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GENDER WAGE GAP AND DISCRIMINATION IN THE CZECH REPUBLIC

Ostrava, 2012

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Foreword

Gender differentials on the labour market represent one of the most important and most discussed research topics in the field of labour economics. Early research emphasizes the role of human capital and discrimination in explaining gender differentials in the labour market outcomes. Recently researchers have started to bring in a number of other socio-economic, psychological and gender identity factors. The empirical research can be divided into three different types according to the data and methodology used:

i) experimental (mostly) laboratory-based evidence,
ii) studies using longitudinal data and
iii) surveys.

In majority of the existing empirical research, some type of Oaxaca-Blinder or John-Murphy-Pierce decompositions are used to examine labour market differences between men and women and to quantify levels of discrimination.

The main objective of the book is to give overview of what we know so far about various factors contributing to the gender pay gap via reviewing existing theoretical and empirical literature, and to extend our knowledge on the topic through data analysis. In our analyses we mainly focus on the *new* factors such as the relationship between social and gender identity norms, preferences, and gender wage gap. The book focuses also on the role of soft skills, personality characteristics and workplace practices in explaining gender wage gaps. Several of the chapters are based on data from a survey designed precisely to get data on these *new* factors. The survey was conducted in the Czech Republic in 2011 based on the questionnaire, which we constructed to cover various aspects of work and family life, preferences, personality traits and other characteristics of employees and their jobs. Traditional linked employer-employee data are also used in some chapters.

This book is aimed at social scientists, policy makers and the non-technical reader interested in the questions related to gender-based wage differences.

In the book:

- A review of existing theory and empirical evidence related to gender differentials in the labour market outcomes and discrimination.
- Analyses focusing on socio-psychological factors, such as gender identity, work-family balance, personality traits and soft skills in explaining gender wage gaps.

- A novel survey covering various aspects of work and family life, preferences, personality and other characteristics of employees and their jobs.
- Novel findings based on a rich survey, database of soft skill's characteristics and a comprehensive linked employer-employee dataset.

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Mariola Pytliková

December 2012, Ostrava

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List of Abbreviations

AEIS	Average Earnings Information System
BMI	Body Mass Index
BS	Business Sector
CAPI	Face-to-face interview using a laptop
CEO	Chief Executive Officer
CR	Czech Republic
CZK	Czech Crown
EFTA	European Free Trade Association
EU	European Union
EU-SILC	The European Union Statistics on Income and Living Conditions
F	Female
FE	Firm Effect
GCE	General Certificate of Education
IDORG	Identification of Organisation
ISCO	International Standard Classification of Occupations
ISPV	Average Earnings Information System
KKOV	Classification of Educational Qualification Types
LEED	Linked Employer-Employee Dataset
M	Male
NACE	Classification of Economic Activities
NBS	Non-business Sector
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Cooperation and Development
PPP	Purchasing Power Parity
UK	United Kingdom of Great Britain and Northern Ireland
USA	United States of America
USD	U.S. Dollar
USSR	Union of Soviet Socialist Republics

Chapter 1

Introduction

By Mariola Pytliková, Lenka Filipová

The twentieth century saw a dramatic improvement in women's economic status thanks to changes in social norms, reduced gender discrimination, affirmative action, lower occupational segregation and increase in access to higher education for women. Technological change has also made women's lives easier through technological advance at homes. Home appliances such as washing machines, refrigerators, vacuum, dishwasher etc. helped women to break free from the traditional *housewife* roles and they allowed women to join the labour force in greater numbers (Greenwood and Seshadri, 2005). However, much of the progress in terms of the gender labour market differentials slowed down in the recent decades.

1.1 Women are more likely to not to work; when they do have jobs, they earn less than men

Despite the fact that there has been a lot of attention paid to improving women´s position on the labour market in the recent decades, data shows that there are still significant gender differences on the labour market.

Figure 1–1 shows female to male median wage ratio for a number of OECD countries for years 2000 and 2010. We may observe that women earn less than men in all developed OECD countries, but the wage gap varies across countries. In Hungary, Poland, Spain, New Zealand and Norway women earn about 90% as much as males, whereas in Israel, Japan and Korea women earn 60 - 70% as much as men. The gender median wage gap has narrowed down in almost all countries since 2000, except for Italy, Portugal and France. Statistics show that women continue to earn less than men even after controlling for characteristics that researchers think might determine productivity (OECD, 2001) and that the differences mentioned are even greater for more educated women and mothers of two or more children (OECD, 2001; Waldfogel, 1998).

There are also substantial differences between men and women in the labour force participation rate. According to Table 1–1 the female labour force participation rate is lower than male participation rate in all developed OECD countries.

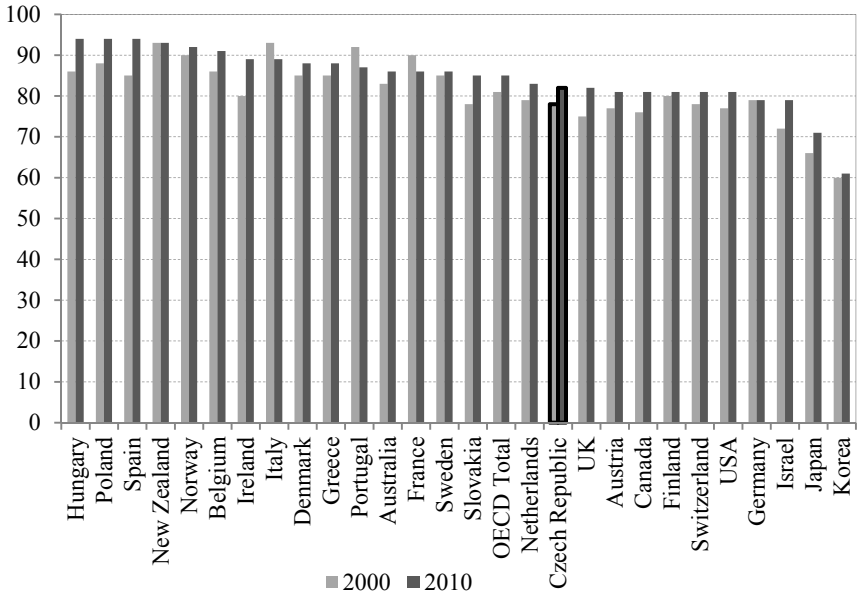

Figure 1–1 Female/male median wage ratio, OECD countries, 2000 and 2010, in %
Source: OECD (2012)

Table 1–1 Gender labour force participation gap, OECD countries, years 2000 and 2011

	2000		2011			2000		2011	
Country	Female	Male	F	M	Country	F	M	F	M
Australia	65	83	71	83	Japan	60	85	63	84
Austria	62	80	70	81	Korea	52	77	55	77
Belgium	57	74	61	72	Netherlands	65	83	73	84
Canada	70	82	74	81	New Zealand	67	83	72	84
Czech Republic	*64*	*79*	*62*	*79*	Norway	76	85	76	80
Denmark	76	84	76	82	Poland	60	72	59	73
Finland	72	78	73	77	Portugal	64	79	70	79
France	62	75	66	75	Slovakia	63	77	61	77
Germany	63	79	72	83	Spain	53	80	68	81
Greece	50	77	58	78	Sweden	76	81	78	83
Hungary	53	67	57	69	Switzerland	72	89	77	89
Ireland	56	80	63	77	United Kingdom	69	84	70	83
Israel	56	67	61	68	United States	71	84	68	79
Italy	46	74	51	73	*OECD Total*	*59*	*81*	*62*	*79*

Source: OECD (2012)
Notes: F = Female, M = Male

Traditionally, Scandinavian countries have the highest female labour participation rates, whereas some Southern European like Greece or Italy, and Central European such as Hungary and Poland, the lowest female labour participation rates among the developed OECD countries. We can as well observe that the female labour force participation increased between 2000 and 2011 for most of the OECD countries with a notable exception of the Czech Republic, Poland and Slovakia. Spain has seen the greatest gains in terms of female labour force participation but from a poor starting point. Further, the gender labour force participation gap has narrowed over time across the OECD (again with the exception of the Czech Republic, Poland and Slovakia).

1.2 Women Matter

Yet, most of the developed (and not only) countries face problems of population aging[1] and increasing female labour participation together with attracting skilled immigrants and encouraging people to work longer is one of the solutions to counteract the population aging. As recent statistics show, women tend to be more educated than men and thus women constitute an important source of skilled labour force, in particular in countries with a relatively low female labour force participation rate. In addition, recent research suggests that women representation on company boards and management is positively correlated with the company's performance, such as profits (Adler, 2001; Adams and Ferreira, 2009). Gender diversity in firms might be also positively correlated to innovation and creativity (Hong and Page, 2001 and 2004; Berliant and Fujita, 2008). Thus, women constitute a valuable part of the work force, and reducing gender inequality should benefit employers, employees and the entire society.

1.3 Factors Explaining Gender Labour Market Differentials

Given the widely observed differences between men and women on the labour market, explaining the differentials has attracted much attention among researchers. In fact, the gender wage gap has been studied extensively since the early 1970s and it became one of the most important topics in the labour economics. The basic research questions regarding the gender wage gap is whether discrimination is an explanatory factor and if so, to what extent.[2] Most of the existing earlier research tries to uncover how much of the gender wage gap remains after adjusting for an individual's productivity enhancing characteristics such as education, experience, occupation and industry. Various decomposition techniques are applied to express the part of wage gap that can be explained by

[1] Demographic projections by the United Nations suggest that during the next three decades, populations in Europe might ceteris paribus decline by 12 per cent (Raftery et al., 2012). The main factor responsible for population aging is a large decline in the total fertility rate over the last half century.

[2] The economics of discrimination started with Becker´s seminal study in 1957 and has been important in explaining differences in wages of equally productive males and females.

different characteristics of men and women and the *unexplained part* that may then be ascribed to gender-based wage discrimination. From the methodological point of view, the methods by Oaxaca (1973) and Blinder (1973) or that of Juhn et al. (1993) and their modifications are usually applied. Using this approach most research finds a sizable *unexplained* gender wage gap, which has been usually considered as discrimination. However, many argue that this approach may be biased because it omits important, although unobservable in the data, variables. On the contrary, some of the included variables may reflect discrimination (like occupation segregation or tenure and other gender-specific factors) and discrimination would be underestimated. Thus the residual gap cannot directly be seen as a measure of discrimination (Blau and Kahn, 2000). That is why we are reluctant to use the term *discrimination* and instead will use the concept of *unexplained part of the gender wage gap*.

What do we know about factors explaining the observed gender differentials? So far we know that family situations play an important role in explaining the gender wage gap. Research on this topic can be divided into two groups according to the core of interest which is: (1) marital status[3], or (2) children.[4] The relationship between marital status and pay is different for men and women. Research has shown that there is a *marriage premium* for men, whereas there is a *marriage penalty* for women. As far as impact of children is concerned, the *motherhood penalty* in wages for bearing the childcare duties has been the most investigated topic. In connection to that the effect of family-friendly policies, such as the length of maternity and parental leave, on gender wage gap has been investigated, e.g. in Gupta et al. (2008). Also the need for family-friendly workplaces, i.e. workplaces, which make it possible for employees to balance better their family and work commitments, such as flexible work schedule, access to part-time and work from home, have been discussed recently.

In addition, there has been an increasing focus on psychological and socio-psychological factors as possible explanations for gender differences on the labour market. A comprehensive review of this research is given by Bertrand (2010). As shown in the experimental economics literature women tend to be more risk-averse than men, prefer a less competitive work environment, are more altruistic, have stronger preferences for redistribution and finally are less likely to negotiate on behalf of themselves as men (Bertrand, 2010; Borghans et al., 2009). Further, other socio-psychological factors, such as the effect of gender identity and social norms are put forward as possible determinants of the gender differences in the labour market. In particular the hypothesis that as long as the social norm that *men work in the labour market and women work at home* exists, women will have lower motivation to participate in the labour market than men, with consequences on wages and other labour market outcomes (Akerlof and

[3] See for instance Korenman and Neumark (1991), Antonovics and Town (2003), Gupta et al. (2005).

[4] See for instance Mincer and Polachek (1974), Becker (1985), Waldfogel (1998), Joshi and Davies (2002) or Blau et al. (2009).

Kranton, 2000). Further, the theory of preferences points towards different priorities of men and women considering work-family balance (Hakim, 2002 and 2008). Hakim claims that women choose three combinations of lifestyle preferences: home-centered, work-centered, or adaptive; and that these lifestyle preferences are an important determinant of fertility, employment patterns, and job choice. However, empirical research on the role of those psychological and socio-psychological attributes in explaining the labour market outcomes is still in its infancy.

1.4 Women on the Czech Labour Market

In the Czech Republic, similarly to other post-communist countries, gender equality was a highly proclaimed policy goal during the socialist era and evidence shows that the differences in wages between women and men were rather low at that time (Brainerd, 2000). The transition towards market economy has led to an increase in the gender earnings gap similar to those in the developed market economies (Večerník, 2001). Jurajda (2003b) shows that women's hourly wages were up to 30% lower than that of men 1998. According to more recent data the gender median wage gap in the Czech Republic was above the OECD average at around 18% in 2011, see Figure 1–1. The difference in average wages between men and women was around 25% in 2011, see Chapter 5. Jurajda (2005) finds that segregation of women into low-wage jobs is a significant source of wage differences between men and women in the Czech Republic.

There are also some recent studies suggesting that the unexplained part of wage differences between Czech men and women may be caused by their different preferences related to work-family balance, e.g. Křížková et al. (2006), Mysíková (2007), Filipová and Machová (2011). Transition towards market economy brought also increase in the gender gap in labour force participation. As observed from the Table 1–1 the gender gap in the labour force participation in the Czech Republic got larger over time and it is currently around the OECD average at 17%, see Table 1–1. The female labour force participation is in general rather low and even decreased over time, from 64% in 2000 to 62% in year 2011, whereas the male labour force participation rate remained unchanged. Thus, there is surely a great potential for increasing labour force through raising the female labour force participation and in this way solving (at least partly) the increasing fiscal burden in connection with the population aging.[5]

[5] The Czech Republic has one of the lowest fertility rates in the world at around 1.4 children per woman (2011), much below the *replacement* rate of 2.1. Consequently the Czech population is aging dramatically, placing a huge fiscal burden for the future generations.

1.5 Organization of the Book

Chapter 2 written by *Lenka Filipová and Dagmar Brožová* gives an overview of the existing existing theoretical and empirical literature regarding the factors determining differentials on labour market by gender, in particular it reviews literature on gender wage gap. Further, we contribute with our own research based on two different datasets from the Czech Republic. First, we use a linked employer-employee micro- dataset (LEED) based on the Average Earnings Information System (AEIS)[6], which is an official data source collected for purposes of the Czech Statistical Office and the Ministry of Labour and Social Affairs. AEIS encompasses monthly gross wages, hourly wages and working hours as well as personal and job characteristics of individuals. It enables us to investigate wage and gender wage differences in time and account for firm specific fixed effects. However, the set of wage determinants that it is possible to create from this data source is quite limited. It covers traditional wage determinants such as education, tenure and other demographic characteristics, job and firm characteristics. On the other hand, the AEIS does not contain the wage determinants focused in the most recent research literature, i.e. data related to family-career balance, preferences, gender identity or socio-psychological characteristics. Due to these data limitations we have developed our own questionnaire, which covers various aspects of work and family life, preferences, personality and other characteristics of employees and their jobs. A survey using this questionnaire (64 questions in total) was carried out on a representative sample of employees in the Czech Republic in 2011. This unique survey helps us to shed some more light on the factors explaining gender wage gap and to overcome the problem of omitted variable bias mentioned above. Relative to the existing literature, we are able to develop a more comprehensive model of wage determinants and consequently to reduce the unexplained part of the gender based wage gap. *Chapter 3* written by *Jiří Balcar, Lenka Filipová, Petra Vašková and Zuzana Machová* describes the data used in our research and gives a first descriptive analysis of these data. *Chapter 4* written by *Jaromír Gottvald, Petra Vašková and Lenka Janíková* uses the traditional data source (LEED based on AEIS) for evaluation of wage determinants in the Czech Republic and discusses the limitations of this data source. Here, we compare also the unexplained residual estimated using AEIS with the residual estimated on the basis of our survey. *Chapter 5* written by *Lenka Filipová, Mariola Pytliková, Jiří Balcar and Jaromír Gottvald* provides results of analysis of the gender wage gap and discrimination in the Czech Republic using our own survey. This survey is then analysed in more detail in *Chapters 6* and *7*, specifically: *Chapter 6* written by *Lenka Filipová, Lenka Janíková and Jaromír Gottvald* focuses on family factors, family-career balance, preferences and gender identity factors, whereas *Chapter 7* written by *Jiří Balcar* concentrates on soft skills. *Conclusion* part, written by *Mariola Pytliková,* summarizes and provides some policy recommendations.

[6] In Czech it is called *Informační systém o průměrném výdělku* (ISPV).

Chapter 2

Theory and Empirics of Gender Wage Gap and Discrimination

By Lenka Filipová, Dagmar Brožová

The first part of this chapter presents a brief overview of the gender wage gap literature. The second part describes decomposition techniques usually applied to express gender-based wage discrimination.

2.1 Gender Wage Gap

This chapter gives a brief overview of the gender wage gap literature. A more detailed literature review related to the specific topics of gender wage gap and discrimination will be presented in the chapters focused on those specific topics. Gender wage gap has been systematically studied since the early 1970s when Mincer (1974) expressed the relation between human capital (education, age and/or experience) and wages as an equation which started to serve as a methodological base for the research of wage determinants. Later some other authors, e.g. Dickens and Katz (1987), Krueger and Summers (1987) and (1988) or Allen (2001) modified Mincer's wage regression by adding a labour status description (the position in one's employment, working hours, type of employment contract, and qualification requirements), employer's characteristics (company size, commercial and non-commercial sectors, and industries), institutional factors (legal protection of employment and the minimum wage), and regional factors. The economics of discrimination which started with Becker´s seminal study in 1957 has been an important approach when explaining differences in wages of equally productive males and females. Various decomposition techniques are mostly applied to express the part of wage difference that can be explained by objective characteristics of men and women and the unexplained part that may then be ascribed to gender-based wage discrimination. From the methodological point of view, the methods by Oaxaca (1973) and Blinder (1973) or that of Juhn et al. (1993) and their modifications are usually applied. However, as emphasized in the introduction, research studies on this topic have a challenge like all regression analysis with omitted variable bias. If some relevant variables were omitted – and if for instance men were

more highly endowed with respect to these omitted variables – then discrimination would be overestimated. On the contrary, some of the included variables may reflect discrimination (like occupation segregation or tenure and other gender-specific factors) and discrimination would be underestimated. Thus the residual gap cannot directly be seen as a measure of discrimination (Blau and Kahn, 2000).

Women's greater responsibility for children is considered as an important factor in explaining why women earn less than men. Research on this topic can be divided into two groups according to the core of interest which is: (1) marital status, e.g. Hill (1979), Korenman and Neumark (1991), Gray (1997), or (2) children, e.g. Mincer and Polachek (1974), Becker (1985), Joshi and Davies (2002), Fuchs (1988), Blau et al. (2009), Waldfogel (1998). According to Waldfogel and Sigle-Rushton (2007) there can be at least four types of explanations of the gender and especially motherhood gap or penalty in pay. The first, human capital theory (Mincer and Polachek, 1974; Becker, 1985; Polachek, 1995) emphasizes that women generally have lower wages than men because they have lower levels of human capital such as education or training; work experience; and job tenure. Women with children tend to earn even lower wages than other women because they spend more time at home when they have children, are more likely to work part-time, and change employers. Since they anticipate shorter and more discontinuous work lives, they have lower incentives to invest in market-oriented formal education and on-the-job training. Several recent studies prove that career interruptions can explain a sizeable proportion of the gender wage gap (Bertrand et al., 2009) which is commonly explained by the above-mentioned theory of accumulating less human capital. A second explanation for the lower wages of women with children is connected with the trade-off women make between wages and flexibility (part-time jobs, location close to home etc.). Third, the lower wages of mothers are also explained by their lower real or perceived productivity and effort. It is supposed that longer hours that women spend on housework and taking care of children may also decrease the effort they put into their market jobs compared to men or women without children. Fourth, the lower wages of mothers can be explained by a selection. It is supposed that women who anticipate having children and difficulties in combining work and childcare, invest less in human capital and thus have lower wages. On the contrary, women who expect to be higher earners may choose not to have children.

There is also a growing number of studies pointing out the unexpected detrimental effect of family-friendly policies on women's economic attainments. They emphasize that although family-friendly policies enhance women's economic independence by facilitating their participation in the paid economy (OECD, 2001), other forms of gender inequality begin to appear. One of them is a gender-based occupational segregation which is more evident in the women-friendly Scandinavian labour markets than in the liberal market economies like USA and Canada (Jacobs and Gerson, 2004; Jacobs and Lim, 1992; Chang, 2000; Wright et al., 1995). This gender-based occupational segregation is

explained by the increased demand for female labour associated with welfare state expansion which is characterized by the growth of the social service sector. State-sponsored family services such as child care facilities, educational institutions, and care homes for the elderly are female dominated occupations which on the one hand bring job opportunities for women, on the other they are connected with low earnings (Esping-Andersen, 1990; Kolberg, 1991; Gornick and Meyers, 2003).

