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Labor Market Participation: The Impact of Social Benefits in the Czech Republic

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Abstract:

This paper aims to quantify the impact of social benefits on labor market participation in the Czech Republic. It applies the logistic regression to estimate the probability of labor market participation depending on social benefits related to net wage of the individuals, controlling for individual and household characteristics (age, presence of spouse and children etc.). The work disincentives via social benefits do exist and proved to be relatively strong. When trying to understand the reasons for recently decreasing participation rate in the Czech Republic, the often called "generous" Czech social benefit system appears to be relevant.

Keywords: inactivity trap, labor market participation, social benefits

JEL: I38, J21

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1 Introducion

The total participation rate was gradually increasing in the EU-25 from 68.7% in 2000 to 70.5% in 2006 as well as the male (from 77.4% to 78.0%) and female (from 60.0% to 63.1%) participation rates (European Commission, 2007). This trend appears not to be followed by the Czech Republic where the total participation rate was continuously decreasing from 71.3% to 70.3% in the same period with male rate falling from 79.1% to 78.3% and female rate from 63.6% to 62.3%.

Social benefits can create substantial disincentives to labor market participation. If we try to achieve higher participation rate, such disincentives should be eliminated in order to "make work pay". The Czech Republic experienced reforms in social security system recently with its first phase already starting from 2008. The main goal is to spur the labor market participation by lowering the income redistribution.¹ In this context, this paper is concerned with the impact of social benefits on decision about labor market participation in the Czech Republic.

¹ The total amount of redistributed income should be lowered by more than 8 billions CZK during 2008 (Ministry of Labor and Social Affairs).

Using the most recent data from the Statistics on Income and Living Conditions database it aims to find out whether the social benefit level influences the participation on the labor market. More precisely, it estimates the probability of labor market participation of the individuals depending on the social benefits they would receive in case they did not work in the previous year related to their net wage. Consequently, it tries to reveal whether the social security reforms can affect the participation decision in the Czech Republic.

This paper offers an econometric analysis of labor market participation—using the microeconomic data—which controls for social benefits related to wage, family structure and other variables. Its aim is to reveal how the probability of labor market participation differs depending on the relative social benefits in the Czech labor market, running the regression model for all individuals as well as for women separately.

The paper is organized as follows: The next section provides a literature overview and outlines the importance of the selected topic. Section 3 depicts the methodology for the participation equation estimations. It also describes the EU-SILC data to which the present paper is to be applied and variables used in the model. Section 4 presents the results, also separately for women. The main results are summarized in Section 5, including the discussion of possible effect of social security reforms on the labor market participation.

2 Literature overview and motivation

It is often argued that the tax-benefit systems have caused the labor market problems both on demand and supply side (see, e.g., Immervoll, O'Donoghue, 2003; OECD, 1997). In particular, generous out-of-work income can create significant disincentives to search well-paid work or to stay in work. These disincentives were often assumed to be one of the main causes of slow economic growth and unemployment (European Commission, 2000).

Generally, the social protection policies have been traditionally focused particularly on old age, short-term unemployment and disability. Several crucial factors influenced the social protection regimes in the past decade. First, increasing long-term unemployment led to longer unemployment benefits claims and greater dependence on social assistance as the unemployment benefits are often time-limited.² Second, the family structure changed over time; there are more single-parent families, more households of individuals living alone etc., which are threatened by poverty more likely and are, therefore, more dependent on social assistance.³

The study of the European Commission (2004) points out that the so-called working age benefit dependency ratio recorded significant changes in EU member states during the 1990s.⁴ The benefit dependency ratio expresses the number of persons receiving a social security benefit in relation to the number of persons in employment.⁵ Considering only the unemployment benefits and social assistance the ratio rose until 1993 and declined thereafter in majority of covered countries. Generally, the benefit dependency is higher among women than among men although the difference has decreased over the 1990s.

The social benefit system (together with the tax system) involves the trade-off between the equity and efficiency targets. Work dis/incentives can be captured by various measures. The out-of-work income relative to in-work income, measured by the replacement rates as a proxy for benefit generosity (e.g., OECD, 2002), affects the decision to participate on the labor

 $^{^{2}}$ For example, the long-term unemployment as a percentage of labor force rose from 2.0 in 1998 to 4.2 in 2005 in the Czech Republic (European Commission, 2006).

