Investigating the motherhood-caregiver penalty

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Abstract

There are many factors influencing wages that are connected with the individual attributes of employees and workplaces or describe the general situation of the labour market. However, family duties, especially providing care to children or the elderly, are also important determinants affecting women economic activity and their wages because the primary caregivers are mostly women, who are penalized because of that. The aim of this research is to identify factors influencing monthly wages in Poland, especially to answer the question concerning the existence of caregiver penalty. These goals fill the gap in the literature and result from the necessity of monitoring the situation of women in the labour market. The research is provided on the basis of microdata, originating from the Polish Labour Force Survey. In our analysis, we estimate econometric models, which explain monthly incomes obtained by all respondents regardless of gender, male and female employees, and women aged 25-54 years. Explanatory variables describe the individual characteristics of employees, the structure of households and workplaces. Using econometric models, we identify the determinants of monthly wages for each analyzed group of respondents. We also conclude that male employees earn more than female ones and married men earn more than unmarried ones whereas married women earn less than unmarried female employees. According to the parameter estimates, we may claim that the caregiver penalty exists in Poland but mostly among female employees. We detect the motherhood penalty and eldercare penalty. However, the latter touches only women in age 25-54 years.

Keywords: labour market, wages, gender inequality, motherhood penalty, eldercare penalty.

1. Introduction

Women situation in the labour market has been changing due to different factors. Therefore, the position of women, their economic activity, wage disparities, etc. should be permanently monitored and it requires detailed studies which are provided in all EU member states. Improvement of the women's situation in the labour market is a key issue to be addressed in the formulation of the key strategies of the European Union (EU).

Knowledge about the mechanisms, that have been influencing the men and women participation in the labour market and their remuneration, can be used not only in the theoretical but also in the practical aspects, and may support the monitoring and evaluation of the actions, which are taken to improve the status of women in the labour market. They might be also helpful in the formulation of new strategies to ensure a balance in the labour market.

Gender inequality (also in wages) has both social and economic dimension Therefore, governments and various organizations undertake many actions, that are focused on fair treatment of men and women. The first policies toward gender equality in societies and economies were formulated in the second half of the 20th century. In the United States president, J. F. Kennedy signed the *Equal Pay Act* in 1963. And according to the US Bureau of Labor Statistics, the US gender wage gap (GPG) had been decreased from 38% to 20% in 2004 since the adoption of the Equal Pay Act. The European Economic Community established a general framework for equal treatment in employment and occupation by the *Directive 2000/78/EC* [1] in 2000. However, GPG evaluated as an average for the European Union member states has been still two digits number. At present, the policy of equality is fully reflected in the formulated strategies such as e.g. H*orizon 2020*, *Strategy for equality between women and men 2010-2015*, and the proposal for a *Directive on improving the gender balance among non-executive directors of companies listed*.

Poland is a country with a long tradition of female employment. After the Second World War, the communist system was imposed in Poland. This system assumed full employment, but it did not assure remunerations high enough to maintain a basic living standard. Therefore, both adults in a nuclear family

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[1] The *Directive* generates the general framework to ensure equal treatment of individuals in the European Union, regardless of their religion or belief, disability, age or sexual orientation, as regards access to employment or occupation and membership of certain organisations. All these actions taken by politicians have been improving the situation of women.

had to work, i.e. women had to be active in the labour market and the female participation rate was then very high[2] (i.e. about 80% of women in working age). An economic and political transformation took place in 1989, and the Polish labour market has been changing since then. At the beginning of the transition, the Polish economy experienced all the negative features of a market economy such as unemployment, high inflation and impoverishment of society. As a result, female economic activity essentially decreased in comparison to the situation observed when the Polish economy was centrally planned. The situation was improving in the following years, and this made the labour market in Poland similar to the ones in developed economies. Poland became a member of the European Union in 2004 and must obey all strategies and persecute law formulated by the EU.

The research aims[3] to identify factors influencing monthly wages in Poland. Primarily, we would like to answer the question concerning the existence of caregiver penalty. These goals fill the gap in the literature and result from the necessity of monitoring the situation of women in the labour market. The research is provided based on data, originating from the Polish Labour Force Survey. In our analysis, we estimate econometric models, which explain monthly incomes (obtained by all respondents regardless of gender, male and female employees, and women aged 25-54 years).

The paper is organized as follows. The second section contains the literature review. The third section gives a short description of the situation in Poland. Information about the sample and model specifications are presented in sections four and five. Obtained results are discussed in the sixth section, and the last section concludes the findings.

2. Literature review

The differences in the employment of men and women are explained based on the three most popular theories: human capital theory (Becker 1964), discrimination theory (Becker 1971) and preferences theory. Preferences theory refers to women's preferences who would like to reconcile work and family life.

Factors influencing wages can be divided into three main groups.

- Individual characteristics of the employee, for instance: age, length of service (job seniority), the type and level of education, occupation, working profile (full or part-time job), job contract, family economic status, etc.;

- Enterprise characteristics such as type of industry, sector (public or private), size of the enterprise, the activity of trade unions, etc.;

- Characteristics of the environment, for example, the economic situation in the region/country, the structure of the labour market, family policy, e.g. external solutions for the care of children and elder people, the legal solutions and the activities of various institutions against discrimination in the labour market, cultural background and stereotypes.

A great body of literature points out problems of gender disparity at the labour market which might provide to discrimination and there are many examples that women obtain significantly lower salaries than their male colleagues. Income disparities are documented and discussed by (Cain, 1986; McConnell and Brue, 1986; Blanchard, 1997; Kot, 1999; Blau and Kahn, 2006; Neuman and Oaxaca, 2003; Ñopo *et al.*, 2011; Witkowska, 2013) among others. Research concerning the situation in Poland is presented by (Kot, 1999; Grajek 2001; Newell, Socha, 2005 2007; Witkowska, 2012, 2014; Baran *et al.*, 2016 and Kompa, Witkowska 2018).