Over the last ten years psychological and socio-psychological factors have been increasingly considered as possible explanations for gender differences in the labour market. Bertrand (2010) presents a comprehensive review of this research. In respect to psychological attributes, gender differences in risk taking, attitudes towards competition, social preferences and attitudes towards negotiation have been evaluated thoroughly. A lot of experimental literature on this topic has proved systematic differences in the attributes mentioned between men and women. I.e. women are more risk-averse than men, prefer a less competitive work environment, are more altruistic with stronger preferences for redistribution and don´t negotiate for themselves as well as men. Other personality traits that are most frequently researched is the so-called Big Five model, i.e. extroversion, agreeableness, conscientiousness, neuroticism and openness to experience. The research of empirical implications of those psychological attributes for labour market outcomes is in its infancy, but promising, see Duckworth and Quinn (2009), Almlund et al. (2011), Borghans et al. (2009).

The research of socio-psychological factors is methodologically based on the identity model imported into economics from social psychology. Akerlof and Kranton (2000) suggested the utility model according to which one´s identity can influence economic outcomes because behaving differently from what is expected for one´s social category could decrease the person´s utility. Regarding gender identity the impact of social norms about what is appropriate for men to do and what is appropriate for women to do is researched. The identity model could then explain labour force participation or occupational segregation by gender with the impact on wages. As long as the social norm that *men work in the labour market and women work at home* exists, women will have less motivation to participate in the labour market than men. Considering occupational segregation Goldin (2002) assumes that men do not want women in certain jobs because men are afraid of losing the prestige they get from working in those jobs and accepting women as co-workers would threaten their own gender identity. Using data from the World Values Surveys Fortin (2005) analyzed the influence of women´s view of themselves regarding their labour force participation and relative earnings in a sample of 25 OECD countries over a 10-year period. The results show that representation of women as homemakers is quite stable across cohorts and over time, which may have an impact on their labour market outcomes. On the basis of the gender identity model the changes in women´s labour market outcomes are dependent on the changes in meaning of the male and female social categories.

Another approach to evaluating social factors uses the theory of preferences to look at the differences in priorities for men and women considering work-family balance, e.g. Hakim (2002 and 2008). As mentioned in the introduction, Hakim claims that women choose three combinations of lifestyle preferences: home-centered, work-centered, or adaptive and that these lifestyle preferences are an important determinant of fertility, employment patterns, and job choice.

2.2 Gender-Based Wage Discrimination

Discrimination started to be methodologically studied after the publication of Becker´s seminal work (Becker, 1957). After just a short while economists presented an equation to measure discrimination. Discrimination is a multidimensional phenomenon, which can be examined (due to the complexity of social relations) only on the basis of a multidimensional approach. One of the biggest contributions of economics to this research is undoubtedly the method of measuring discrimination, at least approximately. The American economist R. Oaxaca elaborated on this technique and it became known as Oaxaca´s decomposition of wage differential between two groups of workers, which has been a vital part of *labour economics* since the 1970´s. This approach was further developed by other authors, e.g. A. Blinder.

2.2.1 Regression Model

Regression analysis is the technique that is often used to measure earnings differences according to gender. Regression equation describes the relations between a dependent variable (Y) and explanatory variables (X_i).

A regression equation (2.1) has the general form:

$$Y = \alpha + \beta_1 Xi_1 + \beta_2 Xi_2 + \beta_3 Xi_3 + \cdots \mu i, \qquad (2.1)$$

where Y is the dependent variable, X_{is} are the independent variables, those that are determining the result, Y. μ is the error term and represents the influence of factors that affect Y but are unobserved and aren´t included in the model. α and β are the regression coefficients, α is the constant term and β measures the effect on Y of a one unit change in X, if the value of all the other X variables are constant (ceteris paribus). Regression analysis uses the statistical information on the values of Y and the Xs to estimate the values of coefficients α and β for each separate X variable.

In the regression analysis gender wage differentials are dependent variables of the earnings of two groups of workers, men and women, so called gender pay gap. Explanatory variables are the factors that affect these earnings.[7]

[7] For more detailed analysis see Hoffman and Averett (2010), chap. 10.

2.2.2 The Oaxaca-Blinder Decomposition[8]

The principal idea of the Oaxaca Blinder decomposition of wage differential is based on the fact that every wage differential between two groups of people, defined for example by gender, can be divided into two parts. An explained part, that is related to differences in factors determining the earnings, and the residual, unexplained part. This part can be seen as a quantitative indicator of the degree of discrimination.

The first step consists in identification of the factors – determinants of differences in earnings of men and women. The earnings depend on investments in human capital, on number of years of education and on number of years of work experience. These investments depend on innate skills and endowment, and on personal characteristics: responsibility, carefulness, purposefulness, persistence, willpower.

The persons with greater endowments of these characteristics acquire new knowledge more easily and with less effort than those less endowed. They acquire skills and competences with lower costs, so they study and invest in their human capital more often and much more than the less endowed ones. The number of years of work experience also belongs to human capital, because these increase its value. Other determinant characteristics of earnings are, for example, the age of the worker, professional market (or branch), the size of the firm, where one works, the size of the town or village, where one lives, or the region where the firm is, and so on. These factors determining earnings are then written as explaining variables into the earnings functions of men and women and their influence on the level of their earnings is identified, respectively the influence of wage differential between men and women. The part of the wage differential that remains unexplained by these observed determinants is then ascribed to discrimination. That is why this methodological approach is described as *residual*, because it describes the unaccounted-for remainder from the difference between earnings of men and women, by the factors observed, and then elaborated into the model.

The earnings equation (2.2) can be written:

$$Earnings = \alpha + \beta_1 x\ years\ of\ education + \beta_2 x\ years\ of\ work\ experience + \beta a\ x\ age + \beta g\ x\ gender + \ldots \mu,^{9} \quad (2.2)$$

where *years of education* and *years of work experience* are continuous variables, easily interpreted numerical values, 13 or 18 years of education for example. Constant term α represents the basic earning without investment in human capital and in other characteristics affected productivity of labour and without investment in work experience. Coefficients β in equation represents the impact

[8] This classical procedure see Oaxaca (1973), and further development and enrichment see Blinder (1973), Oaxaca and Ransom (1994), Juhn et al. (1993), Oaxaca and Ransom (2010).

[9] Hoffman and Averett (2010), p. 338, adjusted.

on earnings of having one more year of education or one more year of work experience. *Gender* do not have numerical values, variables like these are included in a regression by using a *dummy* variable: let X = 0 if a person is male and let X = 1 if a person is female. Regression coefficient for the dummy variable gender measure the impact on earnings of being female (rather than male). For example, if the estimated regression coefficient on a female dummy variable is negative, it means that women have lower earnings than men, ceteris paribus.

In the simplest version we suppose only one factor determining earnings – education (denoted by s). The average male wage can be indicated w_m and the average female wage can be indicated w_f, while the difference in mean wages we can written $\Delta w = w_m - w_f$.

The earnings functions for men (2.3) and women (2.4) describe the dependence of earnings on the number of years of education for each of the two groups, which can be written as:

$$w_m = \alpha_m + \beta_m s_m \text{ for men,} \quad (2.3)$$

$$w_f = \alpha_f + \beta_f s_f \text{ for women,} \quad (2.4)$$

where α_m and α_f describe earnings of men and women for their skills with zero years of education, if employers valued the skills of men and women who have zero years of education equally: $\alpha_m = \alpha_f$. β_m and β_f are coefficients, expressing by how much a man´s and woman´s wage increases if he or she gets one more year of education, if employers valued the education acquired by women as much as they value the education acquired by men , these coefficients would be equal: $\beta_m = \beta_f$.

Raw wage differential (2.5) can be written:

$$\Delta_w = w_m - w_f = \alpha_m + \beta_m s_m - \alpha_f - \beta_f s_f, \quad (2.5)$$

where s_m *a* s_f is the mean quantity of education of men and the mean quantity of education of women (in the number of years).

It is possible to modify the wage differentials (Borjas, 2010): to add and subtract the term $\beta_m s_f$ to the right – hand side of equation, and the terms in the equation can be rearranged and rewritten (2.6) in the form:

$$\Delta w = (\alpha_m - \alpha_f) + (\beta_m - \beta_f)s_f + \beta_m(s_m - s_f), \quad (2.6)$$

where part $(\alpha_m - \alpha_f) + (\beta_m - \beta_f)s_f$ expresses the discrimination and $\beta_m(s_m - s_f)$ expresses the difference in skills originating from education.

The equation breaks down the raw wage differential in two parts. The second term on the right – hand side of equation describes the difference arising from different quantum of education. If men and women have the same average quantum of education, the second term would be zero ($s_m - s_f = 0$). If the average quantum of education for men and women differs, it is clear that part of the wage differential arises because the two groups differ in their skills originating from education.

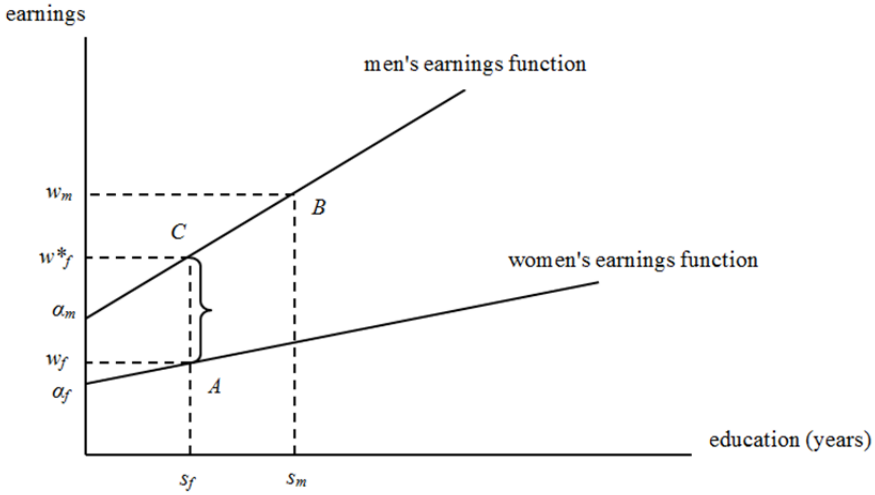

Figure 2–1 The impact of discrimination on wage
Source: Borjas (2010)

The first term represents this unexplained part from education, residuum-part, which has been seen as an indicator of discrimination. It has a positive value if employers appreciate a man´s education more than they value a woman´s education. ($\beta_m > \beta_f$) or if employers pay men more than women for any level of education. The intercept of the earnings function with axis y is higher for men than for women ($\alpha_m > \alpha_f$). The wage gap that arises from this differential treatment of men and women is defined as discrimination.

Figure 2–1 describes the graphical interpretation of the Oaxaca decomposition. The relation between earnings and education attendance is illustrated by the earnings functions of men and women. The steeper the earnings function is and the higher the point in which intercepts the axis y, the higher the evaluation of men in comparison with women by the firms.

The starting position of men is more advantageous. Their abilities and skills are better awarded by higher payment than women even if the two groups have no education attendance. Men have also higher income resulting from additional years of education than women. The wage differential between men and women in the figure is presented by the vertical difference. $w_m - w_f$ and it arises with the growing number of education years. Women have in average s years of schooling and their average earning is w (point A). Men have in average s_m years of education and earn w_m (point B). That part of the wage differential arises from the fact that men have in average more years of education than women. The difference ($w_m - w^*_f$) is the part of differential that is the consequence of different education (line segment BC on the earnings function). If a given woman is paid the same as a given man with the same level of education, they

acquire w^*_f (point *C*). The discrimination is then measured by the difference (w^*_f – w_f, respectively line segment AC).

It is obvious that the validity of this method of measuring discrimination depends on the extent to which we are successful in defining, describing and including in the model all the factors determining different earnings of men and women: number of years of work experience, age, marital status, the size of the firm, the size of the residence, region etc. If some of them are not included in the regression model, its evidence about the extent of influence of discrimination on the earnings would be appreciably devalued. In reality, it is impossible to include all the relevant factors determining the level of earnings. For instance, the difference in quality of education acquired by both groups cannot be included. When men and women attend educational institutions of varying quality, the Oaxaca decomposition generates a difference that is attributed to discrimination, when, in fact, the skills acquired differ. Another factor that is difficult to include in the model is individual effort or motivation, which varies from case to case, and can stem from purely personal incentives or preferences. The unexplained part of wage differential, the so-called residual part, comprises also the part that cannot be explained by the model due to lack of information about characteristics of men and women and omission of further relevant characteristics influencing differences in earnings. Therefore this unexplained part of wage differential should be interpreted not as a quota attributed to discrimination, but *as the maximum possible upper limit of wage discrimination.*

This procedure can be extended. Other explanatory variables can be incorporated into the model and the equation can be converted into a logarithmic form that facilitates the interpretation. The equation (2.7) can be expressed by the natural logarithm of wages (Stupnytsky, 2007):

$$lnw_i = \alpha + \beta_1 s_i + \beta_2 a_i + \beta_3 b_i + \beta_4 X_i + e_i, \qquad (2.7)$$

where *s expresses* number of years of education, *a* is number of years of work experience, *b* is age, X_i are the other explanatory variables (e.g. branch, company size, size of settlement, region, proportion of women in the company), e_i expresses residual part.

Earnings functions for men (2.8) and women (2.9) have the following form:

$$lnw_{mi} = X_{mi}\beta_{mi} + \varepsilon_i \text{ for men,} \qquad (2.8)$$

$$lnw_{fi} = X_{fi}\beta_{fi} + e_i \text{ for women,} \qquad (2.9)$$

where lnw_{*i} is the natural logarithm of wages and *X* is vector the other explanatory variables.

The wage differential can be written (2.10) in the form (Stupnytsky, 2007):

$$lnW_m - lnW_f = (X_m - X_f)\beta_m + (\beta_m - \beta_f)X_f + \varepsilon - e, \qquad (2.10)$$

where the first part of the term on the right – hand side of equation represents the explained part (from different characteristic men and women), the second remains unexplained and represents discrimination.

Beblo et al. (2003) break down the gender wage gap in accordance with the general approach by Oaxaca-Blinder into two parts. The first part of decomposed gender wage gap is explained by differences in observable characteristics of human capital, endowment, and the other different, for the job issues relevant, characteristics between the two groups. This part is called endowment effect. It actually reflects differences in work productivity between men and women. The second part of wage differential represents differences in evaluation which is attributed to male and female characteristics, which is therefore the price, respectively the remuneration for endowment and talent, which is afforded these by society – it is called remuneration effect. It is this second part that is often interpreted as wage discrimination.

Provided that $lnw^J = X^J\beta^J$ (for all J = *M, F),* decomposition of wage differential (2.11) by Beblo et al. (2003):

$$\underbrace{(lnw^M - lnw^F)}_{\text{raw wage differential.}} = (lnw^M - lnw^{*F}) + (lnw^{*f} - lnw^F), \qquad (2.11)$$

The term in the first parentheses on the right side of the equation denotes the hypothetical wage differential if women had the same wage structure as men. The term in the second parentheses indicates the disparity between the hypothetical wage rate for women and their actual mean wage, provided that we consider male prices (possibly a weighted price vector as reference). When using female prices as reference, the wage decomposition might offer diverse results. These alternatives and their practical outcomes are presented in particular in the paper of Oaxaca and Ransom (1994).

Decomposition (2.12) of the gender wage gap into *endowment effect* and *remuneration effect:*

$$(lnw^M - lnw^F) = \underbrace{(X^M - X^F)\beta^M}_{\text{endowment effect}} + \underbrace{X^F(\beta^M - \beta^F)}_{\text{remuneration effect}}, \qquad (2.12)$$

where vector β^M represents non-discriminatory, i.e. male wage structure, vector β^F represents female wage structure and $lnw^{*F} = X^F\beta^M$.

These authors also present their opinions on the two aspects of the classic approach of Oaxaca and Blinder. The first is concerned with the reference group. Which structure of earnings should be considered as non-discriminatory? The classical approach of Oaxaca (1973) and Blinder (1973) assumed both possibilities, to consider as non-discriminatory either the earnings structure of men or the earnings structure of women. The use of one earnings structure as the referential one, as shown by Beblo et al. (2003), brings potential assymetrics in discovered effects. Other authors consider as non-discriminatory the structure obtained as an average of earnings structures of men and women, while the importance is determined by the relative size of the respective group (Cotton, 1988), which substantially eliminates the above mentioned problem. Neumark

(1988) works with one structure created on the base of all the set of men and women. Oaxaca and Ransom (1994) show that the results of wage differentials decompositions are significantly influenced and they use the combination with representation of male and female wage structure.

The second aspect of critics of Oaxaca-Blinder approach is the observation that it works with wage decomposition of average, which may conceal a great number of potential influences on wage distribution.

Juhn et al. (1993) elaborated a method explaining the profile of wage gap across the whole distribution of wages. Because each of these wage decompositions is based on wage equations estimation, it is necessary to use a consistent technique of this estimation. The wage equations are estimated while using individual characteristics (e.g. human capital, age, etc.) and other characteristics (referring to the firm, region) as explaining variables. The human capital and characteristics of work of men and women are used to enumerate the weighted averages for the group of men and women. This part reflects the differences in work productivity (*endowment effect*). The second part of wage differential represents the differences in remuneration for respective characteristics (*remuneration effect*).

Furthermore, Juhn et al. (1993) described wage differentials according to quantile distribution of wages. This approach enabled them to obtain additional information about the nature of gender wage inequalities. The principal characteristic feature of their approach is the decomposition of wage differential according to diverse qualities of quantile distribution of wages. The method of decomposition (2.13) enables the analysis on the level of quantiles:

$$\Delta lnW_q = \underbrace{\left(X_q^M - X_q^F\right)\beta^M}_{\substack{endowment \\ effect}} + \underbrace{X_q^F(\beta^M - \beta^F)}_{\substack{remuneration \\ effect}} + \underbrace{\left(\varepsilon_q^M - \varepsilon_q^F\right)}_{\substack{unobservable \\ effect}}, \qquad (2.13)$$

where Xq represents the sample mean of X for quantile q.

The Juhn-Murphy-Pierce decomposition is often used in studies discussing the gender wage gap between men and women over time or across countries, since the quantiles are not influenced by the real or nominal level of wages.

Chapter 3

Data and Descriptive Analysis of Gender Wage Gap in the Czech Republic

By Jiří Balcar, Lenka Filipová, Petra Vašková, Zuzana Machová

This chapter starts with a description of data used in our research followed by descriptive analysis of the gender wage gap in the Czech Republic (CR) in 2011.

3.1 Data Description

The most common, *canonical* data source used for analysis of the wages structure in the Czech Republic is Average Earnings Information System (AEIS), which is provided by the Czech company Trexima. There are other sources like the survey of household income or The European Union Statistics on Income and Living Conditions (EU-SILC) – both carried out by the Czech Statistical Office.

AEIS is the only official source – in the Czech Republic – of information on wages in particular occupations based on individual data (Trexima, 2012a). This data is obtained from the business, as well as the non-business sector. Economic subjects in the non-business sector are all included in the survey (sample probability equals 1). Data for companies in the business sector with more than 250 employees are all included in the survey and simple stratified random sampling without replacement is used for companies up to 250 employees. The stratification is based on firm size, region and NACE. As data is collected differently it is appropriate to carry out analyses separately for business and non-business sector (Trexima, 2012b). The survey in 2011 included 4,823 economic entities in business sector with 1.5 m employees and 13,371 economic entities of non-business sector with 556,000 employees.

The Average Earnings Information System has data about monthly gross wages, hourly wages and working hours as well as personal and job characteristics of individuals. It makes it possible to study wage and gender wage differences over time or firm fixed effects. However, the data contain all of the

traditional wage determinants such as education age, gender and citizenship; job characteristics like full-time/part-time job, occupation; institutional factors such as industrial sectors according to NACE, ownership, size of firms, classification of wage bargaining system and location of firm. On the other hand, it is not possible to use this data source for evaluation of the newly proposed wage determinants related to family-career balance, preferences, gender identity model or socio-psychological characteristics. In order to get such *modern* wage determinants we have created our own questionnaire. On the basis of this questionnaire (64 questions) a survey was carried out on a representative sample of employees in the Czech Republic in 2011.

The questionnaire covers the following employee characteristics and topics:

- respondents characteristics such as gender, region etc. obtained automatically by the survey criteria,
- characteristics of families and households,
- information about the respondents and his/her partner´s income,
- education,
- work experience, current and previous job and workplace characteristics,
- preferences – job related,
- preferences – related to family and life roles,
- psychological characteristics,
- health/beauty characteristics.

The complete questionnaire is reproduced in Appendix 1.

