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Occupational Sex-Composition and Earnings: Individual and Societal Effects

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Abstract

This paper investigates the micro and macro-level factors affecting the empirical association between occupational sex-composition and individual earnings. This is done in two analytical steps using data from the second round of the European Social Survey. In a first step, country-fixed-effects regressions are used to test the extent to which job-specialization, gender attitudes and the relative supply of domestic work can account for the impact of occupational sex-composition on earnings. In accordance with previous research, it is found that all these micro-level variables have a significant effect on the analyzed association, yet only job-specialization can explain it away by itself. In a second analytical step, macro-level interactions are tested under the hypothesis that *defamilialization* policies reduce the pay-offs of sphere specialization by sex, generating incentives for all types of women to invest in the labor market. Empirical results suggest that gender attitudes and the relative supply of housework are much more loosely associated to earnings in social-democratic and former communist societies than in conservative or liberal regimes. This finding is interpreted as consistent with the defamilialization hypothesis.

Keywords

Sex composition, earnings, gender attitudes, job-specialization, housework, welfare states, defamilialization, European Social Survey

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INTRODUCTION

It is well documented that women earn less than men and that occupational sex-composition —i.e. the proportion of women in an occupation— is the largest contributor to this gap (see e.g.: Blau and Khan, 2000; Boraas and Rodgers 2003; Groshen 1991; Meyersson-Milgrom, Petersen and Snartland 2001; Petersen and Morgan 1995; Petersen et al. 1997; Tomaskovic-Devey 1993). In other words, women earn less than men mainly because they are more likely to occupy jobs that entail lower rewards. Yet despite the very large body of empirical research produced over the last decades, important theoretical controversies remain unresolved in the literature on sex-segregation and the gender wage gap. These controversies are mainly about the social processes that link individuals to jobs, on the one hand, and jobs to rewards, on the other (see e.g.: England, Hermsen and Cotter 2000; Tam 1997; 2000). Two main competing views on the factors that govern such *allocation* and *valuation* processes can be distinguished in the literature. To simplify, I call the first view “socio-cultural” and the second “economic”.

Socio-cultural theories stress the crucial role that gender attitudes play in both allocation and valuation processes. Gender attitudes are thought to influence these processes both at the supply and the demand side of the labor market by making men and women differ in their occupational choices and career aspirations as well as by making employers prone to sex-discrimination in their employment, promoting and rewarding practices. In sharp contrast to socio-cultural explanations, economic or rational action theories stress the crucial role that cost-benefit calculations play in driving both human capital investments and reward structures. Such micro-level calculations are crucially influenced by the risk of job disruptions, which, in turn, depends heavily on the existing societal distribution of childcare and domestic tasks. Economic explanations do not require ‘gendered’ rationalities to explain ‘gendered’ outcomes. Socio-cultural and economic approaches are reviewed in greater detail below.

A review of socio-cultural and economic theories of allocation and valuation reveals that there are three different set of micro-level factors that are expected to affect the observed association between occupational sex-composition and individual earnings, namely: 1) gender ideology; 2) job-specialization and 3) the distribution of domestic tasks. Although there is empirical research on each of these factors, their relative contribution in explaining the association between occupational sex-composition and earnings has hardly ever been tested *simultaneously* (see, however: Polavieja forthcoming). This limits our capacity to understand the crucial association between individual’s sex, the female composition of their jobs and their earnings, which lies at the very heart of the observed differences in pay between men and women in industrialized societies.

This paper seeks to contribute to the study of the mechanisms behind the gender wage gap by focusing on the crucial empirical association between occupational sex-composition and earnings. Its main goal is to unpack this association by introducing in the earnings functions indicators that capture individuals’ level of job-specialization,

their gender attitudes and their relative supply of domestic work, as well as by testing for macro-level institutional variation in the impact of attitudinal and domestic-sphere variables. Institutional variation is investigated under the hypothesis that welfare policies conducive to ensure women's economic independence from other family members —i.e. *defamilialization* policies— reduce the opportunity costs of job-specialization for women (and for their employers), whilst increasing their intra-household bargaining power. Both processes would help to erode the traditional division of labor between the sexes and this, in turn, would affect the relative weight that gender attitudes and the relative input of domestic work play in accounting for the association between occupational sex-composition and earnings.

The paper thus adds a comparative dimension to previous research on the mechanisms of the gender wage gap. It builds on both micro and macro-level analyses, as well as on both empirical and theoretical contributions. In particular, the paper follows up on Tam's seminal study of the role of job-specialization in explaining the empirical association between occupational sex-composition and earnings in the US (see: Tam 1997), as well as on Polavieja's analysis of the attitudinal and economic determinants of such association in Spain (Polavieja forthcoming). On the other hand, the defamilialization hypothesis draws on the theoretical literature on gender and the welfare state (see e.g.: Esping-Andersen 1999: chap. 4; Lewis 1992; Daly and Rake 2003; Orloff 1993; 1996; Sainsbury 1994; 1999) and builds on recent contributions that explore the impact of welfare institutions on women's skill-formation (see: Estevez-Abe 2005; Tåhlin forthcoming), as well as on women's intra-household bargaining power (see e.g.: Evertsson and Neramo 2004; Fuwa 2004).

Individual and institutional hypotheses are tested using the second round of the European Social Survey (ESS) carried out in 2004. The analyzed sample includes all employed wage-earners older than 24 and country nationals from Belgium, the Czech Republic, Denmark, Finland, Germany, Luxemburg, Norway, Poland, Spain, Sweden, Switzerland and the United Kingdom. The ESS allows us to perform a multivariate simultaneous test of the impact of attitudes, job-specific human capital and the relative supply of domestic work in accounting for the observed correlation between occupational sex-composition and individual earnings, as well as to test for macro-level societal effects. These latter effects are tested via interaction terms using a typology of societal "clusters" that adds post-communist societies to the well-known and widely used welfare regime types originally proposed by Esping-Andersen (1990).

EXPLANATIONS OF SEX-SEGREGATION AND THE GENDER WAGE-GAP

Socio-Cultural Explanations of Sex Segregation and the Gender Wage Gap

Socio-cultural theories stress the crucial role that gender values play in both *allocation* and *valuation* processes. Gender views are acquired through various processes of socialization both in childhood and in adult life and reflect the existing balance of power between the sexes (see e.g.: Baxter and Kane 1995). Socialization shapes men

and women's occupational choices and career aspirations differently. As a result, women *on average* would be more likely to assign a greater value to home-and-child-caring than men and to look for particular job amenities not necessarily linked to monetary rewards. Women holding traditional gender views would, therefore, tend to self-select themselves either out of employment or into less demanding but also less economically rewarding jobs (see e.g.: Correll 2001; Hakim 1991; Shu and Marini 1998; Vogler 1994; Waite and Berryman 1985). On the demand-side, employers' socialization in patriarchal gender attitudes would also affect the allocation process by generating more or less avert forms of gender discrimination. Discrimination in allocation processes would be typically produced via sex-typing and sex aversion/sex affinity practices, which employers would incur when employing and promoting their workforces (see e.g.: Bergmann 1986; Goldin 1990; Reskin and Padavic 1988; Ridgeway 1997).

