

## DOES THE HOUSEHOLD STRUCTURE INFLUENCE REMUNERATION IN POLAND?\*

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DOI: 10.15611/eada.2018.4.02

JEL Classification: C21, E24, J13, J23

**Abstract:** The main income determinants are: general economic situation, individual attributes of employees and characteristics of the workplace. However, there are also family duties which affect economic activity and wages, mostly in case of women who are the main care providers to children, the elderly, handicapped or sick. The aim of our research is to find out if the structure of the households influences the monthly remuneration of employees in Poland. The investigation consists in estimation econometric models which describe monthly remuneration on the basis of the microdata. Research is provided for the sample of employees regardless of gender, separately for male and female employees, and for women in three age classes. The analysis based on econometric models enables to find out that on average: (1) male employees earn significantly more than females, (2) married women earn less than unmarried ones while in case of men the situation is the opposite, (3) the motherhood penalty exists in Poland and (4) care providers for the elderly are mostly women, and care duties influence mostly remuneration received by women aged 25-54.

**Keywords:** gender wage disparities, remuneration, structure of the household.

### 1. Introduction

Incomes are determined by many factors such as: (1) the general situation at the labor market, (2) the individual attributes of employees or (3) the characteristics of the particular workplace. A large body of literature points out the problems of gender disparity on the labor market which might cause discrimination. Also, situations when women obtain significantly lower salaries than their male colleagues are quite common. Remuneration disparities are documented and discussed by [Cain 1986,

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\* This work was supported by the National Science Centre in Poland, Grant 2015/17/B/HS4/00930 'Changes of women's position in the labour market. Analysis of the situation in Poland and in the selected European Union States in the years 2002–2014.

p. 693; McConnell, Brue 1986, p. 290; Blanchard 1997, pp. 302-310; Kot 1999, p. 142; Blau, Kahn 2006; Neuman, Oaxaca 2003; Ńopo et al. 2011; Witkowska 2013] among others. Research concerning the situation in Poland was presented by [Kot 1999, pp. 225-226; Grajek 2001; Newell, Socha 2005; 2007; Cukrowska 2011; Witkowska 2012; 2014; Kompa, Witkowska 2018].

The research shows that there may be a variety of reasons causing earning disparity. Ńopo et al. [2011] distinguish several aspects that have been usually attributed to explain the differences between pay earned by men and women:

- the personal and job characteristics of women, such as: age, education, experience, occupation, working time, job status, type of job contract,
- the labor market structure, for instance occupational segregation by gender, and level of formality,
- institutional, cultural and social norms and traditions.

Historically, gender differences in work values which were perceived as a rationalization for occupational gender segregation, have been de-emphasized in the sociological literature. Gender segregation in the labour market is the tendency for men and women to be employed in different occupations across the entire spectrum of jobs. In other words, occupational segregation is defined as the concentration of males and females in particular kinds of jobs. In the literature horizontal and vertical segregation is identified. The former is the concentration of women in certain sectors of the economy. The latter is the concentration or the over-representation of women in certain levels of the professional hierarchy.

Occupational segregation is derived from the belief that, because of the biological differences between men and women, who are different as far as character and personality are concerned. Men are viewed as being strong and powerful and women as being weak and emotional. More recent experimental studies in behavioral economies have noted essential differences between men and women in individual attitudes towards altruism and greed, leadership and competitiveness [Fortin 2005].

Family duties, especially providing care to children, the elderly, the handicapped and the sick are also important determinants influencing women's economic activity and their wages because the primary caregivers for children, aging spouses and aging parents are mostly women, who are penalized because of that. Since female employees are forced to resign or limit their jobs and if they decide to continue professional activity, they tend to choose caregiver-friendly jobs which usually pay lower wages. According to [Correll et al. 2007], mothers in the workplace face additional disadvantages compared to childless female employees. This causes a pay gap between mothers and women who are not mothers which could be even larger than the gender pay gap. Evidence of the so-called motherhood penalty in Poland is presented in [Cukrowska 2011; Cukrowska-Torzewska 2015; Cukrowska-Torzewska, Lovasz 2016].

The aim of our research is to find out if the structure of the households influences the monthly remuneration of employees in Poland. The investigation consists in

estimation econometric models which describe monthly salaries on the basis of the microdata originating from Polish Labor Force Survey (PLFS). The explanatory variables represent employees and workplace controls together with variables describing the structure of the households. Analysis is provided for the sample of employees regardless of gender, separately for male and female employees and women in three age classes.

## 2. The structure of the sample

The original PLFS (Q1 2009) database includes information about nearly 55 thousand of respondents. For the purpose of our study, the number of individual records was reduced and contains microdata concerning the respondents who were working during the month preceding the survey only. We also removed all the records with incomplete data<sup>1</sup>. As a result, the sample used in our research contains observations regarding 7044 respondents, among them 3293 women and 3751 men. The female employees are additionally classified into four age groups, however further investigation is provided with the exclusion of the group of women aged 65 and above. The structure of the sample is presented in Tables 1 and 2.

As one can see (Table 1) 48% of respondents are heads of the households but among the male employees this percentage is 63%, while for the female employees it is only 31%. Among the women who declared that they are the heads of the household, 81.1% are 25-54 years old, 15.5% aged 55-65, 2.4% are the youngest employees, and 1% the oldest. If the position in the households for different age groups is considered, we note that the older group of women is considered the higher percentage of heads of households are in the group, since among the oldest female employees 83.3% are households' heads, in the age group 55-65 these are 58% of respondents, and 31% of women aged 25-54, and only 9% from the group of the youngest.

**Table 1.** Structure of the sample in terms of the respondent's position in the household

Variants of the feature	Total	Men	Women	Women aged			
				15-24	25-54	55-65	>65
Head of the household	3396	2361	1035	25	840	160	10
Others	3648	1390	2258	264	1876	116	2
Married	4795	2653	2142	36	1924	175	7
Others	2249	1098	1151	253	792	101	5
Sum of respondents	7044	3751	3293	289	2716	276	12

Source: own elaboration on the basis of [Podliński 2012].

<sup>1</sup> In other words, only data concerning respondents who answered all (needed for the model construction) questions in the questionnaire are taken into account.