The survey was conducted as face to face computer assisted personal interviews (CAPI). The respondents were citizens of the Czech Republic. The main points of the data collection were:

- Date: 23 October – 14 November 2011,
- Population of respondents: employees aged 25 – 54 years (representative sample for the Czech Republic),
- Selection of respondents: quota sampling; quota characteristics: gender, age, education, region, community size representative sample for the Czech Republic,
- There were a total of 481 trained interviewers participating in the questionnaire collection,
- 1,984 questionnaires were collected in total,
- The average interview length was 31 minutes.

The sample was chosen to be representative for the Czech Republic on the basis of the following criteria of population structure: sex, age, highest achieved education, region and size of municipality of residence. Respondents were chosen randomly according to quotas in the home area of interviewers, unless otherwise agreed. The interviews were conducted in the respondents' home, and only one person per household was interviewed. All respondents were asked at the end of interview whether they would be willing to take part in the second stage of the survey.

Given the method of data capture (CAPI), maximum control was ensured by using an electronic questionnaire. The CAPI system ensured correct and complete filling of questionnaires and disqualified inappropriate respondents. Further logic data control was carried out on the exported data in SPSS. This part of control focused on deeper logical relations among variables and control of answers in the open questions. In the case of incomplete or ambiguous answers, respondents were asked again in order to make the answers more precise. Data was then supplemented by the employer identification number and ISCO 88 classification on the basis of respondents' description. By reason of ISCO classification the relevant variables (education, gender, occupation name, job description and name of employer) were recorded to the web application of the partner agency Gallup Europe.

The field control by phone included 30% of all questionnaires. On the basis of this control, 21 questionnaires from 5 interviewers were excluded from the database. The whole process resulted in a unique, quality survey which can help us to shed some light on the factors influencing gender wage gap as a whole.

3.2 Descriptive Analysis of Gender Wage Gap in the Czech Republic in 2011 Using AEIS Data

This part provides descriptive analysis of data separately for business and non-business sector in 2011 using AEIS data source.

3.2.1 Wage Differences

The mean gross hourly wage was 189.48 CZK/hour in business sector and 174.08 CZK/hour in non-business sector (see Table 3–1). Looking at hourly wages by gender, men have higher wages in business sector, whereas women have higher wages in non-business sector. Another pattern is that men's wages are higher than women's wages in both of sectors but the difference is greater in business sector than in the non-business. This is the consequence of the fact that the distribution of wages is more uniform in the non-business sector than in the business one.

Table 3–1 Hourly wages

Hourly wage (CZK/hours)	Business sector			Non-business sector		
	Total	Male	Female	Total	Male	Female
- *Mean*	189.48	211.99	159.62	174.08	192.82	164.32
- *St. Dev*	1890.23	279.65	2864.96	76.51	90.17	66.26

Source: AEIS

3.2.2 Education and Work Experience

The educational structure of respondents in Table 3–2 shows that the most common level of educational attainment reached by men is secondary vocational education with certificate in business sector and tertiary education in non-business sector. In the case of women it is mainly secondary and post-secondary education in both sectors. It is evident that employees in the non-business sector

Table 3–2 Education

Indicator (share in %)	Business sector			Non-business sector		
	Total	Male	Female	Total	Male	Female
„Non stated"	1.37	1.16	1.64	0.01	0.01	0.01
Incomplete or complete basic education (KKOV A, B, C)	8.91	7.29	11.07	5.54	4.43	6.12
Lower secondary education (KKOV D, E, J)	3.26	3.06	3.51	2.98	1.96	3.51
Secondary vocational education with certificate (KKOV H)	36.35	41.09	30.06	13.3	16.45	11.66
Secondary and post-secondary education (KKOV K, L, M, N)	35.11	30.90	40.70	44.25	37.91	47.55
University education (KKOV R, T, V)	15	16.50	13.02	33.93	39.25	31.16

Source: AEIS

achieve a higher level of education and there are also a number of employees whose education is unknown.

The work experience can be approximated by employee's age. The mean age of men and women is very similar but it varies according to sector. Women are about 4 years and men about 3 years older in non-business sector than in the business sector. However, women have generally less work experience than men due to maternity leave. Focusing on work experience related to current employer – tenure, it is 8.66 years on average in business sector and 10.95 years in non-business sector. Women are employed for a longer time by the same employer in non-business sector whereas men in business sector (see Table 3–3).

Table 3–3 Experience

Indicator (mean)	Business sector			Non-business sector		
	Total	Male	Female	Total	Male	Female
Age	40.42	40.49	40.31	43.99	43.12	44.45
Tenure	8.66	9.76	7.99	10.95	10.69	11.36

Source: AEIS

3.2.3 Gender and Citizenship

In Table 3–4, we can see that there were about one third more men than women in the business sector in 2011. More women than men were employed in non-business sector and the difference in employment share is greater in this sector than in the business one. In this sector about twice as many women as men were employed in 2011.

Now if we focus on structure by citizenship we can see that more than 99% of employees in the non-business sector have Czech citizenship while in business sector it is about 95%. Slovak citizenship has the second highest representation in both sectors and there are no significant differences between genders.

Table 3–4 Gender and citizenship

Indicator (share in %)	Business sector			Non-business sector		
	Total	Male	Female	Total	Male	Female
Gender	100	57	43	100	34.2	65.8
Citizenship						
Czech citizenship	94.90	94.30	95.69	99.22	99.27	99.19
Slovak citizenship	2.59	2.82	2.28	0.55	0.51	0.58
EU 15 + EFTA + OECD citizenship	1.02	1.32	0.63	0.07	0.08	0.07
Other EU countries citizenship	0.45	0.57	0.29	0.01	0.02	0.01
Former USSR countries citizenship	0.48	0.36	0.65	0.11	0.07	0.13
Other countries citizenship	0.55	0.62	0.46	0.03	0.05	0.02

Source: AEIS

Table 3–5 Occupation

Indicator (share in %)	Business sector			Non-business sector		
	Total	Male	Female	Total	Male	Female
Armed Forces (ISCO 0)	–	–	–	3.18	8.27	0.53
Managers, senior officials and legislators (ISCO 1)	4.76	5.61	3.63	5.16	6.38	4.53
Professionals (ISCO 2)	12.05	12.46	11.50	33.62	24.90	38.16
Technicians and associate professionals (ISCO 3)	17.27	15.15	20.08	27.33	28.96	26.48
Clerks (ISCO 4)	8.55	4.96	13.30	5.88	2.55	7.61
Service and sales workers (ISCO 5)	11.71	6.33	18.84	13.45	13.94	13.20
Skilled agricultural, fishery, and forestry workers (ISCO 6)	0.42	0.36	0.49	0.24	0.39	0.17
Craft and related trades workers (ISCO 7)	16.41	23.76	6.67	1.31	3.33	0.26
Plant and machine operators and assemblers (ISCO 8)	22.77	26.52	17.80	1.88	4.72	0.41
Elementary occupations (ISCO 9)	6.07	4.85	7.68	7.94	6.57	8.56

Source: AEIS

3.2.4 Job Characteristics

Main occupation classes according to the classification of occupation (ISCO) are contained in Table 3–5.

Classes Plan and machine operators and assemblers are the biggest group in the business sector followed by Technicians and associate professionals. Professionals and Technicians and associate professional are the most represented in non-business sectors where both classes employed two thirds of employees within the non-business sector. The greatest differences by gender are in class Craft and related trades workers, which has a relatively high proportion

of men. Within class Service and sales workers the opposite is the case. The structure is similar for both genders within the non-business sector.

Table 3–6 shows that full-time work was more prevalent in the non-business sector and among men.

Table 3–6 Work load

Indicator (share in %)	Business sector			Non-business sector		
	Total	Male	Female	Total	Male	Female
Full-time job	81.33	84.73	76.83	89.86	93.59	87.92
Part-time job	18.67	15.27	23.17	10.14	6.41	12.08

Source: AEIS

3.2.5 Firm Characteristics

Structure of data file by firm characteristics is contained in Table 3–7. The most employees work in the business sector. Regarding industrial sectors (according to CZ-NACE classification), there are more employees in Manufacturing than in Services. In the non-business sector the majority of employees are employed in *Public administration and defence, compulsory social security* (42.67% in total and 61.53% of men). Regional composition in both sectors does not differ greatly. The least employees were employed in firms in region Karlovy Vary and the most were in Prague. This was the case for both sectors.

Firm size is fairly similar for both sectors; the least employees are employed by firms of less than 9 employees and the most by firms with more than 1,000 employees. Looking at differences according to gender, we can see differences occur in non-business sector where women are employed almost half as much as men in firms with more than 1,000 employees and more than double in firms with employees between 10 and 49.

Ownership differs greatly by sectors. More employees work in foreign firms than in domestic firms, whilst, logically, these forms of ownership do not occur at all in non-business sector. We can see only state and communal ownership in the non-business sector, where women work more in firms of communal ownership and men in firms of state ownership.

Another firm characteristic that is looked at is the type *collective agreement*. Regarding business sector, employees mostly work in firms with arranged collective agreement on firm level, next in firms without any collective agreement and at the bottom of the Table 3–7 firms with collective agreement on higher than firm level. Only 2.5% of the data of this sector did not state the type of the agreement. The type of the agreement was not stated for 90% of employees in non-business sector and if we consider the stated cases there are mostly collective agreements on firm level and the rest is on higher than firm level.

Table 3–7 Firm characteristics

Indicator (share in %)	Business sector			Non-business sector		
	Total	Male	Female	Total	Male	Female
Regions (NUTS3)						
Prague	19.13	19.08	19.2	20.98	23.00	19.93
Central Bohemia	10.15	10.38	9.84	8.31	7.68	8.63
South Bohemia	5.57	5.14	6.12	5.56	5.93	5.37
Plzeň	5.53	5.51	5.56	5.1	4.78	5.26
Karlovy Vary	2.46	2.22	2.77	2.55	2.63	2.51
Ústí	7.08	7.03	7.14	6.84	6.79	6.87
Liberec	3.59	3.52	3.69	3.35	3.50	3.27
Hradec Králové	4.66	4.49	4.88	5.04	5.12	4.99
Pardubice	4.83	4.64	5.09	4.08	4.15	4.05
Vysočina	4.26	4.56	3.85	4.72	4.42	4.88
South Moravia	9.92	9.85	10.00	11.53	11.40	11.59
Olomouc	5.26	5.21	5.32	6.39	7.20	5.97
Zlín	4.95	4.64	5.37	4.45	3.74	4.82
Moravia-Silesia	12.62	13.72	11.16	11.11	9.66	11.86
Industries (NACE)						
Agriculture, forestry and fishing	1.31	1.60	0.93	0.03	0.06	0.02
Mining and Quarrying	2.12	3.30	0.55	–	–	–
Manufacturing	40.25	45.18	33.71	–	–	–
Electricity, Gas, Steam and Air conditioning supply	1.27	1.72	0.67	0.00	0.00	0.00
Water Supply; Severage, Waste management and remediation activities	1.63	2.20	0.88	0.54	1.23	0.18
Construction	3.78	5.67	1.27	0.00	0.00	0.00
Wholesale and retail trade; repair of motor vehicles and motorcycles	12.25	7.33	18.77	–	–	–
Transportation and Storage	10.22	11.51	8.51	1.24	2.94	0.36
Accommodation and food service activities	1.33	0.81	2.02	0.65	0.33	0.81
Information and communication	3.54	4.12	2.78	0.05	0.07	0.04
Financial and insurance activities	4.52	2.76	6.85	–	–	–
Real estate activities	0.31	0.36	0.24	0.19	0.29	0.13
Professional, scientific and technical activities	2.06	2.01	2.11	0.53	0.68	0.44
Administrative and support service activities	5.94	6.08	5.76	0.04	0.07	0.02
Public administration and defence; compulsory social security	0.52	0.18	0.98	42.67	61.53	32.86
Education	3.22	2.92	3.61	31.05	16.28	38.74
Human health and social work activities	4.77	1.57	9.01	18.81	11.50	22.62
Arts, entertainment and recreation	0.42	0.28	0.61	3.8	4.68	3.34
Other service activities	0.54	0.39	0.73	0.41	0.35	0.44

Indicator (share in %)	Business sector			Non-business sector		
	Total	Male	Female	Total	Male	Female
Size of firm						
1 – 9 employees	0.26	0.27	0.26	4.84	3.72	5.42
10 – 49 employees	1.72	1.86	1.53	23.27	13.42	28.40
50 – 249 employees	12.9	13.02	12.74	25.55	19.81	28.53
250 – 999 employees	40.11	40.96	38.98	13.29	14.87	12.46
Above 1000 employees	45.01	43.88	46.50	33.06	48.18	25.19
Ownership						
Private	28.13	31.46	23.79	–	–	–
Cooperative	1.56	0.75	2.65	–	–	–
State	17.7	16.58	19.23	47.84	59.42	41.81
Communal	–	–	–	52.16	40.57	58.18
Associations, political parties and churches	0.76	0.41	1.22	0.00	0.01	0.00
Foreign	51.73	50.8	53.11	–	–	–
„Non-stated“	0.12	–	–	–	–	–
Collective agreement						
„Non stated“	2.60	2.51	2.72	89.18	87.03	90.30
Doesn‘t exist	28.41	25.47	32.31	–	–	–
On firms level	63.81	65.54	61.52	9.18	9.71	8.91
Higher	5.18	6.48	3.45	1.64	3.26	0.79

Source: AEIS

3.3 Descriptive Analysis of Gender Wage Gap in the Czech Republic in 2011 Using Our Survey Data

Appendices 2, 3 and 4 provide a descriptive statistics of the variables from our questionnaire data.

3.3.1 Income and Financial Dependency on Individual's Economic Activity

Since data were gathered with the intention of analysing wage differences, the data description should start with this category. The mean gross monthly wage from main job declared by respondents was 20,198.91 CZK (standard deviation 7,919.91 CZK).[10] Considerable wage differences were identified between genders, because women earn 77.80% of men's wages. The mean gross monthly wage reaches 22,558.98 CZK (standard deviation 8,434.87 CZK) in case of men and 17,550.09 CZK (standard deviation 6,331.19) in case of women.

The wage level, however, does not say anything about the financial dependency of an individual on economic activity. It was approximated by influence of loss of individual's income on family's standard of living. Results in

[10] The mean of gross monthly wage was counted on the basis of whole sample, where 93.55% of respondents have full-time job (95.80% of men and 91.03% of women) and 6.45% have part-time job. However, the mean of gross monthly wage is not significantly affected by part-time workers, because the average gross wage of fulltime workers is 20,516.23 CZK.

Table 3–8 show that an income of 81.96% of respondents is very important for family's standard of living, because its loss would lead to a significant decrease. This pressure is slightly higher in case of men (83.68%) than in case of women (80.08%).

Table 3–8 Impact of losing respondent's total income on family's standard of living

Indicator (share in %)	Total	Male	Female
Standard of living WOULD significantly decrease	81.96	83.68	80.02
Standard of living WOULD NOT significantly decrease	18.04	16.32	19.98
Total	100.00	100.00	100.00

Source: Questionnaire

3.3.2 Education and Work Experience

The educational structure in Table 3–9 shows that most often the level of educational attainment reached by men is lower secondary education (44.08% of men in comparison with 32.80% of women) and higher secondary education in case of women (38.46% of women in comparison with 32.16% of men). Higher levels of education, i.e. higher professional schools and tertiary education (not segregated into different degrees), do not embody as significant gender differences as were described, but there is a prevalence of women.

Generally, humanities and technical sciences are the most frequent fields of study (47.38% and 39.52% of respondents respectively). They are followed by agriculture and forestry (4.99% of respondents), health and medical fields of study (4.46%), natural sciences (2.77%), art (0.71%) and military sciences (0.20%). There are, of course, huge differences in representation of genders among particular fields of study. Men are overrepresented in technical sciences (61.35% of men compared to 15.06% of women), agriculture and forestry (6.01% of men compared to 3.84% of women) and military (0.38% of men compared to no women), while women are overrepresented in humanities (28.53% of men compared to 68.48% of women), health and medical fields of study (1.05% of men compared to 8. 23% of women), natural sciences (2.48% of men compared to 3.10% of women) and art (0.19% of men compared to 1.28% of women). It is obvious that different fields of study are rewarded differently on the labour market.

A match of field of study and the job is, however, also a very important factor for an individual's productivity and subsequently for his/her wage (but also for efficiency of expenditures on education). The results in Table 3–10 show that 59.08% of people work in a job entirely or partly related to their field of study, while 27.67% of them work in a totally different area. Although there is nearly no difference between genders among those working in field of their study (the difference of 1.23 pp.), it is sharpened by focusing only on those who reported entire match of job and field of study (the difference of 4.09 pp.).

Table 3–9 Educational attainment

Indicator (share in %)	Total	Male	Female
Basic school	4,28	4,10	4,49
Lower secondary education	38,76	44,08	32,80
Higher secondary education	35,13	32,16	38,46
Higher professional school	6,35	4,96	7,91
University, bachelor degree	5,29	3,82	6,94
University, master degree	10,08	10,69	9,40
University, doctor degree	0,10	0,19	0,00
Total	100,00	100,00	100,00

Source: Questionnaire

Table 3–10 Match of job and field of education

Indicator (share in %)	Total	Male	Female
Entirely match	30.75	28.82	32.91
More or less match	28.33	29.68	26.82
Rather do not match	13.26	14.69	11.65
Entirely do not match (I work in other field)	27.67	26.81	28.63
Total	100.00	100.00	100.00

Source: Questionnaire

Total work experience of respondents, including current employer, is 16.38 years in average (standard deviation 8.81 years). The mean work experience of men is 3.05 years longer than work experience of female, which can be put down to women's absence from the labour market due to maternity leave. Men's mean work experience is 17.82 years (standard deviation 9.02 years) and women's is 14.77 years (standard deviation 8.27). Looking at how long the respondent has worked for the current employer, it is 7.43 years in average (standard deviation 6.53 years) for all respondents. However, men's tenure is 1.23 year longer on average in comparison with women. Mean tenure is 8.01 year (standard deviation 6.88 years) in case of men and 6.77 years (standard deviation 6.05 years) in case of women. Both work experience and tenure were found statistically significant wage determinant in many studies (e.g. Altonji and Williams, 2005; Abowd and Kang, 2002; Topel, 1991; Altonji and Shakotko, 1987), which led to their consideration also in this study. Men also change their employers more often than women (3.08 and 2.93 employers, where the respondent had main job for more than 6 months, respectively), although the difference is not substantial.

It can be assumed that on-the-job education/training plays a significant role in the determination of labour market outcomes (such as employment, prestige or wage). The survey shows that informal education is the most common form of further development of an individual, because self-education, e.g. in the form of reading books relevant for a job, was undertaken by 33.72% of respondents in last 12 months, see Table 3–11. Similar share of respondents (31.05%) stated also education/training provided by employer. Personal development through

Table 3–11 Education/training relevant for performed job in last 12 months

Indicator (share in %)	Total	Male	Female
Education/training provided by employer	31.05	32.16	29.81
Education/training not provided by employer	13.16	11.26	15.28
Self-education (reading books related to jobs etc.)	33.72	31.20	36.54
Total	100.00	100.00	100.00

Source: Questionnaire

activities ensured by the individual himself/herself (without any financial support from an employer) is rarer, because it was identified for 13.16% of respondents.

It is also possible to find some gender differences in usage of these forms of personal development. Employers provide education/training to men more often (the difference 2.35 pp.), while women work on their development by their own through self-provided education/training (the difference 4.02 pp.) or informal education (the difference 5.34 pp.).

3.3.3 Job Characteristics and Preferences Related to Them

The respondents were asked how they did get their current job. Personal recommendation is the most common way of getting a job in the Czech Republic (in 30.09% of cases) followed by getting information on the vacancy from friends, family etc. (24.50% of cases), see Table 3–12. It corresponds to other studies (e.g. Fernandez and Weinberg, 1997) showing the importance of individual's social capital for finding a job. It also suggests low efficiency of job intermediation by the employment office, because it was mentioned only by 6.15% of respondents. Surprisingly, there are only negligible differences in using mechanisms/ways of obtaining job mentioned between genders. The most significant differences – though still small in magnitude – can be found in the case of recommendation, which is more typical for women (the difference 2.29 pp.), and direct offer from an employer, which is more typical for men (the difference 2.83 pp.).

Since job characteristics can influence wage level significantly, they were taken into account as well. However, the survey focused mainly on the characteristics connected with a need to balance work and family life and so they can be gender sensitive. Respondents have the opportunity to use flexitime in 28.63% of cases (30.06% of men, 27.03% of women), change of workload from fulltime to part time and vice versa in 18.15% of cases (15.27% of men and 21.37% of women) and work from home in 10.89% of cases (11.74% of men, 9.94% of women). As we can see, the most significant gender difference can be identified in the case of change of workload (the difference of 6.10 pp.) It suggests that women may prefer employers who can offer part time jobs.