Discrimination through patriarchal attitudes could also affect the valuation process — i.e. the process that links female jobs to relative lower wages— if employers consider the work mostly performed by women as less worthy. Both experimental evidence as well as evidence from prestige surveys do indeed suggest that people tend to assign a lower value to the work that is typically carried out by women (see: Tam 1997:1655-56). Defenders of the theory of cultural devaluation claim that this cultural bias that is captured by attitudinal surveys and experiments should also translate into the wage-setting process via the gender attitudes of both employers and male-dominated trade unions (see e.g.: England et al. 1994; Reskin 1988; Stanek Kilbourne et al. 1994). Yet employers' gender attitudes are generally unobservable (at least in relation to their employees' rewards). This implies that all the evidence in support of the cultural devaluation theory is of an *indirect* kind. It rests on the observed empirical association between the sex-composition of respondents' occupations and their earnings, after controlling for numerous workers' characteristics that are interpreted as capturing differences in human capital (see e.g.: Sorensen 1990; England 1992; Macpherson and Hirsch 1995).

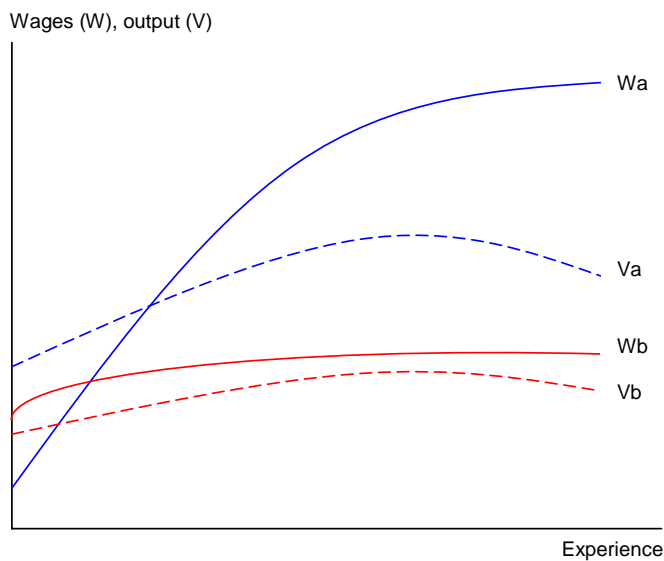
Economic Explanations of Sex-Segregation and the Gender Wage Gap

In sharp contrast to socialization arguments, economic (or rational action) approaches see both allocation and valuation processes as mainly driven by purely economic determinants. This perspective stresses the importance of cost-benefit calculations, economic specialization, and, crucially, the consequences that human capital investments and contractual hazard might have for the allocation and valuation choices of both individual employers and employees.

Rational individuals take into consideration the expected costs and benefits of their allocation choices. Their calculations are affected by two crucial variables: the existing distribution of domestic and childbearing responsibilities and the different skill-investment requirements of jobs. The former imposes different risks (costs) of job-disruption for men and women, whilst the latter has a crucial impact on the structure of rewards.

Jobs requiring low investments in specific-skill acquisition will offer significantly lower returns to tenure. In contrast, jobs requiring specific skills must be compensated for with higher tenure-earning profiles. The typical compensation structure for jobs requiring specific skills is one where employees are paid below their productivity at the early stages of their careers (when most training takes place) but receive significant wage premiums at the end (see e.g.: Lazear 1995: chap. 4). By offering lower starting wages, employers shift part of the skill-investment costs to their employees; whilst by offering wage premiums linked to tenure employers encourage employees to invest in specific skills, to work harder and to stay longer in the firm —thus safeguarding the firm’s training investments (see: Becker 1993[1964]:34-49)¹. The result is upward-sloping tenure-earning profiles for jobs that require skill specialization but flatter tenure-earning profiles for the rest. Figure 1 represents these two different reward structures that follow from economic theories of compensation.

Figure 1. Compensation profiles over experience for high-specialization (a) and low-specialization (b) jobs



Note that, given such compensation schemes, any rational actor anticipating job disruptions will be less inclined to incur investment costs that can only be recouped in the future and only as long as the employment relationship is maintained. Given the existing distribution of childcare and domestic responsibilities, women are more likely to experience such disruptions and hence will be more likely to choose, or be chosen for, jobs that have lower requirements in terms of job-specialization. If this is so, then the effect of occupational sex-composition on wages could be in principle explained away by simply introducing in the wage equations more refined indicators of the specific skill requirements of jobs than usually available.

This was precisely Tam's strategy (Tam 1997). Using data from the 1988 US Current Population Survey, Tam showed that the association between occupational sex-composition and earnings disappeared once the job-specific human capital requirements of individuals' occupations were accounted for in the earnings functions. Tam's finding seemed inconsistent with the cultural devaluation hypothesis as it showed that there were no observable differences in rewards for individuals employed in occupations requiring similar levels of specific human capital². Yet it must be noted that Tam's finding did not rule out the possibility that women's gender attitudes play a role in the job-allocation process and consequently have an effect on their earnings. Tam could have not tested this possibility out as his data did not include any information on women's gender views.

Using the Spanish sample of the 2004 round of the European Social Survey (ESS), Polavieja (forthcoming) replicated Tam's approach to find again that job-specialization absorbs all the impact of occupational sex-composition on earnings. This finding was also interpreted as incompatible with the cultural devaluation hypothesis but in line with the expectations of economic models. Yet Polavieja also found that traditional gender attitudes were associated with lower earnings for Spanish women, as well as with a reduction of the association between occupational sex-composition and earnings. This suggests that socialization in gender roles could indeed play a depressing effect on women's earnings net of economic variables—including job-specialization—which was interpreted as consistent with supply-side theories of gender-role socialization. Finally, Polavieja (forthcoming) found that the relative supply of domestic work was associated with lower earnings, a finding which was also interpreted as in line with economic theories of sphere-specialization.