When considering marital status (Table 1), we note that among all the respondents 68% are married. For the men this percentage is 71% and for the women, 65%. Comparing the number of married women in the four distinguished age groups it can be seen that 71% of women aged 25-54 are married, 63% in the group 55-65, 55% in the oldest group, and 12.5% among the youngest females.

If working-time is taken into account (Table 2), the majority of employees work full time, 73%, and there are no essential differences if different age groups are taken into account, since 62% of women aged 55-65, 74% women aged 25-54, and 74.5% of the youngest female employees, work full time. The only exception appears when the oldest female employees are considered, since the majority of them (two-thirds) work fewer than 40 hours per week. Men are used to work longer than 40 hours per week twice more than women, while women have a part-time job as many as 2.5 times more than men. Among women of different ages, a part-time job is the most popular for the oldest, next for female employees aged 55-65 i.e. 35%, and for the youngest women 17%, while in the case of women 25-54 years old, 14% of them work fewer than 40 hours a week. Female employees from this age group are the most active since 12% of them work more than 40 hours a week, followed by the groups of the youngest and the oldest women (8%), while additional work is not popular in the group of female employees 55-65 years old – only 3%.

**Table 2.** Structure of the sample in terms of working time

Number of hours worked during a week	Total	Men	Women	Women aged			
				15-24	25-54	55-65	>65
Less than 20 hours	343	106	237	22	155	54	6
Between 21 and 39 hours	431	128	303	28	231	42	2
40 hours	5145	2748	2397	216	2006	172	3
More than 40 hours	1125	769	356	23	324	8	1

Source: own elaboration on the basis of [Podliński 2012].

Table 3 contains information about the households' size and their structure according to the declaration of women from the three age groups. The biggest group of households' members consists of the adults aged 19-65 (75% for the women from all the three age groups, with a small variance among age groups), followed by the group of employed persons, 40%, which is in the majority a subsample of the former group, and the group with children aged 5-16 (10% in total but only 7% in the group of women 55-65 years old). In fact, all children aged 18 and below make up only 20%, and elderly people just 5% of households' members. This means that over 30% of households' members aged 19-65 are not employed<sup>2</sup>.

<sup>2</sup> The situation in the households, which are described by male respondents, is similar.

**Table 3.** Number of children and other persons in the households

Set of variables	Explanatory variable NUM describing number of:	Women aged			
		15-24	25-54	55-65	Total
S1,3,4	persons living in the household	1311	10 105	792	12 208
S2,3,6	children below 5 years of age	37	483	15	535
S2,6	children aged 6-15	133	1 067	59	1 259
S2,6	children aged 16-18	77	587	13	677
S3	persons aged 19-65	1003	7 459	657	9 119
S2,4,5,6	elderly persons over 65	61	509	48	618
S4,5	unemployed children living in the household	25	138	14	177
S6	employed children living in the household	571	4 098	184	4 853

Source: own elaboration on the basis of [Podliński 2012].

In the households of women aged 15-55, the number of elderly people is about 24% of the number of children below 19 years old, while in the last age group this proportion is 55%. In fact, the majority of children and people over 65 live in the households of women aged 25-54 (81.8%), which makes caregiving an important issue for these respondents and their households.

### 3. Model construction

In our research we use the exponential regression model estimated after linearization (i.e. for the logarithm of wages) by the Ordinary Least Squares method. This type of models is often used in research concerning wages [Grajek 2001; Blau, Kahn 2006; Newell, Reilly 2001; Newell, Socha 2007; Cukrowska 2011]. It is also the usual approach [Newell, Reilly 2001; Grajek 2001; Blau, Kahn 2006; Witkowska 2012; 2013] to provide analysis for all respondents and models estimated separately for men and women that simplifies gender wage gap analysis<sup>3</sup>.

In our study, econometric models explaining the natural logarithms of monthly pay, are estimated for the whole sample and separately for subsamples of men and women (denoted by the letters T, M and W, respectively), and for subsamples of women in three age groups, i.e. 15-24, 25-54 and 55-65 (denoted as WA, WB and WC, respectively).

The explanatory variables describe the individual attributes of employees and the structure of their households, together with their workplaces' characteristics, therefore the considered features are both quantitative and qualitative. The last characteristics are represented by ten dummies, which are presented in Table 4 where the symbol of the feature together with its description, information about number of variables

<sup>3</sup> Such an approach, often used in gender disparities analysis, was proposed by [Juhn et. al 1991].

**Table 4.** List of dummies

Symbol and description of features (number of dummies)		Reference variant
GEN	Gender (2)	<i>women</i>
REL	Relationship with the head of the household (2)	<i>not a household head</i>
MAR	Marital status (2)	<i>not married</i>
RES	Size of the place of residence measured by number of inhabitants (6)	<i>countryside</i>
EDU	Level of education (6)	<i>lower than preliminary</i>
SIZ	Size class of the workplace measured by number of employees (6)	<i>20-49 employees</i>
OWN	Ownership of the enterprise or institution (2)	<i>private</i>
WOR	Working profile measured by work-time (4)	<i>40 hours per week</i>
SEC	Economic sector of employment (4)	<i>other</i>
OCU	Occupation class (9)	<i>industry workers</i>

Source: own elaboration.

(dummies) representing different variants for each feature (in parenthesis) and the reference variant are given. Quantitative variables are defined as age (AGE) and age squared, together with eight variables related to the family situation (NUM) which are described in Table 3. It is worth mentioning that all variables describing structure of the household cannot be included in one model at the same time since some information is repeated by more than one variable. Therefore, we can distinguish six sets of “family variables” (denoted as: S1, S2, ..., S6) which determine the model specification. The set of variables contains from one (S1) to five (S6) variables which is visible in Table 3, where the first column contains information about the belongingness of each variable to the determined set of explanatory variables.

## 4. Empirical results

As was already mentioned, all the models are denoted according to their specification (i.e. variable sets S1-S6) and the sample which is used in the estimation procedure (e.g. men or women). For instance, MT2 denotes the model built for the second set of “family” variables S2 and estimated for the whole sample. While model MWB2 contains the same set of “family” variables, it is estimated for the subsample of women aged 25-54. Tables 5 to 9 contain estimation results obtained for 24 models applying the OLS method. In the tables the parameter estimates and determination coefficients are presented. Symbol: \*denotes significance level  $\alpha = 0.1$ , \*\*for  $\alpha = 0.05$ , and \*\*\*for  $\alpha = 0.01$ ;  $\times$  – denotes lack of variables. In our study we assume that a variable is statistically significant if the null hypothesis can be rejected at significance level  $\alpha = 0.05$  or less.

