
Czech Rep.	8.1	10.3	9.9	5.0	7.3	7.1
Lithuania	11.7	14.1	11.8	14.6	18.6	11.0
Latvia	13.6	12.9	10.2	15.1	14.4	10.6
Slovenia	6.7	7.0	6.8	7.0	6.5	5.8
Slovakia	13.1	18.6	19.2	12.2	18.9	17.4

Note: Data for the Eastern European countries refer to the years 1996-1998, for 1995 there was no comparable information available.
Source: Eurostat 2007

Table A4.4: Development of occupational segregation (ISCO88 2-digit), 23 EU Member States, 1995-2004

	Gap	Sex-typing of occupations (D_{st})			Dissimilarity of occupational chances (D)			Association Index (A)		
	1995-2004	1995	2000	2004	1995	2000	2004	1995	2000	2004
Denmark	4.9	47.47	48.58	49.73	50.22	47.72	51.34	4.73	4.55	5.27
Finland	4.4*	54.08*	49.34	49.74	54.88*	54.20	55.53	5.32*	4.91	4.52
Sweden	2.6*	47.10*	50.38	46.05	49.97*	50.45	45.32	4.35*	4.65	4.5
UK	3.9	47.84	47.46	45.35	48.51	46.82	47.28	4.16	4.75	5.28
Ireland	14.9	40.99	44.49	44.17	48.35	46.94	49.50	2.96	4.58	4.68
Greece	7.1	41.42	39.85	41.36	36.07	37.14	44.35	3.88	4.25	4.47
Italy	9.8	38.32	38.24	39.08	35.26	36.10	39.35	2.94	3.2	3.6
Spain	16.6	41.27	41.57	43.62	41.52	43.85	50.73	3.31	4.19	4.42
Portugal	7.3	41.96	40.00	43.32	38.18	41.69	48.60	3.55	4.72	4.85
Austria	1.7	37.45	46.05	45.29	40.88	47.64	49.47	2.53	4.46	4.5
Belgium	7.6	47.63	47.91	50.28	44.86	46.37	50.75	3.84	5.03	5.24
France	5.3	46.44	46.25	43.62	49.56	49.89	48.89	3.31	3.99	3.79
Germany	3.9	45.33	44.86	44.17	49.39	49.47	49.21	3.13	3.1	3.83
Netherlands	12.0	46.25	47.03	45.70	45.91	45.65	45.58	3.89	4.64	4.89
Luxembourg	8.0	52.86	58.25	55.53	49.43	48.35	45.07	4.91	7.33	6.73
Hungary	3.5*	44.03	45.09	43.39	48.78	48.73	49.73	4.19*	4.86	4.73
Poland	-5.5*	44.27	45.07	44.35	41.67	42.27	49.20	4.55*	4.46	4.86
Estonia	-0.3*	49.60	49.59	52.06	52.27	53.57	53.93	5.26*	4.95	5.9
Czech Rep.	-2.7*	44.00	43.71	43.37	52.94	52.36	52.11	4.53*	4.41	4.81
Lithuania	-0.8*	46.71	52.64	50.15	46.97	48.77	54.72	5.21*	5.41	5.65
Latvia	3.4*	46.62	49.65	44.46	47.77	47.74	44.80	4.45*	4.94	4.31
Slovenia	1.9*	44.45	42.77	46.04	40.70	41.15	45.58	5.84*	5.72	5.58
Slovakia	-2.6*	44.56	43.38	46.69	54.36	52.82	54.09	4.72*	4.59	5.05

*Note: * Data only for 1998 available*
Source: EULFS 1995-2004/5, own calculations

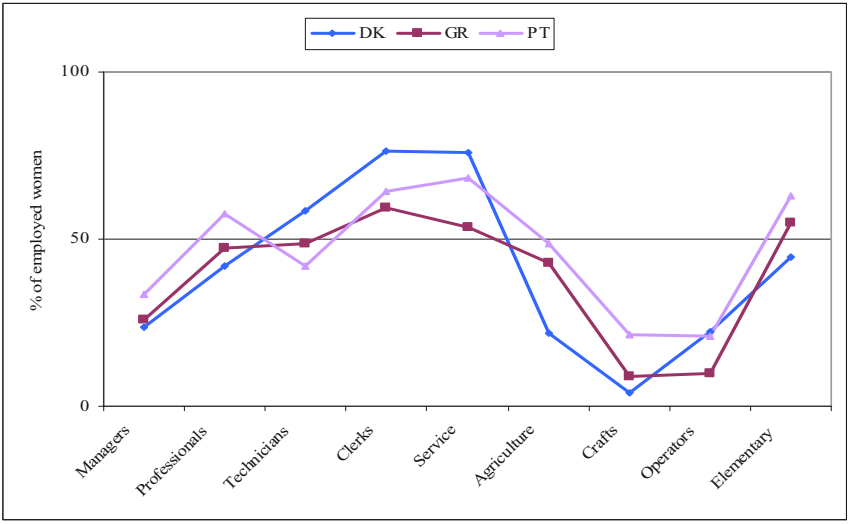
Table A4.5: Gender-specific occupational status gap (ISEI 2 without agriculture), 23 EU Member States, 2004

	Overall			Non manual sector			Manual sector		
	M	**W**	**GG**	**M**	**W**	**GG**	**M**	**W**	**GG**
Denmark	44.4	45.6	1.2	57.5	49.4	-8.0	29.2	26.0	-3.2
Finland	44.8	46.8	1.9	58.5	51.7	-6.9	29.9	26.6	-3.3
Sweden	45.3	47.9	2.6	56.2	50. 7	-5.5	30.4	27.5	-2.9
UK	45.8	46.7	0.95	59.0	50.8	-8.2	29.3	26.6	-2.7
Ireland	44.6	50.4	5.8	56.0	53.6	-2.4	29.9	27.1	-2.8
Greece	41.3	44.4	3.1	53.6	51.9	-1.7	29.2	25.4	-3.9
Italy	42.2	44.9	2.8	53.2	50.1	-3.1	30.0	27.7	-2.3
Spain	40.1	44.5	4.5	54.3	51.7	-2.6	29.3	25.9	-3.4
Portugal	39.9	41.8	1.95	52.7	49.8	-2.9	29.9	27.5	-2.4
Austria	42.9	44.0	1.1	52.6	48.8	-3.8	29.9	25.7	-4.3
Belgium	45.6	49.5	3.8	56.7	54.5	-2.1	29.8	26.5	-3.3
France	43.6	45.2	1.6	56,0	50.4	-5.6	30,0	26.6	-3.4
Germany	44.6	46.4	1.8	56.5	50.3	-6.2	30.7	26.9	-3.8
Netherlands	47.5	49.0	1.5	56.9	52.2	-4.7	30,0	26.0	-3.95
Luxembourg	46.3	46.1	-0.2	56.5	52.0	-4.5	29.7	25.5	-4.3
Hungary	41.1	46.7	5.6	55.3	52.9	-2.5	30.6	28.8	-1.7
Poland	38.8	44.3	5.5	55.2	53.6	-1.6	28.9	26.0	-2.95
Estonia	41.0	46.1	5.2	56.4	54.0	-2.3	30.1	27.9	-2.1
Czech Rep.	41.6	45.2	3.7	53.9	50.9	-3.1	31.4	29.2	-2.2
Lithuania	38.0	45.7	7.7	58.7	56.1	-2.6	28.6	26.8	-1.8
Latvia	38.9	45.5	6.6	55.7	52.4	-3.3	28.8	26.2	-2.6
Slovenia	41.1	45.7	4.7	54.4	53.5	-0.9	30.1	27.6	-2.5
Slovakia	39.9	45.9	6,0	53.5	51.8	-1.7	30.6	29.0	-1.6

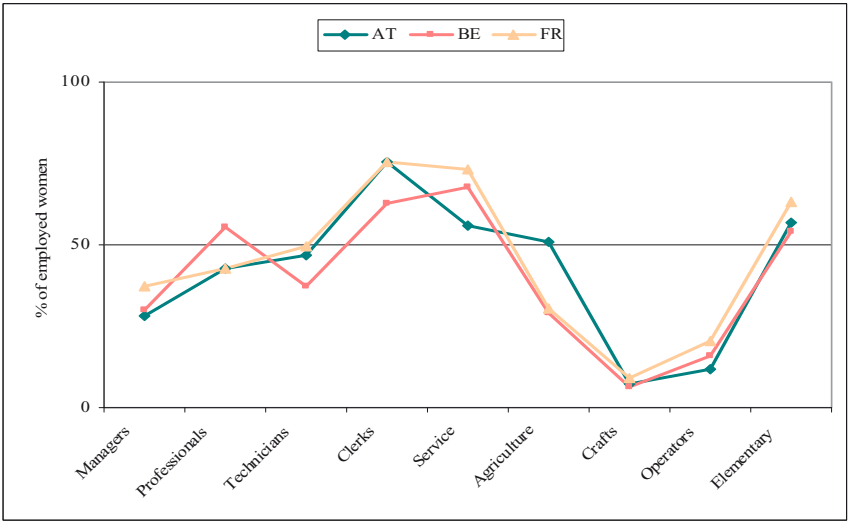
Notes: M=men, W=women, GG=gender-specific occupational status gap (status women-status men)
Source: EULFS 2004/5, own calculations