Family duties, especially providing care to children, the elderly, handicapped or sick, are also important determinants influencing women economic activity and their wages because the primary caregivers for children, ageing spouses and ageing 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 their professional activities, they tend to choose caregiver-friendly jobs which usually give lower wages. The negative effect of providing care on caregiver's wages is called care penalty.

Problems concerning childcare are usually recognized by politicians who formulate family policy to help parents, for instance, parental leaves or family allowance. However such benefits might contribute to strong and long-lasting income effect, with the depressing effect on the lifetime level of labour force participation (Gehringer *et al.*, 2014). Motherhood penalty is found out by (Brody, Schoonover 1986; Anderson *et al.*, 2003, Budig and Hodges, 2010; Harkness, Waldfogel, 2003; Davies and Pierre, 2005; England, 2005; Simonsen

and Skipper, 2006; Correll *et al*., 2007; Gangl and Ziefle, 2009; Napari, 2010; Angelov *et al*., 2013; Cukrowska-Torzewska and Lovasz, 2017). There is also research concerning the situation in Polish households (see: Cukrowska-Torzewska, 2015).

Problems concerning the ageing of societies in developed economies are relatively new and they are rarely subject to family policy. Also, the literature on the impact of caring for the elderly to wages has not been so rich (as the one concerning parent care), and it mostly concerns the conditions and costs of institutional care. However, the eldercare penalty is concluded by (Synak, 1989; Stone and Short, 1990; Soldo and Hill, 1995; Wolf and Soldo, 1994; Johnson and Lo Sasso, 2000, 2006; Vittaten, 2007, 2010). But there is no such research provided for Polish families.

3. Situation in Poland

Family duties are significantly diversified between genders, i.e. mostly women point them out as a reason of economic inactivity. According to the Eurostat data from 2014, in the European Union there are five reasons for inactivity in the labour market of persons aged 15-64 years:

1. pension (18.6% for women and 27.9% for men),
2. problems with health (15.8% and 26.9% for women and men respectively),
3. studying (13.5% and 22.1% for women and men respectively),
4. caring for children or other relatives required care (18.5% for women and 1.7% for men),
5. housework (12.0% for women and 2.4% for men).

In Poland 2015, 51% of women in age 15 years and more are inactive at the labour market while there is only 35% of inactive men in that age. The majority of inactive persons are pensioners, the second reason for inactivity is studying, the third one - problems with health, then family duties and problems with finding the proper job (Statistics Poland Yearbook, 2016).

One should notice that families in Poland are very traditional, although multigeneration households have become less and less often. Therefore, in the years 2007-2011 women were responsible for (Niewiadomska, 2013, p. 112):
- childcare in 98.1% cases,
- housekeeping in 96.1% cases and
- care of someone with a long-term illness or disability and elderly person in 75.5% cases.

Poland is a country where demographic problems, concerning ageing society and low fertility rate have been present for twenty years now. Therefore, the family policy is established to encourage fertility and reduce child poverty, which provides some instruments such as:

- parental leave (36 months for children aged six years and less) which is mostly taken by mothers,
- family program called 500+ which consists of a monthly payment of PLN 500 (€115) net for every child after the first until the age of 18, and for the first child in families whose income is below a defined threshold,
- school starter kit (300 PLN = €70 net) paid once a year for each enrolled child aged 18 years and less.

Education in Poland, including public university education, is free of charge. Children start obligatory pre-school education when they are six years old, and they enter primary school-aged seven years. They continue their education at least till age 16 years when students may attend high schools which last for three or four years. Thus, university education starts for young people being at least 19 years old. In such a situation, usually, children do not regularly work until they are 19 years old (although they become adults in age 18).

Due to the regulations in Poland, employees should be at least 16 years old. The retirement age in Poland is 60 years for female employees and 65 years for male employees. In other words, the majority of the population aged 66 and more are already inactive in the labour market.

4. The structure of the sample

The original Polish Labor Force Survey database includes information about nearly 55 thousand respondents. For our study, the number of individual records was reduced and contained only microdata concerning the respondents who were working during the month preceding the survey. We also removed all records with incomplete data concerning questions under our consideration. As a result, the sample used in our research contains observations regarding 7044 respondents, among them 3293 women and 3751 men. Female employees are additionally classified into age groups, but we discuss results of investigations provided for female employees in prime-age (i.e. 25-54 years old) only. The structure of the sample in terms of selected features is presented in Tables 1-3.

As one can see (Table 1) women in Poland are usually better educated than men since over 26.55% of them have university education while among men this share is 13.12%. Also, women have secondary or post-secondary education more often than men (43.58% and 32.76%, respectively).

TABLE 1: STRUCTURE OF THE SAMPLE [%] IN TERMS OF THE LEVEL OF EDUCATION ACCORDING TO THE INTERNATIONAL STANDARD CLASSIFICATION OF EDUCATION (ISCED)

Level of education	ISCED	Total	Men	Women
University (at least Ph.D.)	6	0.37	0.32	0.43
University	5	19.02	12.80	26.12
Postsecondary	4	4.13	2.13	6.41
Vocational or general secondary	3	33.69	30.63	37.17
Lower vocational	2	33.83	43.11	23.26
Primary	1	8.94	10.98	6.62
Lower than primary	0	0.01	0.03	0.00

Source: Own elaboration based on Podliński (2012)

If place of residence, which is characterized by the number of inhabitants, is taken into account (Table 2), one may notice that 41% of respondents live in the countryside (44% of male and 40% of female employees) however nearly ¼ part of them live in cities with more than 100 thousand inhabitants.

