INCOME FROM WOMEN'S GAINFUL EMPLOYMENT COMPARED TO HOUSEHOLD INCOME

Paweł Ulman, Assoc. Prof.

Cracow University of Economics
Department of Statistics
Rakowicka 27, 31-510 Kraków, Poland
e-mail: ulmanp@uek.krakow.pl

Abstract

Various statistical analyses reveal that the position of women in the labour market is worse when compared to men. In the majority, or nearly in all countries of the EU, women obtain lower income than men and are in a greater risk of becoming unemployed. The problem of such differentiation in the labour market is still valid despite the various activities at the EU agenda aimed at reducing these disparities. The aim of this paper was to present the income situation of women who remain in a formal or informal relationship with men and to identify the factors which affect such a situation without making any reference to the problem of discrimination. The author used the data from Polish household budget survey of 2011.

Introduction

From the statistical point of view, the position of women in the labour market in Poland and in other countries of the European Union is worse than men. Basic statistical data reveal that, in comparison to men, women receive lower average salaries, unemployment is higher among them and the percentage of women with the highest positions in the occupational hierarchy is lower. This general regularity of the inferior position of women in the labour market has prompted researchers and certain social groups to search for and explain the causes of the aforementioned disparity. Thus, within the last several dozen years, numerous theories were put forward that picture the position of women in the labour market. The assumptions and manner of depicting the examined facts in these theories stem from their authors' paradigms and sometimes also result from their personal beliefs. The position of women in the labour market may be investigated from sociological, economic and feminist viewpoints[1].

In sociological theories, such as theories of social stratification by Talcott Parsons and class structure theory by Gerhard Lenski, the fundamental issue is the phenomenon of inequality which is not considered solely on the basis of discrimination between given social groups. Discrimination of women may be one of the factors of inequality between men and women in the labour market, but certainly, it is not the only one. The problem of inequality in the labour market is also the basis of economic theories, such as: human capital theory, taste-for-discrimination theory by Gary Becker, information cost theory (statistical discrimination) by Kenneth Arrow, monopsony discrimination theory (market power of the employer), theory of supply excess and position segregation and dual labour market[2]. The above-listed theories include ones that directly refer to discriminating behaviours[3] (G. Becker's theory) and ones that explain salary diversification between women and men based on economic analysis (e.g. market power of the employer) without referring to behaviours motivated by the inclination to treat women as inferior due to their gender. Finally, feminist theories include universal and detailed ones[4]. The former attempt to explain the universality of the domination of men in social life. The latter, on the other hand, in a more detailed manner present causes and effects of unequal treatment of women, e.g. in professional life. Both types of theories assume that women are discriminated in the labour market. It is worth emphasising that none of the above-mentioned theories provides a complete explanation of the diversification of the men's and women's position in the labour market. This problem is so complex that its complete explanation could be provided following the analysis of biological, cultural, economic, legal, political, historical and religious factors.

The statistical data mentioned at the beginning concerning average salaries in Poland indicate that in 2010 an average salary of a full-time male employee equalled PLN 3,831.73 whereas in the case of women, it equalled PLN 3,256.06, which constitutes 85% of men's remuneration[5]. When considering the fact that female employees are better educated[6], these data would suggest that in Poland, the problem of discrimination exists. However, the solution to this problem is not as easy as one might think particularly, when larger social or occupational groups are compared whose labour market positions are determined by numerous factors, other than education. Based on the aforementioned data, it might be reliably[7] stated that there is a certain gender-based diversification of salaries to the benefit of men. Is this diversification a result of discrimination of women? Or to what degree is it a result of such a discrimination? These questions cannot be answered in a simple way without carrying out detailed, interdisciplinary (multifaceted) analyses.

The aim of this paper was to present the income situation of women who remain in a formal or informal relationship with men and to identify the factors which affect such a situation without making any reference to the problem of discrimination. The statistical data acquired in a standard way and related to income do not allow for explaining the problem of discrimination even to a slight degree. Nevertheless, they help to present the influence of women's gainful employment on their household income.

