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Unemployment and Time Spent in Household Production¹

Introduction

One of the shortcomings of the traditional neoclassical model of consumer choice is that it describes the behaviour of individuals only in the context of monetary prices and monetary incomes. Thus, the proposed predictions are limited to processes and events that take place under market conditions. As a result, a significant part of people's activity, which involves the management of scarce resources but is not subject to monetary exchange, remains beyond the scope of interest of economists (Michael and Becker 1973). Goldschmidt-Clermont (2000) seeks the sources for the perspective adopted by classical economics in the processes that occurred during the industrial revolution of the nineteenth century. The introduction of new technologies which increased productivity and enabled mass production could have created the impression that home production was going to diminish to the extent that it would become insignificant with regard to economic processes and economic analysis. However, that did not happen.

Moreover, the use of one general category of 'leisure' means that in the predictions of the traditional model it is irrelevant whether leisure time includes production, e.g. in the form of dinner preparation, or consists of passive television watching (Aguiar and Hurst 2006). Such a distinction becomes important from an economic point of view when we realize that the final result of the former activity has a market substitute. This, in turn, shows that in the process of con-

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sumption and increasing utility an individual decides about the allocation of not only his/her income, but also his/her time.

Including the non-market activity of individuals in the analysis of decisions is not only connected with the conviction that this helps to better interpret decisions taken in the market. An equally important fact is that, just as in the case of market goods and services, the consumption of the results of household production increases the utility of individuals, thus contributing to the quality of life of household members. Thus, just as in the case of the traditional neoclassical theory, and also in relation to the standard measures of economic activity and welfare such as *GDP per capita*, there can be justifiable doubt as to whether they reflect the welfare of individuals in an adequate manner (Kuznets 1934; Juster 1970; Eisner 1988; Lützel 1989). Human activity which aims to improve the quality of life and increase prosperity still remains largely outside the market sphere. Thus opinions are rightly voiced that the predictions of models that do not take into account non-market activity are to a large extent inadequate. Consequently, any conclusions drawn on their basis should not be the only guidelines for policies aimed at solving the problems of households (Mattila-Wiro 1999).

It is also easy to reach the conclusion that the assessment of the impact of changes in the level of unemployment on the welfare of individuals should also be adjusted according to the estimates of household production. Research into time allocation in the various phases of the business cycle conducted in the US shows that during periods of recession and rising unemployment 30–40% of the time that is ‘taken out’ of the labour market, on average, is devoted to additional household production (Aguilar, Hurst and Karabarbounis 2011).

The aim of this study is to examine what part of an agent’s time released from market work may be used for production realised in the non-market sphere, depending on the socio-economic characteristics of households. Adopting the perspective of economic analysis and the management of the limited resources of families, we refer to the material side of the ambiguous concept of well-being and the role that consumption plays in this context.

At the same time, we also draw attention to the importance of the non-market activity of women in creating well-being. When specifying the aim of this study a working hypothesis was adopted, according to which the level of compensation for market work by household production depends primarily on gender, and only to a lesser extent on the socio-economic characteristics of a household (cf. Jan-kiewicz 2018).

The article presents calculations made with the use of statistical material pertaining to time use among the Polish population. Considering the fact that the frequency of time use surveys in Poland is much lower than in the USA, it is necessary to adopt such methodology which makes it possible to look at how unemployment may affect the structure of the total working time of individuals using cross-sectional data (Burda and Hamermesh 2009a, 2009b). The method of estimating the compensation for market work by household production has become the first step to further estimation by means of multiple regression models.

1. Objective well-being

The introduction of the concept of utility into economic analysis can be attributed to the influence of J. Bentham's idea. The idea was invoked by the creators of the theory of consumption, including W. S. Jevons (1965). Bentham equated the concept of utility with the happiness of an individual (Hirschauer, Lehberger and Musshoff 2015). Utility was thus understood as “property in any object, whereby it tends to produce benefit, advantage, pleasure, good, or happiness, (...) or (...) to prevent the happening of mischief, pain, evil, or unhappiness to the party whose interest is considered (...)” (Bentham 2000, p. 14–15).

Nowadays, some authors treat such concepts as well-being, utility, happiness, life satisfaction, and welfare as synonymous (Easterlin 2003; Allin 2007). However, in a number of scientific studies these are treated as separate concepts, describing different aspects of an individual's state. Support for such a view can be found in the findings of empirical research, which show that even a significant improvement in material conditions and a growth in income, associated with an increase in utility, do not necessarily mean greater happiness (Boarini, Johansson and Mira d'Ercole 2006). Easterlin (1974), the author of one of the most important publications in this field, shows that the relationship between increasing income and the level of happiness among the societies of European, Asian, African, North American and Latin American countries is not unequivocal. For instance in the USA, despite the significant growth of such macroeconomic indicators as real GDP *per capita* and real consumption expenditure, over a period of about five decades subjective assessments of well-being did not show a rising trend (Easterlin 1995). On the contrary, during that period the percentage of people who declared that they were ‘very happy’ in fact slightly fell. Even greater discrepancies between material status and happiness level have been observed, for example, in Japan.