Figure A4.1: Sex typing profiles of remaining EU Member States, 2004

Nordic and Mediterranean countries

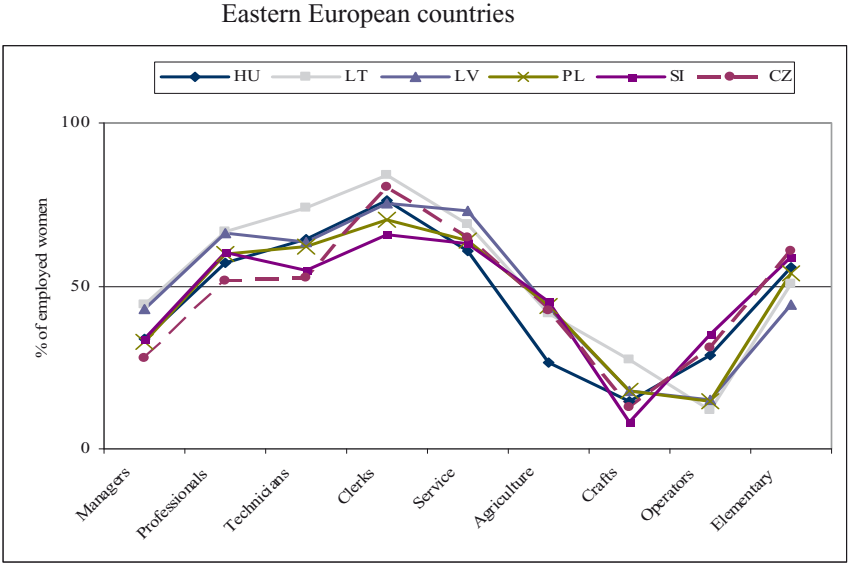


Continental countries



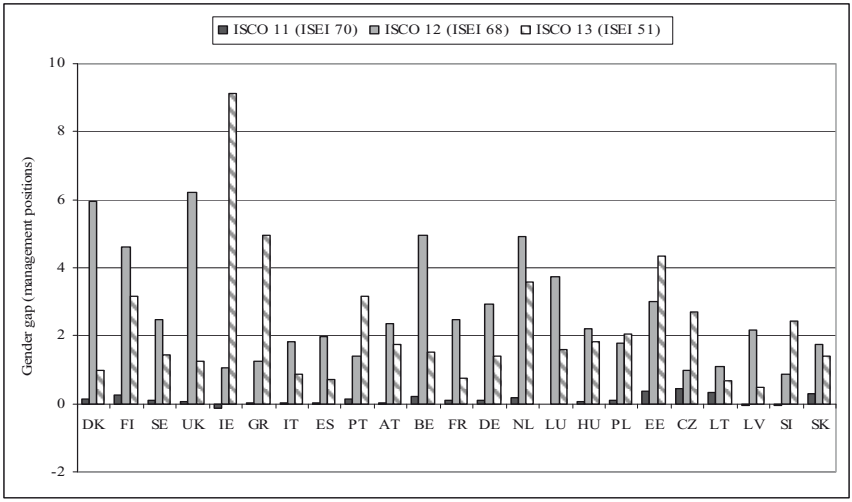
Source: EULFS 2004/5, own calculations

Figure A4.1 (continued): Sex typing profiles of remaining EU Member States, 2004



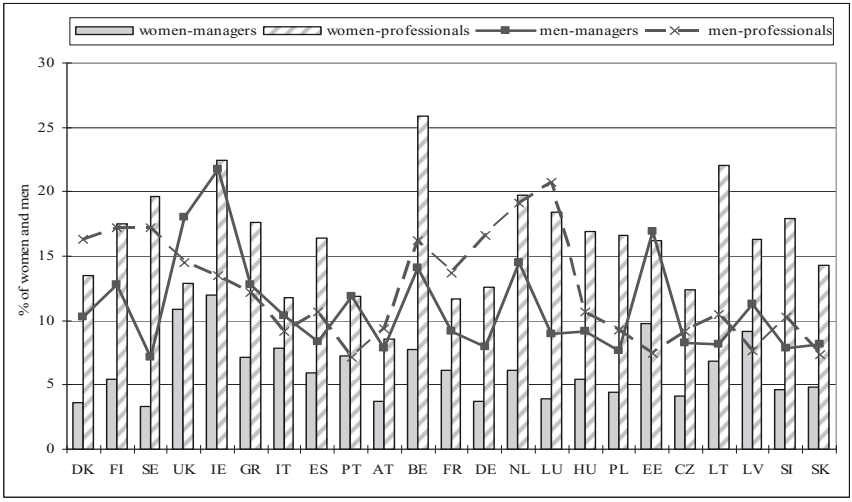
Source: EULFS 2004/5, own calculations

Figure A4.2: Gender gap (% of men - % of women) in management positions, (ISCO88 2-digit, group 11 (legislators & senior officials (70), 12 corporate managers (68), 13 general managers (51)), 2004



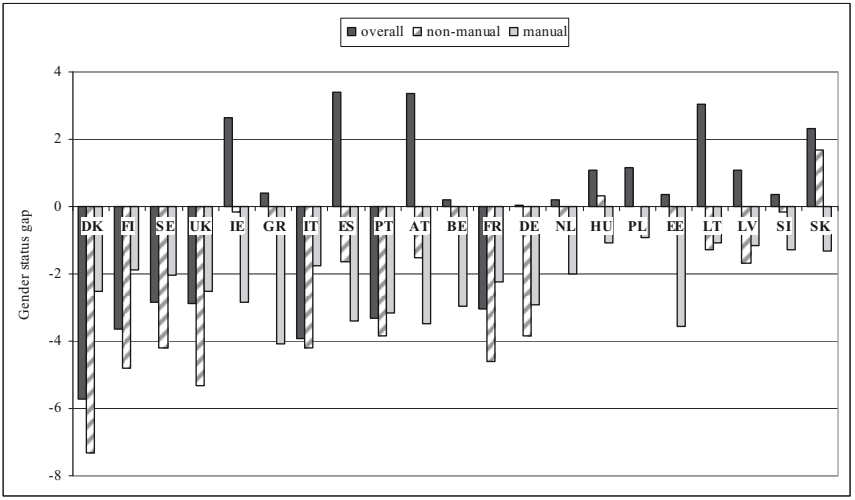
Source: EULFS 2004/5, own calculations

Figure A4.3: Male and female participation rates (%) in management and professional occupations (ISCO88 2-digit, group 1 and 2), 2004



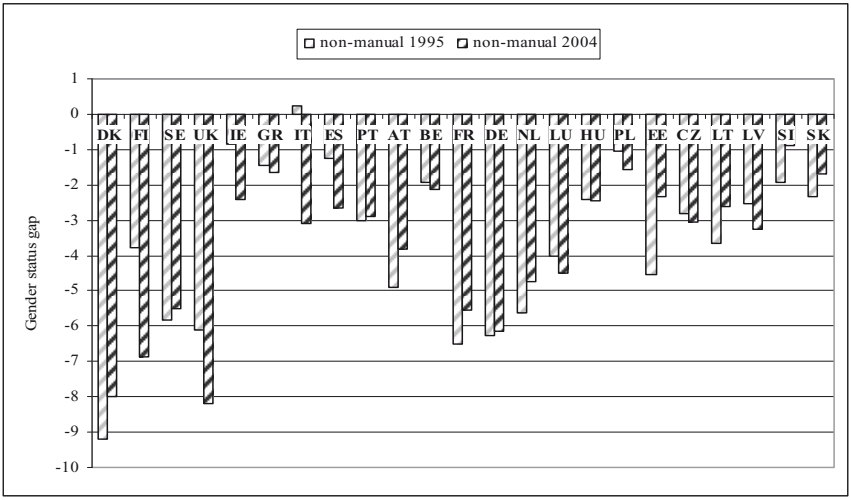
Source: EULFS 2004/5, own calculations

Figure A4.4: Sex-specific occupational status gaps (ISEI 2 without agriculture, tertiary graduates), 23 EU Member States, 2004