The findings of Tam (1997) and Polavieja (forthcoming) advance our understanding of the micro-level mechanisms involved in the gender wage gap in both the US and Spain. But to what extent can these findings be generalized to other societies? Welfare provision conducive to defamilialization is known to be low in both liberal and conservative regimes, to which the US and Spain belong respectively (see below). Are the micro-level findings reported in the literature linked to the degree of defamilialization prevailing in the analyzed societies? More generally, how does defamilialization affect the micro-level mechanisms involved in the gender wage gap? These questions can be addressed by exploiting the comparative potential of the ESS.

Institutional Variation: The Impact of Defamilialization

Welfare provision can have an impact on gender relations and family structures, social citizenship, access to paid work, opportunities for career progression and on the possibility to hold an autonomous household (see e.g.: Orloff 1993; Lewis 1992; O'connor 1996). The welfare state literature uses the concept of *defamilialization* to encompass all the above effects. Defamilialization is often defined as the capacity of welfare regimes to ensure individuals' independence from reliance on other family members (see eg.: Esping-Andersen 1999: chap. 4; Lister 1997:173). The *defamilializing* impact of different welfare states is typically judged by the degree to which social policies and services "free women from the burden of family

obligations; the extent to which motherhood is compatible with careers” (Esping Andersen 1999:51).

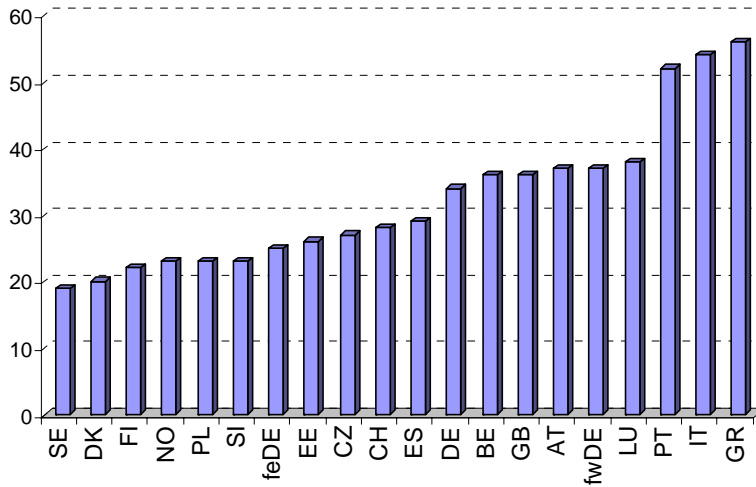
By supporting gender equality in the labor market, defamilialization policies are expected to reduce the pay-offs of traditional sphere specialization. Economic-specialization models stress that a crucial element for career development is the capacity to invest in job-specific human capital. Welfare state institutions, such as paternity/maternity-leave legislation and extensive public childcare provision, can safeguard specific skill-investments by reducing the risks of skill depreciation and missed skill acquisition opportunities. As Estebez-Abe (2005) explains, public childcare is particularly crucial as it reduces women’s time off work, hence increasing women’s opportunities for job specialization, whilst reducing firms’ (re-)training costs.

Public policies aimed at facilitating women’s integration in the labor market and at ameliorating the economic consequences of family disruption should also increase women’s intra-household bargaining power. This follows from both sociological and economic bargaining models, which see the unequal distribution of domestic work as the result of spouses’ relative access to resources³ (see e.g. Bittman et al. 2003; Ermisch, 2003; Evertsson and Neramo, 2004; 2007). Defamilialization should therefore empower women both in the market and inside their households. As a result, we should expect to find lower levels of sex-imbalance in housework and hence a weaker association between housework and wages in highly *defamilializing* welfare states.

Comparative analyses of the division of housework show indeed that the most egalitarian distribution of domestic work between spouses takes place in Nordic European countries, characterized by providing the highest levels of defamilialization (see e.g.: Baxter 1997; Evertsson and Neramo 2004; Fuwa 2004). This finding is further supported by our own preliminary analysis of the European Social Survey, ESS (see Figure 2). To our knowledge, there has been no research as to whether defamilialization also leads to a weaker association between relative domestic input and earnings. This hypothesis will be analyzed in the next section.

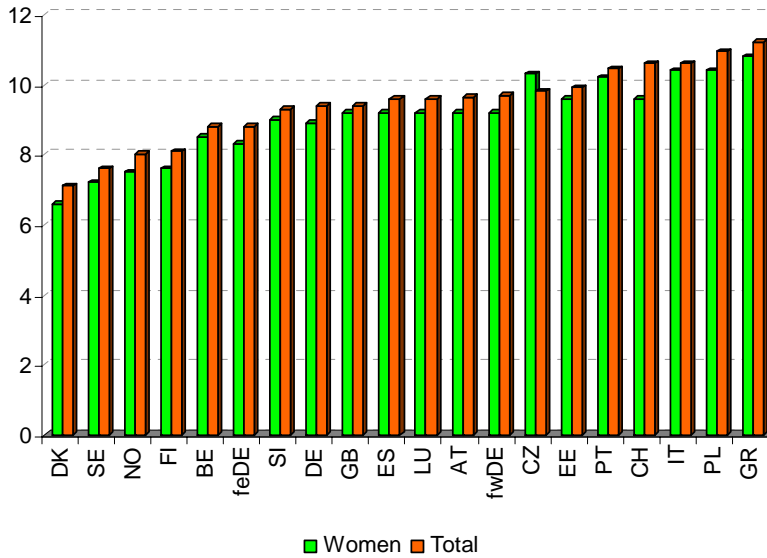
To the extent that gender attitudes are grounded in people’s experiences, defamilialization should also lead to the erosion of gender traditionalism. The comparative studies of Baxter and Kane (1995) and Sjöberg (2004) show indeed that women’s dependence on the family, both at the societal and the individual levels, is associated with less egalitarian gender attitudes. Both studies found that Nordic European countries display the most egalitarian gender attitudes, a finding which is also in line with our own preliminary analysis of the ESS (see Figure 3).

Figure 2: Gender Gaps in Housework (ESS, 2004)



Note. — For each country, gaps are calculated as the proportion of employed women that report doing more than $\frac{3}{4}$ of the housework minus the proportion of employed men that report doing more than $\frac{1}{2}$.

Figure 3. Index of Traditional Sex-Role Attitudes. Mean Scores by Country, ESS (2004)



Apart from having a direct impact on gender attitudes, defamilialization could diminish the impact that these attitudes have on labor market behavior and thereby on individual earnings. This is because public policies aimed at achieving gender equality in the labor market could generate enough incentives such as to induce even the most

traditional women to opt for their career development. If this is the case, the association between women's gender attitudes and their earnings should be weaker in high defamilialization societies. Defamilialization would, therefore, not only affect gender attitudes directly, but also reduce the economic consequences of gender traditionalism. Again, to our knowledge, no previous research has tackled this latter hypothesis, which will be tested in the empirical section of the paper. Table 1 summarizes all the hypotheses discussed in this section.