Respondents were questioned about their preferences on chosen job characteristics. Since it is to be expected that everybody would prefer a better job characteristic, it is related to wage. Thus, the respondents have to choose between the generally preferred job characteristic and wage level. The importance of job security, job flexibility, personal self-fulfilment, demands

Table 3–12 Way of obtaining current job

Indicator (share in %)	Total	Male	Female
Somebody recommended me for this job	30.09	29.01	31.30
Somebody told me about this job/vacancy	24.50	23.95	25.11
Asking for a job without advertised vacancy	14.97	14.69	15.28
Job was offered me by my current employer	11.64	12.98	10.15
On the basis of advertisement in media	9.07	9.16	8.97
Intermediated by employment office	6.15	5.82	6.52
Founded my own firm	0.81	1.15	0.43
Others	2.77	3.24	2.24
Total	100.00	100.00	100.00

Source: Questionnaire

and/or stress related to work and good interpersonal relationship was discussed related to wage level.

As Table 3–13 shows, job security is more important than wage level for 74.60% of respondents. Good interpersonal relations in the workplace are approximately of the same importance as wage, because there is only a slight prevalence of respondents who prefer them (53.48%) to wage (46.52%). The other job characteristics were preferred less than wage, i.e. less demanding and stressful work were preferred by 32.61% of respondents, personal self-fulfilment by 27.87% of respondents and job flexibility by 20.11% of respondents. There are, however, significant differences between men and women. In general, the wage preferences are substantially higher in the case of men regardless of the job characteristics the wage is related to. The most significant differences can be found in the case of interpersonal relationships at work (the share of men preferring wages is 13.44 pp. higher than in case of women), demands and/or stress related to work (11.87 pp. difference) and job security (11.08 pp. difference), i.e. in the case the most important job characteristics (see above). Job flexibility and personal self-fulfilment represent only small differences between genders (5.41 pp. and 3.46 pp. respectively).

3.3.4 Family and Work

This part of the survey was devoted to the identification of respondents' attitudes towards roles of men and women in household and the differences between declared attitudes and reality, because studies from abroad shows on both unequal distribution of housework among men and women (e.g. Hersch and Stratton, 1994) and their influence on wage (e.g. Hersch and Stratton, 2000 and 2002). First, the roles of *breadwinner* and *house maintenance person* were discussed.

Respondents' attitudes to the role of *breadwinner* strongly correspond with the traditional idea of men and women´s roles in the family (breadwinners should be men 58.32% of respondents, men and women equally 40.57%, and women 1.11%), see Table 3–14. However, women are more often in the role of *breadwinner* than the attitudes suggest, because in 14.52% of cases a women

Table 3–13 Preferences of job characteristics

Indicator (share in %)	Total	Male	Female
Job security			
Exclusively wage	5.54	7.25	3.63
Rather wage	19.86	23.38	15.92
Rather given job characteristic	53.58	49.71	57.91
Exclusively given job characteristic	21.02	19.66	22.54
Total	100.00	100.00	100.00
Job flexibility			
Exclusively wage	25.0	27.86	21.79
Rather wage	54.89	54.58	55.24
Rather given job characteristic	15.27	13.65	17.09
Exclusively given job characteristic	4.84	3.91	5.88
Total	100.00	100.00	100.00
Personal self-fulfilment			
Exclusively wage	19.0	21.28	16.45
Rather wage	53.13	52.48	53.85
Rather given job characteristic	23.08	21.56	24.79
Exclusively given job characteristic	4.79	4.68	4.91
Total	100.00	100.00	100.00
Less demanding and stressful work			
Exclusively wage	15.52	18.70	11.97
Rather wage	51.86	54.29	49.15
Rather given job characteristic	27.22	22.71	32.26
Exclusively given job characteristic	5.39	4.29	6.62
Total	100.0	100.0	100.00
Good interpersonal relations at workplace			
Exclusively wage	9.93	12.12	7.48
Rather wage	36.59	40.74	31.94
Rather given job characteristic	41.43	37.02	46.37
Exclusively given job characteristic	12.05	10.11	14.21
Total	100.0	100.0	100.00

Source: Questionnaire

Table 3–14 Responsibility for ensuring an adequate income for a family

Indicator (share in %)	Respondents' attitude			Reality in respondent's household		
	Total	Male	Female	Total	Male	Female
Exclusively a man	15.68	18.61	12.39	21.32	32.06	9.29
Rather a man	42.64	46.76	38.03	33.87	38.45	28.74
Man and woman equally	40.57	33.49	48.50	27.32	22.81	32.37
Rather a woman	0.76	0.86	0.64	4.94	2.39	7.80
Exclusively a woman	0.35	0.29	0.43	9.58	0.86	19.34
Parents that I live with	*Not relevant*	*Not relevant*	*Not relevant*	2.97	3.44	2.46
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Questionnaire

ensured an adequate income for a Czech family. However, the role of man as *breadwinner* is still very strong, because 58.32% of respondents think that a man should fill this role in the family and it is true in 55.19% of cases. Differences in preferences and mainly in perceived reality are very interesting in this case. Although both genders see a man as more responsible for ensuring adequate family income, women emphasize their role as a *co-breadwinner* (the equal contribution of both genders was mentioned more often by women, i.e. the difference in the frequency of this answer between genders is 15.01 pp.) The differences in answers on real responsibility for ensuring family income are much more interesting, because both men and women perceive their role of *breadwinner* more strongly than would correspond with their attitudes: men (women) would prefer to take on the role of family *breadwinner* in 65.37% (1.07%) of cases and this is the reality in 70.51% (27.14%) of cases. It shows that, although a substantial part of respondents (33.49% of men and 48.50% of women) thinks that both sexes should ensure family income equally, in reality there is always one of them more responsible for this task (equal ensuring of the income stated 22.81% of men and 32.37% of women).

Attention was also paid to the role of *house maintenance person*, who is responsible for meal preparation, dish washing, house cleaning, shopping, washing and ironing and taking care of children. Also in this case the respondents' attitudes revealed traditional understanding of family roles (men are responsible for this role in 2.78% cases, both genders are responsible equally in 42.69% of cases and women are responsible in 54.54% of cases), see Table 3–15.

The real division of housework, as in the case of *breadwinner* role, suggests that equal sharing of the role is less frequent than respondents would prefer (respondents divide responsibility for housework equally in 20.94% of cases in comparison with 42.69% of respondents declaring this situation as preferred) and it is more gender specialized (men in 10.19% of cases, women in 66.18% of cases). Gender differences in attitudes and perception of reality can be found also here. Men see women in this role more often than women themselves (47.87% of women see themselves as people responsible for housework and child care in comparison with 60.5% of men). The performance of this role is perceived more strongly by both genders than would correspond with their attitudes: there is 17.46% (74.79%) of men (women) convinced about their role of *house maintenance person* in reality, although they would prefer this situation in 3.72% (47.87%) of cases.

These results correspond with the order of life areas (family, working career, hobbies & free time, non-paid activities), which was declared by respondents according to their preferences and energy devoted to these areas at present (respondents put on first place the most important area). Focusing on individual's preferences, it is possible to conclude (see Table 3–16) that family is the most important area in everybody's life (order value 1.63) followed by working career (order value 2.02).

Table 3–15 Responsibility for ensuring housework and child care

Indicator (share in %)	Respondents' attitude			Reality in respondent's household		
	Total	Male	Female	Total	Male	Female
Exclusively a man	0.81	1.24	0.32	6.96	12.69	0.53
Rather a man	1.97	2.48	1.39	3.23	4.77	1.50
Man and woman equally	42.69	35.78	50.43	20.97	20.71	21.26
Rather a woman	45.82	49.24	41.99	39.11	39.98	38.14
Exclusively a woman	8.72	11.26	5.88	27.07	18.51	36.65
Parents that I live with	*Not relevant*	*Not relevant*	*Not relevant*	2.67	3.34	1.92
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Questionnaire

Table 3–16 Average order of life areas

Indicator (mean)	Respondents' general preferences			Energy devoted to the areas at present		
	Total	Male	Female	Total	Male	Female
Family	1.63	1.78	1.46	1.93	2.09	1.75
Working career	2.02	1.93	2.13	1.58	1.53	1.63
Hobbies & free time	2.46	2.39	2.53	2.59	2.49	2.71
Non-paid activities	3.90	3.91	3.88	3.90	3.90	3.91

Source: Questionnaire

Note: Only 12.9% of all respondents participate in non-paid activities such as charity and humanitarian activities, religious activities, ecological activities, work with children, work in societal organizations etc. (11.5% of men and 14.4% of women).

There are significant differences among genders, because importance of work career in comparison with family is much closer in the case of men (the difference of 0.15 points) than for women (the difference 0.67 points), which shows relatively higher men's preferences of working career.[11] The real energy devoted to these areas, however, does not correspond to the preferences, because career is in first place (order value 1.58) and family in second (order value 1.93). There is significant difference between genders also in this case, because men devote more energy to work than to family in comparison with women (the difference between order values is 0.56 in case of men and 0.12 in case of women).[12] This observation was verified also by real number of hours worked, which was declared by respondents (to avoid bias due to different workload, only full-time jobs with 40 hours per week were taken into account). Men devote 2.26

[11] Respondents stated family as the most important area in 56.9% of cases (47.0% of men and 67.9% of women) and work career in 29.2% of cases (35.7% of men and 22.0% of women).

[12] Respondents stated family as the area where they put the most of their energy at present in 35.3% of cases (27.1% in case of men and 44.4% of women) and work career in 56.2% of cases (61.2% of men and 50.6% of women).

hours per week more to their job than women. Men stated 43.94 hours in average (standard deviation 7.65 hours; 952 observations), while women stated 41.68 hours in average (standard deviation 5.17 hours; 807 observations). It suggests that although both men and women have to devote more energy to working career relative to family (than declared preferences suggests), the relative differences in the family and working career order suggests that both sexes follow their preferences. Other life areas do not represent substantive differences in preferences and real energy devoted to these areas (not even gender differences are taken into account).

3.3.5 Psychological Traits

The method of data gathering (incl. its time limitation) employed in this survey made it impossible to use standard psychological tests to measure psychological traits of respondents. Moreover, a pilot survey showed that questions from standardized tests (in English) had to be adapted for the Czech environment. Therefore, statements describing certain behaviour were created and respondents were asked to specify their agreement with the statement. This method was used as an indication of respondents' psychological traits. Table 3–17 shows results.

Need to excel and be better than others was declared by 52.62% of respondents. It is possible to find a significant gender difference, because the share of men with this need was 6.99 pp. higher than women. *Giving up on a set goal when it proves to be difficult* was admitted by 31.70% of respondents. This trait was more common among women (4.91 pp. in comparison with men). *Being proud of myself* was stated by 76.56% of respondents and there is no significant difference between genders (only 0.13 pp. on behalf of men).

From other traits, a belief in the ability to affect one´s own life can be stated, i.e. locus of control. 70.87% of respondents believe that events in their life are consequences of their decisions and actions, while 29.13% of them believe that they are determined by fate. There is a substantial difference in responses between genders. Men believe more often, in comparison with women (the difference 7.34 pp.), that they are able to control their lives. Respondents were also asked to evaluate risk in the job area that they are prepared to take (on scale from 0 for no risk to 10 for very high risk). The mean value of risk for all respondents is 5.02 (standard deviation 2.33), i.e. in the middle of the scale. Men, however, declared higher readiness to take a risk (mean 5.48, standard deviation 2.25) than women (mean 4.49, standard deviation 2.29).

Comparison of gender differences in stated psychological traits with other studies is, however, ambiguous as there are big differences among results of particular studies. It can be illustrated on locus of control (compare results for gender differences in Semykina and Linz, 2007 and Fortin, 2008) or self-esteem (compare Fortin, 2008, and Goldsmith et al., 1997).

Table 3–17 Psychology traits

Indicator (share in %)	Total	Male	Female
Need to excel in what respondent do, and be better than others in it			
Yes	11.84	13.65	9.83
Rather yes	40.78	42.27	39.10
Rather no	38.51	37.02	40.17
No	8.87	7.06	10.90
Total	100.00	100.00	100.00
Giving up reaching of set goal, when it shows to be difficult			
Yes	4.03	3.63	4.49
Rather yes	27.67	25.76	29.81
Rather no	48.94	49.81	47.97
No	19.35	20.80	17.74
Total	100.00	100.00	100.00
Be proud of myself			
Yes	24.19	24.05	24.36
Rather yes	52.37	52.58	52.14
Rather no	20.36	21.09	19.55
No	3.07	2.29	3.95
Total	100.00	100.00	100.00
Events in your life are consequences of fortune and coincidence or consequences of your action and decisions			
Entirely a consequence of my decisions & actions	19.71	21.66	17.52
Rather a consequence of my decisions & actions	51.16	52.67	49.47
Rather consequence of fortune & coincidences	25.00	21.66	28.74
Entirely a consequence of fortune & coincidences	4.13	4.01	4.27
Total	100	100	100

Source: Questionnaire

3.3.6 Perception of Being Discriminated

The survey revealed that 7.96% of respondents think that they are discriminated against in comparison with their co-workers of opposite gender, see Table 3–18. This is, however, very rough figure, because there is big difference between genders. Only 3.91% of men think that they are discriminated against, but 12.50% of women think so.

Table 3–18 Sense of wage discrimination in comparison with opposite gender co-workers

Indicator (share in %)	Total	Male	Female
I feel discriminated	7.96	3.91	12.50
I do not feel discriminated	81.50	85.59	76.92
I do not have opposite gender co-workers	10.53	10.50	10.58
Total	100.00	100.00	100.00

Source: Questionnaire

The perception of discrimination in case of women can be strengthened by the fact that women are less often rewarded according to objective, measurable criteria than men. The objective way of wage setting was stated by 59.94% of women (entirely objective by 25% and rather objective by 34.94%), while it was

stated by 68.51% of men (entirely objective by 29.01% and rather objective by 39.50%).

As we can see in Table 3–19, the survey of employees also uncovers a considerable difference between men and women in asking for higher wages.

Table 3–19 Ask for wage increase

Indicator (share in %)	Total	Male	Female
Yes, I asked for wage increase in past	49.90	57.16	41.77
No, I have never asked for wage increase	50.10	42.84	58.23
Total	100.00	100.00	100.00

Source: Questionnaire

Only 41.77% of women asked for a rise at some time, in contrast to 57.16% of men.

3.4 Conclusions

We use two main data sources for the analysis of gender wage gap and wage determinants in our project. First, Average Earnings Information System (AEIS) which is the standard data source used in most cases for the purposes of analysis of individual wages in the Czech Republic. It enables the researchers to investigate wage and gender wage differences in time or firm fixed effects. However, the extent of wage determinants that is possible to create from this data source is quite limited for contemporary research. Although it covers traditional wage determinants, it is not possible to use this data source for evaluation of newly proposed wage determinants regarding family-career balance, preferences, gender identity model or socio-psychological characteristics. So we have written our own questionnaire for the purpose of our research that covers these wage determinants. On the basis of this questionnaire (including 64 questions) a survey was carried out on a representative sample of employees in the Czech Republic in 2011.

Besides the differences between men and women considering objective characteristics such as achieved education or work experience, the results actually show significant differences between men and women in all the researched fields, i.e. family-work balance, preferences on job characteristics, psychological traits, and sense of discrimination. All the differences suggest that division of family roles according to gender is very deeply rooted in Czech society while Czech women earn 77.80% of men's wages on average. The findings support the hypothesis that a part of wage differences between men and women may be explained by their different preferences on the labour market or gender identity model.

Chapter 4

Determinants of Individual Wages in the Czech Republic

By Jaromír Gottvald, Petra Vašková, Lenka Janíková

This chapter will take a look at the changes in the wages structure in the last decade in CR. This relatively short period has also seen changes in remuneration due to the economic crisis. Entirely new wage mechanisms have been introduced and wages are beginning to be influenced and formed by new mechanisms in comparison to the previous decade. Their role in wage formation is changing due to a number of exogenous and endogenous factors.

4.1 Review of Theoretical and Empirical Literature

There are numerous ways of explaining why people are paid different wages. Certain theories place an emphasis on personal characteristics as the principal wage determinants. These are reflected in the so-called commonly applied Mincer's wage functions (Mincer, 1974), based on the human capital theory. Other theories emphasize differences in job characteristics such as, for example, the job competition theory. These theories are combined by applying the allocation theory which indicates that people can be characterised according to their abilities, while job positions can be characterised by a certain difficulty. Thus, there can be comparative benefits in hiring individuals for certain jobs which are used in cases when an efficiently functioning labour market exists. In addition, the segmented and discrimination labour market theories emphasise that both supply and demand should also be taken into account to explain differences in wages. When considering various approaches in the foreign literature in this area, the statement that wages are commonly determined by personal characteristics, job characteristics, institutional and market forces is evident and meaningful. To what extent, however, can wage differences be explained by particular characteristics it is question.

Each employee enters the labour market with unique capabilities, qualities and knowledge, generally said, with a different human capital (see also Balcar, 2012). Each person chooses his or her own way of gaining human capital and

this particular human capital is (consequently) offered on the labour market. Thus, certain people choose many years of education whereas others prefer to start earning money sooner. The former have the expectation that after their studies they will find better paid jobs as result for their investment into education. The age-earnings profile is investigated by Mincer‘s type of wage function which is based on the standard theory of human capital. An employee‘s wage is determined by their quality; this means that if the employee has obtained education, has general work experience and specific work experience gained in a company or various companies, as well as certain other qualities independent from education or experience (e.g. soft skills). According to this theory, an employee‘s wage is the return on human capital investment.

Hundreds of studies have showed that the Mincer’s wage function provides a sufficient description of an individual’s income profile in terms of education and experience even in countries with very different institutional structures. Nevertheless, the proportion of education and experience in explaining wage differentiation differs among countries in a range of from 30% to 50%.

Exogenous economic factors are also no doubt significant determinants of wages although they only marginally assist in explaining the wage profile of employees. Wage disparities according to branches in a standard competitive labour market can occur due to possible compensation of differences in job properties directly influencing a worker‘s utility. Shifts in supply and demand among branches, or short-term immobility of workers, can cause the aforesaid differences in wages as well. Thus, the theory of *compensating differences* can also explain the fact that workers can receive compensation in their wages for worsened or hazardous working environments, for example, in mines. Thus, inter-branch differences in labour conditions are a logical explanation for wage disparities among branches for workers of the same qualifications (see Krueger and Summers, 1988).

Chase (1998) in his research has examined the differences in the wage structure in the Czech Republic and Slovakia. Both countries has been in transition from a centrally planned to a marked based economy over the last two decades. Chase has studied the wage return from education and experience. Chase used Mincer‘s traditional function. The return on education was relatively low during the Communist era, 2.5%, grew until 1993 to a level of approximately 5%. The significance of experience decreased during this period. Despite the fact that women had larger returns on education than men, the returns for men grew more in the transition period. The change in the earnings structure was more significant in the Czech Republic than in Slovakia.

The results of the studies by Jurajda (2000) indicate that education of all types was rewarded significantly more in 1998 than was the case in the first years of the transformation. The coefficients for university level education being approximately 0.80 per cent higher in comparison with primary school level both genders in 1998. Experience, in contrast to education, did not become significantly more valuable.

Foreign or domestic ownership of the work place had a significant influence on wages since companies owned by foreigners paid significantly higher wages even when taking into account work and worker characteristics. The gap between them and other types of ownership gradually decreased.

The article by Večerník (2001) was focused on the differentiation of wages and identifying its various factors in 1988, 1992 and 1996. The Mincer wage functions were used in order to measure return on education and experience. A regression analysis, 1988–1996 demonstrated significant changes in the wage structure. The importance of gender and age decreased and as did the combined contribution of gender and age. The wage differences between both groups decreased from 40% to 17%. The importance of education, in contrast, grew from 11% to 20%. Over a relatively short period education became the most important factor of differentiation.

A study by Gottvald (2002) which examined wage determinants in the Czech Republic and Slovakia in the period 1996–2000, Gottvald looked at education, age – as a proxy for experience, gender, number of worked hours and work load. Institutional variables were also examined; kind of ownership, industrial branch, the region and the qualification characteristics of the work positions and the company's structural variables in terms of work productivity, profit, number of employees and structural variables, average level of unemployment in the region and the average gross hourly wage in the region.

The results indicate that the level education and the performing of a specific vocation serves to explain a third of all of the differences in wages and that profession has more importance for the formation of wages of individuals than the level of education. The wages of employees with university level education, was 34 – 46% higher on average compared with those with only a primary education, for example, in 1996–2000. When using the number of years of education this brought employees on average approximately 4.5% higher wages each year. Gender was also an important factor for differentiation of wages, with men having approximately 20 – 30% higher wages than women. The results of the model of institutional variables thus indicate that increased labour productivity by 1% in the year 1996 increased wages by 0.081% and by 0.104% in contrast to the year 1999. But this might be a business cycle phenomena – higher profits in 1999 – and higher wages as indicated by the correlation between high profits and high wages. Companies ranking among the most profitable groups paid their employees from 10 to 25% more than companies which were not making a profit.

Jurajda (2003a) in his article estimated the wage remuneration of education on the basis of the expanded Mincer wage function. This was initially in connection with the education of employees combined with potential experience and their quadrates with a range of company characteristics added later such as the region, the industrial branch, the kind of ownership and the size of the company. The results indicate that the hourly wage of employees with a primary education or with a vocational education was on average on the level of

approximately 67% of the hourly wage of employees with a secondary school education. The obtaining of a university education led to almost twice wage levels as employees with a secondary school education.