³ 4.3% of all households were single-parent households with dependent children and 22.8% were households of individuals in the Czech Republic in 2005 (Czech Statistical Office, 2007a). The at-risk-of-poverty rate (share of persons under poverty threshold, which is 60% of median of national equivalised disposable income) for persons living in single-parent households was 41.0% and 16.4% for one-person households in 2005 in the Czech Republic, while this index was 10.4% on average (Czech Statistical Office, 2007a).

⁴ This study included Austria, Belgium, Denmark, France, Germany, Great Britain, Netherland, Spain and Sweden.

⁵ The benefit years of persons aged 15 to 65 to the total number of labour years (all persons aged 15 or older, in full-time equivalents).

market. If the replacement rate is too high that work "does not pay", it can result in so-called unemployment trap (see, e.g., Carone and Salomäki, 2001; Snower, 1997).

OECD (2002) study compares the net replacements rates (NRR) across member countries.⁶ It provides the net replacement rates for several types of households of various unemployment duration, considering the available level of social benefits and the average production worker salary. NRR for persons in the initial period of unemployment with not working spouse and two children was 70% in the Czech Republic whilst the values ranged from 44% in Greece to 91% in Canada and Switzerland. This figure was 80% for long-term unemployed who do not receive any unemployment benefits in the Czech Republic with the values ranging from 10% in Greece to 87% in Iceland.

This suggests that long-term unemployed average production workers were less motivated to start to work than people in the initial phase of unemployment in the Czech Republic. The social benefits recipients can lose their motivation to search the job and to move from unemployment into employment. Moreover, they can be encouraged to rely fully on the social system and/or withdraw entirely from the labor market. This effect can influence especially the low-wage workers. Not entering the labor market can be in their interest since the earned income could differ only moderately from their out-of-work income. Theoretically, the higher the provided allowances, the lower are incentives to enter the labor market.

Another indicator which can be used to measure the extent to which benefits and taxes decrease the motivation to start to work is the marginal effective tax rate (METR). This measure describes the share of additional income which is taxed away when moving to employment.⁷ Carone et al. (2004) argue that the METR for an unemployed average

⁶ Net replacement rate is calculated as a share of household out-of-work income and net in-work income, where the out-of-work income consists of housing benefits, family and children benefits added to unemployment insurance for short-term unemployed and to social assistance for long-term unemployed.

⁷ METR = $1 - \Delta y_{net}/\Delta y_{gross}$, where the change in income corresponds to the additional income from moving to employment. This measure can be used to capture the unemployment trap (the additional income stems from

production worker with not employed spouse returning to the same wage-level job was 77% in 2001 in the Czech Republic (ranging from 61% in Hungary to 96% in Slovakia).

Beside the unemployment trap, we can distinguish so-called inactivity trap which applies to people not receiving any unemployment benefits, who are out of the labor force or "inactive" in sense of paid employment. Inactive individuals who would like to (re)enter the labor market face up work disincentives resulting from tax benefit systems so that they often decide to stay out of the labor force. Minimum income and various benefits, which would be lost when taking up a paid job, can be one of the reasons for non-participation.

The inactivity trap can be measured by METR for inactive people. According to Carone et al. (2004) study the METR for an inactive person with not employed spouse and two children starting to work with average production salary amounted to 77% in 2001 in the Czech Republic (ranging from 12% in Italy to 96% in Slovakia). Therefore, this suggests that the social benefits for an inactive couple with two children were relatively high, such that a movement to employment leaved the family only with 23% of the additional income. The METR was significantly lower for example for similar family without children (64%). Therefore, the benefits related to children might play a significant role. The decision to participate on the labor market could be also highly influenced by the family structure and economic status of the spouse.

Based on the tax-benefit system in the Czech Republic in 2002, the OECD (2004) study argues that the work disincentives were created mainly to families with children, single parent families and also childless unemployed couples while single persons and persons with employed spouse did not face such significant disincentives to take up a job.⁸

moving from unemployment to employment), inactivity trap (the additional income comes from moving from inactivity to employment) and poverty trap (the additional income is related to increasing the number of hours worked for those already in low-paid work).