Table 1. Summary of hypotheses

Micro-level hypotheses	Macro-level hypotheses
<p><i>H1. Devaluation hypothesis: Employers (consumers and trade unions) assign a lower monetary value to the work mostly performed by women irrespectively of its intrinsic economic value. This would explain the empirical association between sex-composition and earnings.</i></p>	<p><i>H5. Societies that display greater levels of defamilialization should show a weaker association between relative domestic supply and earnings. This is because defamilialization reduces the pay-offs of sphere-specialization by sex, whilst increasing women's intra-household bargaining power.</i></p>
<p><i>H2. Specialization hypothesis: Women are more likely to occupy jobs that entail lower job-specialization requirements from which lower wages follow. Once job-specialization is accounted for, the effect of occupational sex-composition on earnings disappears.</i></p>	<p><i>H6. Similarly, defamilialization should weaken the association between sex-role attitudes and earnings, as it is expected to generate incentives even for the most traditional women to invest in the labor market.</i></p>
<p><i>H3. Women might be likely to occupy particular jobs due to their socialization in particular gender-roles. If this is so, we should be able to find some association between sex-role attitudes, occupational sex-composition and earnings.</i></p>	
<p><i>H4. The unequal distribution of domestic work can have career consequences for women, irrespectively of their preferences or sex-role attitudes.</i></p>	

Hypotheses regarding institutional variation are tested in this paper using Esping-Andersen's original welfare state typology comprising the *Conservative*, the *Social-Democratic* and the *Liberal* regimes (Esping-Andersen 1990), to which a fourth category including the *post-communist* societies of East-Central Europe is added. In accordance with the welfare-state literature, each welfare regime should be regarded as an *ideal-type* that reflects a particular underlying logic of welfare regulation. Esping-Andersen's typology was originally based on the pivotal concept of

decommodification —understood as the degree to which individuals' welfare depends on their labor market participation—, yet subsequent formulations extended the analysis of welfare regimes to incorporate defamilialization as an equally crucial dimension (see: Esping-Andersen 1999: chap. 4 and above).

It is well-known that the *Social-Democratic* model, prevailing in the Nordic countries of Europe, stands out from the rest in terms of its defamilializing impact, as it is the only model fully and explicitly committed to maximize women's economic independence from other family members. Scandinavian countries have achieved a high degree of defamilialization by providing income guarantees that are independent of household resources, by encouraging women's full and life-long integration in the labor market, and by lessening the familial burden through a very generous network of public childcare provision. In contrast, the welfare state commitment to promoting defamilialization is low both in *conservative* and *liberal* regimes. Welfare provision in the *conservative* model focuses on the family, as it is the family and not the individual that is considered the main locus of solidarity. This reinforces the traditional gender division of labor, where men specialize in the labor market and women in the domestic sphere. Welfare policies expressly aimed at increasing defamilialization are also largely absent in the *liberal* model, as the underlying logic of this model views the market as the central organizing principle of individuals' life chances. Policy intervention is targeted accordingly mainly to cases of market failure and demonstrable need.

Former communist societies have not been part of the welfare state literature until very recently. It is widely accepted that East-Central European accession countries and those of the former Soviet Union differ markedly in the constitutive characteristics of their evolving welfare states (see e.g.: Orenstein and Haas 2002). Whilst the former managed to maintain welfare programs after 1989, the welfare institutions of the latter virtually collapsed. The institutional legacy of communism with respect social provision has therefore been more enduring and consequential in the Central and Eastern European post-communist societies represented in the ESS⁴.

Communist regimes were strongly committed to the full integration of women in the productive sphere. Under state-socialism, extensive state-funded childcare provision (typically firm-based) was available and different work-activation laws were enacted in order to promote the "social standard of two workers per household" (Chase 1995:1). In East-Central Europe, such defamilialization policies were combined with generous policies regarding maternity leave (see: Saxonberg and Szelewa 2007). The state provision of transfers and services that sustained communist regimes' commitment to gender equalization in the productive sphere was, however, radically curtailed after regime change. Even East-Central European countries experienced vast cutbacks in public spending on childcare, which led to a sharp drop in enrollment rates and, more generally, to a general process of *refamilialization* (Hantrais 2004). As a result, and although public childcare provision and maternity leave policies were not dismantled in the post-communist societies of East-Central Europe, these societies can no longer be viewed as providing high levels of defamilialization today. Yet it is apparent that past policies can have long-lasting visible effects. According to the

European Social Survey, almost two thirds of the workforces of post-communist societies observed in 2004, were made of individuals who entered employment prior to 1989 —and almost half of these workforces were already older than 30 when regime change took place⁵. Past defamilialization policies could have therefore left an observable imprint in 2004 regardless of the new directions that family policies took after regime change (see: Saxonberg and Szelewa 2007).

DATA, VARIABLES AND METHODOLOGY

Hypotheses listed in Table 1 are tested using the second round of the European Social Survey, ESS (2004). The ESS offers an extraordinary opportunity to test for the mechanisms behind sex-differences in labor market rewards as it includes an exhaustive list of theoretically-informed indicators. Yet an important methodological caveat is that the ESS was primarily designed as an attitudinal survey, not as a survey on earnings. This implies that country samples are small for the purposes of earnings research. High rates of non-response to the questions on earnings reduce the working sample size further. In fact, in several countries the response rates to the earnings questions were below the 50 per cent threshold. Such countries have been excluded from the analysis⁶. The final working sample includes all employed wage-earners (reporting wages) older than 24 and country nationals from Belgium, the Czech Republic, Denmark, Finland, Germany, Luxemburg, Norway, Poland, Spain, Sweden, Switzerland and the United Kingdom (N=6,793). Small sample-size imposes several methodological limitations. It forces us to pool men and women together, to assume country-fixed effects and to test for institutional variation using welfare-regime typologies rather than more direct country-level interactions. Small sample size also generates large standard errors and hence wide confidence intervals around parameter estimates. This should be taken into consideration when interpreting the results.

The dependent variable of our analyses, y , is the logarithm of gross hourly wages before deduction for tax and/or insurance in Euros. According to the ESS, the overall mean gross-pay for the selected countries is 18€ per hour. There obviously are significant differences by country.