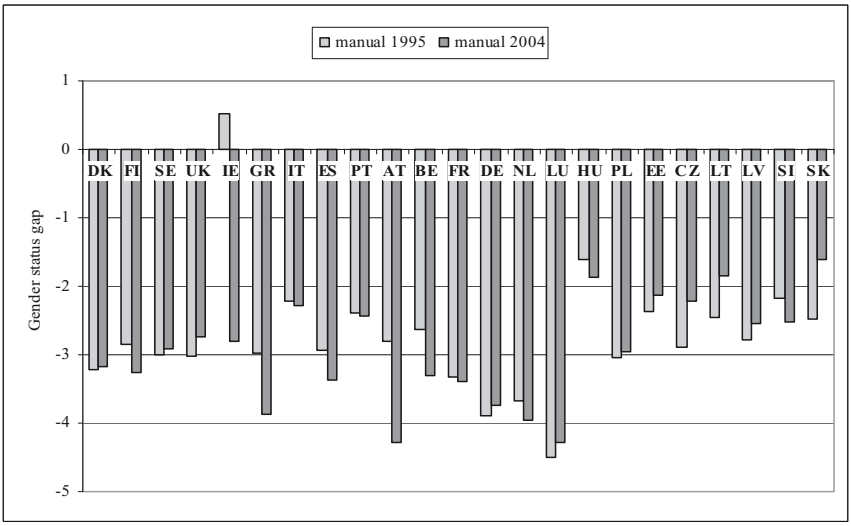
Source: EULFS 2004/5, own calculations

Figure A4.5: Changes in the gender status gap between 1995 and 2004, non-manual sector (ISEI 2 without agriculture, tertiary graduates)



Source: EULFS 2004/5, own calculations

Figure A4.6: Changes in the gender status gap between 1995 and 2004, manual sector (ISEI 2 without agriculture, tertiary graduates)



Source: EULFS 1995-2004/5, own calculations

Chapter 5

Table A5.1: Selected macro-level indictors for the cluster analysis

	1	2	3	4	5	6	7	8
	studvoc	**femter**	**fem-short**	**ftypf**	**ftemp**	**serv**	**length**	**parta**
Austria	37.9	50.6	1.0	13.26	60.7	64.8	20.9	20.2
Belgium	40.5	57.1	1.4	20.82	52.6	77.2	25.2	21.4
Germany	21.4	52.7	1.0	15.65	59.2	71.3	20.1	22.3
Denmark	27.4	58.8	0.7	26.91	71.6	74.8	14.4	22.2
Estonia	14.0	71.6	1.8	51.28	60.0	59.5	10.1	8.0
Spain	13.9	57.7	0.8	20.12	48.3	64.4	20.9	8.7
Finland	28.2	62.0	1.3	23.7	65.6	69.4	21.5	13.5
France	26.2	56.6	1.1	27.37	57.4	75.3	25.4	16.7
Greece	17.9	60.9	1.0	21.79	45.2	62.9	30.6	4.6
Hungary	13.5	63.5	2.0	29.5	50.7	62.0	14.7	4.7
Ireland	15.5	57.0	1.2	34.76	56.5	66.1	18.3	16.8
Italy	37.6	59.1	1.1	33.33	45.2	66.6	27.7	12.7
Lithuania	8.9	66.5	1.1	16.67	57.8	56.1	10.3	8.4
Latvia	14.6	69.2	0.9	40.86	58.5	56.1	8.0	10.4
Nether-lands	51.9	56.1	0.9	14.55	65.8	78.2	20.2	45.5
Poland	25.2	65.5	1.8	38.53	46.2	53.8	23.5	10.8
Portugal	14.1	65.9	1.2	37.29	61.7	54.7	25.0	11.3
Sweden	27.1	61.0	1.3	27.62	70.5	75.1	23.6	23.6
Slovakia	33.7	56.7	2.6	30.53	50.9	61.8	15.9	16.7
Slovenia	33.8	60.4	1.1	27.00	60.5	56.1	27.1	2.7
UK	22.8	57.7	1.1	22.10	65.6	81.3	12.8	25.8

Note: Most indicators are %
Sources: 1-4) All data refer to 2004, see table 4.5 in the text, 5-8) All data refer to 2004, see table 4.1 and 4.2 in the text, measure (overall part time) Employment in Europe 2006, measure (length) own calculations EULFS 2004/5

Table A5.1: Selected macro-level indictors for the cluster analysis - cont

	9	10	11	12	13	14	15	16
	child3	**child6**	**parent**	**gem**	**atright**	**atsep**	**atsuf**	**atmen-chil**
Austria	9.0	82.0	64.0	0.78	54.4	45.9	20.6	63.0
Belgium	28.0	100.0	18.0	0.83	69.6	58.1	37.1	60.0
Germany	7.0	89.0	49.0	0.81	57.3	65.4	38.1	69.8
Denmark	56.0	93.0	47.0	0.86	89.4	76.8	56.0	63.6
Estonia	22.0	79.0	38.0	0.6	75.5	31.9	24.0	69.1
Spain	10.0	98.0	50.0	0.75	62.5	66.4	36.8	90.7
Finland	21.0	70.0	99.0	0.83	83.1	67.8	47.8	74.6
France	43.0	100.0	50.0	0.75	68.3	68.9	41.5	77.9
Greece	7.0	60.0	13.0	0.59	72.6	42.0	14.2	75.3
Hungary	6.0	86.0	114.0	0.53	66.7	30.2	17.8	57.9
Ireland	40.0	66.0	11.0	0.72	77.0	63.0	49.1	66.3
Italy	6.0	93.0	24.0	0.59	56.8	53.2	24.0	68.6
Lithuania	18.0	60.0	148.0	0.61	63.3	20.9	14.0	82.7
Latvia	16.0	75.0	50.0	0.61	69.5	25.2	20.7	64.6
Netherlands	35.0	100.0	11.0	0.81	83.7	67.5	35.4	52.4
Poland	2.0	60.0	50.0	0.61	47.8	35.1	31.8	75.9
Portugal	19.0	75.0	21.0	0.66	59.8	58.4	14.0	86.3
Sweden	41.0	90.0	118.0	0.85	93.4	77.6	54.1	66.6
Slovakia	18.0	70.0	58.0	0.6	54.4	25.6	31.6	74.1
Slovenia	27.0	59.0	38.0	0.6	67.8	54.1	33.8	61.2
UK	28.0	58.0	25.0	0.72	63.7	61.9	42.9	63.3

Note: Most indicators are %, indicator 11 is weeks, and indicator 12,
Sources: 9-11) Data refer to 2003/4, see table 4.7 in the text, 12) GEM: Gender Empowerment Measure, data is from UNDP (2004). Calculating the GEM involves several steps. First percentages for females and males are calculated in each area. The first area is the number of parliamentary seats held. The second area is measured by two sub-components: a) legislators, senior officials, and managers, and b) professional and technical positions. The third area is measured by the estimated earned income (at purchasing power parity US$). Second, for each area, the pair of gender percentages, are combined into an equally Distributed Equivalent Percentage (EDEP) that rewards gender equality and penalizes inequality. It is calculated as the harmonic mean of the two components. The EDEP for economic participation is the unweighted average of the EDEP for each of it's sub-components. The EDEP for income is computed from gender sub-values that are indexed to a scale from 100 to 40,000 (PPP US$). Finally, the GEM is the unweighted average of the three equally Distributed Equivalent Percentage, 13-16) Data refer to 2002/3, see figure 4.16 (Data for indicator 14 is from the World Value Survey 1999, for some countries the data steams also from the Eurobarometer 1994 (question 42)

Table A5.2: Agglomeration schedule

	Cluster Combined			Stage Cluster First Appears		
Stage	Cluster 1	Cluster 2	Coefficients	Cluster 1	Cluster 2	Next Stage
1	5	14	3.1	0	0	14
2	1	3	6.7	0	0	12
3	7	18	10.7	0	0	8
45	2	8	15.5	0	0	12
5	11	21	21.0	0	0	15
6	16	19	27.3	0	0	17
7	9	12	34.1	0	0	9
8	4	7	41.7	0	3	18
9	9	20	49.6	7	0	13
10	6	17	58.9	0	0	13
11	10	13	69.0	0	0	14
12	1	2	80.2	2	4	15
13	6	9	93.1	10	9	17
14	5	10	107.4	1	11	19
15	1	11	122.3	12	5	16
16	1	15	140.2	15	0	18
17	6	16	159.8	13	6	19
18	1	4	183.4	16	8	20
19	5	6	217.0	14	17	20
20	1	5	320.0	18	19	0

Note: Clustering is carried out by the Ward algorithm using squared Euclidean distance matrix based on z-standardised transformations of the selected indicators.