Pursuing the aim of this analysis, the authors consider the issue of increasing the well-being of households. However, it has to be said that to date no universally accepted definition of this term has been developed (Hirschauer, Lehberger and Musshoff 2015). In this case, one of the concepts mentioned by McAllister (2005) is referred to: objective well-being. It refers to the material and social circumstances which can foster an individual's sense of well-being. These include housing standards, income and employment, as well as educational attainment. It must be noted that the adopted concept does not make it possible to analyse how individuals perceive their own situation, how they experience it, or how happy they consider themselves to be. In order to answer such questions, one should refer to the concept of subjective well-being, which is identified with a sense of happiness (Kimball and Willis 2005; Frey and Stutzer 2002).

The view adopted by the authors also relates to Easterlin's stance (2003). He claims that the well-being felt by an individual depends on a number of factors and has many aspects, but at least in part it can be measured by means of income. A rise in income, or in other words an increase in consumption, translates into a person's overall well-being.

2. Data and methodology

Micro-data from two Polish editions of time use surveys was used for the calculations. The first one took place in the period 1.06.2003–31.05.2004 (10,256 households), and the second one covered the whole of the year 2013 (28,209 households)². These surveys were conducted in accordance with the methodology recommended by the European Statistical Office Eurostat (Eurostat 2009).

All the analysed persons were categorized by gender (2), presence/absence of children of up to six years of age (2), three education groups (3), and three age groups (3). This gave us 36 cells for each edition of the survey and a potential sample of 72 grouped observations. In the methodology of the Polish Central Statistical Office it is assumed that the working age for men and women is 18–64 and 18–59 respectively. Therefore, the age groups of 18–24 (AGE 1), 25–44 (AGE 2) and 45–64 (AGE 3) (for women 45–59) were considered in the calculations. Categorizing the people from the 2004 database according to the level of education, the following groups were created: EDU 1: full primary, incomplete primary and two-year vocational; EDU 2: three/four-year vocational and upper secondary; EDU 3: higher. The 2013 database includes more features related to education, so in this case the specified groups included the following levels: EDU 1: primary, lower secondary, basic vocational, incomplete primary, and without any formal education; EDU 2: post-secondary (excluding colleges), upper secondary general and technical, and upper secondary vocational; EDU 3: short-cycle tertiary (teacher training colleges), bachelor's academic or professional or equivalent level, master's or equivalent level, and doctoral or equivalent level.

Out of the activities that take place in the non-market sphere, the analysis included those activities that are productive in nature. The selection was made using third-party criterion as it was considered to be the most important from the perspective of economic analysis (Goldschmidt-Clermont 1993; Hawrylyshyn 1977; Reid 1934).

In order to reduce the potential impact of distorting factors on the average time spent on market work and household production, additional restrictions were introduced into the calculation procedure. In the case of active full-time workers, the analysis was limited to the diaries in which a given day was declared to be a normal working day. As regards the unemployed, those who declared that it was a 'normal' day were selected.

It can be expected that in families with young children (up to 6 years) the compensation will on average be higher than for couples with older offspring. Therefore, the calculations were performed separately for each group.

In order to calculate the level of compensation for market work by household production in the case of unemployed people, the following formula was used (1):

² In subsequent sections of the paper the former database, or time use survey edition, will be referred to as TUS 2004.

$$CTmin = \left(\frac{H_E^{a,f,m} - H_U^{a,f,m}}{M_E^{a,f,m} - M_U^{a,f,m}} \right) \cdot 60 \text{ min}, \quad (1)$$

where:

CTmin – compensation time in minutes,

M – market work time,

H – housework time,

E – employed,

U – unemployed,

– all,

f – female,

m – male.