In Tables 5 and 6 the models constructed for the second and the sixth sets of variables but estimated using different samples, are presented. One may note that in both models estimated for the whole sample, the men earn significantly more than the women since the variable *man* is significant with positive impact onto remuneration. It is also visible that the models estimated for the whole sample and subsample of the women are characterized by high determination coefficients, while for the men the fitting of the models is low<sup>4</sup>.

There are several variables which show influence in the same direction in all the models presented in Tables 5 and 6:

- a significant and positive impact is observed for: age, household head, living in the city with more than 100 thousand inhabitants, university education and higher, vocational or general secondary education, working time longer than 40 hours per week, all economic sectors, and some occupations such as: managerial, professional, technical and skilled workers together with a workplace with more than 100 employees (except for models MW4 and MW5 where the variable describing workplace with 101-250 employees is insignificant);
- a significant and negative impact is observed for: age squared, working time shorter than 40 hours per week, and number of children 16-18 years old in the household.

In other words, the models prove that remuneration increases with age but only to a certain limit, and after obtaining the specified age the pay starts to decrease. One should also note that in the case of dummies, the parameter estimates inform about the relative influence of the certain variant of the feature (represented by the dummy) in comparison to the reference variant. For example, the positive influence of the variable *household head* means that heads of the households earn more than other family members. Employees living in big cities ear more than those living in the country. Also, employees with a higher education earn more when compared with the ones with primary or lower education. A part-time job generates lower monthly salary than a full-time job, and an increase in the number of children aged 16-18 years in a household causes a decrease of remuneration.

Other variants of variables are either insignificant or their impact depends on the estimation sample. Insignificant variables are: the number of elderly persons or children 6-15 years old in the household, public ownership of the place of work and living in a city of 50-100 thousand inhabitants, although the latter variable is significant with a positive influence in the models: MT1, MT3, MT4 and MT5.

There are interesting results concerning situations when the same variable has the opposite impact for men and for women, and here are some such cases:

- Married women earn less than unmarried ones while married men earn more than unmarried ones.

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<sup>4</sup> In fact similar results are obtained for all 18 models (which are not presented in this paper) i.e. models specified according to six data sets S1-S6 and estimated for the whole sample and subsamples of men and women.



**Table 5.** Parameter estimates of models with the set of variables S2

Feature	Model	MT2		MM2		MW2	
	Variable	Parameter estimates					
AGE	<i>age</i>	0.1003	***	0.0299	***	0.1464	***
	<i>age</i> <sup>2</sup>	−0.0012	***	−0.0004	***	−0.0017	***
GEN	<i>man</i>	0.2509	***				
REL	<i>household head</i>	0.0598	***	0.0873	***	0.0587	***
MAR	<i>married</i>	0.0026		0.1015	***	−0.0451	***
RES	<i>&gt;100 thousand</i>	0.0948	***	0.0756	***	0.1111	***
	<i>50-100 thousand</i>	0.0320	*	0.0334		0.0285	
	<i>10-50 thousand</i>	0.0135		−0.0199		0.0431	**
	<i>5-10 thousand</i>	−0.0714	***	−0.0819	***	−0.0648	*
	<i>2-5 thousand</i>	0.0088		−0.0543		0.0960	**
EDU	<i>university (at least Ph.D.)</i>	0.6068	***	0.5780	***	0.6659	***
	<i>university</i>	0.3206	***	0.2174	***	0.4001	***
	<i>post-secondary</i>	0.1151	***	0.0783	*	0.1529	***
	<i>vocational or general secondary</i>	0.1443	***	0.0891	***	0.1880	***
	<i>primary or lower vocational</i>	−0.0643	***	−0.1120	***	−0.0114	
SIZ	<i>≤ 10 employees</i>	−0.0381	**	−0.0971	***	−0.0203	
	<i>11-19 employees</i>	−0.0111		−0.0758	***	0.0405	*
	<i>50-100 employees</i>	0.0359	**	0.0221		0.0507	**
	<i>101-250 employees</i>	0.0566	***	0.0623	***	0.0483	**
	<i>&gt;250 employees</i>	0.1217	***	0.1175	***	0.1119	***
OWN	<i>public</i>	0.0059		0.0214		−0.0147	
WOR	<i>less than 20 hours per week</i>	−0.5779	***	−0.7730	***	−0.5177	***
	<i>from 21 to 40 hours per week</i>	−0.1979	***	−0.3601	***	−0.1405	***
	<i>more than 40 hours per week</i>	0.1046	***	0.1260	***	0.0605	***
SEC	<i>agriculture</i>	4.7773	***	6.5484	***	3.5833	***
	<i>industry</i>	4.8585	***	6.5697	***	3.7418	***
	<i>service</i>	4.7983	***	6.5365	***	3.6171	***
OCU	<i>managerial</i>	0.4267	***	0.3696	***	0.6488	***
	<i>professional</i>	0.3123	***	0.2786	***	0.5015	***
	<i>technical</i>	0.1891	***	0.1582	***	0.3932	***
	<i>clerical</i>	0.0783	***	−0.0457	*	0.3297	***
	<i>sales &amp; services</i>	0.0329		−0.0857	***	0.2854	***
	<i>farmers, fishermen, etc.</i>	0.0804		−0.0780		0.6890	***
	<i>skilled workers</i>	0.0749	***	0.0376	**	0.2241	***
<i>unskilled workers</i>	−0.0913	***	−0.1509	***	0.1184	***	
NUM	<i>children ≤ 5 years old</i>	0.0206	*	0.0029		0.0134	
	<i>children 6-15 years old</i>	0.0015		−0.0076		0.0060	
	<i>children 16-18 years old</i>	−0.0513	***	−0.0294	**	−0.0720	***
	<i>elderly persons &gt; 65 years old</i>	0.0067		−0.0027		0.0263	*
R <sup>2</sup> adjusted		0.997		0.445		0.997	

Source: own elaboration.