Table A5.3: Cluster membership

Case	7 Clusters	6 Clusters	5 Clusters	4 Clusters
1:AT	1	1	1	1
2:BE	1	1	1	1
3:DE	1	1	1	1
4:DK	2	2	2	2
5:EE	3	3	3	3
6:ES	4	4	4	4
7:FI	2	2	2	2
8:FR	1	1	1	1
9:GR	4	4	4	4
10:HU	3	3	3	3
11:IR	5	1	1	1
12:IT	4	4	4	4
13:LT	3	3	3	3
14:LV	3	3	3	3
15:NL	6	5	1	1
16:PL	7	6	5	4
17:PT	4	4	4	4
18:SE	2	2	2	2
19:SK	7	6	5	4
20:SL	4	4	4	4
21:UK	5	1	1	1

Table A5.4: Summary statistics - segregation patterns within four clusters

	Conserv.		Modern		Traditional		Post-com.	
	Ø	S.D.	Ø	S.D.	Ø	S.D.	Ø	S.D.
Student enrolment (%) in vocational/technical education (ISCED 2 and 3)	30.9	12.9	27.6	0.6	25.2	10.0	12.8	2.6
Fem. share (%) of tertiary degree holders	55.4	2.7	60.6	1.6	60.9	3.6	67.7	3.5
Gender ratio of tertiary degree holders, ISCED 5B	1.1	0.2	1.1	0.4	1.4	0.6	1.4	0.5
Share of women in typically male fields	21.2	7.8	26.1	2.1	29.8	7.2	34.6	14.9
Female employment rate (%)	59.7	4.8	69.2	3.2	51.1	7.1	56.8	4.1
Share of employed persons (%) in the service sector	73.5	6.3	73.1	3.2	60.0	5.1	58.4	2.9
Share of persons (%) < 20 years with their employer	20.4	4.3	19.8	4.8	24.4	4.9	10.8	2.8
Share of persons (%) working part time employment (as a percentage of all employed)	24.1	10.0	19.8	5.5	9.6	4.8	7.9	2.4
Childcare provision for children under 3 (%)	27.1	14.2	39.3	17.6	12.7	8.9	15.5	6.8
Childcare provision for children aged 3-6 (%)	85.0	17.3	84.3	12.5	73.6	16.2	75.0	11.0
Effective parental leave (weeks)	32.6	21.5	88.0	36.8	36.3	17.2	87.5	52.3
Gender Empowerment Index	0.8	0.0	0.8	0.0	0.6	0.1	0.6	0.0
Share of persons (%) who disagrees that								
…men should have more right to work if job	67.7	10.4	88.6	5.2	60.2	8.3	68.8	5.2
...men's job is work and women's job to look after the home an	61.5	7.8	74.1	5.4	47.8	14.2	27.1	5.0
…a pre-school child suffers if the mother work	37.8	8.8	52.6	4.3	26.6	9.4	19.1	4.3
…who agree that men should do more childcare	64.7	8.0	68.3	5.7	76.0	10.0	68.6	10.4

Source: See table 5.1 in the text

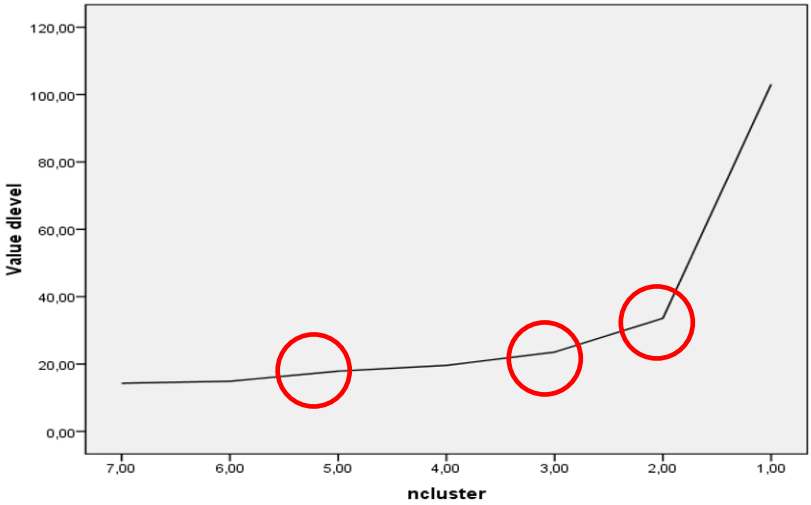
Table A5.5: Sensitivity analysis for the four- and six-cluster solution

Variables included	*4 cluster solution*
Base: Full model*	(AT, BE, DE, FR, NL, IR, UK) (DK, FI, SE) (EE, HU, LT, LV) (ES, GR, IT, PL, PT, SL, SK)
1) B-studvoc	(AT, DE, ES) (BE, FR, NL, IR, UK, DK, FI, SE) (EE, HU, LT, LV, PL, SK) (GR, IT, PL, PT, SL)
2) B-femter	(AT, BE, DE, FR, NL, IR, UK) (DK, FI, SE) (EE, HU, LT, LV, PL, SK) (ES, GR, IT, PT, SL)
3) B-femshort	(AT, BE, DE, FR, ES) (DK, FI, SE, NL, IR, UK) (EE, HU, LT, LV) (GR, IT, PL, PT, SL, SK)
4) B-ftypf	(AT, BE, DE, FR, NL, IR, UK) (DK, FI, SE) (EE, HU, LT, LV) (ES, GR, IT, PL, PT, SL, SK)
5) B-fememp	(AT, DE, ES) (BE, FR, NL, IR, UK, DK, FI, SE) (EE, HU, LT, LV, SK) (GR, IT, PL, PT, SL)
6) B-serv	(AT, BE, DE, FR, NL, IR, UK) (DK, FI, SE) (EE, HU, LT, LV) (ES, GR, IT, PL, PT, SL, SK)
7) B-length	(AT, BE, DE, FR, IR, UK, ES) (DK, FI, SE, NL) (EE, HU, LT, LV, PT) (GR, IT, PL, SL, SK)
8) B-parta	(AT, BE, DE, FR, NL, ES) (DK, FI, SE, IR, UK) (EE, HU, LT, LV, PL, SK) (ES, GR, IT, PT, SL)
9) B-child3	(AT, BE, DE, FR, NL, IR, UK) (DK, FI, SE) (EE, HU, LT, LV) (ES, GR, IT, PL, PT, SL, SK)
10) B-child6	(AT, BE, DE, FR, NL, IR, UK) (DK, FI, SE) (EE, HU, LT, LV) (ES, GR, IT, PL, PT, SL, SK)
11) B-parent	(AT, BE, DE, FR, ES) (DK, FI, SE, NL, IR, UK) (EE, HU, LT, LV, PT) (ES, GR, IT, PL, SL, SK)
12) B-gem	(AT, BE, DE, FR, NL) (DK, FI, SE, IR, UK) (EE, HU, LT, LV) (ES, GR, IT, PL, PT, SL, SK)
13) B-atright	(AT, BE, DE, FR, NL) (DK, FI, SE, IR, UK) (EE, HU, LT, LV, PL, SK) (ES, GR, IT, PT, SL)
14) B-atsep	(AT, BE, DE, FR, NL, IR, UK) (DK, FI, SE) (EE, HU, LT, LV) (ES, GR, IT, PL, PT, SL, SK)
15) B-atsuf	(AT, BE, DE, FR, IR, UK) (DK, FI, SE, NL) (EE, HU, LT, LV, PL, SK) (ES, GR, IT, PL, PT, SL)
16) B-atmenchi1	(AT, BE, DE, FR, NL, ES) (DK, FI, SE, IR, UK) (EE, HU, LT, LV) (GR, IT, PL, PT, SL, SK)
1) B-without vertical aspects (femshort, gem)	(AT, BE, DE, FR, ES) (DK, FI, SE, NL, IR, UK) (EE, HU, LT, LV) (ES, GR, IT, PL, PT, SL, SK)
2) B-without horizontal aspects (ftypf, serv)	(AT, BE, DE, FR, NL, IR, UK) (DK, FI, SE) (EE, HU, LT, LV) (ES, GR, IT, PL, PT, SL, SK)
1) B-horizontal	(AT, BE, DE, FR, IR, UK, ES, GR, IT, PT, SL) (DK, FI, SE, NL) (EE, LT, LV) (PL, PT, SK, HU)
2) B-vertical	(AT, DE, ES, FI, IT) (BE, NL)(DK, SE, FR, IR, UK) (EE, HU, LT, LV,GR, PL, PT, SL, SK)