In the next step, the parameters of the regression models were estimated, in which the compensation coefficients became the dependent variable. The independent variables were the corresponding discrete variables in the form of encoded socio-demographic features. Thus, to describe a given level of compensation expressed in minutes, the variables used in the previous step were included as restricting conditions. For example, if a compensation indicator of 19.3 minutes was obtained as a result of calculations taking into account the time spent on work (market and home) by men with the lowest level of education who are in a relationship and do not have children, then the specified compensation level was described by the *sex* (value = 0), *edu* (value = 1), *spouse* (= 1) and *kid* (= 0) variables. The minimum number of cases observed at the stage of compensation calculations served in this case as a weight in the process of estimating the parameters of the weighted regression equation.³ Thus, in the process of estimating the parameters of equations, the impact of the cases which were calculated on relatively few samples was decreased, and the role of the values in which information about a large number of people from the TUS database was taken into account was increased.

3. Compensation time

Table 1 shows average working times and compensation levels (in minutes): combined and separately for men and women. Standard errors of the means are given in parentheses. The calculations presented show that in the working-age group, for every hour freed from the labour market, about 21 minutes, on average, is devoted to home production every day. Women are characterized by a significantly higher substitution rate between market and home production compared to men. However, in comparison with 2004, this difference diminished slightly in 2013.

³ To calculate the value of the compensation factor, average working times for different populations were used – people who work and those who are unemployed but with the same socio-demographic characteristics.

Table 1
Compensation for market work by household production for people of working age

2004				2013			
	<i>M</i>	<i>H</i>	Compensation		<i>M</i>	<i>H</i>	Compensation
<i>All</i>				<i>All</i>			
Empl	577.47 (1.95)	140.14 (1.41)	21.31	Empl	554.65 (1.58)	152.26 (1.16)	21.58
Unempl	30.09 (2.00)	334.53 (3.79)		Unempl	28.58 (1.50)	341.50 (2.79)	
<i>Men</i>				<i>Men</i>			
Empl	599.14 (2.88)	102.56 (1.71)	15.14	Empl	585.82 (2.40)	107.14 (1.43)	15.51
Unempl	42.83 (3.82)	242.92 (5.72)		Unempl	40.26 (3.15)	248.16 (4.70)	
<i>Women</i>				<i>Women</i>			
Empl	553.11 (2.52)	182.38 (2.03)	23.89	Empl	529.50 (2.06)	188.66 (1.61)	22.93
Unempl	21.84 (2.16)	393.87 (4.46)		Unempl	23.51 (1.65)	382.02 (3.19)	

M – market work, *H* – household work.

Source: own calculations based on GUS data.

3.1. Compensation for specific types of households in 2004

Based on the averages obtained from the TUS 2004 data (Tables 1A and 2A in the Appendix), first basic conclusions can be drawn. To begin with, the degree of compensation depends to the greatest extent on gender – women are compensating more than men in all of the corresponding groups.

If women are childless, the degree of compensation increases along with the education level, reaching its highest value (about 43 minutes) for those who are the best educated and have a partner. Also, among single women without children, a positive relationship can be observed between the level of education and the time spent on production that increases their welfare.

In the case of men, no relationship was observed between the level of education and the degree of compensation. Drawing any conclusions in this case is additionally hampered by the lack of appropriate values for some sub-populations. This is due to either a total lack or a shortage of people with the specific socio-demographic features in the 2004 database. An insufficient number of results for

different age groups, among both men and women, also makes it impossible to discover any regularities with regard to the relationship between the degree of compensation and belonging to a particular age group.

The next most important factor seems to be having a child. In all the examined groups except one (women with the highest education level who are in a relationship) the degree of compensation expressed in minutes is higher among parents than among people without children. This shows the significant impact of young children (under 6 years) on the structure of their caregivers' time. This applies to both women and their partners. As far as women with small children are concerned, the relationship between the degree of compensation and the level of education is not so unequivocal; or rather it should be said that the degree of compensation is not linked to years of education.

When analysing the life cycle of women we noticed that in the case of those without children, the degree of compensation is not significantly different for the various age groups and amounts to about 20–27 minutes for every hour freed from market work. In families with one or more young children, the relationship is rather positive; as they get older, mothers increase the degree of substituting non-market production for market work.

3.2. Compensation for specific types of households in 2013

In 2013, women continue to exhibit a higher degree of compensation than men (Tables 3A and 4A in the Appendix). The only exception is the result obtained for the group of people who have a partner and belong to the EDU 2 category.

Compared to the previous TUS, the relationship between the level of education and the degree of compensation among women became reversed. In the case of both women who are in relationships and those who are single parents, the degree of compensation drops with an increasing level of education. In 2013, the lowest level of compensation among women and men without children was recorded for those who had the highest level of education. For women this is 12 minutes, for men 11 minutes.

In the case of mothers the highest degree of compensation appeared among the EDU3 group: it amounted to about 42 minutes. We did not notice a clear connection between the level of education and the substitution of non-market production for market work.