A study by Basu et al. (2004), used data from large companies in the Czech Republic, Slovakia, Poland and Hungary in order to demonstrate that the wage setting behaviour of companies changed dramatically after the transition to a market system. Estimates indicate that incomes began to change dramatically in connection with company performance in all countries. The effect of ownership on wages, in contrast, was not statistically significant and a significant relationship between wages and the local level of unemployment was not found either, with the exception of Slovakia. The analysis showed that state companies in both the Czech Republic and Slovakia provided employees with a smaller share of the profit than with private companies. Private companies paid higher wages immediately after the beginning of the transformation, but this effect faded away.

The work of Flabbi et al. (2007) tested the increase in returns on education in eight economies in transition. The dependent variable in the regression consisted of monthly earnings and the explanatory variable number of years of school attendance along with a vector of additional control elements. Flabbi et al. also found slowly growing trends of returns from education. The returns for an additional year of education were 3.6% in the year 1994 and 6.6% in the year 2002. There exist, however, marked differences between the countries which have not disappeared, due to stable difference in institutional and structural environment. The Czech Republic and Slovakia ranked, according to the findings, among the countries with the lowest returns.

A study by Verhoeven et al. (2008) tested trends in factors which influenced income in post-communist societies from the year 1991 up to 2002. Their results indicate a growing trend involving the influence of the number of years of education on the income of individuals in all five countries with this tendency being similar in the Czech Republic, Slovakia and Poland. The effects of years of experience on income did not reveal a growing trend.

Eriksson et al. (2009) in their article examined the development of wages over the years 1998–2006. The analysis was based on small samples gathered from companies in the private sector. Their estimates indicate a slightly growing trend of returns from university education and experience (for experience from 1.9% up to 2.5%), while the gap between men and women decreased. The difference between employees with secondary school education and those without any or with only primary education decreased over time, partially due to significant increases in the minimum wage during the given period. Another important factor has been the increase in the allocation of university-educated people into the most productive companies.

Dybczak and Galuščák (2010) investigate the impact of immigration on the development of wages. The results show that returns on education for men were

4.17% in 2002 and 5.06% in 2006, the returns on education for women were 5.09% in 2002 and 5.39% in 2006. The analysis used the traditional wage determinants such as age, age squared, experience, occupation and sector.

Jurajda (2011) investigates the impact of education on wages controlling for several factors. The first one is region. Results show that regions with a higher concentration of tertiary educated workforce tend to have higher returns on education. Another factor is form ownership, where the results indicate that foreign-owned firms employ more tertiary educated workers than Czech firms, both private and state owned. Jurajda (2011) also found a positive correlation between return on education and foreign investments and rate of unemployment; and a negative correlation with the density of population. He also tested the hypothesis of Moretti (2004) about human capital externalities, so-called education spillovers. The results show strong positive spillover effect with including both major cities Prague and Brno that are considered as main recipients of foreign direct investments but not significant spillover effect with excluding those two main cities.

Kalíšková and Münich (2012) study the differences between men and women in employment and in average working hours and also the impact of the factors influencing these indicators differences. Her results show that the differences between men and women are among the highest in the EU. They are highest in the age group 35–44, i.e. when most women return to work after maternity leave. The author explains the results by the absence of women in this age group from the labour market due to lack of pre-school facilities and the lack of part-time and flexible jobs.

4.1 Data and Model

This part shows empirical model used in analysis of wage determinants and wage-age profile in Czech Republic.

4.1.1 Empirical Model of Wage Determinants

The standard method of least squares was used in the empirical model of wage determinants, with and without firm effects. The logarithm of the average gross hourly wage of employees in a given year and given sector was used as the dependent variable. The average hourly earnings of employees were tested according to gender and all variables available from the database, separately for business and non-business sector in the years 2006 and 2011.

The following types of function (4.1 and 4.2) were estimated:

$$\log w_i = W(G), \tag{4.1}$$

$$\log w_i = W(G, P, J, F) \text{ for i = 1,.....N,} \tag{4.2}$$

where w_i is the average gross hourly wage of an employee(s) per year, G is the worker´s gender, P are further personal characteristics (education expressed as a vector of 5 dummy variables reflecting individual levels of completed education, age, citizenship), J are characteristics of worker´s job (occupation expressed as

vector of 10 dummy variables reflecting main levels of first digit classification of occupation ISCO, dummy variable for full-time job), F is the vector of characteristics of worker's firm (dummy variables for 14 regions, dummy variables for 19 industrial sectors, for business sector type of ownership expressed by 6 dummy variables, 4 dummy variables for the type of collective bargaining in the given firm, size of firm expressed using 5 dummy variables).

Only workers doing 30 hours or more per week were included in the analysis.

4.1.2 Problems and Hypotheses

1. What determinants play a key role in forming wages? How did the situation change in Czech economy in the period of transition to a market economy? Is it true that the rate of returns from education has increased?
2. In contrast, the rate of returns for experience was high during the period of communism, since the principle of seniority in remuneration was thoroughly rooted. We are aware that the rate of returns for experience decreased immediately over the first few years of transition. Does experience continue to play a lesser role in the determination of wages, or has its importance stopped decreasing?
3. Wages are determined not only by personal characteristics, but also by job characteristics. Personal characteristics represent the labour market supply while job characteristics represent demand. Every occupation requires a certain set of skills and competences and might requires a certain education, responsibilities as well as skills and abilities, which can be called required skills. What is the importance of a particular occupation as a wage determinant in the structure of other determinants and in relation to personal characteristics? What is the connection between the education level and occupation in the Czech Republic?
4. What is the importance of other personal characteristics and what role do they play in wage determination? What are the differences between wages of men and women?
5. Are the wages of employees higher in larger companies than in smaller ones? If they are, how can the differences be explained?
6. Economic development, i.e. the emergence of new companies, foreign investment, innovation, new technologies, etc., did these processes shift labour demand towards more educated workers? Did the process change the wage structure in branches and regions?
7. Every firm, organisation and institution is different, and has its own tradition of wage setting, moreover, foreign companies use the structure of their parent company. The structure of occupations and the importance of education are different from firm to firm, likewise between business and non-business sector. Is the impact of these firm characteristics and differences important factors in wage determination?

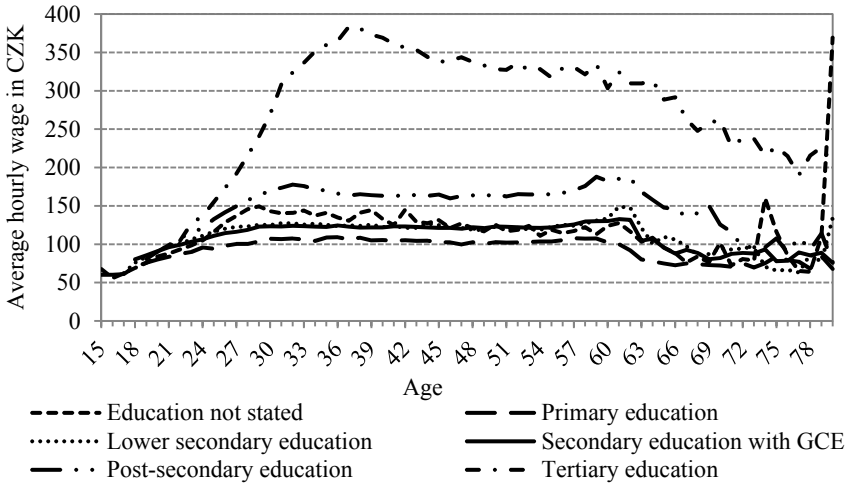

Figure 4–1 Wage-age profile in the Czech Republic, business sector, 2006
Source: AEIS

4.1.3 Descriptive Analysis

As we can see in Figure 4–1, the wages of employees with a primary education in the Czech Republic experience increasing wages up to 30 years when it levels out in the business sector. There is a slight growth with age for skilled workers. For workers with a secondary education the growth with the age trend is more distinct with significant growth shortly before retirement. The initial wage growth is very steep for workers with university education which creates significant gap between the wage curve of university education and other educational groups whereas the corridor in which other education groups lie is narrow.

However, there are interesting differences in the wage curves of university educated employees in 2006 and 2011. In 2006 the wages rise sharply and peak when the workers are 37 years old. In 2011 the initial growth of wages is also steep up to 38 years of age but then the growth continues slowly up to its maximum at 44 years of age, see Figure 4–2. The older cohort could be the same but gets relatively lower wages, they had their prime years before 1989. Then the wages tend to decrease with higher age up to retirement in both researched years.

Wage-age profile for non-business sector is different. Wages grow for all educational levels during the whole age (life) cycle, see Figure 4–3 and 4–4. Also the variance of wages among educational levels is higher but with lower levels of wages.

Difference between university level and other educational categories is not as high. University educated employees have highest wages which grow until retirement age. There is a strong inclination to establish wages in non-business sector on the basis of tables of wage tariffs according to educational level. On the

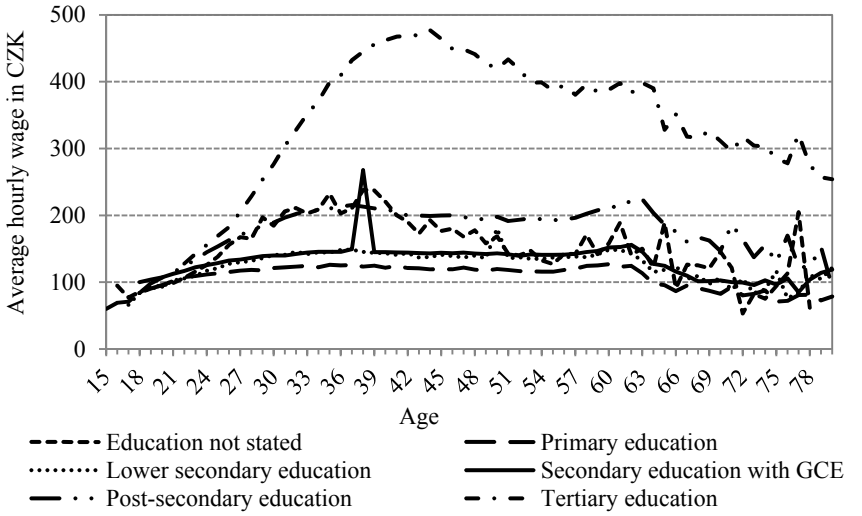

Figure 4–2 Wage-age profile in the Czech Republic, business sector, 2011
Source: AEIS

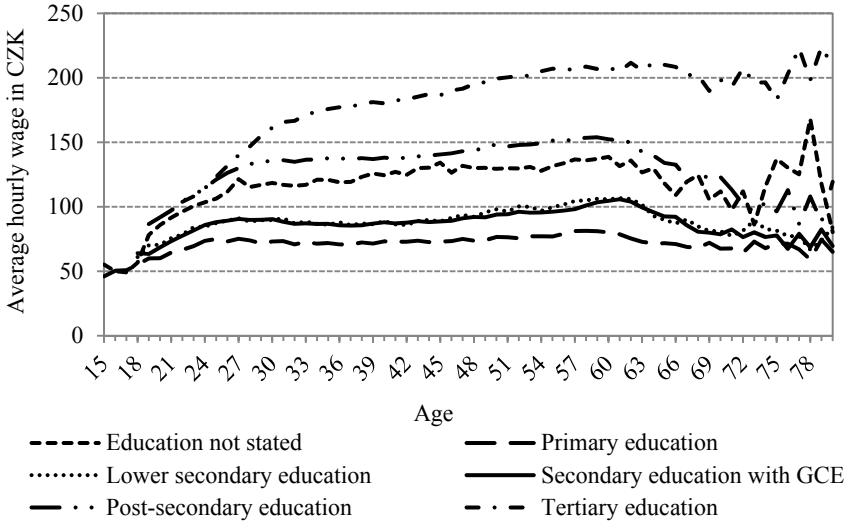

Figure 4–3 Wage-age profile in the Czech Republic, non-business sector, 2006
Source: AEIS

contrary, the wage is related to occupation and work performance in business sector. The wage-age profile is strongly dependent on occupation and has a concave character which is more evident in the case of non-business sector due to senior rule rooted in the tables of wage tariffs.

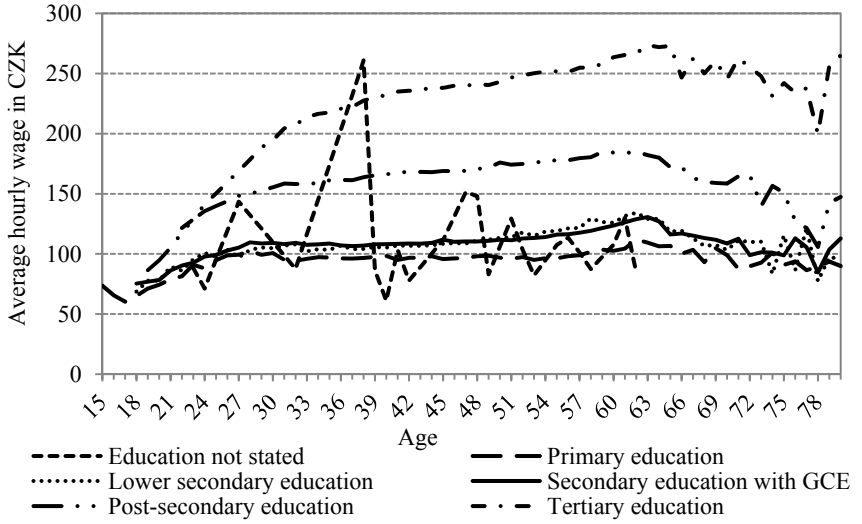

Figure 4–4 Wage-age profile in the Czech Republic, non-business sector, 2011
Source: AEIS

4.2 Empirical Analysis and Results

Table 4–1 shows gender wage gap in the Czech Republic, separately for business and non-business sector in the years 2006 and 2011.

Gender is a significant factor for wage differentiation. Wages of women in business sector are nearly 26% lower than men in 2006 and 2011 although there is evidence of slight decrease of difference from 26.8% in 2006 to 25.6% in 2011. Gender wage gap is much lower in non-business sector, wages of women are lower by 16.6% in 2006 and by 13.7% in 2011. The gender wage gap in business sector is nearly double in 2011. The results are not surprising, in the non-business sector remuneration is based on standard wage rates and there is considerably less use of negotiated pay. The explanatory power of the model dropped down to 5.6% in business sector and 2.6% in non-business sector in 2011. Decreasing low level degree of explained variation can be because that the differences between the declining wages of men and women in both sectors.

The Table 4–2 shows the results of the model with all variables available from database. The Table 4–3 shows the results using firm effects.

When including all variables in the model there was a more pronounced drop in the female coefficient in the business sector to 20.2% in 2011, yet the differences are still almost 50% higher compared to the non-business sector. Added variables had no influence on the female coefficient in the non-business sector in 2011.

Table 4–1 Gender wage gap in the Czech Republic

	2006		2011	
	Business sector	Non-business sector	Business sector	Non-business sector
Female	–0.268*** (0.001)	–0.166*** (0.001)	–0.256*** (0.001)	–0.137*** (0.001)
Constant	4.968*** (0.001)	4.969*** (0.001)	5.166*** (0.001)	5.167*** (0.001)
Observations	1,324,060	666,699	1,525,948	565,847
Adjusted R-squared	0.071	0.040	0.056	0.026

Source: AEIS

Notes: Dependent Variable: Log (average annual hourly wage). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 4–2 Wage determinants in the Czech Republic

	2006		2011	
Variables	BS	NBS	BS	NBS
Gender	–0.217*** (0.001)	–0.141*** (0.001)	–0.202*** (0.001)	–0.137*** (0.001)
Education	*Dummy variables (see Table 4–4)*			
Age	0.030*** (0.000)	0.027*** (0.000)	0.032*** (0.000)	0.030*** (0.000)
Age squared	–0.035*** (0.000)	–0.026*** (0.000)	–0.037*** (0.000)	–0.029*** (0.000)
Citizenship	*Dummy variables (see Table 4–6)*			
Occupation	*Dummy variables (see Table 4–7)*			
Full time	0.001*** (0.000)	0.091*** (0.001)	0.010*** (0.001)	0.074*** (0.001)
Region	*Dummy variables (see Table 4–9)*			
Industry	*Dummy variables (see Table 4–11)*			
Ownership	*Dummy variables (see Table 4–12)*			
Bargaining				
Size				
Constant	3.726*** (0.004)	3.392*** (0.030)	3.400*** (0.009)	3.642*** (0.018)
Observations	1,245,923	658,068	1,449,826	556,157
Adjusted R-squared	0.598	0.709	0.619	0.694

Source: AEIS

Notes: Dependent Variable: Log (average annual hourly wage). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. BS = business sector, NBS = non-business sector.

Table 4–3 Wage determinants in the Czech Republic – firm effect

	2006		2011	
Variables	BS FE	NBS FE	BS FE	NBS FE
Gender	–0.176*** (0.004)	–0.107*** (0.009)	–0.170*** (0.004)	–0.098*** (0.005)
Education	*Dummy variables (see Table 4–5)*			
Age	0.027*** (0.001)	0.026*** (0.001)	0.028*** (0.001)	0.030*** (0.002)
Age squared	–0.030*** (0.001)	–0.025*** (0.001)	–0.031*** (0.001)	–0.028*** (0.002)
Occupation	*Dummy variables (see Table 4–8)*			
Full time	0.002*** (0.000)	0.089*** (0.004)	0.036*** (0.011)	0.068*** (0.005)
Region	*Dummy variables (see Table 4–10)*			
Constant	3.949*** (0.027)	3.509*** (0.037)	4.039*** (0.028)	3.618*** (0.047)
Observations	1,245,923	658,068	1,451,524	556,157
No. of IDORG	3,027	14,095	4,823	13,371
Adjusted R-squared	0.714	0.768	0.730	0.761

Source: AEIS

Notes: Dependent Variable: Log (average annual hourly wage). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. BS = business sector, NBS = non-business sector, FE = firm effect, IDORG = Identification of organisation.

The gender wage gap significantly decreases when including firm effects to the model by about 4 p.p. in the business as well as non-business sector. Firm effects result in lower differences in wages between men and women. The process of equalising wages of men and women might be on the one hand a result of the fight against all forms of discrimination on the labour market and on the other hand certain wage differences are without doubt partly caused by wage, occupational and other forms of discrimination.

Age may be considered an intermediary index for length of experience. The wage – age mechanism is of some significance for wage determination. This is not the case for the public and non-profit sectors where the wage – age mechanism is embedded in the wage tariffs and has a more important role. Their impact on wage determination is stable and oscillated around 0,03 in the years 2006 and 2011, thus with a one year increase in the worker‘s age his or her wage will increase by 3% on average, while its impact was 2.5% in 2000. Thus the results of the empirical analysis are confirmed, the importance of age for wage determination is stable or slightly increasing and a slightly more significant influence persists, namely in the public sector, and particularly in the case of higher educated workers.

Full-time jobs (counted according to hours per week stated in job agreement if full or part time jobs) bring workers a wage ‘bonus’ of 7.4% in 2011 and 9.1% in 2006 but only in non-business sector. In a number of organisations employees working part-time (less than 36 hours per week) do not receive (have no right to

it according to the regulations for bonuses) certain components of the wage which full-time workers receive, the reason being that they do not participate fully in the outcome for which the bonuses are paid. A certain kind of discrimination may be hidden behind this mechanism as is the case for women working part-time, or in the case of two jobs or parallel part-time jobs. This kind of discrimination, if it exists, is difficult to investigate. Wage of employees working part-time is basically the same as wage of workers working full-time. The results are the same even when using firmed effects, i.e. big differences in wages in non-business sector and low in business sector. The results show that the above-mentioned systems of remuneration are not valid in business sector, where wage is dependent on working performance and not on given rules for wages and benefits or on wage tariffs.

The supply side is represented by the achieved wage level and the demand side by the job being performed, thus the formal (dummy) variables were included in the model. The theoretical literature analysis demonstrated that certain jobs will achieve a high correlation (the multicolinearity test confirmed its fairly high rate, but still within statistically insignificant limits) with certain variables for education.

Table 4–4 shows that all the dummy variables for achieved education are statistically significant.

The impact of education slowly decreases or stagnates both in business and non-business sector. Wage disparities between lower secondary education and secondary vocational education and basic education are low, particularly for the business sector. Completion of an apprenticeship – with or without certificate – doesn´t *guarantee* a higher wage. Secondary and post-secondary education increases employees´ salary by 16.2% in the Business sector in 2011, but by as much as 22.3% in the non-business sector. This manifests itself in that the graduation certificate is a (pre)condition for seniority in the non-business sector. This is proved by including firm effects (results are shown in Table 4–5), which makes the difference even more pronounced. This is due to the fact that in the public sector, which is a considerable part of the non-business sector, a certain level of education is mandatory requirement. When it comes to university education, the differences are not so great.

If firm effects are ignored, then there are no differences between the business and non-business sectors which confirmed above mentioned.

Table 4–6 shows wage differences by citizenship.