Occupation segmentation in the sample (Table 3) shows that there is much more (i.e. from two to even four times more) women than men working as professional, clerical and in sales & services and nearly two times more working as technical and unskilled workers. Other professions like farmers, fishers, industry and skilled workers are masculinized, i.e. there are from four to five times more male than female employees. It is also visible that although women are better educated than men, there is much less female than male in manager positions.

TABLE 2: STRUCTURE OF THE SAMPLE [%] IN TERMS OF THE SIZE CLASS OF THE PLACE OF RESIDENCE

No of inhabitants	Total	Men	Women
$>100 \cdot 10^3$	24.15	22.07	26.51
$50 \cdot 10^3 - 100 \cdot 10^3$	8.29	7.70	8.96
$10 \cdot 10^3 - 50 \cdot 10^3$	19.75	19.14	20.44
$5 \cdot 10^3 - 10 \cdot 10^3$	3.93	3.60	4.31
$2 \cdot 10^3 - 5 \cdot 10^3$	2.95	3.09	2.79
below $2 \cdot 10^3$ countryside	40.93	44.39	36.99

Source: Own elaboration based on Podliński (2012)

Occupation group	ISCO	Total	Men	Women	Economic sector	Total	Men	Women
Managerial	1	4.22	5.41	2.85	Agriculture	2.74	4.21	1.06
Professional	2	13.73	6.69	21.74	Industry	39.10	52.68	23.63
Technical	3	11.48	8.77	14.58	Service	58.04	43.11	75.04
Clerical	4	8.89	5.65	12.57	Others	0.11	0.00	0.24
Sales & services	5	12.99	6.80	20.04				
Farmers, fishers, etc.	6	0.68	1.09	0.21				
Skilled workers	7	14.34	22.37	5.19	Ownership	Total	Men	Women
Industry workers	8	21.89	33.86	8.26	Public	35.48	28.02	43.97
Unskilled workers	9	11.78	9.36	14.55	Private	64.52	71.98	56.03

Source: Own elaboration based on Podliński (2012)

One may also notice (Table 3) that in Poland there is less than 3% of employees working in agriculture, and the majority of them are employed in services (58%). The majority of men (nearly 53%) work in the industry whereas the majority of women (75%) work in services. The majority of employees work in private enterprises (64.5%). Males work in the private sector more often than females (72% and 56%, respectively). Women prefer public sector (e.g. education, administration, health care and social services) since work there seem to be more caregivers friendly and employees are better protected than in private firms. In fact, the most feminized economic activities in Poland are (1) education, (2) health care and social services (3) accommodation and food service, together with (4) financial and insurance.

5. Specification of models

In our research, we use exponential regression models estimated after linearization that are often used in research (Grajek, 2001; Blau and Kahn, 2006; Newell and Reilly, 2001; Newell and Socha, 2007). It is also an ordinary approach (Newell and Reilly, 2001; Grajek, 2001; Blau and Kahn, 2006; Witkowska, 2012, 2013) to provide analysis for all respondents and separately for male and female employees that simplifies gender wage gap analysis.

Econometric models, describing natural logarithms of monthly wages, are explained by:

- individual characteristics of employees i.e. age, marital status, position in the household, the level of education, place of living, occupation, working profile;
- situation in the families, e.g. number of children and elderly members of the family in the household;
- workplaces characteristics such as economic branch, public/private sector, size of the enterprise.

Therefore, the model can be written as:

ln (*MoIn*)
= *f*(*AGE*, *AGE²*, *GEN*, *REL*, *MAR*, *RES*, *EDU*, *SIZ*, *OWN*, *WOR*, *SEC*, *OCU*, *NUM*$_{k}$
+ ε

where, ln (*MoIn*) - natural logarithm of monthly remunerations, *f*(…) - a linear function, ε – residual, *GEN*, *REL*,…, *NUK*$_k$ – symbols of variables described in Tables 4 and 5, *AGE* – is the respondents' age, *AGE²* –age squared.

The considered features, which are used to explain monthly wages, are both quantitative and qualitative. The last-mentioned characteristics are represented by ten dummies, which are presented in Table 4.

TABLE 4: LIST OF DUMMIES

Symbol	Description of variables	No. of variants	Reference variant
GEN	Gender	2	*women*
REL	Relationship with the head of the household	2	*not a household head*
MAR	Marital status	2	*not married*
RES	Place of residence distinguished by the number of inhabitants	6	*countryside, i.e. less than 2000 inhabitants*
EDU	Education	6	*lower than primary*
SIZ	Size of the workplace	6	*20-49 employees*
OWN	Ownership of the enterprise or institution	2	*private*
WOR	Work-time	4	*40 hours per week*
SEC	Sector of employment	4	*other*
OCU	Occupation	9	*industry workers*

Quantitative variables are age (*AGE*) and age squared, together with eight variables related to the family situation (*NUM*) which are described in Table 5.

We use age as a proxy of job seniority since there is a lack of information concerning the latter variable in the database[4].

TABLE 5: MODEL SPECIFICATION

Variables describing the family situation by the number of:		Models					
		M1	**M2**	**M3**	**M4**	**M5**	**M6**
NUM_1	persons (individuals) living in the household	+		+	+		
NUM_2	children 5 years old and below		+	+			+
NUM_3	children in age 6-15 years old		+				+
NUM_4	children in age 16-18 years old		+				+
NUM_5	persons in age 19-65 years old			+			
NUM_6	elderly persons over 65 years old		+		+	+	+
NUM_7	unemployed children living in the household				+	+	
NUM_8	employed persons living in the household						+

Note: symbol + denotes that particular variable is included in the model

It is worth mentioning that all variables describing the 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 distinguish six sets of "family variables" (denoted as M1, M2, …, M6) which determine the model specification. The set of variables contains one (M1) to five (M6) variables.