⁸ Another point is that the state social support is not conditioned by active looking for a job so that many beneficiaries stay on benefits for long periods, often ensuring income by working in the grey economy. Renoy at

The inactivity trap affects particularly women, whose labor supply is more elastic than men's, as shown, for example, by the study of Jaumotte (2003). It argues that, based on the data from 2001, the share of inactive women who would like to have work is 12% on average in 19 European countries, with a higher share among women in prime-working age, middle and higher education levels and, especially, among women who do not seek a job due to family commitments.

Jaumotte (2003) applied an econometric analysis using macroeconomic data to determine the impact of relevant policies on female participation rates in several countries: social security system and child care subsidies were especially relevant.

The above discussed studies consider "average" representative worker or family or are based on macroeconomic level, as well as most of the studies concerning the impacts of social benefit system on the labor market. As opposed to such studies, the present paper aims to examine the impact of social benefits on microeconomic level. We relate the (net) social benefits received in case of inactivity to net wages of the individuals and estimate their impact on labor market participation controlling for family circumstances, for both sexes and separately for women. The higher the benefits-wage ratio the lower we would expect the probability of labor market participation. In other words, the higher the benefits-wage ratio the more likely the individuals will be inactive.

3 Methodology and data

The purpose of this study is to assess the relationship between the social benefits and wages and its impact on participation decision. Section 3.1 depicts the approach and methodology applied in this paper. The next section describes the data and section 3.3 explains the variables

al. (2004) argue that housewives and registered unemployed create one of the main groups of undeclared workers.

used to estimate the impact on participation decision and formulates the equation used in the logistic regression for participation.

3.1 Methodology

When individuals decide about their labor market participation, they consider whether the work does pay. We assume that the individuals compare the (net) social benefits they could receive to their possible net wage. Therefore, the social benefits relative to wage are supposed to influence the labor market participation decision rather than the social benefits and wage absolute levels.

Majority of the social benefits are derived from the individual or household income of the previous year, hence, the individual only one year later finds out whether the work does pay. Since the data used in this paper covers only one-year income data, supplemented by the economic activity during the corresponding period, it is impossible to follow the economic activity during the previous year. Besides, it includes the current economic activity status which is several months lagged to the income reference period.

We accept an assumption that the individuals compare their current social benefit level did they not work in the previous year (which mostly depends on last year's income of the whole household and therefore on the economic activity of all household members) to their usual net wage. Therefore, we imputed all available social benefits to households of all individuals simulating the inactivity of the particular individual while all other family circumstances being the same, i.e. the economic activity and incomes of all other household members remaining the same. In other words, we subtracted the earned income of the particular individual from the household income decisive for various social benefits and imputed the social benefits received in such a circumstance. Apparently, the social benefits should correspond to real available allowances for those who were inactive during the whole previous year since their household income does not change.

The assumption of all other family circumstances being the same while simulating the inactivity of one household member is rather strong since there can be various cross-substitution effects. For example, in a household of working individual and not working partner the cross-substitution effect of the individual's shift into inactivity can move her/his partner to start working. Since the household utility function is unknown, we neglect the influence of possible cross-substitution effect. Moreover, nor the own-substitution effect can be observed. Individuals who prefer more leisure or non-paid work (e.g. family and child care) to consumption will tend to be more influenced by the level of available social benefits. Therefore, we expect that the impact of relative social benefits on labor market participation will be stronger for women since women are those who often care about the family.

The imputed social benefits include child benefit, social allowance for families, parental allowance, social assistance benefit and housing allowance (the amounts were derived according to legal framework valid in relevant year, see European Commission, 2005). Since the social benefits are usually assigned at a household level we equivalised the imputed amount to the number of household members.

For those who were employed during the income reference year, we apply their average monthly net wage, and for inactive people, their potential net wage was estimated using the Heckman regression model (Heckman, 1979; for another example of applied Heckman's model, see, e.g., Beblo et al., 2003) in order to avoid the possible bias of estimated wages. This model was suggested in order to eliminate the selection bias which could occur when working individuals do not create a random sub-sample of the population but differ

systematically from non-participating individuals.⁹ The results of Heckman procedure are reported in Appendix.

In our framework, the participation decision is then influenced by relative social benefits, measured as a share of the social benefits to usual net wage. If the ratio was sufficiently high, the work could not pay and the individuals could decide not to participate on the labor market. Finally, the ratio of (net) social benefits and net wage is included into the regressors of the participation model, controlling also for other variables influencing the labor market participation (household composition, presence of the spouse and her/his economic activity etc.).