Occupational sex-composition (S) is calculated as the fraction of workers in respondents' occupation that are women, measured using the 4-digit ISCO classification. This baseline measure is complemented with 3-digit ISCO information for the 4-digit cells containing 0 number of women⁷. Given the abovementioned problems of sample size, these calculations have been made using the whole ESS sample rather than the country specific information. This allows us to maximize the number of observations in each occupational cell but imposes the assumption of a common segregation pattern across the analyzed countries. Such an assumption is supported by very high correlation coefficients between country-specific segregation measures and the overall measure used here (results available on request). It is also supported by Neramo's finding that most countries produce remarkably similar patterns of sex segregation despite significant institutional differences (see: Neramo 1999:118-134).

The job-specialization (JSK) indicator used here is based on respondents' own assessments of the time that it would be required for people with the right qualification to learn to do respondents' jobs well, measured using an interval scale ranging from 1= less than a week, to 8=more than 2 years. This self-reported indicator refers directly to respondents' jobs net of general human capital requirements. Polavieja (forthcoming) has argued that this is an advantage over the externally-imputed values based on the Dictionary of Occupational Titles used by Tam (1997), as DOT values are necessarily based on occupational-level information and they cannot always separate the job-specific from the general human capital requirements of respondents' occupation.

Gender-role attitudes are measured using a battery of ESS questions from which an index of traditional sex-role attitudes has been constructed. The index combines the responses to the following 5 Likert-type items: 1. *whether women should be prepared to cut down on their wages for the sake of their families*, 2. *whether men should have equal domestic responsibilities as women*, 3. *whether men should have preference over scarce jobs*, 4. *whether parents should stick together for children even if they do not get along*, and 5. *whether a person's family should be his/her priority*. The index constructed from the responses to these questions shows a Cronbach's alpha of 0.6, it is normally distributed and ranges from 0 to 20, the latter value implying the highest score in "traditional" gender attitudes.

The relative amount of housework supplied by respondents (HW) is referred to domestic tasks such as cooking, washing, cleaning, shopping, property maintenance and the like, not including childcare nor leisure activities. The fact that childcare is not included allows to maximize the number of observations, as many respondents have no children. HW is measured using respondents' self-reported estimates of the amount of time that they spent on such activities on a typical weekday relative to the total amount of time spent by all the people living in their households. It consists of a 6-interval scale ranging from "none or almost none" to "all or nearly all of the time". All variables are described in Table 2.

As commented on above, institutional interactions are tested using an expanded version of Esping-Andersen's original welfare state typology (Esping-Andersen 1990) that adds a fourth category comprising former communist societies of East Central Europe. The analyzed countries are therefore clustered in the following 4 regime-types: *Conservative* (including respondents from Belgium, Luxemburg, Switzerland, Spain and (former) West Germany); *Social-Democratic* (comprising respondents from Denmark, Sweden, Norway and Finland); *Liberal* (United Kingdom) and *Post-Communist* (Czech Republic, Poland and former East Germany). Having information on former communist societies is a particularly valuable feature of the ESS.

Table 2. Description of key variables. Employed respondents from selected countries

Variable	Description	N	Mean or %	Standard deviation
<i>y</i>	Is the log of the ratio of gross weekly earnings and usually weekly hours in € ⁽¹⁾	7,412	2.49	.88
schooling	Years of schooling completed	18,761	12.3	3.6
experience	Total number of years in paid work	17,448	22.6	14.05
S	Proportion of female in respondent's occupation (ISCO-4 digits complemented with ISCO-3)	18,484	.55	.33
ID	Index of (traditional) gender role attitudes. 21-interval scale ranging from 0=less traditional to 20= more traditional.	18,942	9.04	3.14
f	Sex of employed respondents			
	Male	9,029	47.67	
	Female	9,913	52.33	
JSK	Time that would be required for people with the right qualification to learn to do R's jobs well, measured using an interval scale ranging from 1= less than a week, to 8=more than 2 years	18,942	4.45	1.2
HW	Proportion of weekly housework typically provided by R, measured using a 6-interval scale ranging from -2=none to 3=all	18,942	0.93	1.8
Welfare Typology	Grouping of countries according to Esping-Andersen (1990) welfare regimes plus post-communist Europe			
	Conservative (BE, LU, CH, ES and former West DE)	6,787	35.8	
	Social Democratic (DK, SE, NO, FI)	6,062	32	
	Liberal (UK)	1,567	8.27	
	Post-Communist (CZ, PL, and former East DE)	4,526	23.9	

Note.—⁽¹⁾ Values greater than 6.39 (i.e. 600 €/hour) have been recoded as missing.

Source: European Social Survey, Selected Countries (2004).

Methodology

The analytical strategy adopted is based on nested equations within a model-building framework. Although this strategy tackles allocation and valuation issues, the analytical stress is on the latter. The analysis is performed in two distinct steps. In the first step, micro-level hypotheses are tested via country fixed-effect regressions. The basic methodology used in this first step is akin to that of Tam (1997) and identical to that of Polavieja (forthcoming). This strategy requires fitting 5 different equations and is developed as follows. First, a linear regression is fitted to the ESS data in order to estimate the effect of respondents' sex (*f*) on wages (*y*), after controlling for standard demographic and worker characteristics, represented by vector *X* and by a set of country dummies, represented by vector *C*. Vector *X* includes total working experience, years of schooling completed and a set of industry dummies (equation 1).

Secondly, we estimate the effect, both on y and on f , of the proportion of women employed in respondents' occupation (S), controlling for X and C (equation 2). Once S is estimated, the goal is to explain away its effect. The hypothesis behind this goal is that, contrary to the expectations that follow from cultural-devaluation theory (H1), occupational-sex segregation has no residual impact on wages, once the appropriate variables are controlled for. This hypothesis is tested by introducing both our JSK indicator (H2) (equation 3), the index of gender traditionalism (H3) (equation 4) and respondents' self-reported relative supply of domestic work (H4) (equation 5). The impact of sex-role attitudes on both S and y is tested through an interaction between gender attitudes and respondents' sex ($ID*f$), under the logical assumption that gender traditionalism only depresses wages in the case of women, but not of men. Formally, the following 5 models are estimated in step 1:

$$y = f_1(f, X, C) \quad (1)$$

$$y = f_2(f, X, C, S) \quad (2)$$

$$y = f_3(f, X, C, S, JSK) \quad (3)$$

$$y = f_4(f, X, C, S, JSK, ID, ID*f) \quad (4)$$

$$y = f_5(f, X, C, S, JSK, ID, ID*f, HW) \quad (5)$$

In a second analytical step, the assumption of country fixed-effects is relaxed in order to test for institutional variation. This is done by introducing the regime typology described above, represented by vector R , which is then interacted with HW (equation 6) and $ID*f$ (equation 7). This allows us to test for hypotheses 6 and 7 above. Note that equation 7 tests for an interaction between the interacted term of $ID*f$ and the regime types; that is, it assumes that the main effect of ID (i.e. men's sex role attitudes on y) is fixed for all regime types. This assumption is again imposed by small-sample size, as a complete interaction will consume many degrees of freedom and result in a very small number of observations for the interacted cells. Country fixed-effects are still controlled for in the regime interactions (but in the case of UK, which is dropped from C , as it is the only country represented in the liberal type). Formally, the following 2 models are estimated in step 2:

$$y = f_6(f, X, C, S, JSK, ID, ID*f, HW, R, R*HW) \quad (6)$$

$$y = f_7(f, X, C, S, JSK, ID, ID*f, HW, R, R*(ID*f)) \quad (7)$$

EMPIRICAL FINDINGS

Country Fixed-Effect Models

Table 3 shows the results of fitting the first 5 country fixed-effect equations described above on the ESS selected sample data. Equation 1 is a standard human capital earnings function that yields a 17% “penalty” for women. Equation 2 adds occupational sex-composition (S) to the previous model. Note that this takes up some of the effect of respondents’ sex on y , although not a very substantial share of it. The unstandardized coefficient estimated for S, bs_{j2} , is -0.066. Since y is logged hourly wages, this would mean that Europeans employed in fully female occupations earn on average 7% less per hour than those employed in fully male ones. Large margin errors advise caution in the interpretation of this figure (see below). Note, however, that this is the type of result that has typically been used in support for the cultural devaluation hypothesis. As explained above, this interpretation rests on the assumption that all possible factors affecting the relationship between individuals, jobs and wages are controlled for.

Yet when job-specialization (JSK) is introduced in the earnings function, a significant drop in both the coefficient and significant levels of S is observed: bs drops from -.066 (equation 2) to -.038 (equation 3) and becomes non-significant ($P>|t|=0.20$). JSK is the only variable that can absorb by itself the significant effect of S on y , as neither HW nor $ID*f$ can produce such an effect (results available on request). Hence, as in the case of Tam (1997) and Polavieja (forthcoming), the introduction of JSK does seem to explain away the wage effect of occupational sex-composition (note also that the introduction of JSK reduces the female intercept coefficient). This finding is inconsistent with the devaluation hypothesis (H1) but fully in line with the job-specialization hypothesis (H2).

Equation 4 adds respondents’ share of total housework hours typically provided during a week (HW). Note that this reduces further the effect of the sex intercept ($b_{f4} = -.0123$). It also seems to reduce the wage effect of occupational sex-composition, although very slightly ($bs_{f4} = -.034$; $P>|t|=0.24$). This seems to suggest that women who bear with a greater share of domestic work are more likely to be occupied in jobs that offer lower rewards—even if they are not sex-segregated—, a finding which seems consistent with economic-specialization models and hence with hypothesis 4. Yet it must be noted that this finding is equally consistent with bargaining models of the family, as it could also be possible that women with higher wages reduced their relative domestic labor supply as a result of their greater intra-household negotiating power. The cross-sectional nature of this analysis precludes any interpretation as to the direction of causality and hence does not allow us to distinguish between specialization and bargaining interpretations.

Finally, model 5 introduces sex-role attitudes (interacted with respondents’ sex) to the previous model and this reduces the wage effect of occupational sex-segregation further (although only slightly) ($bs_{f5} = -.030$; $P>|t|=0.29$). The interaction effect tested ($ID*f$) shows that traditional sex-role attitudes have no impact for men, but reduce women’s

earnings significantly. This observed relationship between women’s traditional sex-role attitudes, occupational sex-segregation and wages, net of human capital and job-specialization variables, could, therefore, be pointing in the direction of some sort of self-selection process, as it suggests that working women holding traditional sex-role views are more likely choose particular jobs that entail both a higher proportion of women and lower monetary rewards. This finding seems therefore consistent with the idea that there is a *certain* degree of personal “choice” or at least “attitudinal consonance” involved in allocation processes, as expected by supply-side socialization theories (see: Polavieja forthcoming). Yet it must be also noted that the possibility that sex-role attitudes are an *ex-post* rationalization of women’s own occupational situation cannot be ruled-out, given the cross-sectional nature of the data.

Table 3. Heteroskedasticity robust regressions on the log of gross hourly wages. Country fixed-effects models

	Model 1		Model 2		Model 3		Model 4		Model 5		
	b	Sig.	b	Sig.	b	Sig.	b	Sig.	b	Sig.	b ^s
Female	-0.170 (0.014)	****	-0.148 (0.017)	****	-0.136 (0.017)	****	-0.123 (0.017)	****	(dropped)		
Experience	0.007 (0.001)	****	0.007 (0.001)	****	0.006 (0.001)	****	0.006 (0.001)	****	0.006 (0.001)	****	0.08
Years of education	0.045 (0.002)	****	0.044 (0.002)	****	0.040 (0.002)	****	0.040 (0.002)	****	0.039 (0.002)	****	0.16
S (P female in R's occupation)			-0.066 (0.029)	**	-0.038 (0.029)	n.s.	-0.034 (0.029)	n.s.	-0.031 (0.029)	n.s.	-0.01
JSK (T required to learn R's job)					0.048 (0.004)	****	0.048 (0.004)	****	0.047 (0.004)	****	0.08
HW (P of household work provided by R)							-0.010 (0.004)	***	-0.011 (0.004)	***	-0.02
ID(sex-role attitudes)*f(female)											
f									-0.056 (0.038)	n.s.	-0.03
ID									-0.005 (0.003)	n.s.	-0.02
f*ID									-0.009 (0.004)	**	-0.05
Constant	1.44	****	1.44	****	1.31	****	1.29	****	1.29	****	
N=	6852		6852		6852		6852		6852		
R ² =	0.6909		0.6912		0.6972		0.6975		0.6985		

Notes.— All models control for country of residence and firm’s activity. Selected countries are: BE, CH, CZ, DK, FI, UK, LU, NO, PL, SE and DE (former East and West separated). *b* = unstandardized coefficients. *b^s*= Standardized coefficients. Heteroscedasticity-robust standard errors in parenthesis. ID has been centered to the mean so that it now ranges from -9 to 11.

**** significance ≤ 0.001; *** significance ≤ 0.01; ** significance ≤ 0.05; * significance ≤ 0.1

Source: Calculated by the author from European Social Survey, Selected Countries (2004).