6. Empirical results

Models explaining natural logarithms of payments are estimated using ordinary least squares method for the whole sample and separately for subsamples of men and women (denoted by letters: T, M and W, respectively), and for subsamples of women aged 25-54 years (denoted as WW). All models are also denoted according to their specification (i.e. the set of "family" variables M1-M6). For instance, MT2 denotes the model built for the second set of "family" variables M2 and estimated for the whole sample. While the model MWW2 contains the same set of "family" variables but it is estimated for the subsample of women aged 25-54.

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[4] Introducing this variable into models would cause shorting of the sample by 50%.

Tables 6-10 contain estimation results obtained for 24 models. In the Tables, parameter estimates and adjusted determination coefficients are presented. In our study we assume that variable is statistically significant if the null hypothesis can be rejected at significance level α=0.05 or less, therefore statistically significant parameters are bolded.

6.1. Models estimated for all respondents, and separately for male and female employees

In Tables 6-8 parameter estimates of 18 models, constructed for all sets of explanatory variables but estimated using different samples, are presented. One may notice that in models estimated for the whole sample men earn significantly more than women since the variable man is significant with a positive impact on incomes. It is also visible that models estimated for the entire sample and subsample of women are characterized by high determination coefficients while for men fitting of the models is low.

Table 6: Parameter Estimates: General Models M1-M6

Variable		Estimates of model parameters					
		MT1	MT2	MT3	MT4	MT5	MT6
AGE	*age*	**0,0983**	**0,1003**	**0,1030**	**0,0991**	**0,0987**	**0,1003**
	age²	**-0,0011**	**-0,0012**	**-0,0012**	**-0,0011**	**-0,0011**	**-0,0012**
GEN	*man*	**0,2523**	**0,2509**	**0,2451**	**0,2506**	**0,2538**	**0,2510**
REL	*household head*	**0,0653**	**0,0598**	**0,0745**	**0,0671**	**0,0615**	**0,0595**
MAR	*married*	0,0009	0,0026	0,0025	-0,0059	0,0070	0,0023
RES	*>10⁵ inhabitants*	**0,1033**	**0,0948**	**0,1003**	**0,1025**	**0,0967**	**0,0945**
	(50-100)·10³	**0,0417**	0,0320	**0,0377**	**0,0435**	**0,0360**	0,0317
	(10-50)·10³	0,0208	0,0135	0,0187	0,0211	0,0155	0,0133
	(5-10)·10³	**-0,0650**	**-0,0714**	**-0,0693**	**-0,0640**	**-0,0681**	**-0,0715**
	(2-5)·10³	0,0133	0,0088	0,0157	0,0165	0,0103	0,0087
EDU	*university (at least Ph.D.)*	**0,6168**	**0,6068**	**0,6303**	**0,6185**	**0,6135**	**0,6062**
	university	**0,3292**	**0,3206**	**0,3180**	**0,3281**	**0,3268**	**0,3201**
	post-secondary	**0,1167**	**0,1151**	**0,1076**	**0,1172**	**0,1168**	**0,1147**
	vocational or general sec.	**0,1461**	**0,1443**	**0,1400**	**0,1467**	**0,1455**	**0,1442**
	primary or lower vocational	**-0,0676**	**-0,0643**	**-0,0650**	**-0,0679**	**-0,0672**	**-0,0639**
SIZ	*<10 employees*	**-0,0362**	**-0,0381**	**-0,0376**	**-0,0380**	**-0,0368**	**-0,0383**
	11-19	-0,0102	-0,0111	-0,0088	-0,0108	-0,0107	-0,0113
	50-100	**0,0385**	**0,0359**	**0,0369**	**0,0381**	**0,0378**	**0,0357**
	101-250	**0,0575**	**0,0566**	**0,0580**	**0,0570**	**0,0569**	**0,0564**
	>250	**0,1240**	**0,1217**	**0,1246**	**0,1241**	**0,1234**	**0,1215**
OWN	*public*	0,0035	0,0059	0,0060	0,0039	0,0038	0,0059
WOR	*<20 hours per week*	**-0,5800**	**-0,5779**	**-0,5695**	**-0,5795**	**-0,5796**	**-0,5780**
	21-40	**-0,2020**	**-0,1979**	**-0,1956**	**-0,2017**	**-0,2011**	**-0,1980**
	>40	**0,1038**	**0,1046**	**0,1065**	**0,1042**	**0,1041**	**0,1045**
SEC	*agriculture*	**4,7735**	**4,7773**	**4,6607**	**4,7467**	**4,8015**	**4,7777**
	industry	**4,8497**	**4,8585**	**4,7409**	**4,8230**	**4,8798**	**4,8591**
	service	**4,7909**	**4,7983**	**4,6817**	**4,7641**	**4,8200**	**4,7989**
OCU	*managerial*	**0,4305**	**0,4267**	**0,4332**	**0,4288**	**0,4281**	**0,4268**
	professional	**0,3169**	**0,3123**	**0,3191**	**0,3168**	**0,3143**	**0,3124**
	technical	**0,1936**	**0,1891**	**0,1944**	**0,1924**	**0,1916**	**0,1891**
	clerical	**0,0814**	**0,0783**	**0,0780**	**0,0791**	**0,0813**	**0,0784**
	sales & services	0,0352	0,0329	0,0350	0,0344	0,0342	0,0327
	farmers, fishers, etc.	0,0720	0,0804	0,0686	0,0737	0,0744	0,0808
	skilled workers	**0,0775**	**0,0749**	**0,0746**	**0,0767**	**0,0772**	**0,0746**
	unskilled workers	**-0,0864**	**-0,0913**	**-0,0929**	**-0,0880**	**-0,0861**	**-0,0913**
NUM	*persons in the household*	**0,0073**		**-0,0210**	**0,0218**		
	children below 5 years old		0,0206	0,0389			**0,0207**
	children 6-15		0,0015				0,0015
	children 16-18		**-0,0513**				**-0,0513**
	persons 19-65			0,0456			
	elderly persons over 65		0,0067		-0,0156	0,0067	0,0067
	unemployed children				**-0,0245**	-0,0015	
	employed persons						-0,0095
	R²adjusted	0,997	0,997	0,997	0,997	0,997	0,997