**Table 6.** Parameter estimates of models with the set of variables S6

Feature	Model	MT6		MM6		MW6	
Feature	Variable						
AGE	<i>age</i>	0.1003	***	0.0297	***	0.1463	***
	<i>age</i> <sup>2</sup>	−0.0012	***	−0.0004	***	−0.0017	***
GEN	<i>man</i>	0.2510	***				
REL	<i>household head</i>	0.0595	***	0.0852	***	0.0590	***
MAR	<i>married</i>	0.0023		0.1006	***	−0.0444	***
RES	<i>&gt;100 thousand</i>	0.0945	***	0.0730	***	0.1118	***
	<i>50-100 thousand</i>	0.0317	*	0.0325		0.0293	
	<i>10-50 thousand</i>	0.0133		−0.0219		0.0435	**
	<i>5-10 thousand</i>	−0.0715	***	−0.0840	***	−0.0652	*
	<i>2-5 thousand</i>	0.0087		−0.0559	*	0.0955	**
EDU	<i>university (at least Ph.D.)</i>	0.6062	***	0.5738	***	0.6673	***
	<i>university</i>	0.3201	***	0.2145	***	0.4011	***
	<i>post-secondary</i>	0.1147	***	0.0767	*	0.1539	***
	<i>vocational or general secondary</i>	0.1442	***	0.0881	***	0.1881	***
	<i>primary or lower vocational</i>	−0.0639	***	−0.1091	***	−0.0117	
SIZ	<i>≤ 10 employees</i>	−0.0383	**	−0.0994	***	−0.0206	
	<i>11-19 employees</i>	−0.0113		−0.0771	***	0.0406	*
	<i>50-100 employees</i>	0.0357	**	0.0196		0.0505	**
	<i>101-250 employees</i>	0.0564	***	0.0607	***	0.0481	**
	<i>&gt;250 employees</i>	0.1215	***	0.1155	***	0.1118	***
OWN	<i>public</i>	0.0059		0.0212		−0.0151	
WOR	<i>less than 20 hours per week</i>	−0.5780	***	−0.7739	***	−0.5175	***
	<i>from 21 to 40 hours per week</i>	−0.1980	***	−0.3616	***	−0.1405	***
	<i>more than 40 hours per week</i>	0.1045	***	0.1250	***	0.0607	***
SEC	<i>agriculture</i>	4.7777	***	6.5584	***	3.5833	***
	<i>industry</i>	4.8591	***	6.5803	***	3.7417	***
	<i>service</i>	4.7989	***	6.5477	***	3.6174	***
OCU	<i>managerial</i>	0.4268	***	0.3703	***	0.6487	***
	<i>professional</i>	0.3124	***	0.2800	***	0.5013	***
	<i>technical</i>	0.1891	***	0.1586	***	0.3932	***
	<i>clerical</i>	0.0784	***	−0.0452		0.3294	***
	<i>sales &amp; services</i>	0.0327		−0.0864	***	0.2857	***
	<i>farmers. fishermen etc.</i>	0.0808		−0.0745		0.6901	***
	<i>skilled workers</i>	0.0746	***	0.0363	**	0.2245	***
	<i>unskilled workers</i>	−0.0913	***	−0.1514	***	0.1178	***
NUM	<i>children ≤ 5 years old</i>	0.0207	**	0.0035		0.0132	
	<i>children 6-15 years old</i>	0.0015		−0.0073		0.0058	
	<i>children 16-18 years old</i>	−0.0513	***	−0.0289	**	−0.0717	***
	<i>elderly persons &gt; 65 years old</i>	0.0067		−0.0035		0.0264	*
	<i>employed persons</i>	−0.0095		−0.0567	**	0.0204	
R <sup>2</sup> adjusted		0.997		0.446		0.997	

Source: own elaboration.

- Women working in sales and services and being unskilled workers earn more than female industrial workers, while for male employees the situation is the reverse.

There are also some situations when the distinguished factor is significant for one gender and insignificant for the other. For instance, women working as clerical staff, farmers, etc. obtain higher remuneration than industry workers, while for men these variants of variables are statistically insignificant. A similar situation occurs for respondents living in towns with 2-5 and 10-50 thousand inhabitants, employees with a post-secondary education and working in enterprises or institutions employing 50-100 employees. A different situation is observed for respondents living in towns with 5-10 thousand inhabitants since men earn significantly more than those living in the country, while for women this variable is insignificant. A significantly negative impact is also observed for male employees with a primary or lower vocational education, working in institutions with not more than 20 employees, and for the number of employed persons in the household. These variables do not influence women's wages.

The impact of explanatory variables to monthly remuneration varies in the models estimated for female employees of different age, only with working time shorter than 40 hours per week, age and age squared keep the same impact in all the 18 models estimated for women of different age. The most similar relations to the one observed for all respondents and subsamples of men and women, are visible for the subsample of women aged 25-54. For instance, in models MWB1-MWB6 the earnings of employees working for enterprises with 101-250 employees, are not significantly larger than those obtained in a workplace with 20-49 employees (which is the same result as for models MW4 and MW5).

Considering the remaining variables, we note that in majority of cases the following factors are insignificant in all the models estimated for the youngest and the oldest age class: workplace with more than 100 employees, working time longer than 40 hours per week, and occupation as a skilled or technical worker. Additionally, for the oldest group of women, being a household head, living in a city with more than 100 thousand inhabitants and working as a professional do seem to be significant factors.

Analyzing models estimated for the youngest group of women, one may note that university education and higher, together with vocational or general secondary education and managerial position, is insignificant whereas working in industry and services significantly negatively influences earnings in all the six models. Also, being a household head is insignificant in MWA3, as is the number of children 16-18 years old in MWA2.

Married women earn more than the unmarried ones when aged 15-24 (MWA4) or 55-64 (MWC3), and they earn less than unmarried ones when aged 25-54 (MWA4). According to models MWA1-MWA5, the youngest women working in the public sector earn significantly less than those working in private sector. In the rest of the models this feature is insignificant.