On the whole, Model 5, which provides the best fit of all the country fixed-effect models tested, suggests that JSK is the single most important variable accounting for the wage effect of occupational sex-composition. HW and ID (for women) also have a significant net impact on earnings (and hence on the gender wage gap) but they cannot absorb by themselves the wage effect of occupational sex-composition (although both help to reduce it). Yet it must be bore in mind that these estimations assume that the impact of the tested factors is the same across societies. This assumption is relaxed in the next set of models that test for hypothesis 6 and 7 above, which predict a lower earning impact of sex-role attitudes and relative domestic supply in societies that provide higher levels of defamilialization.

Institutional Variation Models

Table 4 shows the results of fitting equations 6 and 7 to the ESS data. Model 6 tests for an interaction between the relative supply of housework and regime types in order to test for the hypothesis that defamilialization reduces the wage effects of domestic housework. Results seem consistent with hypothesis 6 as they show a significant impact of HW on earnings in conservative countries (BE, LU, ES, CH and former-West DE) ($b_{HW,fg} = -.018$) and in the UK (note that the coefficient for UK is not significantly different from the conservative model), but a significantly weaker impact (indeed no impact at all) in both social democratic (DK, SE, NO and FI) and former communist societies (PL, CZ and former East DE)⁸.

Model 7 assumes that the main effect of ID on earnings (i.e. men's sex-role attitudes), which is not significant, is the same for all regime types but allows the interacted term (i.e. sex-role attitudes for women) to vary across types. This way we can test hypothesis 7 without consuming an excessive number of degrees of freedom. As expected, the data seems to suggest that women's traditional gender attitudes are associated with lower earnings in conservative and liberal societies but the association is much weaker (and in fact it appears as not significant⁹) in both social democratic and former communist societies. This finding would be consistent with the hypothesis that gender attitudes are much less consequential for the economic performance of women in societies that provide (or provided in the past) a high degree of defamilialization (H6).

Table 4. Heteroskedasticity robust regressions on the log of gross hourly wages. Institutional interactions

Input variables	Model 6		Model 7	
	b	Sig.	b	Sig.
Experience	0,006 (0.001)	****	0.006 (0.001)	****
Years of education	0.039 (0.002)	****	0.038 (0.002)	****
S (P female in R's occupation)	-0.033 (0.029)	n.s.	-0.035 (0.029)	n.s.
JSK (T required to learn R's job)	0.047 (0.004)	****	0.046 (0.004)	****
HW (P of household work provided by R)	(dropped)		-0.010 (0.004)	***
ID(sex-role attitudes)*f(female)				
f	-0.058 (0.038)	n.s.	-0.062 (0.040)	n.s.
ID	-0.005 (0.003)	n.s.	-0.005 (0.003)	n.s.
if*ID	-0.009 (0.004)	**	(dropped)	
Societal Clusters (ref. → Conservative)				
Social Democratic	0.923 (0.041)	****	0.907 (0.042)	****
Post-Communist	-1.290 (0.043)	****	-1.316 (0.046)	****
Liberal	0.466 (0.046)	****	0.495 (0.05)	****
Societal Clusters*HW (P of housework provided by R)				
HW (effect for Conservative countries)	-0.018 (0.007)	***		
Social Democratic*HW	0.014 (0.008)	*		
Post-Communist*HW	0.019 (0.011)	*		
Liberal*HW	-0.006 (0.017)	n.s.		
Societal Clusters*[ID(sex-role attitudes)*f(female)]				
f*ID (effect for conservative countries)			-0.012 (0.005)	***
Social Democratic*(f*ID)			0.006 (0.003)	**
Post-Communist*(f*ID)			0.007 (0.004)	*
Liberal*(f*ID)			-0.009 (0.006)	n.s.
constant	1.29 (0.092)	****	1.31 (0.095)	****
N=	6582		6582	
R-squared	0.699		0.699	

Notes.— All models control for country of residence and firm's activity. Heteroscedasticity-robust standard errors in parenthesis. ID has been centered to the mean so that it now ranges from -9 to 11.

**** significance ≤ 0.001 ; *** significance ≤ 0.01 ; ** significance ≤ 0.05 ; * significance ≤ 0.1

Source: Calculated by the author from European Social Survey, Selected Countries (2004).

CONCLUSIONS

Unpacking the individual as well as the societal effects that lie behind the crucial empirical association between occupational sex-composition and earnings is a highly consequential task for the analysis of gender differences in pay. This paper has sought to contribute to this task by presenting different individual as well as institutional hypotheses and by testing them empirically against data drawn from the European Social Survey.

The ESS poses a trade-off between the wealth of theoretically-relevant indicators it contains and the limited number of respondents surveyed in each country. The former offers the promise of mechanism-based research but the latter imposes several limitations as to what can be done with the actual dataset and what can be concluded from the analyses carried out with it. Country fixed-effect wage regressions as well as regressions including interactions on a typology of welfare regimes have been fitted to a pool of men and women employed in various European countries in order to test for the various individual and institutional hypotheses presented in the theoretical section of the paper. This is something we *can* do with the ESS. It must be, however, recognized that many of the features of these models are far from ideal. In particular, drawing on the regime typology as a means to test for the defamilialization hypothesis is admittedly a very indirect test for institutional ‘effects’. Only larger sample sizes would allow for a more detailed analysis of institutional variation, which should ideally be tested using country-level rather than regime-level interactions. Also, small sample size generates large standard errors around the parameter estimates and hence wide confidence intervals. This affects the interpretation of our results by imposing a high degree of caution. It is with caution that the following conclusions are drawn.

First, it has been observed that the effect of occupational sex-composition on earnings disappears once a measure of job-specific skills (JSK) is introduced in the models. This finding seems hard to reconcile with the cultural devaluation hypothesis (H1) but it is fully consistent with the job-specialization hypothesis (H2). Our results are therefore in line with the findings reported by Tam (1997) for the US and by Polavieja (forthcoming) for Spain. Job-specialization is a crucial mediating factor linking women to jobs and jobs to rewards. Hence focusing our attention on the processes leading to sex-differences in job-specialization is expected to yield substantial pay-offs in the analysis of gender differences in labor market rewards.

Country fixed-effects models also suggest that women’s sex-role attitudes could be associated with a higher propensity to end up in sex-segregated jobs offering lower earnings, which seems consistent with socio-cultural theories of allocation (H3). Yet institutional interactions suggest that such an effect of sex-role attitudes does not seem to operate, at least with the same intensity, in either social democratic or in former communist societies, characterized by providing (or having provided) a higher degree of defamilialization. This latter finding seems consistent with hypothesis 6, that is, with the idea that generous social policies and services can induce all types of women, even the most traditional ones, to invest in the labor market. This could explain why

individual variation in gender attitudes becomes less consequential in economic terms in (currently and previously) defamilializing societies.