The Slovaks in the business sector have lower wages by about 4% than Czechs, but in the non-business sector they have higher wages by 3% than Czechs. There is no evidence of discrimination on the grounds of citizenship. As far as employees from OECD countries are concerned, there is a definite change, as in 2006 they were paid less by 3.1%, whereas in 2011 received, on average, 7.4% more in the business sector. This was a gradual, rather than a sudden rise. We get the impression that there is an influx of better-qualified workers in better-

Table 4–4 Wage differences by education

	2006		2011	
Education	BS	NBS	BS	NBS
Education non-stated	0.072*** (0.002)	0.184*** (0.002)	0.121*** (0.003)	0.033 (0.050)
Lower secondary education	0.068*** (0.001)	0.075*** (0.002)	0.057*** (0.002)	0.044*** (0.002)
Secondary vocational education with certificate	0.058*** (0.001)	0.075*** (0.001)	0.057*** (0.001)	0.043*** (0.002)
Secondary and post-secondary education	0.150*** (0.001)	0.247*** (0.002)	0.162*** (0.001)	0.223*** (0.002)
University education	0.469*** (0.002)	0.444*** (0.002)	0.439*** (0.002)	0.447*** (0.002)

Source: AEIS
Notes: Incomplete or complete basic education = omitted. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. BS = business sector, NBS = non-business sector.

Table 4–5 Wage differences by education – firm effect

	2006		2011	
Education	BS FE	NBS FE	BS FE	NBS FE
Education non-stated	0.039*** (0.002)	0.163*** (0.002)	0.102*** (0.003)	Omitted category
Lower secondary education	0.037*** (0.002)	0.078*** (0.002)	0.032*** (0.002)	0.048*** (0.002)
Secondary vocational education with certificate	0.041*** (0.001)	0.071*** (0.001)	0.036*** (0.001)	0.043*** (0.001)
Secondary and post-secondary education	0.107*** (0.001)	0.227*** (0.001)	0.111*** (0.001)	0.195*** (0.002)
University education	0.386*** (0.001)	0.420*** (0.002)	0.349*** (0.001)	0.409*** (0.002)

Source: AEIS
Notes: Incomplete or complete basic education = omitted. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. BS = business sector, NBS = non-business sector, FE = firm effect.

paid professions. The Czech labour market is becoming attractive for this type of workers. On the other hand, workers from the remaining EU countries, the former Soviet Union, and other countries are paid 10% less than Czechs, and this discrepancy is growing.

Table 4–7 shows wage differences by occupation.

The wage differentiation by occupation increases both in the business and non-business sector. This applies in particular to the first 3 groups of professions (ISCO 1–3) and in the business sector. Managers in the business sector reach a wage level that is comparable to that of their counterparts in the non-business sector, which is clearly because their pay (mostly negotiated) is performance-

Table 4–6 Wage differences by citizenship

	2006		2011	
Citizenship	BS	NBS	BS	NBS
Slovakia	–0.046*** (0.002)	0.026*** (0.004)	–0.035*** (0.002)	0.034*** (0.005)
From EU 15 + OECD	–0.031*** (0.005)	–0.020* (0.011)	0.074*** (0.004)	–0.012 (0.012)
Other members of EU	0.089*** (0.012)	–0.075*** (0.027)	–0.289*** (0.006)	–0.099*** (0.028)
Former states of USSR	–0.032*** (0.005)	–0.032*** (0.010)	–0.072*** (0.004)	–0.030*** (0.010)
Others	–0.068*** (0.008)	–0.085*** (0.016)	–0.095*** (0.005)	–0.027 (0.021)

Source: AEIS
Czech nationality omitted. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. BS = business sector, NBS = non-business sector.

Table 4–7 Wage differences by occupation

	2006		2011	
Occupation	BS	NBS	BS	NBS
Armed Forces occupations (ISCO 0)		0.187*** (0.002)		0.258*** (0.002)
Managers, senior officials and legislators (ISCO 1)	0.758*** (0.002)	0.687*** (0.002)	0.865*** (0.003)	0.737*** (0.002)
Professionals (ISCO 2)	0.454*** (0.002)	0.493*** (0.002)	0.495*** (0.002)	0.497*** (0.002)
Technicians and associate professionals (ISCO 3)	0.358*** (0.001)	0.439*** (0.001)	0.380*** (0.001)	0.429*** (0.002)
Clerks (ISCO 4)	0.178*** (0.001)	0.278*** (0.002)	0.249*** (0.001)	0.332*** (0.002)
Service and sales workers (ISCO 5)	0.051*** (0.001)	0.242*** (0.001)	0.054*** (0.001)	0.272*** (0.001)
Skilled agricultural, fishery, and forestry workers (ISCO 6)	0.153*** (0.003)	0.188*** (0.006)	0.223*** (0.004)	0.170*** (0.007)
Craft and related trades workers (ISCO 7)	0.163*** (0.001)	0.195*** (0.002)	0.202*** (0.001)	0.233*** (0.003)
Plant and machine operators and assemblers (ISCO 8)	0.173*** (0.001)	0.232*** (0.002)	0.165*** (0.001)	0.223*** (0.003)

Source: AEIS
Elementary occupations (ISCO 9) = omitted. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. BS = business sector, NBS = non-business sector.

Table 4–8 Wage differences by occupation – firm effect

	2006		2011	
Occupation	BS FE	NBS FE	BS FE	NBS FE
Armed Forces occupations (ISCO 0)		0.174*** (0.002)		0.359*** (0.003)
Managers, senior officials and legislators (ISCO 1)	0.817*** (0.002)	0.716*** (0.002)	0.900*** (0.002)	0.771*** (0.002)
Professionals (ISCO 2)	0.473*** (0.002)	0.511*** (0.001)	0.506*** (0.002)	0.517*** (0.002)
Technicians and associate professionals (ISCO 3)	0.357*** (0.001)	0.431*** (0.001)	0.366*** (0.001)	0.435*** (0.002)
Clerks (ISCO 4)	0.211*** (0.001)	0.261*** (0.002)	0.243*** (0.002)	0.329*** (0.002)
Service and sales workers (ISCO 5)	0.120*** (0.002)	0.221*** (0.001)	0.127*** (0.002)	0.241*** (0.001)
Skilled agricultural, fishery, and forestry workers (ISCO 6)	0.154*** (0.003)	0.170*** (0.005)	0.181*** (0.004)	0.180*** (0.006)
Craft and related trades workers (ISCO 7)	0.179*** (0.001)	0.190*** (0.002)	0.187*** (0.001)	0.229*** (0.003)
Plant and machine operators and assemblers (ISCO 8)	0.155*** (0.001)	0.184*** (0.002)	0.145*** (0.001)	0.216*** (0.002)

Source: AEIS

Elementary occupations (ISCO 9) = omitted. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. BS = business sector, NBS = non-business sector, FE = firm effect.

related normally.[13] This type of remuneration is not usually paid in the non-business sector. Logically, this disparity is increases when fixed effects are included, see Table 4–8.

Office workers´ wages in the business sector are lower than in the non-business sector. Even though the difference compared to unqualified and unskilled labourers (ISCO 9) considerably increases from 17.8% to 24.9% in 2011, which is not only due to wage rate tables in the non-business sector, but also the structure of the civil service. The wages of services workers (ISCO 5) are very low in the business sector. But if we take firm effects into account, then the differences vary greatly from firm to firm and wage disparity increases. In the non-business sector the situation of services workers is completely different, with wages about 25% higher if the difference is compared to the reference category of employees. In the non-business sector police officers and firemen are included and their pay is higher than that of service workers in the business sector.

As you can see in Table 4–9, Prague, as the capital of the Czech Republic, has the highest wages. Surprising, however, is the fact that differences between

[13] To think that performance related pay is *objective* is naive. E.g., managers in bankrupt firms get bonuses, the size of the bonuses is related to *other* factors.

Table 4–9 Wage differences by region

	2006		2011	
Region	BS	NBS	BS	NBS
Prague	0.233*** (0.001)	0.092*** (0.001)	0.219*** (0.001)	0.100*** (0.001)
Central Bohemia	0.142*** (0.001)	0.017*** (0.001)	0.148*** (0.001)	0.024*** (0.002)
South Bohemia	0.036*** (0.002)	–0.022*** (0.001)	0.017*** (0.002)	–0.006*** (0.002)
Pilsen region	0.108*** (0.002)	–0.005*** (0.002)	0.064*** (0.002)	0.013*** (0.002)
Carlsbad region	0.084*** (0.002)	0.010*** (0.002)	0.018*** (0.002)	0.008*** (0.002)
Ústí region	0.060*** (0.001)	–0.010*** (0.001)	0.040*** (0.001)	0.011*** (0.002)
Liberec region	0.105*** (0.002)	–0.012*** (0.002)	0.073*** (0.002)	–0.015*** (0.002)
Hradec Králové region	0.034*** (0.002)	0.013*** (0.002)	0.050*** (0.002)	0.012*** (0.002)
Pardubice region	–0.004*** (0.002)	–0.014*** (0.001)	0.005*** (0.002)	–0.010*** (0.002)
Vysocina region	0.040*** (0.002)	–0.029*** (0.002)	0.023*** (0.002)	–0.025*** (0.002)
South Moravia region	0.039*** (0.001)	–0.008*** (0.001)	0.049*** (0.001)	–0.011*** (0.001)
Zlín region	0.037*** (0.002)	–0.015*** (0.002)	0.022*** (0.002)	–0.023*** (0.002)
Moravia-Silesia region	0.072*** (0.001)	–0.012*** (0.001)	0.042*** (0.001)	–0.018*** (0.001)

Source: AEIS
Olomouc region = omitted. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.BS = business sector, NBS = non-business sector.

Prague and the rest of Czech Republic are slightly decreasing, but only in the business sector. Wages in the business sector are higher in Prague by about 10 up to 23% than in other regions in 2006 and by 7 up to 22% in 2011.

Using firm effects lowers differences in the business sector, see Table 4–10. This is probably caused by the effect of sectors in regions. Prague companies have local branches in the regions and remuneration follows the same principles as in the Prague headquarter and this phenomenon reduces the regional wage differences. On the contrary, wage differentials between regions increase in the non-business sector when using firm effects. Important parts of the organizations and firms in non-business sector are public institutions with headquarters in Prague (institutions are more prestigious, high level (prime minister, ministries, Central Bank etc.). This is the reason why firm effects increase the wage differences between regions in the non-business sector. It is not surprising that

Table 4–10 Wage differences by region – firm effect

	2006		2011	
Region	BS FE	NBS FE	BS FE	NBS FE
Prague	0.205***	0.078***	0.199***	0.115***
	(0.024)	(0.010)	(0.018)	(0.016)
Central Bohemia	0.075***	0.034***	0.066***	0.047***
	(0.017)	(0.007)	(0.018)	(0.013)
South Bohemia	0.028*	–0.030***	0.014	0.010
	(0.014)	(0.006)	(0.015)	(0.008)
Pilsen region	0.040***	0.007	0.037**	0.024***
	(0.014)	(0.008)	(0.016)	(0.009)
Carlsbad region	0.013	0.005	0.007	0.001
	(0.014)	(0.007)	(0.016)	(0.010)
Ústí region	0.011	–0.001	–0.004	0.027***
	(0.016)	(0.006)	(0.016)	(0.009)
Liberec region	0.025*	0.001	0.007	0.014*
	(0.014)	(0.009)	(0.018)	(0.008)
Hradec Králové region	0.003	0.022**	0.011	0.025***
	(0.012)	(0.010)	(0.020)	(0.009)
Pardubice region	–0.002	–0.018***	0.006	–0.006
	(0.014)	(0.005)	(0.015)	(0.004)
Vysocina region	–0.004	–0.004	–0.001	0.013
	(0.017)	(0.010)	(0.015)	(0.019)
South Moravia region	0.033***	–0.011	0.016	–0.016
	(0.007)	(0.008)	(0.013)	(0.026)
Zlín region	–0.005	–0.015	–0.006	0.001
	(0.015)	(0.011)	(0.015)	(0.014)
Moravia-Silesia region	0.005	–0.004	–0.028*	0.003
	(0.016)	(0.004)	(0.015)	(0.010)

Source: AEIS
Olomouc region = omitted. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.BS = business sector, NBS = non-business sector, FE = firm effect.

wage differentials between the other regions are minimal, with the exception of Central Bohemia region (around Prague), so this is actually a capital-periphery issue and not inter-regional differences.

Table 4–11 shows wage differences by industrial sectors. The highest wages in the business sector are paid in branch D – suppliers of electricity, gas and water and this by more than 40.7% higher than in agriculture and forestry, followed by branch B – mining with 40.3% and J – information and communication with higher wages by 29.6% in the year 2011. In contrast, the lowest wages were paid in N – administrative and support services with 19.2% lower wages. Results in 2006 are very similar the order of sectors is different. The basic proportions in terms of the differences in wages are nevertheless preserved. There is probably a connection of better paid professions in J – information and communication with higher education. High earnings in the

Table 4–11 Wage differences by industrial sectors

	2006		2011	
Industry	BS	NBS	BS	NBS
B – Mining	0.383*** (0.003)	–	0.403*** (0.003)	–
C – Manufacturing	0.138*** (0.002)	–0.270*** (0.053)	0.128*** (0.003)	–
D – Electricity, gas and water supply	0.340*** (0.003)	0.225** (0.100)	0.407*** (0.004)	0.381*** (0.078)
E – Waste removal	0.105*** (0.003)	–0.024 (0.030)	0.124*** (0.003)	–0.039** (0.018)
F – Construction	0.168*** (0.003)	–	0.118*** (0.003)	–0.300*** (0.037)
G – Repairs, trade	–0.060*** (0.002)	–	0.023*** (0.003)	–
H – Transport and logistics	0.141*** (0.002)	0.036 (0.030)	0.069*** (0.003)	–0.027 (0.018)
I – Hotels and restaurants	–0.145*** (0.003)	–0.074** (0.030)	–0.181*** (0.004)	–0.107*** (0.018)
J – Information and communication	0.202*** (0.003)	0.006 (0.033)	0.296*** (0.003)	–0.103*** (0.029)
K – Financial intermediation	0.249*** (0.003)	–	0.229*** (0.003)	–
L – Real estate	0.168*** (0.007)	0.005 (0.030)	0.192*** (0.006)	–0.035* (0.019)
M – Professional, R&D activities	0.177*** (0.004)	–0.023 (0.030)	0.142*** (0.004)	–0.023 (0.019)
N – Administrative services	–0.251*** (0.003)	–0.040 (0.032)	–0.192*** (0.003)	–0.057** (0.025)
O – Public services, defence and social insurance	0.121*** (0.004)	0.025 (0.029)	0.150*** (0.004)	–0.083*** (0.018)
P – Education	–0.019*** (0.003)	–0.041 (0.029)	–0.063*** (0.003)	–0.065*** (0.018)
Q – Health care	0.027*** (0.003)	0.040 (0.029)	0.115*** (0.003)	–0.024 (0.018)
R – Arts, entertainment, recreation	0.068*** (0.005)	–0.145*** (0.029)	0.115*** (0.006)	–0.235*** (0.018)
S – Other activities	–0.083*** (0.008)	–0.030 (0.030)	–0.043*** (0.006)	–0.075*** (0.018)

Source: AEIS

Agriculture = omitted. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. BS = business sector, NBS = non-business sector.

sector of mining and electricity, gas and water supply are caused by having to pay danger money to compensate for the risk of working in such environments. In the non-business sector there are few statistically significant results. Branch D – suppliers of electricity, gas and water – records the highest wages even in non-

Table 4–12 Wage inequalities by size of company, ownership and collective agreement

	2006		2011	
Variables	BS	NBS	BS	NBS
Ownership				
Cooperative ownership	–0.096*** (0.002)	Ownership not monitored in non-business sector	–0.146*** (0.002)	Ownership not monitored in non-business sector
State ownership	0.024*** (0.001)		0.068*** (0.001)	
Foreign ownership	0.136*** (0.001)		0.155*** (0.001)	
Size of company				
Firm size 10–49 employees	Omitted category	0.029*** (0.002)	0.259*** (0.008)	0.021*** (0.001)
Firm size 50–249	0.037*** (0.003)	0.040*** (0.002)	0.310*** (0.008)	0.036*** (0.002)
Firm size 250–999	0.067*** (0.003)	0.063*** (0.002)	0.343*** (0.008)	0.096*** (0.002)
Firm size more than 1000	0.113*** (0.003)	0.110*** (0.002)	0.386*** (0.008)	0.131*** (0.002)
Collective agreement				
Collective agreement not stated	0.015*** (0.002)	0.044*** (0.005)	0.045*** (0.002)	0.006** (0.003)
Firm collective agreement	–0.027*** (0.001)	0.054*** (0.005)	0.000 (0.001)	0.050*** (0.003)
Higher and central collective agreement	–0.055*** (0.001)	Omitted category	–0.045*** (0.002)	omitted category

Source: AEIS

Private ownership omitted. Not signed collective agreement omitted. The smallest firms (1–9 employees) omitted. In year 2006 size category of the smallest firms has not been monitored. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. BS = business sector, NBS = non-business sector.

business sector and despite the fact that parts of this sector has not been privatized yet and part of firms are still in public sector.

In Table 4–12, results for other firm characteristics are shown – size of company, type of ownership and type of collective agreement.

Generally, workers in large companies have higher wages. A number of factual reasons are logical and are apparent in reality while others are controversial. Larger companies can employ higher qualified workers for specific and specialised jobs and this reality is related to their possibility and ability to pay higher wages to their employees.

Companies pay efficiency wages and ensure a higher benefit and productivity from their work. Most of the larger companies have higher vertical occupation differentiation, because they for example have their own research and development department. Consequently, they have a higher proportion of high-wages professions and a greater internal wage differentiation. On the other hand,

they often pay higher wages to avoid conflict with trade unions while small companies refuse to establish trade unions but can offer better working conditions as their vertical management structure is closer to the demands and requirements of the common employee. Greater market share, increasing returns to scale, higher profits, monopolistic pricing due to market power might be also the factors *behind* this fact. It explains why big firms (over 1000 employees) in business sectors had higher wages by 38.6% than the smallest firms (to 10 employees). The results show that wages grow with the size of the firm. The results for 2006 are affected by a failure in the monitored (data collection) smallest businesses. Nevertheless, it is evident that there is a clear wage growth with the size of enterprises and wages in the largest enterprises are higher by 11.3% than in companies ranging in size from 10 to 49 employees. The non-business sector records similar results, earnings are higher with higher number of employees in the firms but the differences are significantly lower. The biggest companies paid wages only by 13.2% higher than the smallest organizations in 2011 and the difference is similar also in 2006.

Type of ownership is statistically significant and the results prove that the trend in recent years is that wages in state companies and in business sector firms are higher than in private and cooperatively owned firms. This difference increased between 2006 and 2011. Foreign owned firms paid the highest wages – by 13.6% in 2006, resp. 15.5% in 2011. Foreign owned firms from OECD countries employ the highest number of foreign workers and in some companies all CEO comes from the firm´s country of origin.

The Czech system of collective bargaining and signing collective contracts is not unified and cannot be characterised as either decentralised or centralised. The principle of arbitration does not work and its impact on the business sector is marginal. This is evident in the results of the model. Wage levels in business sector companies that have no collective contracts are the highest of all, whereas in companies with the highest form of collective contracts wage levels are lowest. One would expect this result more from a decentralised system of collective bargaining, where workers in a firm without collective contracts favour a higher wage over the job security that a contract guarantees (neo-classical theory). In non-business sector the highest wages are in organisations with business contracts, where unions have a strong bargaining position and the employer is the state or another employer from the public sector.

4.3 Conclusions

Our analysis shows that wages are formed in accordance with the principles of a market economy. Functional legislative framework have been formed which react to the gradual economic development of the second part of the last decade. This is apparent in the given increase in the levels of wages closely related to levels of education and occupation.

A particularly important determinant of wages is gender. Although the differences are decreasing, they are nevertheless significant and still attain levels

which are higher than some of the advanced countries of the European Union. The gender wage gap is much lower in non-business sector.

The inclusion of additional personal, institutional and structural characteristics into the model increases the interpretative validity of our study to almost 77% of all the differences in the wages of individuals in the Czech Republic. The Female coefficient fell dramatically in the business sector, although there are still differences of round 50% more compared to the non-business sector, where added variables had no effect on the female coefficient in 2011.

Age is not a particularly significant determinant of wages, although it can be considered as an indicator mediating the length of specialised work experience in wages. Empirical analyses demonstrate that the wage—age mechanism is more significant in non-business sector, but not within the business sector. Nevertheless, a general slow decrease in the influence of age as well as the length of specialised work experience on the levels of wages is apparent.

The impact of education slowly decreases or stagnates both in business and non-business sector. Education is not the leading determinant of wages, but rather the type of occupation involved. Top-level employees (group 1 in the ISCO 88) have almost 70–90% more than the wages of assistant employees and unqualified workers (group 9) in the business and non-business sectors. The division of employees in terms of profession is, however, strongly influenced statistically by the level and type of education, with the indicators significantly in correlation. Both of these factors explain the majority of the differences in wages in Czech Republic.