Note: Bold letters denote significant variables.

TABLE 7: PARAMETER ESTIMATES: MODELS M1-M6 ESTIMATED FOR MEN

Variable		Estimates of model parameters					
		MM1	MM2	MM3	MM4	MM5	MM6
AGE	*age*	**0.0289**	**0.0299**	**0.0310**	**0.0292**	**0.0292**	**0.0297**
	age²	**-0.0004**	**-0.0004**	**-0.0004**	**-0.0004**	**-0.0004**	**-0.0004**
REL	*household head*	**0.0857**	**0.0873**	**0.0874**	**0.0865**	**0.0867**	**0.0852**
MAR	*married*	**0.1059**	**0.1015**	**0.1041**	**0.1039**	**0.1034**	**0.1006**
RES	*>10⁵ inhabitants*	**0.0754**	**0.0756**	**0.0745**	**0.0752**	**0.0753**	**0.0730**
	(50-100)·10³	0.0337	0.0334	0.0327	0.0343	0.0345	0.0325
	(10-50)·10³	-0.0205	-0.0199	-0.0208	-0.0200	-0.0199	-0.0219
	(5-10)·10³	**-0.0806**	**-0.0819**	**-0.0823**	**-0.0802**	**-0.0800**	**-0.0840**
	(2-5)·10³	-0.0561	-0.0543	-0.0534	-0.0543	-0.0541	-0.0559
EDU	*university (at least Ph.D.)*	**0.5761**	**0.5780**	**0.5775**	**0.5771**	**0.5773**	**0.5738**
	university	**0.2190**	**0.2174**	**0.2177**	**0.2189**	**0.2189**	**0.2145**
	post-secondary	0.0786	0.0783	0.0762	0.0795	0.0795	0.0767
	vocational or general sec.	0.0900	0.0891	0.0885	0.0900	0.0900	0.0881
	primary or lower vocational	**-0.1138**	**-0.1120**	**-0.1133**	**-0.1140**	**-0.1140**	**-0.1091**
SIZ	*<10 employees*	**-0.0969**	**-0.0971**	**-0.0969**	**-0.0970**	**-0.0970**	**-0.0994**
	11-19	**-0.0758**	**-0.0758**	**-0.0754**	**-0.0761**	**-0.0761**	**-0.0771**
	50-100	0.0226	0.0221	0.0226	0.0227	0.0227	0.0196
	101-250	**0.0622**	**0.0623**	**0.0624**	**0.0621**	**0.0622**	**0.0607**
	>250	**0.1180**	**0.1175**	**0.1180**	**0.1182**	**0.1183**	**0.1155**
OWN	*public*	0.0205	0.0214	0.0213	0.0206	0.0206	0.0212
WOR	*<20 hours per week*	**-0.7773**	**-0.7730**	**-0.7718**	**-0.7770**	**-0.7769**	**-0.7739**
	21-40	**-0.3622**	**-0.3601**	**-0.3605**	**-0.3623**	**-0.3623**	**-0.3616**
	>40	**0.1251**	**0.1260**	**0.1255**	**0.1251**	**0.1251**	**0.1250**
SEC	*agriculture*	**6.5787**	**6.5484**	**6.5278**	**6.5701**	**6.5682**	**6.5584**
	industry	**6.5994**	**6.5697**	**6.5499**	**6.5907**	**6.5887**	**6.5803**
	service	**6.5856**	**6.5365**	**6.5161**	**6.5568**	**6.5549**	**6.5477**
OCU	*managerial*	**0.3707**	**0.3696**	**0.3710**	**0.3703**	**0.3703**	**0.3703**
	professional	**0.2796**	**0.2786**	**0.2779**	**0.2789**	**0.2790**	**0.2800**
	technical	**0.1585**	**0.1582**	**0.1580**	**0.1584**	**0.1584**	**0.1586**
	clerical	-0.0433	-0.0457	-0.0450	-0.0442	-0.0444	-0.0452
	sales & services	**-0.0844**	**-0.0857**	**-0.0850**	**-0.0844**	**-0.0844**	**-0.0864**
	farmers, fishers, etc.	-0.0806	-0.0780	-0.0817	-0.0799	-0.0799	-0.0745
	skilled workers	**0.0391**	**0.0376**	**0.0377**	**0.0388**	**0.0388**	**0.0363**
	unskilled workers	**-0.1482**	**-0.1509**	**-0.1499**	**-0.1487**	**-0.1487**	**-0.1514**
NUM	*persons in the household*	-0.0043		-0.0133	-0.0005		
	children below 5 years old		0.0029	0.0163			0.0035
	children 6-15		-0.0076				-0.0073
	children 16-18		-0.0294				**-0.0289**
	persons 19-65			0.0140			
	elderly persons over 65		-0.0027		-0.0028	-0.0034	-0.0035
	unemployed children				-0.0067	-0.0072	
	employed persons						**-0.0567**
	R²adjusted	0.444	0.445	0. 445	0.444	0.444	0.446

Note: Bold letters denote significant variables.