**Table 7.** Parameter estimates of models estimated for women aged 15-24

Feature	Model	MWA1		MWA2		MWA3	
	Variable	Parameter estimates					
1	2	3		4		5	
AGE	<i>age</i>	1.2593	***	1.1765	***	1.2586	***
	<i>age</i> <sup>2</sup>	−0.0267	***	−0.0249	***	−0.0267	***
REL	<i>household head</i>	0.1737	**	0.1833	**	0.1614	*
MAR	<i>married</i>	0.1208	*	0.1110	*	0.1108	
RES	<i>&gt;100 thousand</i>	0.1255	**	0.1364	**	0.1263	**
	<i>50-100 thousand</i>	−0.0163		−0.0294		−0.0181	
	<i>10-50 thousand</i>	0.0092		0.0188		0.0126	
	<i>5-10 thousand</i>	−0.2499	**	−0.2390	**	−0.2419	**
	<i>2-5 thousand</i>	−0.0318		−0.0105		−0.0293	
EDU	<i>university</i>	0.0424		0.0554		0.0505	
	<i>post-secondary</i>	−0.0672		−0.0413		−0.0666	
	<i>vocational or general secondary</i>	0.0414		0.0514		0.0449	
	<i>primary or lower vocational</i>	−0.3264	**	−0.3027	**	−0.3397	***
SIZ	<i>≤10 employees</i>	−0.1106		−0.1256	*	−0.1106	
	<i>11-19 employees</i>	−0.0659		−0.0766		−0.0685	
	<i>50-100 employees</i>	0.0738		0.0621		0.0733	
	<i>101-250 employees</i>	0.0113		−0.0009		0.0157	
	<i>&gt;250 employees</i>	−0.0424		−0.0576		−0.0392	
OWN	<i>public</i>	−0.1231	**	−0.1241	**	−0.1253	**
WOR	<i>less than 20 hours per week</i>	−0.8639	***	−0.8695	***	−0.8599	***
	<i>from 21 to 40 hours per week</i>	−0.3012	***	−0.2817	***	−0.3025	***
	<i>more than 40 hours per week</i>	0.0471		0.0542		0.0454	
SEC	<i>industry</i>	−7.7395	**	−6.7954	*	−7.7174	**
	<i>service</i>	−7.7188	**	−6.7786	*	−7.6888	**
OCU	<i>managerial</i>	0.1930		0.1707		0.1846	
	<i>professional</i>	0.2940	**	0.2909	**	0.2841	*
	<i>technical</i>	−0.0312		−0.0309		−0.0442	
	<i>clerical</i>	−0.0715		−0.0698		−0.0832	
	<i>sales &amp; services</i>	−0.0947		−0.0929		−0.1037	
	<i>skilled workers</i>	−0.1515		−0.1695		−0.1492	
	<i>unskilled workers</i>	−0.0846		−0.0998		−0.1011	
NUM	<i>persons in the household</i>	−0.0054				0.0002	
	<i>children ≤5 years old</i>			0.0242		0.0277	
	<i>children 6-15 years old</i>			0.0019			
	<i>children 16-18 years old</i>			−0.0773	*		
	<i>persons 19-65 years old</i>					−0.0129	
	<i>elderly persons &gt; 65 years old</i>			0.0499			
R <sup>2</sup> adjusted		0.473		0.495		0.476	

1	2	3		4		5	
AGE	<i>age</i>	1.3318	***	1.3065	***	1.1419	***
	<i>age</i> <sup>2</sup>	-0.0284	***	-0.0278	***	-0.0242	***
REL	<i>household head</i>	0.1815	**	0.1841	**	0.1737	**
MAR	<i>married</i>	0.1347	**	0.1209	*	0.1091	*
RES	<i>&gt;100 thousand</i>	0.1294	**	0.1426	**	0.1288	**
	<i>50-100 thousand</i>	-0.0214		-0.0130		-0.0316	
	<i>10-50 thousand</i>	0.0186		0.0228		0.0226	
	<i>5-10 thousand</i>	-0.2394	**	-0.2410	**	-0.2263	**
	<i>2-5 thousand</i>	-0.0161		-0.0162		-0.0013	
EDU	<i>university</i>	0.0530		0.0659		0.0452	
	<i>post-secondary</i>	-0.0403		-0.0419		-0.0216	
	<i>vocational or general secondary</i>	0.0489		0.0556		0.0560	
	<i>primary or lower vocational</i>	-0.3101	**	-0.3048	**	-0.3083	**
SIZ	<i>≤10 employees</i>	-0.1112		-0.1184	*	-0.1115	
	<i>11-19 employees</i>	-0.0641		-0.0659		-0.0702	
	<i>50-100 employees</i>	0.0762		0.0689		0.0630	
	<i>101-250 employees</i>	0.0187		0.0041		0.0123	
	<i>&gt;250 employees</i>	-0.0438		-0.0514		-0.0456	
OWN	<i>public</i>	-0.1332	**	-0.1270	**	-0.1006	
WOR	<i>less than 20 hours per week</i>	-0.8587	***	-0.8627	***	-0.8718	***
	<i>from 21 to 40 hours per week</i>	-0.2906	***	-0.2947	***	-0.2841	***
	<i>more than 40 hours per week</i>	0.0640		0.0625		0.0502	
SEC	<i>industry</i>	-8.4822	**	-8.2799	**	-6.3605	*
	<i>service</i>	-8.4607	**	-8.2625	**	-6.3519	*
OCU	<i>managerial</i>	0.1619		0.1568		0.1545	
	<i>professional</i>	0.2835	*	0.2914	**	0.2583	*
	<i>technical</i>	-0.0391		-0.0350		-0.0489	
	<i>clerical</i>	-0.0791		-0.0730		-0.0947	
	<i>sales &amp; services</i>	-0.1030		-0.0921		-0.1271	
	<i>skilled workers</i>	-0.1655		-0.1550		-0.2072	*
	<i>unskilled workers</i>	-0.0853		-0.0850		-0.1444	
NUM	<i>persons in the household</i>	-0.0269					
	<i>children ≤5 years old</i>					0.0303	
	<i>children 6-15 years old</i>					0.0046	
	<i>children 16-18 years old</i>					-0.0877	**
	<i>persons 19-65 years old</i>						
	<i>elderly persons &gt; 65 years old</i>	0.0824	*	0.0573		0.0540	
	<i>unemployed children</i>	0.0203		-0.0064			
	<i>employed persons</i>					-0.1544	**
R <sup>2</sup> adjusted		0.482		0.479		0.506	

Source: own elaboration.