1. Statistical data

The statistical information is derived from the household budget survey of 2011 which is conducted annually by the Central Statistical Office of Poland (Polish: Główny Urząd Statystyczny, GUS). The entire set of individual observations of households constitutes 37,375 records. Out of them, the cases in which a woman remains in a relationship with a man were selected. A situation could occur that one household consists of two married couples. Such cases were treated as two separate observations. Finally, 27,738 observations of male-female relationships were selected. The thematic scope of household budget analysis makes it possible to assign each person their individual features and their family characteristics (household characteristics). Due to the fact that the aim of the analysis is income obtained from gainful employment, in the majority of conducted analyses, the data set was limited to the cases in which a woman was in the working age (below the age of 60). The number of such a data set equalled 21,955 observations.

The subject of the study is the individual income of women and men who remain in a relationship. When analysing household budgets, financial income from one month is assigned to individual persons. Thus, the level and structure of individual income sources may be identified. The income of single persons acquired from numerous sources forms their individual income. We were particularly interested in the income obtained from hired work and from self-employment. The former covers all the incomes gained from hired employment, including: remuneration for work; sick leave payments (received at the time of employment contract duration), compensatory and nursing benefits; non-cash incomes (granted by the employer); receipts from a company social benefit fund; compensation paid to retired or dismissed persons. The latter includes the part of income from business activity (excluding a private farm in agriculture) and free profession which was allocated to purchasing consumer goods and services and to housing investments and savings to satisfy household's needs[8].

2. Income from men's and women's gainful employment

In the introduction to this paper, the author quotes data related to average remuneration of men and women which reveal that women receive lower average salaries than men. In the methodology of remuneration researches, particular attention is paid to the comparability of the acquired pay among employees, i.e. independent of their working hours and of the number of days spent at work. Therefore, such an analysis includes full-time employees who worked for a complete month with no intervals. In the case of this study, such standardization of subject employees was neither feasible nor purposeful. In order to capture an actual contribution of a given person to shaping household budget, it is worth investigating the financial situation of men and women that is determined by various factors such as part-time employment or having more than one full-time job.

Table 1 presents the average income of men and women obtained from given sources, the share of given income sources in the separate men's and women's income as well as the share of given sources in the total income. Table 2, on the other hand, in analogical arrangement, presents data concerning the average income of men and women, the share of this income in the total household income and the contribution of persons obtaining a given type of income assuming that the studied population of married couples is limited to those cases in which women are in the working age.

In both cases, the total average income and income obtained from dependent employment and self-employment of women occurred to be lower than the analogical income of men.

Table 1. Income of women and men, income structure and contribution to the total income
– results for all analyzed units

Incom from:	Average income		Share in the group income in %		Share in the total income in %	
	W	M	W	M	W	M
Hired work:	781.73	1,312.20	56.92	57.57	21.40	35.92
of which	769.35	1,233.39	56.02	54.11	21.06	33.77
Self-employment	91.01	293.24	6.63	12.87	2.49	8.03
Private farm in agriculture	125.07	173.66	9.11	7.62	3.42	4.75
Property	0.59	1.22	0.04	0.05	0.02	0.03
Rental of a property and land	6.07	6.96	0.44	0.31	0.17	0.19
Social security benefits	281.49	445.75	20.50	19.56	7.71	12.20
Other social benefits	58.92	24.28	4.29	1.07	1.61	0.66
Other sources	28.41	22.04	2.07	0.97	0.78	0.60
Indyvidual income	1,373.30	2,279.34	100.00	100.00	37.60	62.40

W – women; M – Men.

Source: own calculations on the base of the individual data from polish HBS 2011.