TABLE 8: PARAMETER ESTIMATES: MODELS M1-M6 ESTIMATED FOR WOMEN

Variable		Estimates of model parameters					
		MW1	MW2	MW3	MW4	MW5	MW6
AGE	*age*	**0.1431**	**0.1464**	**0.1474**	**0.1439**	**0.1445**	**0.1463**
	age²	**-0.0016**	**-0.0017**	**-0.0017**	**-0.0016**	**-0.0017**	**-0.0017**
REL	*household head*	**0,0639**	**0,0587**	**0,0785**	**0,0661**	**0,0585**	**0,0590**
MAR	*married*	**-0,0527**	**-0,0451**	**-0,0460**	**-0,0600**	**-0,0443**	**-0,0444**
RES	*>10⁵ inhabitants*	**0,1247**	**0,1111**	**0,1218**	**0,1250**	**0,1150**	**0,1118**
	(50-100)·10³	0,0432	0,0285	0,0386	0,0464	0,0352	0,0293
	(10-50)·10³	**0,0553**	**0,0431**	**0,0522**	**0,0555**	**0,0478**	**0,0435**
	(5-10)·10³	-0,0572	-0,0648	-0,0609	-0,0555	-0,0608	-0,0652
	(2-5)·10³	**0,1049**	**0,0960**	**0,1006**	**0,1043**	**0,0999**	**0,0955**
EDU	*university (at least Ph.D.)*	**0,6896**	**0,6659**	**0,7146**	**0,6859**	**0,6791**	**0,6673**
	university	**0,4106**	**0,4001**	**0,3889**	**0,4084**	**0,4093**	**0,4011**
	post-secondary	**0,1523**	**0,1529**	**0,1375**	**0,1521**	**0,1549**	**0,1539**
	vocational or general sec.	**0,1866**	**0,1880**	**0,1767**	**0,1883**	**0,1883**	**0,1881**
	primary or lower vocational	-0,0222	-0,0114	**-0,0138**	-0,0212	-0,0199	-0,0117
SIZ	*<10 employees*	-0,0195	-0,0203	-0,0222	-0,0245	-0,0194	-0,0206
	11-19	0,0417	0,0405	0,0438	0,0404	0,0409	0,0406
	50-100	**0,0544**	**0,0507**	**0,0500**	**0,0515**	**0,0537**	**0,0505**
	101-250	**0,0502**	**0,0483**	**0,0493**	0,0479	**0,0496**	**0,0481**
	>250	**0,1137**	**0,1119**	**0,1149**	**0,1125**	**0,1146**	**0,1118**
OWN	*public*	-0,0186	-0,0147	-0,0153	-0,0178	-0,0182	-0,0151
WOR	*<20 hours per week*	-0,5186	-0,5177	-0,5073	-0,5182	-0,5171	-0,5175
	21-40	-0,1480	-0,1405	-0,1386	-0,1477	-0,1451	-0,1405
	>40	**0,0576**	0,0605	0,0630	**0,0594**	**0,0589**	0,0607
SEC	*agriculture*	**3,5747**	**3,5833**	**3,4582**	**3,5420**	**3,6094**	**3,5833**
	industry	**3,7250**	**3,7418**	**3,6173**	**3,6946**	**3,7619**	**3,7417**
	service	**3,6033**	**3,6171**	**3,4950**	**3,5733**	**3,6391**	**3,6174**
OCU	*managerial*	**0,6497**	**0,6488**	**0,6550**	**0,6458**	**0,6465**	**0,6487**
	professional	**0,5062**	**0,5015**	**0,5170**	**0,5072**	**0,5012**	**0,5013**
	technical	**0,3993**	**0,3932**	**0,4042**	**0,3959**	**0,3951**	**0,3932**
	clerical	**0,3358**	**0,3297**	**0,3357**	**0,3329**	**0,3329**	**0,3294**
	sales & services	**0,2881**	**0,2854**	**0,2890**	**0,2867**	**0,2866**	**0,2857**
	farmers, fishers, etc.	**0,6557**	**0,6890**	**0,6536**	**0,6532**	**0,6662**	**0,6901**
	skilled workers	**0,2270**	**0,2241**	**0,2274**	**0,2270**	**0,2260**	**0,2245**
	unskilled workers	**0,1197**	**0,1184**	**0,1111**	**0,1184**	**0,1234**	**0,1178**
NUM	*persons in the household*	**0,0137**		**-0,0223**	**0,0345**		
	children below 5 years old		0,0134	0,0337			0,0132
	children 6-15		0,0060				0,0058
	children 16-18		**-0,0720**				**-0,0717**
	persons 19-65			**0,0602**			
	elderly persons over 65		0,0263		-0,0071	-0,0266	0,0264
	unemployed children				**-0,0373**	-0,0012	
	employed persons						0,0204
	R²adjusted	0,997	0,997	0,997	0,997	0,997	0,997

Note: Bold letters denote significant variables.

There are some factors which influence incomes similarly in all models, regardless of the sample used for their estimation. Positive and significant impact is observed for: age, household head, vocational or general secondary and at least university education, working more than 40 hours a week, all variants of the economic sector, working as manager, professional, technical, sales & services, and skilled workers, employees in cities over 10 thousand inhabitants, being employed in the workplace with at least 101 employees. The parameter estimates for age squared and working less than 40 hours are significantly negative.