*Notes: Clustering is carried out by the Ward algorithm using squared Euclidean distance matrix based on z-standardised transformations of the selected indicators. * The reference full model is the one detailed in figure 5.1 in the text*

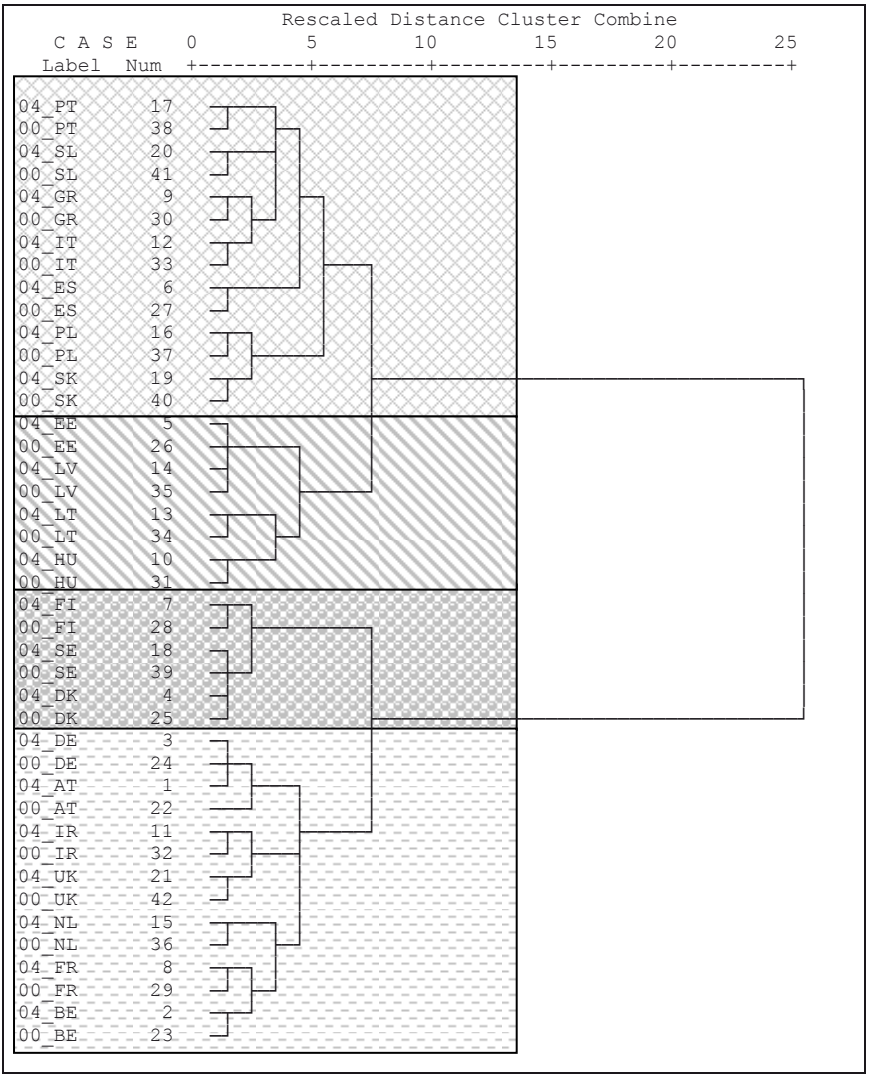
Sources: See table A5.1 for the used indicators, own calculations

Figure A5.1: Inverse Scee Diagramm



Note: Clustering is carried out by the Ward algorithm using squared Euclidean distance matrix based on z-standardised transformations of the selected indicators.
Sources: See table A5.1 for the used indicators, own calculations

Figure A5.2: Dendogramm, sensitivity analysis (based on all indicators, family and cultural indicators for 2000 and 2004 are the same)



Note: Clustering is carried out by the Ward algorithm using squared Euclidean distance matrix based on z-standardised transformations of the selected indicators.
Sources: See table A5.1 for the used indicators from 2004. Data for 2000 is from the same data sources, own calculations

Chapter 6

6A) Model specifications for being in a typical male vs. an integrated occupation:

A simple random intercept multi-level equation with one explanatory variable at the individual level *(women)* predicting the log odds of being in a typically male vs. an integrated occupation takes the following form.

(7.1.) $$\ln\left[\frac{P_{typmaleocc}}{P_{inocc}}\right] = \beta_{0j} + \beta_{1j}(women)_{ij} + \beta_{ij}X_{ij}$$

Where

β_{01} *intercept (log odds of being in a typically male occupation for unmarried working men aged 20-34 with a lower tertiary degree in an integrated field of study in country j)*

β_{1j} *difference in log odds of being in a typically male occupation between men and women in country j)*

β_{ij} *slopes for i control variables X in country j (including marital status, age cohort, higher tertiary degree and field of study).*

For the country-level the following formulas can be specified:

(7.2.) $$\beta_{0j} = \gamma_{00} + u_{0j}$$
$$\beta_{1j} = \gamma_{10}$$
$$\beta_{ij} = \gamma_{ij}$$

Where

γ_{00}, γ_{10} *and* γ_{ij} *2-level intercepts of the intercept and the slopes for unmarried men aged 20-34 with a tertiary degree in an integrated field of study in country j*

u_{0j} *country-specific error terms or residual corresponding to the variation of the intercept at the country level.*

Combining both formulas the complete random intercept model is as follows:

(7.3.) $$\ln\left[\frac{P_{typmaleocc}}{P_{inocc}}\right] = \underbrace{\gamma_{00} + \gamma_{10}(women)_{ij} + \gamma_{ij}X_{ij}}_{\text{Fixed effects}} + \underbrace{u_{0j}}_{\text{Random effect}}$$

With all parameters as defined previously in formulas 7.1. and 7.2.

Enhancing the model specificity by a random slope model it is first assumed that the slope of the *'gender'* variable on the individual level is random

$$(7.4.) \qquad \ln\left[\frac{P_{typmaleocc}}{P_{inocc}}\right] = \gamma_{00} + \gamma_{10}(women)_{ij} + \gamma_{ij}X_{ij} + u_{0j} + u_{1j}(women)_{ij}$$

Where

u_{1j} *country-specific error terms corresponding to the variation of the intercept and the slopes for women at the country level.*

All other parameters are defined as previously in formulas 7.1. and 7.2.

Furthermore, to determine whether the above demonstrated country-level variation in the gender slope is contingent upon country-level factors (here for instance *Vocational*), cross-level interaction are introduced (see exemplarily equation (7.5.) and (7.6.) for one educational context variable). While the individual level formula is the same as in equation (7.1.), for the country-level the following formula can be specified:

$$(7.5.) \qquad \begin{aligned} \beta_{0j} &= \gamma_{00} + \gamma_{01}(Vocational)_j + u_{0j} \\ \beta_{1j} &= \gamma_{10} + \gamma_{11}(Vocational)_j + u_{1j} \\ \beta_{ij} &= \gamma_{ij} \end{aligned}$$

Including equation (7.5.) into (7.1.) the final model can be specified as follows:

$$(7.6.) \quad \ln\left[\frac{P_{typmaleocc}}{P_{inocc}}\right] = \gamma_{00} + \gamma_{01}(Vocational)_j + \gamma_{10}(women)_{ij} + \gamma_{11}(Vocational_j * women_{ij}) + \gamma_{ij}X_{ij} + u_{0j} + u_{1j}(women)_{ij}$$

6B) Model specification for being in a management vs. a non-management position:

A simple random intercept multi-level equation with one explanatory variable at the individual level *(women)* predicting the log odds of being in a management vs. a non-management position takes the following form.

$$(8.1.) \qquad \ln\left[\frac{P_{management}}{P_{non-management}}\right] = \beta_{0j} + \beta_{1j}(women)_{ij} + \beta_{ij}X_{ij}$$

Where

β_{01} *intercept (log odds of being in a management position for unmarried working men aged 20-34 with a lower tertiary degree in an integrated field of study in country j)*

β_{1j} *difference in log odds of being in a management position between men and women in country j)*

β_{ij} *slopes for i control variables X in country j (including marital status, age cohort, higher tertiary degree and field of study).*

For the country-level the following formulas can be specified:

(8.2.)
$$\beta_{0j} = \gamma_{00} + u_{0j}$$
$$\beta_{1j} = \gamma_{10}$$
$$\beta_{ij} = \gamma_{ij}$$

Where

γ_{00}, γ_{10} *and* γ_{ij} *2-level intercepts of the intercept and the slopes for unmarried men aged 20-34 with a tertiary degree in an integrated field of study in country j*

u_{0j} *country-specific error terms or residual corresponding to the variation of the intercept at the country level.*

Combining both formulas the complete random intercept model is as follows:

(8.3.)
$$\ln\left[\frac{P_{management}}{P_{non-management}}\right] = \underbrace{\gamma_{00} + \gamma_{10}(women)_{ij} + \gamma_{ij}X_{ij}}_{Fixed\ effects} + \underbrace{u_{0j}}_{Random\ effect}$$

With all parameters as defined previously in formulas 8.1. and 8.2.