3.2 Data description

The household survey EU-SILC¹⁰ is a new panel survey which replaced the ECHP¹¹ in 2004. It is a harmonized survey compulsory for all EU member states, and thus providing reliable data for a possible cross-country comparison. EU-SILC is a so called four-year rotational panel, which means that information is being collected for four years about a number of households, out of which one quarter is dropped and a correspondent number randomly added each year. The data will consist of cross-sectional as well as longitudinal components in the following years.

This study is based on EU-SILC 2005 data. The information is collected on a household level (mainly information on living conditions) and also on an individual level (e.g. individual and job characteristics, wages, income, social allowances). Reference period for income variables is the year 2004; the majority of other variables is related to the current situation, which means the time of the survey (the second quarter 2005 in case of the Czech Republic).

⁹ For more detailed discussion of appropriateness of the Heckman model, see, e.g., Mysíková (2007).

¹⁰ European Union – Statistics on Income and Living Conditions.

¹¹ European Community Household Panel.

The Czech data includes 10,333 individuals (8,628 aged 16 and over) in 4,351 households. In this study, individuals aged 16 to 64 years old are considered only. In order to avoid the ambiguity of participation decision, individuals in retirement, students, disabled and people in compulsory military community are excluded as their choice of economic activity is limited. Further, self-employed are eliminated since their income contains irregularities which would make the analysis biased. Part-time employees are excluded since their monthly income is incomparable with full-time workers' wage.¹² Finally, unemployed were also excluded since the information on their unemployment status is self-reported and hence rather ambiguous.¹³

In other words, individuals who moved between full-time employment and inactivity during the survey reference period are included. This leaves us with 3,322 individuals, 3,107 of them do participate on the labor market and 215 do not. The female sub-sample consists of 1,579 individuals. The data provides us with yearly net wages, therefore, the net monthly earned income was constructed according to the number of worked months. Individual weights which reflect the number of people in the whole population who are represented by a particular individual were included.

3.3 The model and variables description

The logistic regression is used for computations since the endogenous variable in the applied model is dichotomous. This variable is the participation on the labor market, which takes the value of 1 if the individual participates and 0 if she/he is out of the labor force in the current reference period (second quarter 2005).

¹² The exclusion of part-time workers represents a negligible number of workers since part-time employment is very low in the Czech Republic. Moreover, we excluded those who have never worked since their job characteristics are missing and those whose monthly wage was highly undervalued due to sickness; these cases covered sufficiently small number of individuals that the exclusion cannot influence the results.

¹³ From participation decision point of view, the unemployed people are participating in the labor market. But is hard to distinguish whether a self-reported unemployment status means that the individual is not able to find a job or whether she/he lacks the effort to find a job and therefore her/his economic status is rather "inactive". Moreover, the unemployment benefits are rather of different nature than the social benefits—the first serve as a time-limited compensation for lost wage while the second should compensate lasting weak social conditions.

The logistic model takes the following form:

$$ln\left[p/(1-p)\right] = \beta_0 + \beta_i X_i \tag{1}$$

where p is the probability of participation on the labor market and vector X_i includes all explanatory variables. The explanatory variables included in equation (1) were the benefitswage ratio, age, education, sex, presence of working and not working partner, presence of children and region as a proxy for unemployment rate.

The benefits-wage ratio (*BEN_WAGE*) is the share of the imputed equivalised monthly social benefits to the "usual" net monthly wage.¹⁴ *AGEk* are the dummies for age reflecting also the work experience. The education (*EDUC_TER*) is represented by a dummy variable for tertiary education.¹⁵ *SEX* is a dummy variable which equals 1 when the individual is male. *EM_PART* and *NEM_PART* are dummies for the presence of employed partner and not employed partner in the household, respectively. The counterpart to these two variables is living without any partner. *CHILD0_2, CHILD3_5* and *CHILD6_15* are dummies for the presence of children aged 0 to 2, 3 to 5 and 6 to 15 years, respectively.