**Table 8.** Parameter estimates of models estimated for women aged 25-54

Feature	Model	MWB1		MWB2		MWB3	
	Variable	Parameter estimates					
1	2	3		4		5	
AGE	<i>age</i>	0.2251	***	0.2318	***	0.2396	***
	<i>age</i> <sup>2</sup>	−0.0027	***	−0.0028	***	−0.0029	***
REL	<i>household head</i>	0.0488	***	0.0463	***	0.0683	***
MAR	<i>married</i>	−0.0249		−0.0242		−0.0156	
RES	<i>&gt;100 thousand</i>	0.1115	***	0.1008	***	0.1089	***
	<i>50-100 thousand</i>	0.0290		0.0164		0.0232	
	<i>10-50 thousand</i>	0.0497	***	0.0372	**	0.0464	**
	<i>5-10 thousand</i>	−0.0371		−0.0461		−0.0401	
	<i>2-5 thousand</i>	0.0888	**	0.0813	**	0.0880	**
EDU	<i>university (at least Ph.D.)</i>	0.3163	***	0.2927	**	0.3141	***
	<i>university</i>	0.3893	***	0.3809	***	0.3534	***
	<i>post-secondary</i>	0.1441	***	0.1432	***	0.1238	***
	<i>vocational or general secondary</i>	0.1157	***	0.1170	***	0.1045	***
	<i>primary or lower vocational</i>	0.0272		0.0317		0.0347	
SIZ	<i>≤10 employees</i>	−0.0320		−0.0350		−0.0425	*
	<i>11-19 employees</i>	0.0136		0.0143		0.0127	
	<i>50-100 employees</i>	0.0340		0.0314		0.0276	
	<i>101-250 employees</i>	0.0373		0.0356		0.0366	
	<i>&gt;250 employees</i>	0.0987	***	0.0945	***	0.0982	***
OWN	<i>public</i>	−0.0188		−0.0159		−0.0134	
WOR	<i>less than 20 hours per week</i>	−0.4311	***	−0.4358	***	−0.4236	***
	<i>from 21 to 40 hours per week</i>	−0.1713	***	−0.1655	***	−0.1622	***
	<i>more than 40 hours per week</i>	0.0553	***	0.0592	***	0.0624	***
SEC	<i>agriculture</i>	2.2099	***	2.1095	***	1.9218	***
	<i>industry</i>	2.2730	***	2.1766	***	1.9897	***
	<i>service</i>	2.1840	***	2.0859	***	1.9061	***
OCU	<i>managerial</i>	0.5601	***	0.5569	***	0.5563	***
	<i>professional</i>	0.4427	***	0.4404	***	0.4506	***
	<i>technical</i>	0.3629	***	0.3588	***	0.3608	***
	<i>clerical</i>	0.3004	***	0.2946	***	0.2903	***
	<i>sales &amp; services</i>	0.2041	***	0.1993	***	0.1968	***
	<i>farmers. fishermen etc.</i>	0.5744	***	0.6021	***	0.5609	***
	<i>skilled workers</i>	0.1579	***	0.1578	***	0.1592	***
	<i>unskilled workers</i>	0.0479		0.0405		0.0308	
NUM	<i>persons in the household</i>	−0.0002				−0.0516	***
	<i>children ≤5 years old</i>			0.0082		0.0510	***
	<i>children 6-15 years old</i>			−0.0001			
	<i>children 16-18 years old</i>			−0.0892	***		
	<i>persons 19-65 years old</i>					0.0865	***
	<i>elderly persons &gt; 65 years old</i>			−0.0298	**		
R <sup>2</sup> adjusted		0.979		0.979		0.979	

1	2	3		4		5	
AGE	<i>age</i>	0.2290	***	0.2293	***	0.2318	***
	<i>age</i> <sup>2</sup>	−0.0027	***	−0.0027	***	−0.0028	***
REL	<i>household head</i>	0.0510	***	0.0424	***	0.0465	***
MAR	<i>married</i>	−0.0402	**	−0.0247		−0.0237	
RES	<i>&gt;100 thousand</i>	0.1090	***	0.0986	***	0.1016	***
	<i>50-100 thousand</i>	0.0310		0.0193		0.0172	
	<i>10-50 thousand</i>	0.0462	**	0.0379	**	0.0376	**
	<i>5-10 thousand</i>	−0.0366		−0.0427		−0.0461	
	<i>2-5 thousand</i>	0.0889	**	0.0828	**	0.0807	**
EDU	<i>university (at least Ph.D.)</i>	0.3086	***	0.3127	***	0.2937	**
	<i>university</i>	0.3857	***	0.3866	***	0.3815	***
	<i>post-secondary</i>	0.1411	***	0.1441	***	0.1440	***
	<i>vocational or general secondary</i>	0.1171	***	0.1170	***	0.1173	***
	<i>primary or lower vocational</i>	0.0274		0.0276		0.0316	
SIZ	<i>≤10 employees</i>	−0.0398	*	−0.0347		−0.0350	
	<i>11-19 employees</i>	0.0137		0.0144		0.0144	
	<i>50-100 employees</i>	0.0333		0.0338		0.0311	
	<i>101-250 employees</i>	0.0358		0.0367		0.0354	
	<i>&gt;250 employees</i>	0.0963	***	0.0978	***	0.0946	***
OWN	<i>public</i>	−0.0188		−0.0184		−0.0160	
WOR	<i>less than 20 hours per week</i>	−0.4326	***	−0.4315	***	−0.4356	***
	<i>from 21 to 40 hours per week</i>	−0.1699	***	−0.1686	***	−0.1654	***
	<i>more than 40 hours per week</i>	0.0578	***	0.0572	***	0.0593	***
SEC	<i>agriculture</i>	2.1015	***	2.1746	***	2.1101	***
	<i>industry</i>	2.1644	***	2.2401	***	2.1772	***
	<i>service</i>	2.0764	***	2.1502	***	2.0868	***
OCU	<i>managerial</i>	0.5542	***	0.5541	***	0.5567	***
	<i>professional</i>	0.4457	***	0.4392	***	0.4402	***
	<i>technical</i>	0.3619	***	0.3597	***	0.3588	***
	<i>clerical</i>	0.2980	***	0.2977	***	0.2943	***
	<i>sales &amp; services</i>	0.2013	***	0.2015	***	0.1993	***
	<i>farmers, fishermen etc.</i>	0.5670	***	0.5798	***	0.6030	***
	<i>skilled workers</i>	0.1587	***	0.1566	***	0.1581	***
	<i>unskilled workers</i>	0.0426		0.0468		0.0398	
NUM	<i>persons in the household</i>	0.0347	***				
	<i>children ≤5 years old</i>					0.0079	
	<i>children 6-15 years old</i>					−0.0003	
	<i>children 16-18 years old</i>					−0.0890	***
	<i>persons 19-65 years old</i>						
	<i>elderly persons &gt; 65 years old</i>	−0.0657	***	−0.0298	**	−0.0296	**
	<i>unemployed children</i>	−0.0544	***	−0.0180	***		
	<i>employed persons</i>					0.0177	
R <sup>2</sup> adjusted		0.979		0.979		0.979	

Source: own elaboration.