Enhancing the model specificity by a random slope model it is first assumed that the slope of the *'gender'* variable on the individual level is random

(8.4.)
$$\ln\left[\frac{P_{management}}{P_{non-management}}\right] = \gamma_{00} + \gamma_{10}(women)_{ij} + \gamma_{ij}X_{ij} + u_{0j} + u_{1j}(women)_{ij}$$

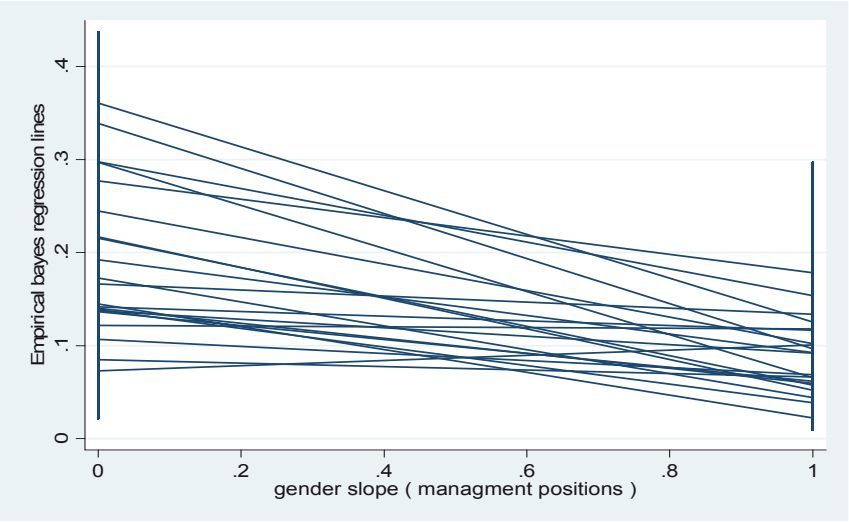
Where

u_{1j} *country-specific error terms corresponding to the variation of the intercept and the slopes for women at the country level.*

All other parameters are defined as previously in formulas 8.1. and 8.2.

This is illustrated in the following figures (8.1.) and (8.2.) showing the empirical bayes predictions of country-specific regression lines for random slope models of being either in a management or non-management position. In case of no variation in the gender effect between countries the lines should be parallel with a possible variation in the intercept (as in case of a random-intercept model). However, the graphs clearly show that the occupational distribution of men and women varies across countries not only with respect to the intercept but also with respect to the slope.

Figure A6.1: Empirical Bayes Predictions of country-specific regression lines for random slope models to be in a management vs. non-management position (ISCO88 group 1)



Source: EULFS 2004/2005, own calculations

Furthermore, to determine whether the above demonstrated country-level variation in the gender slope is contingent upon country-level factors (here for instance *Short*), cross-level interaction are introduced (see exemplarily equation (8.5.) and (8.6.) for one educational context variable). While the individual level formula is the same as in equation (8.1.), for the country-level the following formula can be specified:

(8.5.)
$$\beta_{0j} = \gamma_{00} + \gamma_{01}(Short)_j + u_{0j}$$
$$\beta_{1j} = \gamma_{10} + \gamma_{11}(Short)_j + u_{1j}$$
$$\beta_{ij} = \gamma_{ij}$$

Including equation (8.6.) into (8.1.) the final model can be specified:

(8.6.)
$$\ln\left[\frac{P_{management}}{P_{non\text{-}management}}\right] = \gamma_{00} + \gamma_{01}(Short)_j + \gamma_{10}(women)_{ij} + \gamma_{11}(Short_j * women_{ij}) + \gamma_{ij}X_{ij} + u_{0j} + u_{1j}(women)_{ij}$$

Table A6.1: Pearson's correlations: educational system indices

	1	2	3	4
	Student enrolment (%), voc./tech. education	Fem.share (%) of tertiary degree holders	Gross completion rate of women, ISCED 5B	Share of women in typical male fields
1	1			
2	-.562(**)	1		
3	-.016	.221	1	
4	-.371	.715(**)	.400	1

*N = 21, * Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).*

Table A6.2: Pearson's correlations: post-industrial indices

	1	2	3	4	5	6
	Fem. employment rate (%)	Share of empl. persons (%), service sector	Share of persons (%), over 20 years with employer	Share of persons (%), work part time	Share of women (%), public service sector	EPL index 2003
1	1					
2	.428	1				
3	-.306	.100	1			
4	.513(*)	.755(**)	-.045	1		
5	.549(**)	-.128	-.570(**)	-.067	1	
6	-.235	-.322	.279	-.208	-.141	1

*N = 21, * Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).*

Table A6.3: Pearson's correlations: family and gender policy indices

	1	2	3	4	5	6
	Childcare (%), children < 3	Childcare (%), children 3-6	Eff. parental leave (weeks)	GEM	equ	prohi
1	1					
2	.254	1				
3	-.092	-.083	1			
4	.558(**)	.512(*)	-.033	1		
5	.092	.063	.013	.194	1	
6	-.682(**)	.000	.094	-.503(*)	.296	1

*N = 21, * Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).*

Table A6.4: Pearson's correlations: 'gender culture' indices (Share of persons (%) who disagree that...)

	1	**2**	**3**	**4**
	...men should have more right to work if jobs are scare	... men's job is work and women's job to look after the home	… a pre-school child suffers if the mother works	… men should do more childcare
1	1			
2	.502(*)	1		
3	.548(*)	.758(**)	1	
4	-.340	-.082	-.209	1

*N = 21, * Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).*

Table A6.5: Results (two binary hierarchical logistic regressions) for the division between typically male vs. integrated ('male') and typically female vs. integrated ('fem.') occupations - additional EPL indicator

	M7b_alt		**M8b_alt**		**M8b_alt_add**	
	male	**fem.**	**male**	**fem.**	**male**	**fem.**
Intercept	-1.98***	-3.25***	-1.98***	-3.25***	-1.98***	-3.24***
	(0.22)	*(0.19)*	*(0.19)*	*(0.18)*	*(0.21)*	*(0.17)*
Fixed effects						
Individual level						
Women	-1.10***	1.06***	-1.09***	1.06***	-1.09***	1.05***
(ref. men)	*(0.07)*	*(0.05)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.05)*
Country level						
FER[a]	-0.007	0.008	-0.03	0.03	0.01	-0.02
	(0.03)	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.02)*
Service[b]			**0.07***	**-0.05***		
			(0.03)	*(0.03)*		
Public[c]					-0.06	**0.10****
					(0.05)	*(0.04)*
EPL[d]	-0.76	-0.35	-0.48	-0.56	**0.79***	-0.31
	(0.39)	*(0.34)*	*(0.37)*	*(0.33)*	*(0.38)*	*(0.30)*
Cross level						
FER*women	-0.004	**0.02*****	0.001	**0.03*****	-0.010	**0.02****
	(0.008)	*(0.007)*	*(0.009)*	*(0.007)*	*(0.009)*	*(0.008)*
Service*women			-0.01	-0.009		
			(0.009)	*(0.007)*		
Public*women					0.014	-0.001
					(0.014)	*(0.012)*
EPL*women	-0.08	0.03	-0.12	-0.009	-0.07	0.03
	(0.12)	*(0.09)*	*(0.11)*	*(0.09)*	*(0.12)*	*(0.09)*
Random effects						
Var *(intercept u_{0j})*	1.01	0.76	0.78	0.64	0.95	0.57
	(0.31)	*(0.24)*	*(0.24)*	*(0.20)*	*(0.30)*	*(0.18)*
Var *($women_j$)*	0.06	0.05	0.05	0.04	0.06	0.05
	(0.03)	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*
Covar *(u_{0j}, $women_j$)*	-0.10	0.08	-0.07	0.05	-0.09	0.08
	(0.08)	*(0.05)*	*(0.06)*	*(0.05)*	*(0.07)*	*(0.05)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (Individual level) = 196,033 for typically female vs. integrated occupation and 224,107 for typically male vs. integrated occupation, N (Country level) = 21*

Notes: a) Female employment rate, b) Share of persons in the service sector, c) Female share in the public sector, d) Employment Protection Legislation Index