Similarly, country fixed-effect models suggest that wage-earners could experience a wage-penalty associated with their relative domestic supply (and this regardless of their sex-role attitudes). Yet institutional interactions qualify this finding by showing that such penalty does not seem to take place, at least with the same intensity, in either social democratic or in former communist societies. This is also consistent with our expectations regarding institutional variation as expressed in hypothesis 5.

Present and past defamilialization could reduce the observed association between women's domestic supply and their earnings in two different ways: First, by reducing the individual pay-offs of sphere-specialization. These pay-offs are expected to be lower in societies where the risks (i.e. costs) associated with women's job-specialization are reduced via generous conciliation policies and services (public childcare, in particular). Secondly, by increasing women's intra-household bargaining power, which should depend less on women's earnings if there are welfare policies that reduce the costs of marital/partnership dissolution.

That gender attitudes and the relative supply of housework are loosely connected to earnings in social-democratic societies is therefore interpreted as indicating that sphere-specialization and gender traditionalism are no longer consequential factors for explaining gender differences in pay in these societies (or at least not so consequential as in other societies). Defamilialization policies could have eroded the traditional family-work nexus by empowering women in both the productive and the domestic spheres.

Findings regarding post-communist societies are, however, interpreted mainly as an echo of the past. That is, it is assumed that defamilialization did indeed help to erode the traditional family-work nexus under communism and that our statistical results based on 2004 data are capturing such effects through the age composition of our samples. This could explain why former communist societies of Central and Eastern Europe appear to behave in this respect as social democratic ones despite the fact that they can no longer be considered high defamilialization societies after regime change. It is therefore expected that the passing of time increases the earning consequences of both gender attitudes and the division of household labor in former communist societies as the demographic imprint of past defamilialization fades away.

More research on this topic is, however, needed. Small sample size has forced us to cluster together all the former communist societies of East-Central Europe for which earnings data were available. Although it has been argued that there are important institutional commonalities stemming from the communist era, important differences in the degree of defamilialization should be expected *within* these societies¹⁰ (see: Orenstein and Haas 2002; Saxonberg and Szelewa 2007). Only larger sample sizes would allow us to investigate *within* cluster differences, which would, in turn, increase our capacity to capture institutional effects more precisely.

Future research should also go beyond the limitations of cross-sectional analysis when it comes to dealing with issues of causality. Two such issues are particularly consequential. The first concerns the nature of the association between gender attitudes and earnings, as such association could reflect either “choice” (i.e. traditional women’s preferences for secondary jobs) or “adaptation” (i.e. *ex-post* rationalization of unsuccessful job-matches). Cross-sectional analysis cannot differentiate between the two. Similarly, cross-sectional analysis leaves the nature of the association between domestic input and earnings undetermined in casual terms. This association could be reflecting the negative earning consequences of coping with a disproportional share of the domestic burden (a penalizing effect); but also the positive impact of higher earnings on intra-household bargaining power (an empowering effect). It is widely acknowledged that longitudinal analysis is much better prepared to deal with issues concerning the direction of causality than cross-sectional research. Yet the problem with many of the existing longitudinal surveys is that they often lack either theoretically-relevant indicators or a cross-national dimension—and frequently they lack both. Research on the causal mechanisms behind the gender wage gap thus illustrates the limitations of our existing data sources.

Finally, more theoretical work is also needed, particularly on the relationship between institutions and job-specialization in connection to the gender wage-gap. In this paper it has been assumed that the effect of job-specialization on earnings (and on the association between occupational sex-composition and earnings) was constant across different welfare regimes mainly because we had no hypotheses leading us to expect otherwise. Developing such hypotheses in connection to recent contributions to the varieties of capitalism literature¹¹ seems an interesting ground for future work, particularly since it has been now shown that job-specialization plays a crucial role in the gender wage gap.

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ENDNOTES

¹ Various economic theories that depart from the human capital approach have also stressed the crucial role of job-specific human capital investments. As such, both efficiency wage theories (see: Akerloff and Yellen 1986; Shapiro and Stiglitz 1984), personnel economics (see: Lazear 1995; Milgrom and Roberts 1992) and transaction cost models of the employment contract (see: Williamson 1985; 1996) stress the pecuniary effects of job specialisation. The later two approaches have, in turn, had a clear impact on rational-action theories of class and the employment contract (see: Goldthorpe 2000: chap. 10; Sorensen 1994; 2000).

² Tam's contribution generated an important debate in the field (see: England et al. 2000; Tam 2000; Tomaskovic-Devey and Skaggs 2002).

³ According to economic bargaining models, each spouse would have a personal threat point and a single-state utility that acts as a constraint on their relative bargaining positions. The spouse with the lower threat point has less bargaining power and, hence, ends up assuming a larger share of domestic work. Threat points can be based on the spouses' respective labor marginal returns (see: Manser and Brown, 1980; McElroy and Horney, 1981) or on their respective chances of remarriage (see: Ermisch, 2003; Lundberg and Pollack, 1993).

⁴ This is not to deny that there are important differences in social policies *within* Eastern-Central countries. See e.g.: Saxonberg and Szelewa (2007) for a comparison of family policies between the Czech Republic and Poland.

⁵ Calculated by the author.

⁶ Unsatisfactory response rates were found in the country samples of Austria, Estonia, France, Greece, Italy, Portugal and Slovenia.

⁷ Calculating the proportion of women in respondents' occupation using 4-digit information yields a 0 value for approximately ¼ of the cases. This is an important source of bias due to small sample size. In order to mitigate this distorting effect, calculations for these cases have been made using a 3-digit classification. Less than 10 % of the 4-digit ISCO cells are occupied only by women. No changes have been made to these latter cells.

⁸ Note that the interacted terms capture how different is the effect in each societal cluster relative to that of the reference category, which is the conservative model. Both the social-democratic and the post-communist interacted-term coefficients are significant and very similar in absolute magnitude to the reference category but with a positive sign, thus indicating that the actual effect of HW in these societal clusters is very close to 0 and hence not significant in absolute terms.

⁹ That gender attitudes for women have no penalising impact cannot be read-off automatically from Table 4 but has been confirmed with the ESS data (results available on request). Non-significance could, however, be due to small sample size.

¹⁰ In their comparative analysis of Poland and the Czech Republic, Saxonberg and Szelewa (2007) argue that these countries show diverging paths in their family policies. Although refamilialization is observed in both countries, Poland would be taking a more *liberal* route, whereas the Czech Republic would be moving towards the *conservative* welfare model. According to these authors, such divergent paths are built upon institutional differences already observed in the communist era.

¹¹ See, in particular: Estevez-Abe (2005) and Tåhlin (forthcoming).