Table 2. Income of women and men, income structure and contribution to the total income
– results for couples, in which wife is in the working age

Incom from:	Average income		Share in the group income in %		Share in the total income in %	
	W	M	W	M	W	M
Hired work:	942.95	1,568.05	24.70	41.07	50.70	64.01
of which	928.38	1,473.29	24.32	38.59	49.33	60.41
Self-employment	107.41	347.23	2.81	9.09	4.77	11.38
Private farm in agriculture	150.33	208.56	3.94	5.46	6.00	6.79
Property	0.67	0.82	0.02	0.02	0.05	0.08
Rental of a property and land	6.33	7.47	0.17	0.20	0.44	0.51
Social security benefits	104.49	217.45	2.74	5.70	10.42	14.52
Other social benefits	71.12	27.29	1.86	0.71	15.52	3.41
Other sources	32.93	24.94	0.86	0.65	5.63	5.04
Indyvidual income	1,416.24	2,401.80	37.09	62.91	80.78	94.19

W – women; M – Men.

Source: own calculations on the base of the individual data from polish HBS 2011.

The average income of women is higher only in the case of the remaining benefits and other income sources. The structure of income acquired from various sources for both men and women is similar. Only does the share of income from men's self-employment exceed the respective share of women by over 6 pp. Men contribute over 62% of the total income to the household budget irrespective of whether the entire population of married couples is

investigated or whether the population is limited with respect to the working age of women. In the latter case, the share of women's gainful employment income does not exceed 28% of the total income of the married couple and in the case of men, it constitutes over 50%. Men, much more often than women, gain income from dependent employment as well as from self-employment and women are in the majority with respect to other benefits. Overall, more than 94% of men obtain any income and in the case of women, the percentage is nearly 81.

The comparative analysis of the distribution of income obtained by men and women from their gainful employment and income of the married couple may result in interesting conclusions. For this purpose, the Singh-Maddala distribution (Burr 12)[9] is applied with the distribution function $F(y) = 1/[1 + e^{-a} y^{-b}]^c$ whose parameters are estimated with the use of maximum likelihood method (MLE). The parameterisation of theoretical distributions allows to widen the possibilities of its application. One or more parameters may be made functions of characteristics of analysed statistical units. This allows capturing the impact of these characteristics on the entire distribution and not on just one of its characteristics. In this study, when the marriage income distribution was created, the parameters b and c were made variable by using a dummy variable identifying the fact of obtaining gainful employment income by women. In this case, the outcomes of the estimation of the Burr 12 distribution parameters are presented in Table 3[10].

Table 3. Estimation results of the parameterised Burr 12 distribution of income drawn from labour

Parameter	Estimate	Standard Error	t-value	p-value
a	−26.5117	0.1922	−137.9	<0.0001
b_0	3.4749	0.0283	122.9	<0.0001
b_1	−0.2954	0.0065	−45.4	<0.0001
c_0	0.7030	0.0152	46.3	<0.0001
c_1	0.4972	0.0283	17.6	<0.0001

Source: own calculations on the base of the individual data from polish HBS 2011.

Based on the outcomes of the estimation of theoretical distribution parameters and by using appropriate formulas for its characteristics, their values were determined for the total population of women, women in the working age, men in the working age and married couples. In the case of married couples, the variation mentioned above enabled to determine the influence of women's gainful employment on the income of the married couple. This is presented in Table 4 and in Figures 1 and 2.

Table 4. Descriptive statistics of distributions of: income from work
as well total income of women and men

Statistic	Income from work:			Couple income	
	women, generally	women in the working age	men in the working age	generally	without women income from work
Average	1,901.65	1,907.55	2,550.23	4,406.02	3,055.78
Median	1,628.47	1,633.99	2,145.95	3,869.71	2,389.59
Mode	1,341.55	1,351.86	1,751.48	3,258.62	1,871.50
Coef. of variation	0.6867	0.6856	0.7484	0.6101	1.1433
RAD	0.2150	0.2129	0.2210	0.2031	0.2516
Gini	0.3058	0.3029	0.3141	0.2891	0.3551
Skewness	0.4289	0.4249	0.4185	0.4268	0.3390
Sen	1,320.15	1,329.78	1,749.08	3,132.04	1,970.59

RAD – relative average deviation; Gini – Gini coefficient, Sen – Sen indeks.