REGl are dummies for region as a proxy for unemployment rates. The unemployment rates in regions on NUTS2 level were clustered into four groups. The unemployment rate in region is supposed to have some effect on labor market participation via "discouraged worker effect" although the evidence of this effect is rather ambiguous (see, e.g., Sandmeyer and Warner, 1970; Schweitzer and Smith, 1974).

¹⁴ The benefits-wage ratio is similar to the net replacement rate (in this study, the net in-work income includes earned income only). The marginal effective tax rate (METR) could be also included among the regressors. METR serves as another indicator of work dis/incentives bearing similar information. However, its addition into the model would require microsimulations including conversions between net and gross earnings which would be very rough and, therefore, we omit this variable.

¹⁵ The number of individuals with primary education was too low, therefore, this group was merged with the group of individuals with secondary educational level.

4 Results

The results for both sexes (model (1)) and female model (2) are reported in Table 1. The best fitted models were selected. Both the models appeared to be robust—Gini coefficient (cumulative accuracy ratio) amounts to 83.9 for total model (1) and 83.4 for female model (2), Kolmogorov-Smirnov test to 75.2 for total model (1) and 77.1 for female model (2). Another widely used measure of the overall fit of the model is to examine its ability to correctly classify observations. This figure shows 97.0% correctness for the total model and 94.8% for female model.¹⁶

The benefits-wage ratio proved to be significant and negative in model (1) and affirms the expectations that the high values of social benefits do negatively affect labor market participation. If the benefits-wage ratio rises by 1, the chance of participation will change 0.60 times.¹⁷ For example, if the benefits are zero and the share of participating individuals to not participating individuals is 1, i.e. the probability of participation is 50%, then the rise of benefits to the wage level will lower the share of the participating individuals to not participating individuals to 0.6, i.e. the probability of participation decreases to 37%.

¹⁶ The cut value is 0.5.

¹⁷ For details about the interpretation of continuous variables in a logistic regression, see Hosmer and Lemeshow (2000).

	Total model (1)			Female model (2)		
	coeff.	s.e.	odds	coeff.	s.e.	odds
B_W	-0.513**	(0.257)	0.599	-0.603*	(0.343)	0.547
AGE_30	0.923***	(0.508)	2.518	-	-	-
AGE31_45	1.204**	(0.517)	3.333	-	-	-
AGE46_55	0.692	(0.506)	1.998	-	-	-
EDUC_TER	-	-	-	1.052**	(0.419)	2.863
SEX	3.756***	(0.395)	42.766	-	-	-
EM_PART	-	-	-	-0.495	(0.340)	0.610
NEM_PART	0.797**	(0.390)	2.219	-0.844*	(0.487)	0.430
CHILD0_2	-4.166***	(0.258)	0.016	-5.041***	(0.307)	0.006
CHILD3_5	-2.055***	(0.256)	0.128	-2.256***	(0.289)	0.105
CHILD6_15	-0.731***	(0.245)	0.482	-0.539**	(0.273)	0.583
CONSTANT	2.725***	(0.444)	15.254	4.282***	(0.360)	72.399

Table 1 Participation model

Notes: * significance at the 10% level, ** significance at the 5% level, *** significance at the 1% level. Standard errors in parentheses.

Model (1): Correctness of observation classification 97.0%, cumulative accuracy ratio 83.9, K-S test 75.2. Model (2): Correctness of observation classification 94.8%, cumulative accuracy ratio 83.4, K-S test 77.1. Source: Own calculations based on EU-SILC data.

The other, controlling, variables do not show surprising results—the highest probability of participation occurs when the individuals are aged between 31 and 45; men are more likely to participate on the labor market; the presence of non-employed partner in the household increases the probability of participation (compared to individuals living with employed spouse or without any spouse); the presence of children lowers the probability of participation—the younger the children the lower the probability. The dummies for regions were highly insignificant in both models.

Similarly, the female model (2) proved the benefits-wage ratio to be significant and the effect is even stronger— if the benefits-wage ratio rises by 1, the chance of participation will change 0.55 times. The same illustrative example as for the total model (1) shows that if the benefits are zero and the share of participating individuals to not participating individuals is 1, i.e. the probability of participation is 50%, then the rise of benefits to the wage level will lower the share of the participating individuals to not participating individuals to 0.55, i.e. the probability of participation decreases to 35%. This also affirms our assumption that women

tend to prefer unpaid work, i.e. mostly the family and child care, or leisure to paid work more than men.