The first mentioned variable is a quantitative one, i.e. the increase of age causes an increase in wages while negative parameter for age squared means that wages are increasing till the certain age, then salaries are decreasing. Other mentioned variables are sets of dummies and a positive (or negative) signs for these parameters mean that the dependent variable increases (or decreases) for this feature in comparison to the reference variant of the variable.

There are also some cases when the same variable has the opposite impact on men and women.

- Married women earn less than unmarried ones while married men earn more than unmarried ones.
- Women working in sales and services and being unskilled workers earn more than female industry workers while for male employees the situation is the opposite.

There are also some situations when the distinguishing factor is significant for one gender and insignificant for the second one. For instance, women working as clerical, farmers, etc. obtain higher incomes than industry workers while for men these variants of variables are statistically insignificant. A similar situation is for respondents:

- living in towns with 2-5 and 10-50 thousand inhabitants,
- employees with 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 the ones living in the countryside while for women this variable is insignificant. A significantly negative impact is observed for male employees with primary or lower vocational education, working at a workplace with not more than 20 employees, and for the number of employed persons in the household. These variables do not influence women's wages.

6.2. Models estimated for female employees aged 25-54

In our research, we estimate models for female employees of different ages. However, from the aim of our investigation, the most interesting results are obtained when the sample of women is limited to the ones aged 25-54 years, containing 2716 respondents (i.e. 83% of all women). Therefore, only these models are presented (Table 9).

When the characteristics of employees and workplace are considered, the results obtained for the subsample of women in age 25-54 years old are similar to the one observed for all women. However, some relations concerning "family" variables are different. The parameters standing by the number of elderly persons (MWW2, MWW3-MWW6), unemployed children (MWW4 and MWW5) and children 16-18 years old (MWW2 and MWW6) are significantly negative. Whereas variables representing the number of persons aged 19-65 (MWW3), children 5 years old and less (MWW3) and the number of persons in the household have a significantly positive impact on monthly incomes.

7. Conclusion

Our research aims to find out if care providers obtain lower incomes than employees who do not have such duties. The major findings are presented in Table 10. The most important variables which identify caregivers are the number of unemployed children and the number of persons aged at least 66 years. The former variable appears only in the models M4 and M5 and has a negative impact on the dependent variable. However, it significantly decreases monthly incomes obtained by all respondents and female employees (in the model M4) and women aged 25-54 years (both models) only. The latter variable is present in the models M2, M4, M5 and M6 but it significantly influences incomes only in case of females 25-54 years old. It means that the caregiver penalty exists in Poland but mostly among female employees. Especially motherhood and eldercare penalty are detected. However, the latter touches only women in age 25-54 years.

TABLE 9: PARAMETER ESTIMATES OF MODELS ESTIMATED FOR WOMEN AGED 25-54 YEARS

Variable		Estimates of model parameters					
		MWW1	MWW2	MWW3	MWW4	MWW5	MWW6
AGE	*age*	**0,2251**	**0,2318**	**0,2396**	**0,2290**	**0,2293**	**0,2318**
	age²	**-0,0027**	**-0,0028**	**-0,0029**	**-0,0027**	**-0,0027**	**-0,0028**
REL	*household head*	**0,0488**	**0,0463**	**0,0683**	**0,0510**	**0,0424**	**0,0465**
MAR	*married*	-0,0249	-0,0242	-0,0156	-0,0402	-0,0247	-0,0237
RES	*>10⁵ inhabitants*	**0,1115**	**0,1008**	**0,1089**	**0,1090**	**0,0986**	**0,1016**
	(50-100)·10³	0,0290	0,0164	0,0232	0,0310	0,0193	0,0172
	(10-50)·10³	**0,0497**	**0,0372**	**0,0464**	**0,0462**	**0,0379**	**0,0376**
	(5-10)·10³	-0,0371	-0,0461	-0,0401	-0,0366	-0,0427	-0,0461
	(2-5)·10³	**0,0888**	**0,0813**	**0,0880**	**0,0889**	**0,0828**	**0,0807**
EDU	*university (at least Ph.D.)*	**0,3163**	**0,2927**	**0,3141**	**0,3086**	**0,3127**	**0,2937**
	university	**0,3893**	**0,3809**	**0,3534**	**0,3857**	**0,3866**	**0,3815**
	post-secondary	**0,1441**	**0,1432**	**0,1238**	**0,1411**	**0,1441**	**0,1440**
	vocational or general sec.	**0,1157**	**0,1170**	**0,1045**	**0,1171**	**0,1170**	**0,1173**
	primary or lower vocational	0,0272	0,0317	0,0347	0,0274	0,0276	0,0316
SIZ	*<10 employees*	-0,0320	-0,0350	-0,0425	-0,0398	-0,0347	-0,0350
	11-19	0,0136	0,0143	0,0127	0,0137	0,0144	0,0144
	50-100	0,0340	0,0314	0,0276	0,0333	0,0338	0,0311
	101-250	0,0373	0,0356	0,0366	0,0358	0,0367	0,0354
	>250	**0,0987**	**0,0945**	**0,0982**	**0,0963**	**0,0978**	**0,0946**
OWN	*public*	-0,0188	-0,0159	-0,0134	-0,0188	-0,0184	-0,0160
WOR	*<20 hours per week*	**-0,4311**	**-0,4358**	**-0,4236**	**-0,4326**	**-0,4315**	**-0,4356**
	21-40	**-0,1713**	**-0,1655**	**-0,1622**	**-0,1699**	**-0,1686**	**-0,1654**
	>40	**0,0553**	**0,0592**	**0,0624**	**0,0578**	**0,0572**	**0,0593**
SEC	*agriculture*	**2,2099**	**2,1095**	**1,9218**	**2,1015**	**2,1746**	**2,1101**
	industry	**2,2730**	**2,1766**	**1,9897**	**2,1644**	**2,2401**	**2,1772**
	service	**2,1840**	**2,0859**	**1,9061**	**2,0764**	**2,1502**	**2,0868**
OCU	*managerial*	**0,5601**	**0,5569**	**0,5563**	**0,5542**	**0,5541**	**0,5567**
	professional	**0,4427**	**0,4404**	**0,4506**	**0,4457**	**0,4392**	**0,4402**
	technical	**0,3629**	**0,3588**	**0,3608**	**0,3619**	**0,3597**	**0,3588**
	clerical	**0,3004**	**0,2946**	**0,2903**	**0,2980**	**0,2977**	**0,2943**
	sales & services	**0,2041**	**0,1993**	**0,1968**	**0,2013**	**0,2015**	**0,1993**
	farmers, fishers, etc.	**0,5744**	**0,6021**	**0,5609**	**0,5670**	**0,5798**	**0,6030**
	skilled workers	**0,1579**	**0,1578**	**0,1592**	**0,1587**	**0,1566**	**0,1581**
	unskilled workers	0,0479	0,0405	0,0308	0,0426	0,0468	0,0398
NUM	*persons in the household*	-0,0002		-0,0516	0,0347		
	children below 5 years old		0,0082	0,0510			0,0079
	children 6-15		-0,0001				-0,0003
	children 16-18		-0,0892				-0,0890
	persons 19-65			0,0865			
	elderly persons over 65		-0,0298		-0,0657	-0,0298	-0,0296
	unemployed children				-0,0544	-0,0180	
	employed persons						0,0177
	R²adjusted	0,979	0,979	0,979	0,979	0,979	0,979