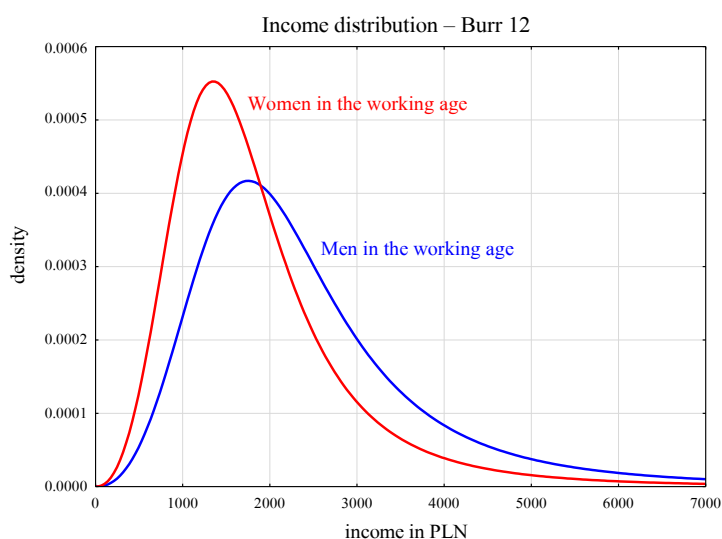Source: own calculations on the base of the individual data from polish HBS 2011.

Fig. 1. The Singh-Maddala distribution of income from work for women and men in the working age

Source: own calculations on the base of the individual data from polish HBS 2011.

Attention should be paid to the fact that the fundamental difference in the income distribution of men and women lies in the higher average income obtained by men. However, the income variation level of both women and men is similar. As can be concluded from the above, a higher value of Sen index (abbreviated welfare measure) for men is primarily determined by a higher

level of their income. If, for any reasons, a wife does not engage in gainful employment, the average level of marriage income dwindles considerably and, at the same time, its diversification and asymmetry increase. It may be concluded that the individual income of women obtained from gainful employment improves the financial situation of married couples in a significant way and leads to a more equal distribution of the common income. The outcomes obtained so far indicate inferior financial situation of women in comparison to men. This prompts the search for the causes of such a situation. Unfortunately, the data from household budgets do not enable a complete identification of factors which determine the difference between men's and women's income[11]. These factors frequently fall outside the paradigm of economic sciences. Table 5 presents a comparison of the position of men and women in the working age in the labour market. The fundamental difference lies in a greater share of workers among men than among women and relatively high share of non-working women who manage their households (nearly 19%). Since these women are not looking for a job (they are not unemployed), the subsequent step of the analysis may be raising a question whether one of the reasons for the lack of their professional activity and decision to take care of the household is high income of their husbands. Table 6 presents the average income of women, their husbands, married couple and the entire household including the type of activity of women in the working age.
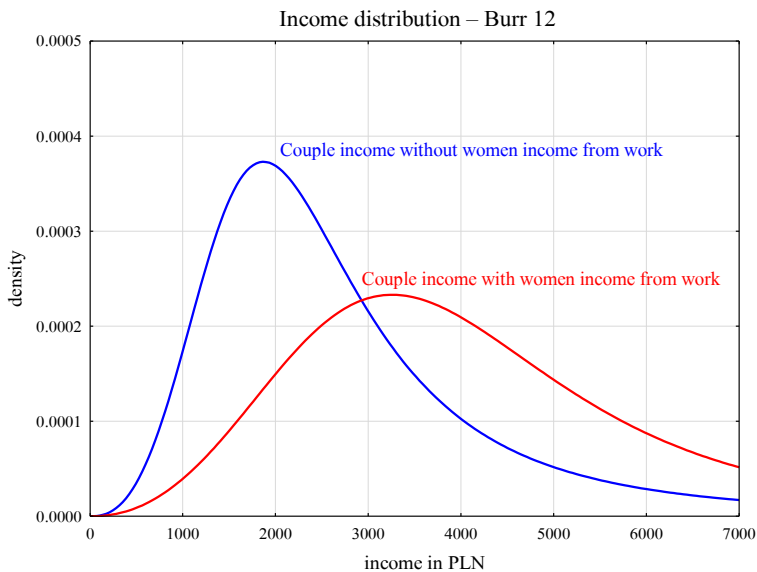

Fig. 2. The Singh-Maddala distribution of income in the case of the coupe with income from work and without women income from work

Source: own calculations on the base of the individual data from polish HBS 2011.