Source: EULFS 2004/2005, own calculations

Table A6.6: Results (two binary hierarchical logistic regressions) for the division between typically male vs. integrated ('male') and typically female vs. integrated ('fem.') occupations - alternative gender policy indices

	M7c_alt		***M8c_alt***	
	male	**female**	**male**	**female**
Intercept	-1.98***	-3.25***	-1.98***	-3.25***
	(0.23)	*(0.20)*	*(0.17)*	*(0.18)*
Fixed effects				
Individual level				
Women	-1.12***	1.05***	-1.11***	1.06***
(ref. men)	*(0.07)*	*(0.06)*	*(0.06)*	*(0.06)*
Country level				
Child3[a]			**-0.05****	0.006
			(0.02)	*(0.02)*
Child6[b]			**0.04*****	-0.007
			(0.01)	*(0.01)*
Parent[c]			0.004	0.008
			(0.005)	*(0.005)*
Equality[d]	0.97	-0.68	1.68	-0.77
	(1.12)	*(0.97)*	*(0.93)*	*(0.98)*
Prohibit[e]	-0.50	-0.02	**-1.09****	0.03
	(0.31)	*(0.27)*	*(0.34)*	*(0.36)*
Cross level				
Child3*women			0.009	0.005
			(0.006)	*(0.006)*
Child6*women			-0.006	-0.005
			(0.004)	*(0.004)*
Parent*women			0.003	0.001
			(0.001)	*(0.002)*
Equality*women	0.85	0.23	0.71	0.16
	(0.60)	*(0.34)*	*(0.60)*	*(0.35)*
Prohibit*women	0.08	-0.10	0.18	-0.04
	(0.09)	*(0.09)*	*(0.12)*	*(0.12)*
Random effects				
Var *(intercept u_{0j})*	0.61	0.69	0.61	0.69
	(0.19)	*(0.22)*	*(0.19)*	*(0.22)*
Var *($women_j$)*	0.04	0.07	0.04	0.07
	(0.02)	*(0.02)*	*(0.02)*	*(0.02)*
Covar *(u_{0j}, $women_j$)*	-0.05	0.06	-0.05	0.06
	(0.05)	*(0.05)*	*(0.05)*	*(0.05)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (Individual level) = 196,033 for typically female vs. integrated occupation and 224,107 for typically male vs. integrated occupation, N (Country level) = 21*

Notes: a) Childcare facilities for children aged 0-3, b) Childcare facilities for children aged 3-6, c) Effective parental leave, d) Anti-discrimination legislation, e) Legislation prohibiting women to enter specific occupations

Source: EULFS 2004/2005, own calculations

Table A6.7: Results (hierarchical logistic regression) for the division between management and non-management positions - additional EPL indicator

	M7b_alt	**M8b_alt**	**M8b_alt_add**
Intercept	-1.38***	-1.38***	-1.38***
	(0.10)	*(0.09)*	*(0.08)*
Fixed effects			
Individual level			
Women	-0.77***	-0.77***	-0.77***
(ref. men)	*(0.04)*	*(0.04)*	*(0.04)*
Country level			
FER[a]	0.001	0.01	**-0.03***
	(0.01)	*(0.01)*	*(0.01)*
Service[b]		**-0.03****	
		(0.01)	
Public[c]			**0.07*****
			(0.02)
EPL[d]	-0.33	**-0.47****	**-0.30***
	(0.18)	*(0.16)*	*(0.14)*
Cross level			
FER* women	0.007	0.01	-0.001
	(0.006)	*(0.006)*	*(0.006)*
Service* women		-0.008	
		(0.006)	
Public*women			**0.02****
			(0.009)
EPL*women	-0.06	-0.10	-0.05
	(0.08)	*(0.08)*	*(0.07)*
Random effects			
Var *(intercept u_{0j})*	0.21	0.15	0.12
	(0.07)	*(0.05)*	*(0.04)*
Var *($women_j$)*	0.03	0.03	0.02
	(0.01)	*(0.01)*	*(0.01)*
Covar *(u_{0j}, $women_j$)*	0.04	0.03	0.01
	(0.02)	*(0.02)*	*(0.01)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (Individual level) = 250,237 for management vs. non-management positions, N (Country level) = 21*
Notes: a) Female employment rate, b) Share of persons in the service sector, c) Female share in the public sector, d) Employment Protection Legislation Index
Source: EULFS 2004/2005, own calculations

Table 6.8: Results (hierarchical logistic regression) for the division between management and non-management positions - finer gender indices

	M7c_alt	**M8c_alt**
Intercept	-1.38***	-1.38***
	(0.10)	*(0.09)*
Fixed effects		
Individual level		
Women	-0.77***	-0.77***
(ref. men)	*(0.04)*	*(0.04)*
Country level		
Child3[a]		0.01
		(0.009)
Child6[b]		**-0.02***
		(0.006)
Parent[c]		0.002
		(0.002)
Equality[d]	-0.67	-0.86
	(0.52)	*(0.49)*
Prohibit[e]	-0.007	0.15
	(0.14)	*(0.18)*
Cross level		
Child3*women		**0.008***
		(0.004)
Child6*women		-0.004
		(0.002)
Parent*women		**0.002***
		(0.001)
Equal*women	-0.27	-0.40
	(0.24)	*(0.23)*
Prohibit*women	-0.08	0.01
	(0.06)	*(0.07)*
Random effects		
Var *(intercept u_{0j})*	0.22	0.17
	(0.07)	*(0.05)*
Var *($women_j$)*	0.03	0.02
	(0.01)	*(0.01)*
Covar *(u_{0j}, $women_j$)*	0.04	0.02
	(0.02)	*(0.02)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (Individual level) = 250,237 for management vs. non-management positions, N (Country level) = 21*
Notes: a) Childcare facilities for children aged 0-3, b) Childcare facilities for children aged 3-6, c) Effective parental leave, d) Anti-discrimination legislation, e) Legislation prohibiting women to enter specific occupations.
Source: EULFS 2004/2005, own calculations

Results for the sensitivity analyses applying a broader definition of management positions

Table A6.9: Individual-level coefficients (random intercept and random slope models) to be in a management or non-management positions (EGP)

	M0	***M1***	***M2***	***M3***	***M4***
Intercept	-0.39***	-0.02	-0.02	-0.06	-0.13
	(0.06)	*(0.07)*	*(0.07)*	*(0.07)*	*(0.12)*
Fixed effects					
Individual level					
Women		-0.73***	-0.72***	-0.62***	-0.60***
(ref. men)		*(0.008)*	*(0.06)*	*(0.06)*	*(0.11)*
High. Tert. Degree				0.94***	0.94***
(ref. sec. degree)				*(0.03)*	*(0.03)*
Male field				0.13***	0.13***
(ref. integrated field)				*(0.01)*	*(0.01)*
Female field				-0.20***	-0.20***
				(0.01)	*(0.01)*
Young age cohort				-0.14***	-0.14***
(ref. old age cohort)				*(0.01)*	*(0.01)*
Married				0.06***	0.06***
(ref. not married)				*(0.009)*	*(0.009)*
Country level					
Conservative seg. regime					*Ref.*
Modern seg. regime					0.13
					(0.22)
Traditional seg. regime					0.07
					(0.17)
Post-com. seg. regime					0.13
					(0.20)
Cross level					
Modern*women					-0.27
					(0.18)
Traditional *women					0.004
					(0.14)
Post-com.*women					0.05
					(0.17)
Random effects)					
Var *(intercept u_{0j})*	0.08	0.09	0.10	0.10	0.10
	(0.03)	*(0.03)*	*(0.03)*	*(0.05)*	*(0.03)*
Var *($women_j$)*			0.08	0.08	0.07
			(0.03)	*(0.05)*	*(0.02)*
Covar *(u_{0j}, $women_j$)*			-0.03	-0.03	-0.03
			(0.02)	*(0.02)*	*(0.02)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (Individual level) = 250,237 for management vs. non-management positions, N (Country level) = 21*
Source: EULFS 2004/2005, own calculations

Table A6.10: Results (hierarchical logistic regression) for the division between management and non-management positions (EGP) - education indices