Note: Bold letters denote significant variables.

Number of	MT1	MM1	MW1	MWW1
persons in the household	**0,0073**	-0,0043	**0,0137**	-0,0002
	MT2	**MM2**	**MW2**	**MWW2**
children below 5 years old	0,0206	0,0029	0,0134	0,0082
children 6-15 years old	0,0015	-0,0076	0,0060	-0,0001
children 16-18 years old	**-0,0513**	**-0,0294**	**-0,0720**	**-0,0892**
elderly persons over 65 years old	0,0067	-0,0027	0,0263	**-0,0298**
	MT3	**MM3**	**MW3**	**MWW3**
persons in the household	**-0,0210**	**-0,0133**	**-0,0223**	**-0,0516**
children below 5 years old	**0,0389**	0,0163	0,0337	**0,0510**
persons 19-65 years old	**0,0456**	0,0140	**0,0602**	**0,0865**
	MT4	**MM4**	**MW4**	**MWW4**
persons in the household	**0,0218**	-0,0005	**0,0345**	**0,0347**
elderly persons over 65 years old	-0,0156	-0,0028	-0,0071	**-0,0657**
unemployed children	**-0,0245**	-0,0067	**-0,0373**	**-0,0544**
	MT5	**MM5**	**MW5**	**MWW5**
elderly persons over 65 years old	0,0067	-0,0034	0,0266	**-0,0298**
unemployed children	-0,0015	-0,0072	-0,0012	**-0,0180**
	MT6	**MM6**	**MW6**	**MWW6**
children below 5 years old	**0,0207**	0,0035	0,0132	0,0079
children 6-15 years old	0,0015	-0,0073	0,0058	-0,0003
children 16-18 years old	**-0,0513**	**-0,0289**	**-0,0717**	**-0,0890**
elderly persons over 65 years old	0,0067	-0,0035	0,0264	**-0,0296**
employed persons	-0,0095	**-0,0567**	0,0204	0,0177

Note: Bold letters denote significant variables.

One may also conclude that the parenthood penalty concerning children 16-18 years old is also observed since the estimated parameters for this variable is significantly negative in all models where this variable is employed (i.e. models M2 and M6). Although it is hard to find out why monthly incomes decrease with the increase in the number of children 16-18 years old. Unexpecting results are also obtained in case of children aged 5 and below, which number has a significant and positive impact on monthly incomes (in models MT3, MT6 and MWW3). Such situation may be caused by the fact that in Poland pre-school institutional care is not free of charge and parental leaves for children aged six years and less may last for 36 months thus one of parent may give up job for that time.

The number of employed persons in the household (in models MT3, MM3, and MWW3) and the number of family members (- MT1, MT4, MW1, MW4, MWW4) significantly influence the increase of incomes obtained by respondents. That gives us an obvious conclusion that bigger families require more money to afford the costs of living. However, in the models M3 this relation is the opposite (MT3, MM3, MW3, MWW3) and that might be in contradiction with the variable describing the number of persons aged 19-65, which has a positive and significant impact in all models with the exception of the one estimated for men (MM3). Also, the number of employed persons in the household has a significant and negative impact in model estimated for male employees (MM6) which might suggest that male employees do not need to increase their incomes when there are more employed persons in the household.

According to the model estimates it is also proved that:
- male employees earn more than female ones (see models MT1-MT6),
- households' heads have higher incomes than other members of families regardless gender since the parameter estimates for this variable is significantly positive in all models,
- married men earn more than unmarried ones whereas married women earn less than unmarried female employees.

The obtained results can be used not only in the theoretical but also in the practical aspects and may support the monitoring and evaluation of the actions, which have been taken to improve the status of women in the labour market. They might be also helpful in the formulation of new strategies to ensure a balance in the labour market.

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