On the Czech labour market there is no obvious tendency towards discrimination of employees of Slovak citizenship, but this is not the case with other citizenships, except those from EU 15 and the other countries of OECD.

Full-time jobs brought workers a wage 'bonus' of approximately 7% in 2011 and 9% in 2006 but only in the non-business sector. In the business sector wages are virtually the same. In many non-business companies employees working part-time do not receive certain components of the wage which full-time workers receive, the reason being that they do not participate fully in the outcome for which the bonuses are paid.

Firm effects play a very significant role as determinant of wages in both business and non-business sectors but in the business sector significantly more.

The author's hypotheses assumed a significant influence on the part of certain institutional characteristics on the level of wages. The authors expected its influence to have decreased and reached roughly the same level as in other European countries. The most significant factor is industry and it continues to be valid that the concentration of certain occupations in a definite industry leads to the formation of a certain structure of wage distribution. The influence of other

institutional factors is also particularly significant. Wages in the capital, Prague, are higher than in all other regions, but the gap is slowly becoming smaller.

The general public accepts the fact that workers in large companies have higher wages. Most of the larger companies have higher vertical occupation differentiation; they maintain their own research and development, etc. Consequently, they have a higher proportion of these professions and wage differentiation. This explains why big firms in both the business and non-business sectors with more than 1000 employees paid higher wages than the smallest businesses.

Ownership type is statistically important and confirms the trends of recent years where state concerns and institutions pay higher wages than in the private firms and co-operatives, and the gap increased between 2006 and 2011. Businesses owned by foreign companies paid the highest wages, which is due to the fact that they employ the highest number of foreign workers, with some firms even having the top management coming from the mother country.

The Czech system of collective bargaining and signing collective contracts is not unified and wages in private companies where there are no collective contracts are highest, whereas in companies with the highest form of collective contracts wage levels are lowest. In non-business sector the highest wages are in organisations with business contracts, where unions have a strong bargaining position and the employer is the state or another employer from the public sector.

Chapter 5

Reinvestigating the Determinants of Gender Wage Gap: Evidence from Survey

By Lenka Filipová, Mariola Pytliková, Jiří Balcar, Jaromír Gottvald

Even though the research in the gender wage gap is one of the most important topics in labour market economics and has been systematically studied since the early 1970s[14], there are still some unclear factors behind the existing gender wage differentials. Differences in human capital accumulation and discrimination have been discussed as the main sources of the gender wage gap and occupational segregation by gender. However, recent studies suggest that in addition psychological and socio-psychological factors may explain large proportion of the gender differences in labour market outcomes (Bertrand, 2010). Specifically, some experimental literature has proved systematic differences in psychological attributes between men and women in the sense that women are more risk averse than men, prefer less competitive environment, are more altruistic with stronger preferences for redistribution and negotiate worse for themselves than men (Bertrand, 2010; Borghans et al., 2009; Mueller and Plug, 2006). Further, other socio-psychological factors, such as the impact of gender identity roles and social norms were put forward as possible determinants of the gender differences on the labour market. In particular the hypothesis that as long as the social norm that *men work in the labour market and women work at home* exists, women will have lower motivation to participate in the labour market than men with the consequences on wages and other labour market outcomes (Akerlof and Kranton, 2000). However, the empirical research on the role of those psychological and socio-psychological attributes in explaining the labour market outcomes is still in its infancy. Moreover, the existing research has often focused

[14] Usually, earlier studies were applying wage regressions and decomposition of wage differences between men and women as the methodological base in the gender wage gap analysis, recently surveys help to uncover some unclear reasons of the existing gender differentials on the labour market.

on single aspects of psychological and socio-psychological factors, and often did not cover other factors that may explain the gender differences.

This chapter contributes to the literature with analyses of different aspects of gender based wage differentials using a rich survey, which we designed for the research project. In this way we are able to enrich the human capital model as envisioned by Becker (1964) and to dig deeper into the potential existence of gender based wage discrimination. In particular, the survey helps us to understand better the role of psychological, non-cognitive skills, socio-psychological and gender identity factors, job characteristics and work-life preferences, which are rarely considered in the previous literature. The survey is described in detail in Chapter 3 and in Balcar et al. (2012).

In our analyses we first run wage equations starting with very parsimonious specification with the female dummy as a sole explanatory variable, and then we add various subsets of variables one by one in order to examine the effect of their inclusion on the female dummy coefficient. We find that female dummy shows 25.3% wage difference with respect to men and it explains approximately 11.6% of the variance in monthly wages (adj. R-squared) in this most parsimonious model specification. Adding our rich subsets of variables decreases the coefficient to female dummy substantially to 3.2%, and our full model specification explains 53.5% of variance of monthly wages. Finally, we explore the role of particular variables in explaining the gender wage gap by following the Oaxaca and Blinder and Juhn-Murphy-Pierce earnings decomposition methodology. We find that observable characteristics explain approx. 87% of the gender wage gap, whereas approx. 13% remains unexplained. One of the major factors contributing to explanation of the difference between men and women is lower tenure and more leave due to child bearing taken by women. Finally, based on our results we present a number of policy recommendations that could help bringing more gender equality on the labour market, and at the same time lessen problems of population aging that the Czech Republic experiences.

The rest of the chapter is organized as follows: The next subsection 1 derives hypotheses and briefly describes the data. Section 2 provides the empirical model of wage determinants and presents its results. Section 3 includes Oaxaca-Blinder and Juhn-Murphy-Pierce decomposition of wage differences between men and women and discusses results from the decompositions. Section 4 offers some concluding remarks and discusses policy implications.

5.1 Hypotheses Development and Some Descriptive Evidence

What do we know about factors explaining the observed gender differentials? Most of the existing earlier research tries to uncover how much of the gender wage gap remains after adjusting for an individual's productivity enhancing characteristics such as education, experience, occupation and industry, variables covered by commonly existing micro-data. Using this approach most research finds a sizable *unexplained* gender wage gap, which has been usually considered as discrimination. However, many argue that this approach may be biased

because it omits important, although unobservable in the data, variables. Recent research, which we discuss already in Chapter 2, suggests that there are a number of factors that influence the wage differentials and that are not covered at commonly available micro-datasets.

The factors hypothesised to have an effect on pay could be divided into the following groupings: *human capital factors, demographic and family factors*, *job and employer characteristics*, *gender identity and family situation variables*, *psychological traits, health and appearance characteristics.*

Regarding the *human capital factors,* in line with previous research in tradition of Mincerian earnings function (Mincer, 1974), a number of traditional human capital controls such as education, tenure and experience are usually covered in the previous studies as factors determining wages. Often individuals' age served as a proxy for their experience or tenure. In our survey we ask directly about respondents' tenure, experience and age, thus we can separate effects of all those variables. A number of studies suggest that labour market experience gained through job changes might affect wages positively or negatively depending on the voluntary or involuntary job change's character. In particular, the voluntary job mobility might be the quickest way in which workers can advance in their careers and move up in the wage structures, whereas the layoffs might be correlated negatively with wages (Antel 1986; Loprest, 1992; Bernhardt et al., 1999). In the survey we ask about the number of employers (employment lasting for at least 6 months) the respondent have had in his working career and in this way we control for wage gains (or loses) in connection with respondents' job mobility.

Work experience may be affected by leaves due to child bearing, and in this way a women career can receive a *maternity penalty*. This is of particular importance when studying gender differentials in wages in the Czech Republic, as the total length of paid maternity and parental leave is highest among the developed OECD countries summing up to 164.5 weeks, see Figure 5–1, and most likely the longest paid leave in the world. There is a deep tradition for parental leave in the Czech Republic. During the communist era, there was a strong commitment to the full integration of women in the economic sphere as well as by providing generous public childcare facilities.[15] The paid parental leave has been introduced in 1964 initially only to mothers and for a period of 1 year (52 weeks) for one child and up to 2 years (104 weeks) for 2 and more kids. The parental leave period was increased further to 1.5 year (78 weeks) in 1984 and since then it could be shared equally between mothers and fathers. In 1988, the length of parental leave was increased further till child's third birthday (156 weeks) and till fourth birthday (208 weeks) in 1996. In 2006, the government introduced a flexibility of choice between 2, 3 or 4 years of paid parental leave. Specifically, since 2006 a woman goes on paid maternity leave six to eight

[15] Unfortunately, many of these institutional features collapsed after the Fall of Iron Curtain.

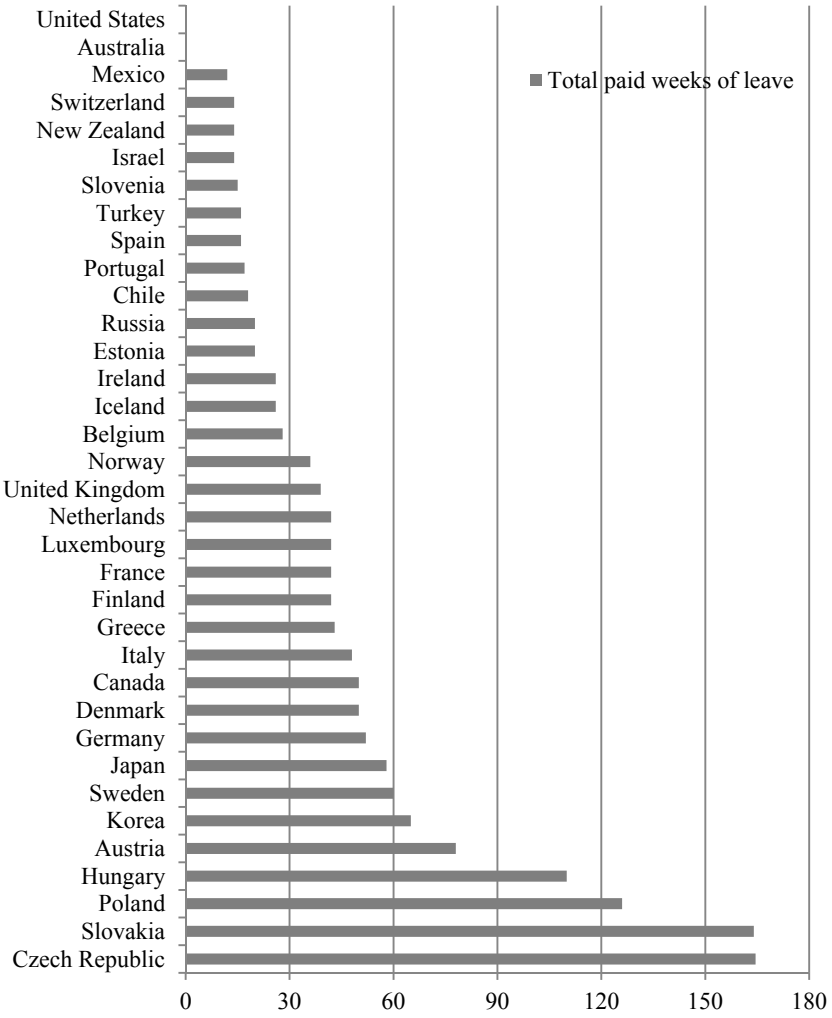

Figure 5–1 Total paid weeks of maternity and parental leave in 2011, OECD countries
Source: OECD (2012)

weeks before her official due date and the maternity leave lasts 28 weeks. After the first 6-weeks after the birth pass by the parental leave follows, which can be shared equally between mothers and fathers and it lasts until the child's third birthday. The person taking care of the child may afterwards ask his/her employer for a grant of unpaid leave until the child's fourth birthday. Although the leave can be shared between parents, in vast majority only mothers take up the parental leave.

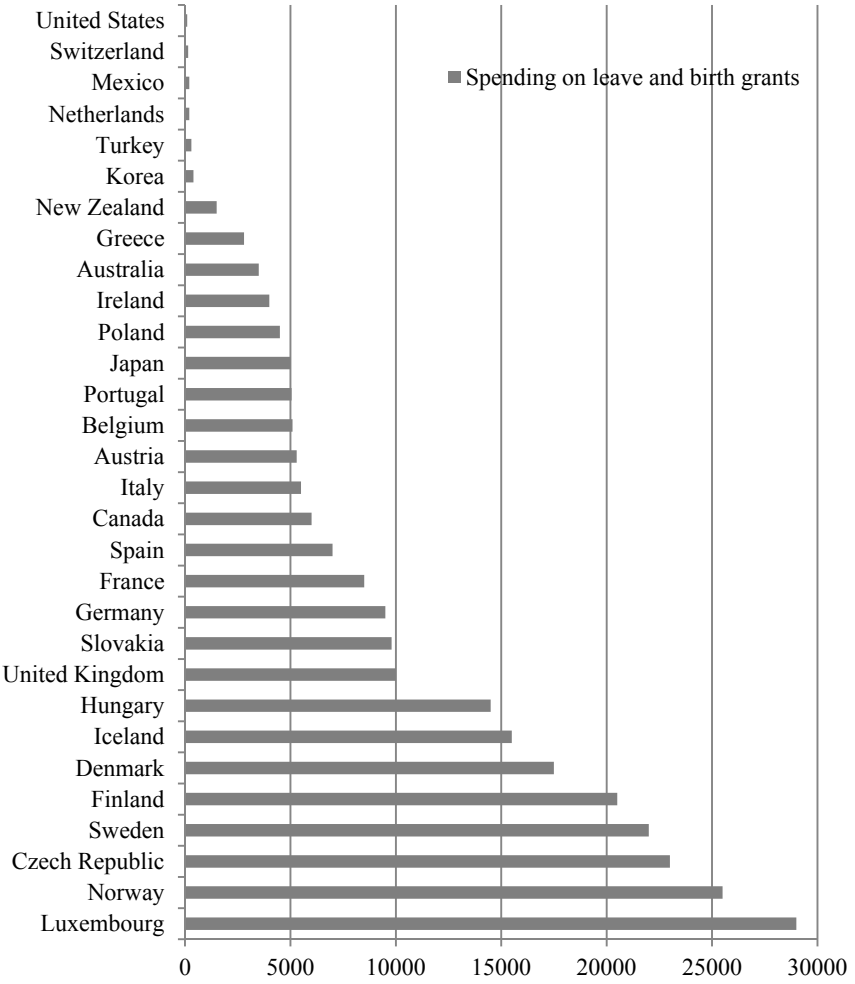

Figure 5–2 Spending on child related leave and births grants per childbirth in 2007 in USD adjusted for PPP, OECD countries
Source: OECD (2012)

The maternity and parental leave system in the Czech Republic is also very generous in comparison to other developed OECD countries. Specifically, the spending on child related leave and birth grants per childbirth in the Czech Republic is third highest among the developed OECD countries after Luxembourg and Norway, and even higher than other Nordic countries traditionally considered to be very generous, see Figure 5–2.

Maternity leave is meant to improve mothers' health and children's welfare, through a reduction in early maternal employment. Proponents further argue that maternity leave promote gender equality and increase women's earnings as they

allow mothers to retain valuable firm-specific human capital and match-specific search capital after childbirth (Schönberg and Ludsteck, 2012). But the long and generous maternity and parental leave that is considered almost sacred by most of Czech society may be working against women who want to advance in their career. Such a long leave from work is likely to influence negatively women's work experience and affect their wages negatively in comparison with the same cohort of men. It may also make women to suffer from a depreciation of their skills, which may show up in lower occupational positions after their return to their jobs. One may also expect that the longer the period of leave, the higher the costs borne to employers will probably be if they need to replace employees for the absence from work, and thus employers may in this way indirectly discriminate against female employees by giving them lower wages. All three factors point towards a negative effect of long periods of leave on worker's wages.

Previous evidence suggests that leave affects wages negatively and the effect is relatively persistent over workers careers. For instance for Germany, each year of work interruption is estimated to depress the wage received on return to work and within the few years after by 6% to 19%, depending on empirical specifications (Ondrich et al., 2003; Beblo et al., 2009). Similarly for France, each year of leave is estimated to lower later wages by 7% to 17% depending again on specification (Lequien, 2012). There is mixed evidence on whether the negative effects are long lasting. Schönberg and Ludsteck (2012) found that increasing maternity benefit period beyond the job protection period reduced earnings of employed mothers by around 3% two to six years after childbirth, whereas other expansions of maternity benefit period within the job protection period had only very small effects on mothers' income three to six years after the childbirth. Other studies did not find any detrimental effects on labour market outcomes in the medium and long run, see Lalive et al. (2011) for evidence from Austria. In our survey we directly ask for the number of weeks respondents took off in connection with the parental leave. We are not able to distinguish between mechanisms (i.e. depreciation of skills and lower occupational positions, lower work experience or discrimination) and say anything about a causal effect of leave duration on wages, but we expect wages to be negatively correlated with the length of parental leave.

Besides, it is also suggested that individual's cognitive ability has an effect on his earnings. The ability is often hard to observe by the commonly available data, and in previous studies usually individual's unobserved time constant fixed effects were added to control for the unobserved ability. By using our survey we are able to single out the cognitive ability by questions related to respondent's math grades in the grammar school and his satisfaction with the grade. We expect the wage to be higher the better is the math grade and the higher is the satisfaction. Please note that in the Czech system, the grade goes from 1 to 5 with 1 being the best grade and 5 the worst, thus we expect a negative relationship between math grade and wages.

Regarding the *demographic and family factors* we cover variables usually considered in previous literature as well, such as age, nationality (approximated by mother tongue), marital status, number of children and number of household members. In addition, we ask about respondent's sisters and brothers. It has been hypothesized that parents face a trade-off between *child quantity and child quality* and therefore a number of sisters and brothers can have an effect on respondent's labour market performance (Butcher and Case, 1994). We use information on parental education of the respondent as a proxy for her unobserved family background. We use both mother's and father's schooling as there might be difference in the wage effects, see Altonji and Dunn (1996) or Plug (2004). Other incomes such as social benefits may influence the willingness to work, therefore we asked the respondents about their net monthly income from other than main job and social benefits. We further include a dummy indicating whether with losing respondent's income the living standard of the family would decrease significantly.

Regarding *job and employer characteristics* that determine wages we control similarly as in the previous literature for employee's occupation (ISCO code), working hours, employers industry (NACE), region, size and firm ownership. Previous research showed that allocation of men and women into different jobs play a key role in explaining gender differences in wages. In addition as described in Chapter 3 we ask a number of questions related to: job specialization, such as a performance of the same or very similar work / work tasks during workers labour market career and also a correspondence of job with their field of study (the variable uses the following scale: *it does not correspond at all – I am doing something else*, *it does not correspond much*, *it corresponds partly* and *it corresponds entirely*), and job flexibility, such as availability of flexitime, working from home and change of workload, and their use (the variable uses the following scale: *employer provides it and I use it*, *employer provides it but I do not use it*, *employer does not offer it*). We would expect that more specialized jobs will be correlated positively with wages, whereas the effect of job flexibility on wages may be unclear. On one hand job flexibility can be a part of earnings package in worker's negotiations and thus job flexibility would be negatively correlated with wages. On the other hand job flexibility is usually connected to white collar better-paid occupations and it may also reflect more modern and more successful firms, and thus may be positively correlated to wages. Further, we expect that there might be differences in pay depending on whether respondents' job performance is rewarded in objective/measurable or subjective fashion. We also ask question related to gender of respondent's supervisor and friendship with their bosses. We would expect that female supervisor would discriminate less and help women to earn more, and that friendly relationship with bosses would be positively correlated with wages. Further, we create dummies for different ways of getting a job, such as getting a job through an offer, recommendation, somebody's referral, employment office, media advertisement etc. Finally, we test for the existence of monopsonistic situation and request information about the number of potential employers in

respondents' commuting area. We expect the number of potential employers to be positively correlated with wages.

Previous research suggests that gender identity and socio-economic preferences are important when explaining wage differences between men and women (Akerlof and Kranton, 2000; Fortin, 2005; Hakim, 2008). In the survey we focused on covering preferences, gender identity and position in the family. The variables are described and discussed in detail in the next section on the effects of family and gender identity on wages, and the theoretical background is discussed in Chapter 2. In this section we only summarize the subset of gender identity and family variables shortly. Respondents were enquired to declare their preferences for selected job characteristics (job security, job flexibility, personal self-fulfilment, demands and/or stress related to work and good interpersonal relationship) over wage. The question was asked in such a way as to reveal what is more important to them (at scale almost entirely wage level, rather wage level, rather the other characteristic, almost entirely the other characteristic), and thus we use the variables as categorical variables. We would expect that wages would be positively correlated with more importance put on wages and career advancement, whereas we would expect wages to be negatively correlated with more importance on other job characteristics such as flexibility, security and good atmosphere. Regarding examinations of family roles we asked respondents questions on who should be responsible for ensuring an adequate income for the family and who for housework (meal preparation, dish washing, cleaning, shopping, washing and ironing) and taking care of children; and questions on who does it in reality (at scale almost entirely me, mostly me, me and my partner equally, mostly a partner, almost entirely a partner). We would expect respondents higher *real* responsibility for housework (income) to be negatively (positively) correlated with wages. Respondents were also asked to order life areas (family, working career, hobbies & free time, non-paid activities) according to their general preferences and according to energy and time devoted to them at present (reality). Again we would expect those respondents preferring a working career over other areas to have higher wages. Further a number of questions investigate respondent's use of help with housework or with their children up to age of 3 years. We would expect the use of different types of help to be positively correlated with wages.