Table 5. The structure of the economic activity in the case of respondent
in the working age (%)

Were you in the last month	Women	Men
Working person	62.34	85.31
Working person, but temporarily absent from the work	1.83	0.57
Unemployed	6.29	4.81
Pensioner or old age pensioner	7.96	7.49
Student	0.67	0.22
Housekeeper	18.91	0.18
Unfit to do work	0.71	0.68
Other	1.29	0.75
Total	100.00	100.00

Source: own calculations on the base of the individual data from polish HBS 2011.

These results do not negate the hypothesis that high income of the husband is a reason (surely, not the only one) for the wife's decision to remain at home and manage the household. In this situation, the average income of men is one of the highest and is higher than the income of men whose wives work professionally and, above all, it is higher than the income of husbands of unemployed wives. These results may indicate that some unemployed women would resign from seeking for a job if their husbands earned a sufficient amount of money. It is worth noticing that a relatively high level of the income obtained by the husband of a woman who manages the household does not ensure equally high income of the household or income per person in the household. In other words, professional absence of women worsens the financial situation of the household, which has already been demonstrated. The conclusions mentioned above are also confirmed in the outcomes of the logit model estimation for a variable identifying a situation in

Table 6. Average income of women, men and household on account
of the economic activity type of women in the working age

Were you int the last month	Women income	Men (husbands) income	Household income	Income per capita in household
Working person	1,976.17	2,470.15	4,897.19	1,423.70
Working person, but temporarily absent from the work	1,722.99	2,820.78	5,345.93	1,461.88
Unemployed	283.32	1,988.72	3,055.72	830.15
Pensioner or old age pensioner	996.26	1,813.95	3,730.92	1,243.97
Student	711.20	2,074.71	3,763.30	1,342.05
Housekeeper	214.22	2,584.08	3,600.35	905.94
Unfit to do work	612.77	1,507.76	2,760.94	812.24
Other	461.93	2,132.01	3,100.20	903.63
Total	1,416.24	2,401.80	4,405.62	1,263.28

Source: own calculations on the base of the individual data from polish HBS 2011.

which the wife does not work (manages household) with reference to the couples in which the wife maintains gainful employment. The results are presented in Tables 7 and 8.

Table 7. The results of the estimation of the non-working women logit models
in relation to the different variables connected with the economic situation of household

Variable	Estimate	Standard error	t-value	p-value
Constant	−1.207500	0.024100	−50.05	<0.0001
Husband income	0.000008	0.000007	1.26	0.2071
Constant	−2.718600	0.072400	−37.57	<0.0001
Economic situation	−0.522400	0.023400	−22.30	<0.0001
Constatnt	−3.032600	0.084900	−35.71	<0.0001
Income situation	−0.574500	0.025300	−22.69	<0.0001

Source: own calculations on the base of the individual data from polish HBS 2011.

Table 8. The results of the estimation of the non-working women logit model

Variable	Estimate	Standard error	t-value	p-value
Constatnt	1.1122	0.1259	8.83	<0.0001
Secondary education	−0.4375	0.0412	−10.62	<0.0001
Tertiary education	−1.4355	0.0613	−23.41	<0.0001
Age	−0.0337	0.0019	−17.69	<0.0001
Little and medium Town	0.2452	0.0413	5.94	<0.0001
Big Town	−0.0707	0.0573	−1.23	0.2176
Rather bad economic situation	−0.2254	0.0980	−2.30	0.0214
Medium economic situation	−0.7912	0.0877	−9.02	<0.0001
Good and very good economic situation	−0.9893	0.0946	−10.46	<0.0001
Number of children	0.1200	0.0161	7.45	<0.0001
Chi.kw. (9) = 1,543.6; p < 0.0000; n = 18,393				

Source: own calculations on the base of the individual data from polish HBS 2011.