**Table 9.** Parameter estimates of models estimated for women aged 55-65

Feature	Model	MWC1		MWC2		MWC3	
	Variable	Parameter estimates					
1	2	3		4		5	
AGE	<i>age</i>	0.2412	***	0.2397	***	0.2437	***
	<i>age</i> <sup>2</sup>	-0.0021	***	-0.0021	***	-0.0022	***
REL	<i>household head</i>	0.0935		0.1067	*	0.0943	
MAR	<i>married</i>	0.1179	*	0.1166	*	0.1299	**
RES	<i>&gt;100 thousand</i>	-0.0418		-0.0349		-0.0379	
	<i>50-100 thousand</i>	0.0104		0.0092		0.0168	
	<i>10-50 thousand</i>	-0.0137		-0.0190		-0.0138	
	<i>5-10 thousand</i>	-0.0358		-0.0384		-0.0221	
	<i>2-5 thousand</i>	0.0959		0.1227		0.1027	
EDU	<i>university (at least ph.d.)</i>	0.6897	**	0.6950	**	0.6799	**
	<i>university</i>	0.6028	***	0.6105	***	0.6170	***
	<i>post-secondary</i>	0.1519		0.1440		0.1606	
	<i>vocational or general secondary</i>	0.1949	**	0.2124	**	0.2045	**
	<i>primary or lower vocational</i>	-0.0099		-0.0089		-0.0082	
SIZ	<i>≤10 employees</i>	-0.2698	***	-0.2953	***	-0.2754	***
	<i>11-19 employees</i>	-0.1540	*	-0.1700	*	-0.1588	*
	<i>50-100 employees</i>	-0.0100		-0.0423		-0.0034	
	<i>101-250 employees</i>	0.0465		0.0409		0.0519	
	<i>&gt;250 employees</i>	0.1339		0.1081		0.1355	
OWN	<i>public</i>	0.0030		-0.0031		-0.0029	
WOR	<i>less than 20 hours per week</i>	-0.8589	***	-0.8568	***	-0.8620	***
	<i>from 21 to 40 hours per week</i>	-0.1700	**	-0.1643	**	-0.1762	**
	<i>more than 40 hours per week</i>	0.2052		0.2270		0.1952	
SEC	<i>agriculture</i>	-0.1596		-0.1901		-0.1756	
	<i>industry</i>	0.2248		0.2121		0.2060	
	<i>service</i>	0.1321		0.1052		0.1175	
OCU	<i>managerial</i>	0.5033	***	0.4991	**	0.4834	**
	<i>professional</i>	0.1904		0.2111		0.1800	
	<i>technical</i>	0.2763	*	0.2820	*	0.2630	*
	<i>clerical</i>	0.0449		0.0583		0.0367	
	<i>sales &amp; services</i>	0.0085		0.0361		0.0042	
	<i>farmers, fishermen etc.</i>	0.8395	*	0.8631	*	0.8594	*
	<i>skilled workers</i>	0.0303		0.0150		0.0236	
	<i>unskilled workers</i>	-0.1015		-0.0968		-0.1068	
NUM	<i>persons in the household</i>	-0.0215				0.0039	
	<i>children ≤5 years old</i>			-0.0251		0.0178	
	<i>children 6-15 years old</i>			-0.1029	*		
	<i>children 16-18 years old</i>			0.1241			
	<i>persons 19-65 years old</i>					-0.0414	
	<i>elderly persons &gt; 65 years old</i>			0.0160			
R <sup>2</sup> adjusted		0.975		0.975		0.975	



1	2	3		4		5	
AGE	<i>age</i>	0.2419	***	0.2403	***	0.2405	***
	<i>age</i> <sup>2</sup>	-0.0022	***	-0.0021	***	-0.0021	***
REL	<i>household head</i>	0.0961	*	0.0966		0.1092	*
MAR	<i>married</i>	0.1190	*	0.1062	*	0.1169	*
RES	<i>&gt;100 thousand</i>	-0.0383		-0.0352		-0.0339	
	<i>50-100 thousand</i>	0.0150		0.0199		0.0103	
	<i>10-50 thousand</i>	-0.0104		-0.0068		-0.0183	
	<i>5-10 thousand</i>	-0.0293		-0.0255		-0.0320	
	<i>2-5 thousand</i>	0.1087		0.1124		0.1180	
EDU	<i>university (at least Ph.D.)</i>	0.6786	**	0.6818	**	0.6947	**
	<i>university</i>	0.6105	***	0.6092	***	0.6101	***
	<i>post-secondary</i>	0.1605		0.1626		0.1427	
	<i>vocational or general secondary</i>	0.2012	**	0.1996	**	0.2149	**
	<i>primary or lower vocational</i>	-0.0050		-0.0091		-0.0084	
SIZ	<i>≤10 employees</i>	-0.2702	***	-0.2684	***	-0.2919	***
	<i>11-19 employees</i>	-0.1571	*	-0.1556	*	-0.1704	*
	<i>50-100 employees</i>	-0.0061		-0.0084		-0.0422	
	<i>101-250 employees</i>	0.0529		0.0571		0.0401	
	<i>&gt;250 employees</i>	0.1385		0.1410		0.1104	
OWN	<i>public</i>	0.0026		-0.0004		-0.0039	
WOR	<i>less than 20 hours per week</i>	-0.8610	***	-0.8619	***	-0.8556	***
	<i>from 21 to 40 hours per week</i>	-0.1739	**	-0.1776	**	-0.1617	**
	<i>more than 40 hours per week</i>	0.1970		0.1932		0.2247	
SEC	<i>agriculture</i>	-0.1552		-0.1492		-0.2153	
	<i>industry</i>	0.2159		0.2255		0.1950	
	<i>service</i>	0.1217		0.1327		0.0874	
OCU	<i>managerial</i>	0.4808	**	0.4782	**	0.5014	**
	<i>professional</i>	0.1855		0.1905		0.2131	
	<i>technical</i>	0.2630	*	0.2612	*	0.2847	*
	<i>clerical</i>	0.0423		0.0432		0.0610	
	<i>sales &amp; services</i>	0.0107		0.0146		0.0351	
	<i>farmers, fishermen etc.</i>	0.8282	*	0.8150		0.8705	*
	<i>skilled workers</i>	0.0285		0.0220		0.0206	
	<i>unskilled workers</i>	-0.1042		-0.1100		-0.0895	
NUM	<i>persons in the household</i>	-0.0194					
	<i>children ≤5 years old</i>					-0.0177	
	<i>children 6-15 years old</i>					-0.0989	*
	<i>children 16-18 years old</i>					0.1216	
	<i>persons 19-65 years old</i>						
	<i>elderly persons &gt; 65 years old</i>	0.0324		0.0194		0.0160	
	<i>unemployed children</i>	-0.0109	*	-0.0346			
	<i>employed persons</i>					-0.0511	
R <sup>2</sup> adjusted		0.975		0.975		0.975	