The degree of compensation does not change much during people's life cycle. For childless women and men the lowest numbers can be found in the last age group. Regardless of gender, the degree of substituting household work for market activity increases with age when there is no partner; however, this appears more clearly in the case of men than for women.

As far as mothers are concerned, the relationship between the degree of compensation and age group is not unequivocal. We noted only that the highest degree of compensation (31 min) was found in the 18–24 age group.

3.3. The influence of selected characteristics among individuals and households on the degree of compensation

Table 2 shows parameter estimations for four models that pertain to both genders. In Table 3, models 5 and 6 describe only women, and models 7 and 8 only men. In the case of equations which apply to both genders, in models 1 and 2 the inclusion of individuals in the analysis did not require that the analysed person's partner must be employed. As a result, the analysis includes couples in which compensation calculations were performed for men who have unemployed partners and those who have economically inactive partners. In models 3 and 4, however, a restriction was applied which specified that if the analysed person has a partner, they must do some kind of market work.

Table 2
Changes in the degree of compensation related to selected characteristics of individuals and households, TUS 2004

Dependent variable: <i>compensation</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
Independent variables:				
<i>intercept</i>	17.82***	18.46***	19.98***	20.39***
<i>edu</i>	0.75***	–	2.49***	–
<i>kid6</i>	5.52***	5.26***	6.63***	6.56***
<i>sex</i>	5.73***	5.94***	5.24***	5.32***
<i>spouse</i>	0.29*	0.21	1.22***	1.18***
<i>age</i>	–	0.24**	–	–0.50***
Stat. <i>F</i>	1318.38	1284.98	519.75	602.70
Adj. <i>R</i> ²	0.80	0.79	0.73	0.76
Root MSE	1.90	1.84	2.58	2.21
<i>n</i>	1358	1364	786	781

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: own calculations based on GUS data.

The parameters of models 1–4 indicate that the most important role with regard to the degree of compensation in TUS 2004 is played by gender and by the presence of children of up to 6. Apart from the ones mentioned, they include variables describing the level of education, age, as well as information on whether a given person has a partner.

The gender variable has been encoded as 0 – man, 1 – woman. The estimates obtained show that in the case of women the compensation is on average higher by between 5 and 6 minutes for every hour freed from the labour market. Very similar parameter values describe the effect of a small child. Its presence increases the compensation level from 5 to over 6 minutes.

Having a partner, regardless of their economic activity, has a relatively small and statistically insignificant impact on the compensation level (models 1 and 2). However, if the presence of only employed partners is taken into account, the value of the appropriate parameters is clearly higher (models 3 and 4). The level of education is positively correlated with the degree of compensation, but depending on the model (1 or 3) the strength of this correlation varies. Only the influence of age on the phenomenon studied is ambiguous: depending on the model (2 or 4) the values of the respective parameters have different signs.

The influence of the presence of children in a household on the degree of compensation, separately for women and men, is illustrated by models 5–8 (Table 3). The first two models describe the situation of women, and the subsequent ones pertain to the degree of compensation for men. It should be noted that in the models described in Table 3, the calculations were performed only for people whose partner, if they have one, is employed. The presence of children aged 0 to 6 years increases, on average, the degree of compensation for both genders between 5 and 6 minutes, which confirms the results obtained for the models in Table 2.

Interestingly, the presence of a working partner to a greater extent encourages the substitution of household work for market work among unemployed men (about 3 minutes for each hour). A significantly smaller impact in this respect is observed in the case of women whose partners are employed (1 minute).

Table 3

The influence of selected factors on the degree of compensation for women and men separately, TUS 2004

Dependent variable: <i>compensation</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>
	Women		Men	
Independent variables:				
<i>intercept</i>	16.01***	29.48***	25.36***	7.45***
<i>edu</i>	4.66***	–	–4.15***	–
<i>kid6</i>	6.50***	6.32***	5.47***	6.61***
<i>sex</i>	–	–	–	–
<i>spouse</i>	1.05***	1.02***	2.72***	3.09***
<i>age</i>	–	–2.08***	–	4.12***
Stat. <i>F</i>	805.86	780.27	198.42	176.46
Adj. <i>R</i> ²	0.80	0.80	0.77	0.74
Root MSE	2.03	1.76	1.76	1.94
<i>n</i>	605	599	181	182

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: own calculations based on GUS data.