When as an exogenous variable we assume income of the husband, it occurs that the evaluation of the parameter is not statistically significant, which is confirmed in Table 6 (the average income of husbands of working women and of women managing the household is similar). When, however, we introduce variables identifying the financial situation (economic situation or income situation[12]), the conclusion is that the better the situation, the lower the probability that the wife manages the household. This conclusion is also confirmed in two last columns of Table 6. Table 7 presents the outcomes of the logit model estimation with the application of additional exogenous variables i.e. education of the wife, type of place of

residence, financial situation of the household (dummy variable sets with the following points of reference: primary education, place of residence: countryside; bad financial situation), age of the wife in years and the number of children. The improvement of financial situation is related to professional activity of women – the better the situation, the lower the probability that a woman manages the household[13]. The probability that a woman will remain at home in order to manage it decreases with older age, higher level of education and improvement of financial situation. Having greater number of children, on the other hand, is conductive to the increase of this probability.

Table 9. The results of the estimation of the Heckman selection model
for ln women income from work

Variable	Estimate	Standard error	t-value	p-value
Equation fot ln ln women income from work				
Constatnt	5.58820	0.0810000	68.95	<0.0001
Seconadary education	0.22890	0.0107000	21.32	<0.0001
Tertiary education	0.60630	0.0118000	51.41	<0.0001
Age	0.08190	0.0040000	20.48	<0.0001
Squared age	−0.00086	0.0000048	−17.78	<0.0001
Little and medium Town	0.02200	0.0098000	2.25	0.0247
Big Town	0.18320	0.0116000	15.78	<0.0001
Disabled	−0.23120	0.0278000	−8.31	<0.0001
Lambda	−0.53930	0.0085000	−63.36	<0.0001
Selection sample equation (n = 21,955; censored observations 10,239 (46.6%))				
Constat	−0.01480	0.0518000	−0.2852	0.7755
Rather bad economic sit.	0.15610	0.0414000	3.77	0.0002
Medium economic sit.	0.55840	0.0369000	15.11	<0.0001
Good and very good economic sit.	1.00260	0.0388000	25.84	<0.0001
Number of children	−0.07080	0.0067000	−10.50	<0.0001
Age	−0.01010	0.0008000	−12.33	<0.0001
Disability of husband	−0.03460	0.0250000	−1.38	0.1666
Sigma = 0.632976; rho1 = −0.852				

Source: own calculations on the base of the individual data from polish HBS 2011.

The last table presents the results of the estimation of Heckman's sample-selection model for a natural logarithm of women's income. This model includes two equations: selection and outcome equations. The researchers are more interested in the outcome equation. The selection equation, however, determines a sample bias resulting from the fact that in the case of certain units, the value of the analysed dependent variable is not observed[14]. In this study, we model income of women gained from their employment taking into account the fact that not all women undertake such employment (not all women have income from gainful employment).

In the outcome equation, the following factors influencing women's income were taken into consideration: education, age in years, type of place of residence and disability. The level of education and place of residence were identified by means of a set of dummy variables, disability was identified as a dummy variable and age was introduced to the model (with the use of variables: age in years and squared age in years) so that its non-linear influence on women's income is reflected.

Based on the foregoing results, it may be concluded that there is a high correlation between the random components of both equations (rho1 = –0.852), which justifies the usage of the sample-selection model in the women's income analysis[15].

Higher levels of education increase the level of income obtained from gainful employment by nearly 26%[16] in the case of secondary education and by over 83% in the case of higher education as compared to primary education, *ceteris paribus*. Residing in a large city is also related to a higher income of women by average 20% in comparison to women residing in the countryside and disability results in the decrease of income from gainful employment by nearly 21%. The parameter next to *squared age* variable occurred to be statistically significant, which constitutes a confirmation for the non-linear correlation between income and age. The age at which women obtain the highest income from their gainful employment (according to the estimated model) equals approximately 47.6 years. It should be emphasised that in the sample-selection equation a variable of the husband's disability was also taken into consideration. It did not have significant influence on the sample selection. In other words, whether a woman obtains or does not obtain income from dependent employment is not determined by her husband's disability in a significant way.