Source: own elaboration.

Considering the variables dedicated to the structure of the households, we note that these variables are insignificant in the models estimated for the oldest group of women and the five models (MWA1-MWA5) describing the monthly remuneration of the youngest female employees. Number of children 16-18 years old in models MWA6, MWB2 and MWB6, and number of employed persons in the household in model MWA6 are significant for the negative impact to salaries. In the models estimated on the basis of the subsample of women aged 25-54 years, variables representing: number of persons aged 19-65 (MWB3), children 5 years old and under (MWB3) and number of persons in the household have a significantly positive impact on monthly remuneration. While parameters standing for the number of elderly persons (MWB2, MWB3-MWB6), children not in employment (MWB4 and MWB5) and children 16-18 years old (MWB2 and MWB6) are significantly negative.

## 5. Conclusion

In our research we attempted to find out if the structure of the household influences the remuneration of Polish employees, what allows making a conclusion about the ‘care penalty’. Analysis based on econometric models made it possible to formulate the following findings (Table 10).

**Table 10.** Models with a significant impact of “family variables”

Variables		Positive impact	Negative impact
<i>household head</i>		MT1-6, MM1-6, MW1-6, MWA1-2, MWA4-5, MWB1-6	
<i>married</i>		MM1-6, MWA4, MWC3	MW1-6, MWB4
Number of	<i>persons in the household</i>	MT1, MT4, MW1, MW4, MWB4	MT3, MM3, MW3, MWB3
	<i>children &lt;5</i>	MT3, MT6, MWB3	
	<i>children 6-15</i>		
	<i>children 16-18 years old</i>		MT2, MT6, MM2, MM6, MW2, MW6, MWA6, MWB2, MWB6
	<i>persons 19-65</i>	MT3, MM3, MWB3	
	<i>elderly persons</i>		MWB2, MWB4-6
	<i>children not in employment</i>		MT4, MW4, MWB4-5
	<i>employed persons</i>		MM6, MWA6

Source: own elaboration.

1. The existence of the ‘motherhood penalty’ is proved by models MT4, MW4, MWB4 and MWB5 since the variable representing the number of children not in employment is statistically significant and causes a decrease of monthly

remuneration. It is worth mentioning that this variable is not significant in any model (containing this variable) estimated for the subsample of men. One can also note that the 'motherhood penalty' affects mostly women aged 25-54.

2. The 'care for the elderly penalty' is not so notable, but it is proved for women aged 25-54 since all the models containing the variable describing the number of persons aged 66 and more, show the significantly negative impact of this variable on the monthly remuneration.

3. Decreasing monthly remuneration is caused by the increase of number of children 16-18 years old visible in all the models containing this variable estimated for all the samples, subsamples of male and female employees, women aged 25-54 and 15-24 ( model MWA6).

4. The number of children aged 5 and below has a significant and positive impact on remuneration in models MT3, MT6 and MWB3.

5. The number of employed persons in a household (models MT3, MM3, and MWB3) and a number of family members (MT1, MT4, MW1, MW4, MWB4) significantly influence the increase of remuneration received by respondents. However, in the models containing the S3 set of variables this relation is the opposite (MT3, MM3, MW3, MWB3). Also, the number of employed persons in the household has a significant and negative impact in models MM6 and MWA6.

6. Households' heads receive higher remuneration than other members of families regardless of gender since the parameter standing for this variable is significantly positive in the majority of models, although the differences in salaries may be not significant in the group of the youngest female employees and the ones aged 55-65.

7. Married men earn more than unmarried ones (see models MM1-MM6), whereas married women earn less than unmarried female employees (models MW1-MW6 and MWB4). However, the models estimated for the sample of married women aged 15-24 and 55-65 (MWA4 and MWC3) show the same tendency as the models estimated for male employees.

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## CZY STRUKTURA GOSPODARSTW DOMOWYCH WPŁYWA NA WYNAGRODZENIA W POLSCE?

**Streszczenie:** Podstawowymi determinantami płac są: ogólna sytuacja gospodarcza, indywidualne cechy pracowników oraz charakterystyki miejsca pracy. Na aktywność zawodową i wynagrodzenia wpływają także obowiązki rodzinne, szczególnie opiekuńcze. Celem pracy jest sprawdzenie, czy struktura gospodarstw domowych w Polsce wpływa na miesięczne wynagrodzenia pracowników. Badanie polega na estymacji modeli ekonometrycznych opisujących miesięczne wynagrodzenia na podstawie mikrodanych. Analizy przeprowadzono z wykorzystaniem próby wszystkich pracowników, oddzielnie z podziałem na pracowników obu płci oraz dla zatrudnionych kobiet z wyróżnionych trzech grup wiekowych. Badania wykazały, że: (1) mężczyźni zarabiają istotnie więcej niż kobiety, (2) zamężne kobiety zarabiają istotnie mniej niż niezamężne, a wśród mężczyzn relacja jest przeciwna, (3) obowiązki opiekuńcze wypełniają głównie kobiety, co w grupie wiekowej 25-55 lat istotnie wpływa na ich wynagrodzenia.

**Słowa kluczowe:** nierówności płacowe implikowane płcią, wynagrodzenia, struktura gospodarstw domowych.