Table 4
Changes in the degree of compensation related to selected characteristics of individuals and households, TUS 2013

Dependent variable: <i>compensation</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
Independent variables:				
<i>intercept</i>	14.79***	8.87***	19.07***	13.12***
<i>edu</i>	-0.98***	–	-1.45***	–
<i>kid6</i>	6.049***	4.97***	7.01***	5.59***
<i>sex</i>	3.71***	4.94***	3.32***	4.55***
<i>spouse</i>	5.72***	3.45***	5.68***	3.73***
<i>age</i>	–	2.47***	–	2.70***
Stat. <i>F</i>	8734.05	5469.75	5404.74	3106.28
Adj. <i>R</i> ²	0.89	0.83	0.87	0.80
Root MSE	1.7559	2.0132	2.0144	2.4237
<i>n</i>	4460	4360	3192	3076

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: own calculations based on GUS data.

Table 5
Changes in the degree of compensation related to selected characteristics of individuals and households, TUS 2013

Dependent variable: <i>compensation</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>
	Women		Men	
Independent variables:				
<i>intercept</i>	20.01***	14.44***	14.16***	6.90***
<i>edu</i>	-1.90***	–	-0.57***	–
<i>kid6</i>	7.52***	5.47***	4.48***	5.64***
<i>sex</i>	–	–	–	–
<i>spouse</i>	5.16***	3.15***	7.13***	5.09***
<i>age</i>	–	2.24***	–	3.27***
Stat. <i>F</i>	4639.38	1654.2	1518.13	1088.05
Adj. <i>R</i> ²	0.8675	0.7096	0.8104	0.7575
Root MSE	1.9271	2.2535	1.8895	2.5074
<i>n</i>	2126	2031	1066	1045

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: own calculations based on GUS data.

The level of education has a different impact on the degree of compensation for women and men. In the case of the former, it has a positive influence, whereas in the case of men higher education almost to the same extent reduces the unemployed person's involvement in additional household work.

Compared to the results for TUS 2004, the parameters of the models describing the situation in 2013 (Table 4) do not lend support to the hypothesis of the dominant role of gender in determining the degree of compensation. Thus, for the data relating to this period, the hypothesis formulated at the beginning of the article should be considered as untrue. In models 1–4 the highest values of the parameters in absolute terms pertain to the influence of the presence of children. The role of the presence of a partner was also clearly higher than in the previous period. In models 1 and 3, the parameters relating to this variable have even higher values than those describing the effect of gender on compensation.

Both in models 1–4 and 5–8 the role of age in determining the degree of compensation increased compared to the survey from 2003/2004. In 2013, there was a clear positive relationship between these variables; though in the case of men, increasing age has a slightly greater impact on the scale of the analysed substitution (3 minutes vs 2 minutes in the case of women).

4. Discussion

It must be emphasized that the findings presented in this paper should not be interpreted in the context of a substitution between the consumption of market goods and the consumption of market production results. As Been, Rohwedder and Hurd (2015) rightly point out, unemployment, which contributes to the reduction of the opportunity cost of time of an individual, produces two simultaneous effects. The first consists in shrinking the money budget, reducing the possibility of buying market services and consumer goods. The second one results from freeing the time previously allocated for market work. Thus, the presented results of calculations on the degree of compensation in Polish conditions should be understood as the cumulative effect of the elasticity of home production in relation to a change in market consumption and a change in the non-market time resource.

Analyses conducted in various countries reveal that the scale of home production measured by the time people devote to such activity is higher in households with unemployed people compared to those where both partners work (Ahn et al. 2008; Taskin 2011; Colella and Van Soest 2013; Velarde and Herrmann 2014). An analogous situation occurs in Poland, which is shown in the presented calculation results (Table 1).

Burda and Hamermesh (2009b) raise the question in their article of whether household production is readily substitutable for market production. The authors, using data from the USA, Australia, Italy and Germany, obtained an average result of 16 minutes. Using data from the Polish edition of TUS 2004 for the full population, Jankiewicz (2017) obtained virtually the same result. The results of

the calculations presented in this paper, however, show that conclusions relating to the substitution between market and household work should be drawn only on the basis of calculations which use disaggregated data. This is because the degree of compensation differs significantly not only with regard to gender, but also to the level of education, age, and other characteristics of households. The average compensation time for those representatives of Polish households who belong to the economically active population is over 21 minutes. However, for the individual groups that were identified in the study, it ranges between 43 and 7 minutes (TUS 2004), and 42 and 4 minutes (TUS 2013). The highest of these values are similar to the results obtained by Aguiar, Hurst and Karabarbounis (2011), who investigated the substitution of household work for market work during the recent recession in the USA. In the period 2007–2010, approximately 30% of the time that was ‘freed’ from market activity was devoted to household production, and when childcare was included the proportion increased to about 45%.