As opposed to the model (1), the dummies for age proved highly insignificant, while the tertiary education significantly increases the probability of female participation. The probability of participation of women living with employed partner is low (although insignificant) and even lower when they live with not employed partner (compared to women living without any partner). This suggests that women's decision about labor market participation is not sensitive to the economic activity of the partner. The coefficients of the variables referring to the presence of children show that female participation is more negatively influenced than the male participation (or, more precisely, in comparison with the total model). This confirms an intuitive supposition that women with children stay at home and only (re)enter the labor market when their children reach higher age.

5 Conclusion

This paper investigates the impact of social benefits on the labor market participation in the Czech Republic. Since the share of social income to total gross income has been rather increasing recently in the Czech Republic, the social benefits level could be a relevant factor when considering the decreasing labor market participation in the Czech Republic over the last years.

The share of social income amounted to 9.8% of the total gross income in households where the head of the household was an employee in 2004, with a slight decrease to 9.4% in 2005. On the other side, this share rose from 54.3% to 55.4% in households of unemployed and from 36.0% to 40.2% in households of (not retired) inactive persons as a head of the household between these two years (Czech Statistical Office, 2007a-b). Therefore, social benefits can create substantial incentives to withdraw from/enter the labor market.

The social benefits received in case of individual's inactivity relative to her/his net wage proved to be relevant for the probability of participation. If the benefits-wage ratio rises from 0 to 1, the chance of participation will change 0.60 times. The higher the relative social benefits, the more likely individuals decide not to participate on the labor market.

This effect is even more apparent separately for women where the increase of benefits from zero to the wage level changes the chance of female labor market participation 0.55 times, which confirms our initial supposition. Moreover, the presence of children in the household has a higher negative effect of on participation in case of women. Women's probability of participation is lower when they live either with not employed or employed partner, signaling that women's participation decision is insensitive to the economic activity of the partner. Therefore, women are even more likely to prefer unpaid work (family and child care) or leisure than men. Consequently, women's decision about leaving/entering the labor market is more sensitive to changes of relative social benefits.

We can conclude that the often called "generous" social benefit system in the Czech Republic do create certain work disincentives. The proceeding reforms, if effective, could be an appropriate way how to remedy the decreasing labor market participation rate.

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Appendix

	coeff.	s.e.		coeff.	s.e.			
LN_WAGE			PARTICIPATION					
EDUC_Y	0.040***	(0.004)	UNEARN_INC	-0.013***	(0.003)			
YEARS_W	0.017***	(0.002)	AGE_30	0.496**	(0.251)			
YEARS_W2	0.000***	(0.000)	AGE31_45	0.700***	(0.251)			
SEX	0.221***	(0.014)	AGE46_55	0.440	(0.294)			
REG1	0.123***	(0.025)	CHILD0_2	-1.583***	(0.153)			
REG2	0.020	(0.023)	CHILD3_5	-0.871***	(0.134)			
REG3	-0.027	(0.023)	EMP_PART	-0.365***	(0.122)			
REG4	-0.038	(0.025)	EDUC_TER	0.292*	(0.160)			
REG5	-0.076***	(0.023)	SEX	1.504***	(0.243)			
REG6	-0.080***	(0.022)	CONSTANT	1.579***	(0.273)			
REG7	-0.102***	(0.023)	RHO	0.445	(0.163)			
ISCO1	0.562***	(0.040)	SIGMA	0.296	(0.005)			
ISCO2	0.430***	(0.030)	LAMBDA	0.132	(0.049)			
ISCO3	0.418***	(0.025)						
ISCO4	0.335***	(0.028)						
ISCO5	0.086***	(0.028)						
ISCO6	0.027	(0.048)						
ISCO7	0.200***	(0.026)	1					
ISCO8	0.150***	(0.028)	Wald test of indep. eqns. $(rho = 0)$:					
ISCO0	0.682***	(0.064)	chi2(1) = 5.57					
CONSTANT	3.195***	(0.062)	Prob > chi2 = 0.0183					

Table A.1 The results of Heckman model applied for wage imputations

Notes: * significance at the 10% level, ** significance at the 5% level, *** significance at the 1% level. Standard errors in parentheses.

Source: Ôwn calculations based on EU-SILC data.

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