	M5a	**M6a**	**M7a**	**M8a**	**M9a**
Intercept	-0.06	-0.06	-0.06	-0.06	-0.06
	(0.07)	*(0.07)*	*(0.07)*	*(0.07)*	*(0.07)*
Fixed effect					
Individual level					
Women	-0.62***	-0.62***	-0.63***	-0.62***	-0.63***
(ref. men)	*(0.06)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.06)*
Country level					
Short[a]	0.16			0.12	0.14
	(0.16)			*(0.15)*	*(0.16)*
Tertiary[b]		0.02		0.02	0.02
		(0.01)		*(0.01)*	*(0.02)*
Atypical[c]			0.007		-0.003
			(0.007)		*(0.01)*
Cross level					
Short*women	-0.02			-0.02	0.03
	(0.14)			*(0.15)*	*(0.15)*
Tertiary *women		-0.003		-0.002	0.008
		(0.01)		*(0.01)*	*(0.02)*
Atypical*women			-0.005		-0.009
			(0.007)		*(0.01)*
Random effects					
Var *(intercept u_{0j})*	0.10	0.09	0.10	0.09	0.09
	(0.03)	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*
Var *($women_j$)*	0.08	0.08	0.08	0.08	0.07
	(0.03)	*(0.03)*	*(0.03)*	*(0.03)*	*(0.02)*
Covar *(u_{0j}, $women_j$)*	-0.03	-0.03	-0.02	-0.03	-0.03
	(0.02)	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$, ***; standard errors are in parenthesis, N (Individual level) = 250,237 for management vs. non-management positions, N (Country level) = 21*
Notes: a) Share of women graduating from ISCED5B courses, b) Share of women in tertiary education, c) Share of women in atypical fields of study
Source: EULFS 2004/2005, own calculations

TableA6.11: Results (hierarchical logistic regression) for the division between management and non-management positions (EGP) - post-industrial indices

	M5b	M6b	M6b_alt	M7b	M8b	M8b_alt
Intercept	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
	(0.07)	*(0.07)*	*(0.07)*	*(0.07)*	*(0.07)*	*(0.06)*
Fixed effects						
Individual level						
Women	-0.62***	-0.62***	-0.62***	-0.62***	0.62***	0.62***
(ref. men)	*(0.06)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.05)*	*(0.06)*
Country level						
FER[a]	0.003	0.005	-0.007	0.007	0.007	-0.02
	(0.009)	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*
Service[b]		-0.004			-0.004	
		(0.009)			*(0.013)*	
Public[c]			0.03			**0.05***
			(0.02)			*(0.02)*
Length[d]				0.005	0.007	0.02
				(0.01)	*(0.01)*	*(0.01)*
Part-time[e]				-0.004	-0.001	0.004
				(0.009)	*(0.01)*	*(0.001)*
Cross level						
FER* women	-0.003	0.003	-0.002	-0.007	-0.003	-0.003
	(0.008)	*(0.008)*	*(0.01)*	*(0.01)*	*(0.008)*	*(0.01)*
Service* women		-0.01			**-0.03****	
		(0.008)			*(0.01)*	
Public*women			-0.002			-0.008
			(0.01)			*(0.02)*
Length*women				-0.008	-0.002	-0.01
				(0.01)	*(0.01)*	*(0.01)*
Part-time*women				0.003	**0.02***	0.001
				(0.008)	*(0.009)*	*(0.009)*
Random effects						
Var *(intercept u_{0j})*	0.10	0.10	0.09	0.10	0.10	0.08
	(0.03)	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*
Var *($women_j$)*	0.08	0.07	0.08	0.08	0.06	0.08
	(0.03)	*(0.02)*	*(0.03)*	*(0.02)*	*(0.02)*	*(0.02)*
Covar *(u_{0j}, $women_j$)*	-0.03	-0.03	-0.03	-0.03	-0.03	-0.02
	(0.02)	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (Individual level) = 250,237 for management vs. non-management positions, N (Country level) = 21*
Notes: a) Female employment rate, b) Share of persons in the service sector, c) Female share in the public sector, d) Share of persons who stay longer than 20 years with the same employer, e) Share of part-time employment among all employed persons
Source: EULFS 2004/2005, own calculations

TableA6.12: Results (hierarchical logistic regression) for the division between management and non-management positions (EGP) - gender policy indices

	M5c	**M6c**	**M7c**	**M8c**
Intercept	-0.06	-0.06	-0.06	-0.06
	(0.07)	*(0.07)*	*(0.07)*	*(0.06)*
Fixed effects				
Individual level				
Women	-0.62***	-0.62***	-0.62***	-0.62***
(ref. men)	*(0.06)*	*(0.06)*	*(0.06)*	*(0.06)*
Country level				
Child3[a]	0.005	0.005		0.009
	(0.005)	*(0.005)*		*(0.005)*
Child6[b]	-0.005	-0.005		-0.002
	(0.005)	*(0.005)*		*(0.005)*
Parent[c]		0.001		0.001
		(0.002)		*(0.002)*
GEM[d]			-0.63	-1.18
			(0.66)	*(0.83)*
Cross level				
Child3*women	-0.002	-0.002		-0.003
	(0.004)	*(0.004)*		*(0.005)*
Child6*women	-0.002	-0.002		-0.003
	(0.004)	*(0.004)*		*(0.005)*
Parent*women		-0.000		-0.000
		(0.002)		*(0.002)*
GEM*women			-0.17	0.32
			(0.59)	*(0.79)*
Random effects				
Var *(intercept u_{0j})*	0.09	0.09	0.10	0.08
	(0.03)	*(0.03)*	*(0.03)*	*(0.03)*
Var *($women_j$)*	0.08	0.08	0.08	0.07
	(0.02)	*(0.02)*	*(0.03)*	*(0.02)*
Covar *(u_{0j}, $women_j$)*	-0.03	-0.03	-0.03	-0.03
	(0.02)	*(0.02)*	*(0.02)*	*(0.02)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (Individual level) = 250,237 for management vs. non-management positions, N (Country level) = 21*
Notes: a) Childcare facilities for children aged 0-3, b) Childcare facilities for children aged 3-6, c) Effective parental leave, d) Gender Empowerment Measure
Source: EULFS 2004/2005, own calculations

Table A6.13: Results (hierarchical logistic regression) for the division between management and non-management positions (EGP) - 'gender culture' indices

	M5d	***M6d***	***M7d***
Intercept	-0.06	-0.06	-0.06
	(0.07)	*(0.07)*	*(0.07)*
Fixed effects			
Individual level			
Women	-0.62***	-0.62***	-0.62***
(ref. men)	*(0.06)*	*(0.06)*	*(0.06)*
Country level			
Right	0.004		-0.001
	(0.007)		*(0.007)*
Division	-0.002		-0.003
	(0.005)		*(0.006)*
Suffer		0.001	0.005
		(0.005)	*(0.008)*
Childcare		-0.012	-0.011
		(0.007)	*(0.008)*
Cross level			
Right*women	0.002		0.004
	(0.006)		*(0.006)*
Division*women	-0.005		-0.004
	(0.004)		*(0.005)*
Suffer*women		-0.005	-0.003
		(0.005)	*(0.007)*
Childcare*women		0.000	0.002
		(0.007)	*(0.007)*
Random effects			
Var *(intercept u_{0j})*	0.10	0.09	0.09
	(0.03)	*(0.03)*	*(0.03)*
Var *($women_j$)*	0.07	0.07	0.07
	(0.02)	*(0.02)*	*(0.02)*
Covar *(u_{0j}, $women_j$)*	-0.03	-0.03	-0.03
	(0.02)	*(0.02)*	*(0.02)*

*$p < 0.05$, * $p < 0.01$, ** $p < 0.001$,***; standard errors are in parenthesis, N (Individual level) = 250,237 for management vs. non-management positions, N (Country level) = 21*
Notes: a) Right of women to work if jobs are scarce, b) Women=child and men=work, c) Child suffers if the mother works, d) Men should do more childcare
Source: EULFS 2004/2005, own calculations

Table A6.14: Variance components (random slope models) for holding a management or non-management positions (EGP)

	1	2	3	4	5	6	7
Random Slope							
Var *(u_{0j})*	0.08 *(0.03)*	0.10 *(0.05)*	0.10 *(0.03)*	0.09 *(0.03)*	0.10 *(0.03)*	0.08 *(0.03)*	0.09 *(0.03)*
R^2	**3%**		**0%**	**10%**	**0%**	**20%**	**10%**
Var *($women_j$)*		0.08 *(0.05)*	0.07 *(0.02)*	0.07 *(0.02)*	0.06 *(0.02)*	0.07 *(0.02))*	0.07 *(0.02)*
R^2			**13%**	**13%**	**25%**	**13%**	**13%**
Covar *(u_{0j}, $women_j$)*		-0.03 *(0.02)*	-0.03 *(0.02)*	-0.03 *(0.02)*	-0.03 *(0.02)*	-0.03 *(0.02)*	-0.03 *(0.02)*

Notes: 1=zero model, 2=only individual-level variables, 3= individual+segregation regime variables, 4=individual+educational variables, 5=individual+post-industrial variables, 6=individual +family policy variables, 7=individual+gender culture variables
Source: EULFS 2004/2005, own calculations

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