Despite the increasing wealth of the society and the institutional changes that undoubtedly occurred during the first decade of EU membership, the ISO-work phenomenon has not been observed in Poland (Burda, Hamermesh and Weil 2006). Referring to the social norms theory, there are some indications that changes are taking place in this respect. One such indication may be the fact that in the estimations for TUS 2013, gender ceased to be the main determinant as regards the compensation for market work by household production. This may be related to the fact that the second edition of TUS was conducted after 10 years of Polish EU membership; that is, after a period which promoted an adjustment of social norms to those found in highly developed countries.

The results presented in this paper are consistent with the findings published by Vargha, Gál and Crosby-Nag (2017). According to an analysis of data from 14 European countries, the gender gap in household production is not evenly distributed over people’s life cycle. Moreover, working-age women are more likely than men to be responsible for home production, and the main beneficiaries of this activity are children. This is the case until the children reach an age where they no longer need as much care as they did in the early years of their lives.

The findings reveal reversals in certain trends. In 2004, in the case of childless women, the scale of compensation increased with the level of education. In 2013 this tendency was reversed: the best educated women noticeably limited the compensation for lost market labour with home production. This phenomenon can be at least partly explained by the situation in the labour market. During the first edition of TUS (2003–2004) the unemployment rate in Poland was almost twice as high as in 2013; and generally, the higher the level of education, the higher the remuneration. Therefore, the loss of jobs by better educated women entailed a greater depletion of the home budget compared to the situation of less educated ones. In addition, during periods of high unemployment (2003–2004) there is often a prevailing belief that there is little chance of finding a job after losing one (Di Tella et al., 2001). Thus it can be assumed that people who earned relatively high hourly rates will want to compensate for their lower purchasing power after

becoming unemployed with a larger scale of home production (Gimenez-Nadal and Molina 2014, p. 106).

Conclusions

The situation of a household in which one member loses his/her job changes as a result of at least two facts. First of all, a significant part of the time resource is ‘freed’ from the labour market and can be used in any way one wishes. Secondly, the family loses one source of monetary income. This obviously restricts the ability to meet various needs by reducing the consumption of services and market goods. This loss can be offset by increasing the scale of household production and by providing an alternative in the form of goods and services that are substitutes for those offered on the market.

The results show that when measuring the level of compensation for market work by household production it is worthwhile to refer to more detailed information than that pertaining to the whole population. This is demonstrated by significant differences in the values of the indicators, which range from 7 to 43 minutes for TUS 2004, and 4 to 42 minutes for TUS 2013.

The scale of substitution in 2004 is greatest in the case of women, especially those who have the highest level of education (40–43 minutes); men to a lesser extent compensate for the loss of remunerative market activity with productive activity at home. But also in their case, having a child has a significant impact on their allocation of time: fathers are characterized by a higher degree of compensation compared to men without children. The highest average number of minutes was recorded for fathers between 45 and 64 years of age (29 minutes). During the first decade of Polish European Union membership the situation has slightly changed. In 2013 the highest degree of compensation characterised young mothers (30–31 minutes) and young fathers (28 minutes). However, even higher values were recorded among people with the highest level of education (without introducing age restrictions), which amount to 42 minutes for single mothers and 30 minutes for fathers living in a relationship.

The parameters of models 1–4 (Table 2) indicate that the most important role with regard to the degree of compensation in TUS 2004 is played by gender and by the presence of children up to the age of 6. The estimates obtained show that in the case of women the compensation is on average higher by between 5 and 6 minutes for every hour freed from the labour market. Very similar parameter values describe the effect of the presence of a small child: it increases the degree of compensation from 5 to over 6 minutes.

The parameters of the models describing the situation in 2013 (Table 4) do not lend support to the hypothesis of the dominant role of gender in determining the degree of compensation. In this case the highest values of the parameters in absolute terms pertain to the influence of the presence of children (models 1–4

in Table 4). The role of the presence of a partner was also considerably higher than in the previous period. In models 1 and 3, the parameters relating to this variable have even higher values than those describing the impact of gender on compensation.

The presence of a working partner to a greater extent motivates unemployed men to substitute home production for market work than is the case in the reverse situation (the influence of a working man on his unemployed partner). In the 2003/2004 survey, the compensation was about three minutes for each hour for men and one minute for women with a working partner. Similar results were obtained using data from the next TUS; however, as mentioned earlier, in 2013 the role of partners increased. Comparing models 5 and 7 (Table 5), the presence of a working partner results in an increase of about 5 minutes in women's compensation; and when the situation is reversed, the man increases the time spent on home production by 7 minutes per hour.

In addition, it is worth noting that for the vast majority of the specified groups of women, regardless of whether or not they had children, the degree of compensation declined over the course of about a decade. The same phenomenon was observed for men.