Conclusions

Summing up the deliberations on income drawn from gainful employment of women and men who remain in a relationship, it may undoubtedly be stated that, on average, women obtain lower income than men. The analogical relation occurs in the case of the total income. This results in a lower contribution of women's income to the household budget, which is also a partial effect of the lower, when compared to men, share of women (also in the case of women in the working age) who obtain both gainful employment income and total income. For the majority of households, the income from women's (wives') gainful employment is of considerable importance for the situation of the household. Within the examined population, the income of women considerably influences the level of the average household income as

well as the level of inequality in the distribution of this income. However, numerous women in the working age do not undertake employment and do not seek for a job – they manage the household. When searching for the causes (or conditions) of such lack of professional activity of women, one may indicate a relatively high income of the husband, which, however, does not guarantee a high level of financial situation. Nevertheless, when compared to women who declare their unemployment, both the income of the husband and household income (in total and calculated for a single person) are higher in the households where women choose to stay at home. Therefore, it might be assumed that a part of unemployed women would not search for a job if their husbands earned a sufficient amount of money. Unfortunately, the examined statistical data do not allow for a more in-depth analysis of this problem, particularly in terms of the reasons for which women resign from professional work. The factors which proved to positively influence both undertaking work and the height of income are as follows: higher level of education, age and residing in larger cities. It should be emphasised that greater number of children in the household in a significant way raises the probability that a woman will stay at home and manage the household.

Another significant problem is the incorporation of unpaid work for the benefit of the household in the analyses of income or financial situation of households. Undoubtedly, this factor also has a considerable influence on the welfare of the family. Women who decide to manage the household perform a range of works which must be bought by women who work professionally. Consideration of this type of work would certainly provide a more reliable picture of men's and women's contribution to the welfare of the household. Such analyses, however, would require multifaceted individual data concerning income, expenditure, economic activity, household works and time devoted to them as well as data on the motivations to make decisions that have economic effects on the household.

Notes

[1] Cf. Mazur-Łuczak (2010), p. 13.

[2] For more details see: Kot, Podolec, Ulman (1999), pp. 227–235 and Brue, McConnell (1992), pp. 352–366.

[3] Here, discrimination is understood as treating a group of people as inferior in comparison to a different, equivalent group of people. In the labour market, women discrimination means inferior treatment in relation to men when men's and women's efficacy is identical. It must be emphasised, however, that there is no theory that would unambiguously specify which behaviours, attitudes or circumstances lead to discrimination, i.e. inferior treatment of a given social group.

[4] Cf. Mazur-Łuczak (2010), p. 27.

[5] Cf. GUS (2012b), p. 25.

⁶ Cf. ibidem, p. 59.

⁷ The level of reliability depends on the reliability of the conducted statistical research.

⁸ Cf. GUS (2012a), pp. 17, 31.

⁹ For more information concerning the usefulness of Burr distributions in describing empirical distributions of pays and income, see: McDonald (1984); Bandourian (2000); Bandourian, McDonald, Turley (2003); McDonalda, Xu (1995); Ulman (2013); Jędrzejczak (2011).

¹⁰ In this paper, the remaining results of the estimation of the Burr 12 distribution parameters were not presented. All estimations occurred to be statistically significant where the significance level equaled 0.01.

¹¹ A lot of hypotheses can be formulated in the case of research on the causes of wage disparities between men and women. A most of them fall within the scope of the research of sciences such as sociology and psychology. The verification of these hypotheses requires specific surveys.

¹² Economic situation is represented by variable *Economic situation of household* with five categories. The five categories variable *Way of manage the household finance* reflects the income situation.

¹³ The problem whether (or to what degree) financial situation affects the decision to remain at home and manage the household or whether the decision to remain at home determines financial situation, remains unsolved.

¹⁴ Cf. Owczarczuk (2012), pp. 238–241.

¹⁵ Cf. ibidem, p. 240.

¹⁶ Exp(0.2289) – 1 = 0.2572.

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