The above mentioned modifications in behaviour may be connected with changes in social norms as a result of Poland's membership of the European Union. An indication of this is the lesser role of gender in the models describing compensation in 2013 compared to the estimations of the 2004 data. However, it should be stressed that changes in this respect were not advanced enough to bring about equalization between the total working time of men and women.

The presented analysis procedure focuses only on time use. In subsequent studies on the compensation for market work by home production, an attempt should be made to answer the question of what changes the daily time structure of unemployed people to the greatest extent: is it the structure of time modified primarily by this resource having been freed from market activity, or is it the result of a depletion of financial resources caused by the loss of earnings.

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Appendix

Table 1A

Average compensation levels in families without children, TUS 2004

Men	Compensation	Women	Compensation
EDU 1	25.0	EDU 1	25.5
EDU 2	19.2	EDU 2	26.0
EDU 3	26.7	EDU 3	43.1
EDU 1*	–	EDU 1*	17.0
EDU 2*	–	EDU 2*	24.7
EDU 3*	–	EDU 3*	31.4
AGE 1	–	AGE 1	–
AGE 2	19.2	AGE 2	26.8
AGE 3	22.4	AGE 3	24.6
AGE 1*	–	AGE 1*	–
AGE 2*	–	AGE 2*	25.6
AGE 3*	–	AGE 3*	19.6

* No spouse.

Source: own calculations based on GUS data.

Table 2A

Average compensation levels in families with children, TUS 2004

Men	Compensation	Women	Compensation
EDU 1	27.6	EDU 1	31.48
EDU 2	25.8	EDU 2	31.42
EDU 3	–	EDU 3	40.09
EDU 1*	–	EDU 1*	29.31
EDU 2*	–	EDU 2*	35.37
EDU 3*	–	EDU 3*	33.67
AGE 1	–	AGE 1	26.84
AGE 2	26.0	AGE 2	32.00
AGE 3	29.0	AGE 3	32.12
AGE 1*	–	AGE 1*	28.31
AGE 2*	–	AGE 2*	35.65
AGE 3*	–	AGE 3*	31.38

* No spouse.

Source: own calculations based on GUS data.

Table 3A
Average compensation levels in families without children, TUS 2013

Men	Compensation	Women	Compensation
EDU 1	19.29	EDU 1	23.98
EDU 2	23.95	EDU 2	22.70
EDU 3	11.63	EDU 3	19.50
EDU 1*	13.98	EDU 1*	17.64
EDU 2*	12.87	EDU 2*	15.80
EDU 3*	11.12	EDU 3*	12.79
AGE 1	22.41	AGE 1	25.83
AGE 2	20.36	AGE 2	24.24
AGE 3	20.61	AGE 3	22.81
AGE 1*	9.28	AGE 1*	13.16
AGE 2*	13.10	AGE 2*	20.30
AGE 3*	17.92	AGE 3*	21.75

* No spouse.

Source: own calculations based on GUS data.

Table 4A
Average compensation levels in families with children, TUS 2013

Men	Compensation	Women	Compensation
EDU 1	22.19	EDU 1	27.21
EDU 2	26.52	EDU 2	28.47
EDU 3	30.37	EDU 3	26.49
EDU 1*	15.83	EDU 1*	30.33
EDU 2*	–	EDU 2*	27.48
EDU 3*	–	EDU 3*	42.46
AGE 1	28.62	AGE 1	30.86
AGE 2	26.86	AGE 2	26.30
AGE 3	4.32	AGE 3	26.45
AGE 1*	–	AGE 1*	31.29
AGE 2*	–	AGE 2*	26.32
AGE 3*	16.59	AGE 3*	27.04

* No spouse.

Source: own calculations based on GUS data.

UNEMPLOYMENT AND TIME SPENT IN HOUSEHOLD PRODUCTION

Abstract

In recent decades, great interest has arisen in the scientific community about better understanding and measuring of people's well-being. It is widely recognized that an exclusive concern with production and consumption, as measured in national accounts such as GDP, is an insufficient strategy and should not be the only source for guiding policy makers. This paper deals with nonmarket productive activities as sources of economic welfare, which are recognised as part of the objective well-being of households.

In the analysis the micro data from two waves (2003-04 and 2013) of Polish time use surveys were used. The aim of the paper is to investigate how the differences in time use between employed and unemployed people arise from various underlying demographic characteristics. The results indicate how many minutes of additional household production correspond to each hour of market time not worked by unemployed individuals in various types of households. By this research strategy we distinguish the groups in society which suffer the most during recessions and high levels of unemployment, and those for which the cost of unfavourable market circumstances is comparatively low. The results indicate that, independently from the socioeconomic characteristics of households, the highest degrees of compensation are seen among unemployed women. A comparison of the results from TUS 2004 and TUS 2013 reveals changes in the allocation of time for men and women. The scale of substitution in 2004 was greatest in the case of women who have children and the highest level of education. In 2013 the highest degree of compensation characterised young mothers and young fathers.

Keywords: well-being, unemployment, home production, households, total work

JEL: D13, I31

BEZROBOCIE A CZAS POŚWIĘCANY NA PRODUKCJĘ W GOSPODARSTWIE DOMOWYM

Streszczenie

W ostatnich dekadach wśród naukowców wzrosło zainteresowanie lepszym zrozumieniem i pomiarem dobrobytu człowieka. Powszechnie uznaje się, że wyłączenie zainteresowanie produkcją i konsumpcją, mierzonymi w rachunkach narodowych, m. in. w formie PKB, jest strategią niewystarczającą i nie powinno być jedynym źródłem wiedzy dla decydentów politycznych. Niniejszy artykuł dotyczy nierynkowej aktywności produkcyjnej, która jest źródłem ekonomicznego dobrobytu postrzeganego jako składowa obiektywnego dobrobytu gospodarstw domowych.

W analizie wykorzystano mikro-dane z dwóch edycji (2003-04 i 2013) polskich badań budżetu czasu. Celem artykułu było zbadanie, w jaki sposób różnice w wykorzystaniu czasu między pracownikami zatrudnionymi a bezrobotnymi wynikają z różnych podstawowych cech demograficznych. Wyniki wskazują, ile minut dodatkowej produkcji gospodarstwa domowego odpowiada każdej godzinie czasu rynkowego nieprzepracowanej przez osoby bezrobotne w różnych typach gospodarstw domowych. Dzięki przyjętej strategii badawczej wyróżniamy grupy społeczne, które są najbardziej dotknięte podczas recesji gospodarczej i wysokiego poziomu bezrobocia, oraz te, dla których koszt niekorzystnych warunków rynkowych jest stosunkowo niski. Wyniki wskazują, że niezależnie od cech

społeczno-ekonomicznych gospodarstw domowych, najwyższe stopnie kompensacji obserwuje się wśród bezrobotnych kobiet. Porównanie wyników z TUS 2004 i TUS 2013 ujawnia zmiany w alokacji czasu dla mężczyzn i kobiet. Skala substytucji w 2004 r. była największa w przypadku kobiet mających dzieci i dla najwyższego poziomu wykształcenia. W 2013 r. najwyższy stopień kompensacji charakteryzował młode matki i młodych ojców.

Słowa kluczowe: dobrobyt, bezrobocie, produkcja domowa, gospodarstwa domowe, łączna praca

JEL: D13, I31

БЕЗРАБОТИЦА И ВРЕМЯ, ПОСВЯЩАЕМОЕ ДОМАШНЕМУ ХОЗЯЙСТВУ

Резюме

В последние десятилетия среди ученых вырос интерес к лучшему пониманию и измерению благосостояния человека. Существует общее мнение, что изучение только производства и потребления, измеряемых в национальных показателях, в частности, показателем ВВП, является недостаточным и не должно быть единственным источником информации для политиков, принимающих решения. В настоящей статье затрагивается вопрос нерыночной производственной активности, которая является источником экономического благосостояния домашних хозяйств. В анализе были использованы микро данные двух этапов проектов (2003-04 и 2013) польских исследований, касающихся бюджета времени. Авторы статьи решили изучить, каким образом различия в использовании времени между занятыми и безработными вытекают из разных основных демографических черт. Результаты позволили определить, сколько минут дополнительной работы для домашнего хозяйства соответствуют каждому часу рыночного времени неотработанного безработными в разных типах домашних хозяйств. Согласно принятой стратегии исследования, автор выделяет социальные группы, которые наиболее страдают во время экономического спада и высокой безработицы, а также те, для которых последствия неблагоприятных рыночных условий относительно невелики.

Результаты показывают, что независимо от социально-экономических черт домашних хозяйств, самая большая степень компенсации наблюдается среди безработных женщин. Сравнение результатов TUS 2004 и TUS 2013 показывает изменения в аллокации времени для мужчин и женщин. Степень субституции в 2004 году была наибольшей в случае женщин имеющих маленьких детей и имеющих высшее образование. В 2013 году наивысшая степень компенсации отличала молодых мам и молодых отцов.

Ключевые слова: благосостояние, безработица, работа в домашнем хозяйстве, совокупный объем работы

JEL: D13, I31