As discussed in Chapter 2, psychological factors were much in focus in recent literature (see Almlund et al., 2011, for a comprehensive overview of research advancement in the area). In our survey, we approximated respondents' psychological traits through respondents' agreement with statements describing certain behaviour. In particular the survey focused on the role of risk-aversion, competitiveness, self-esteem, determination and locus of control. Respondents were asked whether they *feel a really strong need to excel, and be better than others at what they do* (at scale *no*, *not really*, *fairly*, *yes*). Based on previous evidence we would expect higher returns to wage for more risky and competitive individuals (Mueller and Plug, 2006), and individuals with higher self-esteem and with larger control of their life (Fortin, 2008). We add to the literature by

introducing a variable on grit following literature in psychology by e.g. Duckworth and Quinn (2009). In particular we asked respondents on whether they are determined in their life by asking the following question: *I often leave the goal I have set, when I find it's reaching difficult*, see Appendix 1 for an overview of questions asked in our survey. We expect more determined respondents to have higher wages. Previous literature also suggests that being able to negotiate pays off and that they receive a pay penalty for *not asking*.

Finally, previous literature suggests that more beautiful and healthy people earn more and therefore we add variables related to health and BMI index (as a proxy for appearance) to our analyses of wages.

Appendices 2, 3 and 4 provide a descriptive statistics of the variables from our survey. There are the following interesting differences between men and women from our sample:

- Women are slightly better educated and have higher reported ability in terms of better math grades and being more satisfied with them
- Women are working less in terms of working hours – both scheduled and real working hours
- Women are have lower tenure than men
- Women are keep much longer maternity leave
- Women are more likely to be evaluated objectively
- Women have more likely female as a boss than men do
- Women are more likely working in state sector
- For women is more important to have higher job security, job flexibility, career advancement, less stressful job and a good atmosphere in the workplace over a higher wage.
- Women prefer to equally share income and household responsibility with their partners, but in reality men are more likely to be responsible for income and less responsible for households. On the other hand, men would prefer to be responsible for income and less responsible for households, and it is indeed like that in reality.
- Women tend to score higher in the locus of control, but less in competition, negotiations, risk and grit.

More detailed descriptive statistics is provided by Chapter 3.

5.2 Empirical Model of Wage Determinants and Results

We start our analyses with investigating determinants of wages in the modified (5.1) Mincerian wage model:

$$ln\, w_i = \lambda\, Female_i + \beta X_i + \varepsilon_i, \tag{5.1}$$

where w_i stands for monthly earnings, $Female_i$ is a dummy equal 1 for a female, 0 otherwise, and λ is the coefficient of our interest. The matrix X contains a number of control variables as described above. We stick to the division

introduced in the previous sections and we divide the control variables into the following subsets:

- demographic and family factors such as: age, number of children, marital status, number of household members, number of brothers and sisters, education of mother and father, nationality, all other earnings of respondent, social benefits in household and a dummy for the fact that with losing the person's income the living standard of the family would decrease significantly;
- human capital factors such as: education (with basic and no education being the omitted category), proxies for ability (math grades in the grammar school and satisfaction with those grades), tenure and its square (in order to account for possible non-linearity), length of the total parental leave period, dummy for any training within the last 12 months and the number of companies the person worked so far,
- job characteristics such as: occupation, a dummy for fit of person's job with his/her education, a dummy for having a specialist job, a dummy for job evaluation based on objective criteria, scheduled working hours, real working hours, category variable for a way of getting an employment, a dummy for being dependent on work of others, a dummy for the freedom to decide about method or order of tasks to reach a work-related goal, a dummy for having a female boss, a dummy for having a friendly relationship with a boss, a dummy for having a possibility to change the starting and stopping times at work, a dummy for having a possibility to work some regular paid hours at home, a dummy for having a possibility to change workload, and a dummy for having not many other job opportunities in the person's commuting area/a proxy for monopsony situation, industry (NACE2) controls, firm size and firm ownership;
- gender identity and family situation variables such as: dummies for a preference of job security / job flexibility / career advancement / less demanding and stressful job / good atmosphere over wage; dummies for preference / reality of being the main breadwinner; dummies for preference / reality of being responsible for household chores; a dummy for person's involvement in charity activities; dummies for lifestyle preferences / reality, a dummy for any help with the household duties, and a dummy for help with children,
- psychological traits such as: locus of control, competitiveness, self-esteem, risk aversion, and grit (determination) as a newly introduced psychological characteristics by the authors based on psychological research by e.g. Duckworth and Quinn (2009), and health and appearance characteristics (such as health, BMI and height).

We first run the analyses with the female dummy as the sole explanatory variable, and then we add one by one the subsets of variables in order to examine an effect of their inclusion on the coefficient λ central in our analyses. We should emphasize that we report estimated relationships between our variables and wage, not causal links.

The results of our analyses following the model (1) are presented in Table 5–1. We start with a very parsimonious model specification with a female dummy and a constant on the RHS to show the raw differences in terms of gender, and we add different subsets of additional controls as defined above. In this most parsimonious model specification, see column 1 in Table 5–1, the female dummy shows 25.3% wage difference with respect to men, and it explains approximately 11.6% of the variance in monthly wages (adj. R-squared). The raw wage differential is similar of the one found in the previous chapter for business sector, i.e. 25.6%, and similar to the one found in Jurajda (2003b) for year 1998. Adding regional dummies and demographic variables increases slightly the size of coefficient to female dummy so that now the gender wage gap is on 25.5%, but some increase the explanatory power up to 23.7%. As expected, the coefficient of female dummy decreases to 19.6% once the human capital variables are added and the variables now explain 38% of the variance in monthly wages. This model specification is the closest to the specifications using the traditional micro-data sources, such as the linked employer-employee dataset used in the previous section, and the wage gap is very similar to the one reported in Table 4–2 in Chapter 4 for the business sector, i.e. 20.2% and to the coefficient reported in Eriksson et al. (2013). Adding job characteristics again decreases the female dummy coefficient to 13.7% and increases significantly the models explanatory power to 51.1%. Adding gender identity and other family position variables decreases the gender wage gap further to 6% and increases the explanatory power up to 52.5%. The psychological characteristics decrease the coefficient to female dummy further to 5.6%. Finally, the health and appearance characteristics decrease the gender wage gap to 3.2% and actually take away the statistical significance from the female dummy coefficient. The last two sets of variables do not add much up to the explanatory power of model. Thus, in the fully specified model the gender wage gap is negligible at 3.2% and not statistically significant any more.

We can observe from the Table 5–1 that in particular the addition of subsets of demographic and family variables, human capital and job characteristics increases the explanatory power of the model substantially, however also the set of gender identity and position in the family characteristics and psychological traits are not negligible in terms of adding to the explanatory power. Our fully specified model explains 53.5% of variance of monthly wages.

From the demographic and family explanatory variables considered, we can observe that wages are positively associated with age, number of children, education of father, and with having a partner – being either in marriage or in partnership. As expected, wages are negatively correlated with social benefits.

Among the human capital measures the return rate on education is high at approximately 14%. The grades from math, which serves as our proxy for ability, are as expected negatively correlated to wages (please note that in the Czech system, the grade goes from 1 to 5 with 1 being the best grade and 5 the worst). Thus individuals with higher ability earn more. As expected there are

Table 5–1 Determinants of monthly wages, pooled OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	DepVar: log(monthly wage)							
Female	–0.253***	–0.254***	–0.255***	–0.196***	–0.137***	–0.060**	–0.056**	–0.032
	(0.016)	(0.015)	(0.015)	(0.021)	(0.020)	(0.026)	(0.026)	(0.029)
Region	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic and family								
Age			0.030***	0.031***	0.022**	0.021**	0.023***	0.023***
			(0.009)	(0.009)	(0.009)	(0.008)	(0.008)	(0.009)
Age squared			–0.000***	–0.000***	–0.000***	–0.000**	–0.000***	–0.000***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Children			0.019	0.029**	0.022*	0.020*	0.023*	0.024**
			(0.014)	(0.013)	(0.012)	(0.012)	(0.012)	(0.012)
Marital status: b Single								
Married			0.099***	0.048*	0.037	0.048*	0.046*	0.046*
			(0.029)	(0.027)	(0.024)	(0.026)	(0.025)	(0.025)
Single, partnership, no coh.			0.071*	0.055	0.028	0.019	0.019	0.016
			(0.039)	(0.036)	(0.031)	(0.031)	(0.031)	(0.031)
Single, partnership, cohabitation			0.050	0.039	0.039	0.048*	0.049*	0.048*
			(0.030)	(0.028)	(0.025)	(0.027)	(0.027)	(0.027)
Divorced/widow, without partner			0.048	0.044	0.038	0.017	0.018	0.017
			(0.034)	(0.031)	(0.027)	(0.027)	(0.027)	(0.027)
Divorced/widow, partner., no coh			0.085*	0.109***	0.078*	0.083**	0.088**	0.086**
			(0.047)	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)
Divorced/widow, partner., coh			0.106**	0.070*	0.035	0.042	0.034	0.030
			(0.045)	(0.042)	(0.039)	(0.040)	(0.039)	(0.039)
No of household members			–0.002	–0.001	0.007	0.009	0.009	0.009
			(0.010)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)

Table 5–1 continued	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
No of brothers			–0.010 (0.012)	–0.011 (0.010)	–0.009 (0.010)	–0.007 (0.010)	–0.008 (0.010)	–0.008 (0.010)
No of sisters			–0.006 (0.012)	0.002 (0.011)	0.002 (0.009)	0.004 (0.009)	0.002 (0.009)	0.003 (0.009)
Education of mother: b no or basic								
Secondary and vocational			0.074*** (0.023)	0.039* (0.021)	0.021 (0.019)	0.016 (0.019)	0.016 (0.019)	0.012 (0.019)
Post-secondary non-tertiary			0.037 (0.067)	–0.067 (0.062)	–0.059 (0.055)	–0.095 (0.058)	–0.105* (0.059)	–0.101* (0.060)
Short-cycle tertiary & Bachelor			0.141* (0.077)	0.036 (0.062)	0.005 (0.060)	0.008 (0.055)	–0.003 (0.055)	–0.008 (0.056)
Master & PhD			0.143*** (0.046)	0.023 (0.043)	0.018 (0.038)	0.017 (0.037)	0.020 (0.038)	0.014 (0.038)
Childhood without mother			0.132 (0.107)	0.088 (0.104)	0.038 (0.089)	0.073 (0.074)	0.075 (0.069)	0.057 (0.076)
Education of father: b no or basic								
Secondary and vocational			0.055 (0.034)	0.021 (0.031)	0.020 (0.027)	0.023 (0.027)	0.024 (0.027)	0.024 (0.028)
Post-secondary non-tertiary			0.063 (0.080)	–0.033 (0.063)	–0.024 (0.057)	–0.012 (0.053)	–0.009 (0.055)	–0.007 (0.055)
Short-cycle tertiary & Bachelor			0.102 (0.074)	0.043 (0.063)	0.022 (0.045)	0.036 (0.049)	0.038 (0.049)	0.032 (0.049)
Master & PhD			0.209*** (0.044)	0.091** (0.040)	0.087** (0.036)	0.090** (0.036)	0.087** (0.036)	0.087** (0.037)
Childhood without father			0.030 (0.054)	0.032 (0.048)	0.005 (0.043)	0.014 (0.042)	0.021 (0.042)	0.025 (0.041)
Czech nationality			0.037 (0.051)	0.093 (0.064)	0.064 (0.053)	0.063 (0.055)	0.062 (0.057)	0.068 (0.058)

Table 5–1 continued	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All my other earnings			0.000 (0.000)	–0.000 (0.000)	0.000 (0.000)	–0.000 (0.000)	–0.000 (0.000)	–0.000 (0.000)
Social benefits			–0.000*** (0.000)	–0.000*** (0.000)	–0.000** (0.000)	–0.000*** (0.000)	–0.000*** (0.000)	–0.000*** (0.000)
Living standards would decrease			–0.005 (0.020)	0.000 (0.018)	0.006 (0.016)	–0.005 (0.015)	0.001 (0.015)	–0.001 (0.015)
Human capital								
Education: b no or basic								
Secondary and vocational				0.107*** (0.038)	0.027 (0.033)	0.041 (0.033)	0.027 (0.034)	0.026 (0.033)
Post-secondary non-tertiary				0.212*** (0.050)	0.062 (0.045)	0.085* (0.045)	0.070 (0.046)	0.069 (0.045)
Short-cycle tertiary & Bachelor				0.230*** (0.047)	0.102** (0.041)	0.110*** (0.042)	0.093** (0.042)	0.095** (0.041)
Master & PhD				0.327*** (0.049)	0.152*** (0.044)	0.156*** (0.044)	0.140*** (0.044)	0.138*** (0.044)
Math grade (1highest-5lowest)				–0.047*** (0.012)	–0.037*** (0.011)	–0.034*** (0.011)	–0.030*** (0.011)	–0.028** (0.011)
Satisfied w. math grades				0.004 (0.018)	–0.011 (0.016)	–0.010 (0.016)	–0.010 (0.016)	–0.010 (0.016)
Tenure				0.016*** (0.003)	0.010*** (0.003)	0.010*** (0.003)	0.011*** (0.003)	0.011*** (0.003)
Tenure squared				–0.000*** (0.000)	–0.000** (0.000)	–0.000** (0.000)	–0.000** (0.000)	–0.000** (0.000)
Maternity leave				–0.026*** (0.005)	–0.019*** (0.004)	–0.015*** (0.004)	–0.015*** (0.004)	–0.015*** (0.004)
Training				0.062*** (0.015)	0.026* (0.014)	0.019 (0.014)	0.010 (0.014)	0.009 (0.014)

Table 5–1 continued	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
No of employers so far				–0.001 (0.006)	0.002 (0.006)	0.003 (0.006)	0.004 (0.006)	0.004 (0.006)
Job characteristics								
ISCO					Yes	Yes	Yes	Yes
Match of education & job					0.011* (0.006)	0.010 (0.006)	0.010 (0.006)	0.009 (0.006)
Specialist					0.034** (0.014)	0.034** (0.014)	0.034** (0.014)	0.035** (0.014)
Objective job evaluation					–0.022*** (0.007)	–0.023*** (0.007)	–0.021*** (0.007)	–0.020*** (0.007)
Scheduled working hours					0.014*** (0.003)	0.013*** (0.003)	0.013*** (0.003)	0.013*** (0.003)
Real working hours					0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)
Way of getting employment: b Employer's offer								
Somebody's recommendation					–0.027 (0.022)	–0.028 (0.021)	–0.020 (0.021)	–0.020 (0.021)
Somebody's information on vacancy					–0.032 (0.023)	–0.032 (0.022)	–0.026 (0.022)	–0.027 (0.022)
Job advertisement in media					–0.014 (0.030)	–0.014 (0.029)	–0.007 (0.029)	–0.010 (0.029)
Information from employment office					–0.056* (0.031)	–0.050 (0.030)	–0.038 (0.030)	–0.036 (0.030)
Applied for a job without job vacancy					–0.038 (0.024)	–0.031 (0.024)	–0.028 (0.023)	–0.027 (0.023)
Establishment of his/her own company					–0.183** (0.085)	–0.153* (0.089)	–0.132 (0.091)	–0.132 (0.089)
Other					–0.051 (0.045)	–0.049 (0.043)	–0.042 (0.042)	–0.041 (0.042)

Table 5–1 continued	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Teamwork					0.004 (0.007)	0.004 (0.007)	0.005 (0.007)	0.005 (0.007)
Work & job tasks freedom					0.029** (0.014)	0.029** (0.014)	0.026* (0.014)	0.028** (0.014)
Gender of boss					Yes	Yes	Yes	Yes
Relation with boss					Yes	Yes	Yes	Yes
Flexitime					Yes	Yes	Yes	Yes
Workhome					Yes	Yes	Yes	Yes
Changing workload					Yes	Yes	Yes	Yes
Monopson					0.030*** (0.008)	0.026*** (0.008)	0.025*** (0.008)	0.025*** (0.008)
NACE					Yes	Yes	Yes	Yes
Firm size					Yes	Yes	Yes	Yes
Ownership of firm					Yes	Yes	Yes	Yes
Gender identity and position in the family								
Job security						–0.007 (0.008)	–0.009 (0.008)	–0.009 (0.008)
Job flexibility						–0.020** (0.009)	–0.019** (0.009)	–0.020** (0.009)
Career advancement						0.015 (0.010)	0.006 (0.010)	0.005 (0.010)
Less demanding & stressful job						–0.012 (0.009)	–0.003 (0.009)	–0.001 (0.009)
Good atmosphere						–0.015* (0.009)	–0.015 (0.009)	–0.014 (0.009)
Responsibility for income – pref: b Exclusiv. Me								
Mainly me						0.008 (0.024)	0.011 (0.024)	0.009 (0.023)

Table 5–1 continued	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Me and partner equally						–0.036 (0.027)	–0.036 (0.027)	–0.033 (0.027)
Mainly partner						–0.043 (0.032)	–0.047 (0.032)	–0.044 (0.032)
Exclusively partner						–0.020 (0.038)	–0.023 (0.037)	–0.019 (0.037)
Responsibility for income – reality: b Exclusiv. Me								
Mainly me						–0.031 (0.021)	–0.026 (0.020)	–0.028 (0.020)
Me and partner equally						–0.037* (0.021)	–0.031 (0.021)	–0.033 (0.021)
Mainly partner						–0.120*** (0.025)	–0.112*** (0.025)	–0.114*** (0.025)
Exclusively partner						–0.122*** (0.037)	–0.107*** (0.036)	–0.109*** (0.036)
Parents that I live with						–0.119** (0.054)	–0.118** (0.054)	–0.117** (0.055)
Respons. for households – pref.: b Exclus. Me								
Mainly me						0.026 (0.034)	0.032 (0.033)	0.034 (0.033)
Me and partner equally						0.019 (0.034)	0.027 (0.034)	0.026 (0.034)
Mainly partner						0.035 (0.038)	0.037 (0.037)	0.038 (0.037)
Exclusively partner						0.011 (0.044)	0.014 (0.043)	0.017 (0.043)

Table 5–1 continued	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Respons. for households – reality: b Exclus. Me								
Mainly me						0.002 (0.020)	–0.002 (0.019)	–0.002 (0.019)
Me and partner equally						0.031 (0.021)	0.020 (0.022)	0.021 (0.021)
Mainly partner						0.029 (0.024)	0.023 (0.024)	0.024 (0.024)
Exclusively partner						0.039 (0.029)	0.033 (0.029)	0.033 (0.029)
Parents that I live with						0.006 (0.062)	0.001 (0.062)	0.001 (0.062)
Charity						–0.004 (0.018)	–0.007 (0.018)	–0.004 (0.018)
Lifestyle – reality: b Working career								
Family						–0.006 (0.016)	–0.004 (0.016)	–0.003 (0.015)
Free time and hobbies						–0.007 (0.027)	–0.005 (0.027)	–0.004 (0.026)
Volunteer, non-paid activities						–0.050 (0.083)	–0.040 (0.080)	–0.042 (0.076)
Lifestyle – pref.: b Working career								
Family						–0.025 (0.017)	–0.021 (0.017)	–0.020 (0.017)
Free time and hobbies						–0.025 (0.023)	–0.016 (0.023)	–0.014 (0.023)
Volunteer, non-paid activities						0.041 (0.122)	0.083 (0.125)	0.074 (0.120)
Help in households						0.037*** (0.013)	0.035*** (0.013)	0.033*** (0.013)

Table 5–1 continued	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Help with kids						–0.016 (0.016)	–0.017 (0.016)	–0.017 (0.016)
Psychological traits								
Locus of control							0.002 (0.008)	0.003 (0.008)
Competition							0.027*** (0.009)	0.028*** (0.009)
Self-esteem							0.007 (0.009)	0.006 (0.009)
Negotiation							–0.022* (0.013)	–0.022* (0.013)
Risk (1–10)							0.004 (0.003)	0.004 (0.003)
Grit (Determination)							0.028*** (0.009)	0.027*** (0.009)
Health and appearance								
Health								–0.032 (0.021)
Bmi								–0.000 (0.002)
Height								0.002** (0.001)
Constant	9.964*** (0.011)	10.149*** (0.025)	9.067*** (0.190)	8.920*** (0.218)	8.594*** (0.306)	8.676*** (0.306)	8.397*** (0.301)	8.013*** (0.348)
Observations	1,984	1,984	1,984	1,984	1,978	1,978	1,978	1,978
Adjusted R-squared	0.116	0.163	0.237	0.380	0.511	0.525	0.533	0.535

Source: Questionnaire

Notes: Dependent Variable: Ln (monthly wage). *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses.

statistically significant positive returns to tenure and negative to quadratic tenure. We find a strong negative effect of the maternity leave. In particular, our results indicate that an increase in parental/maternity leave by one year is estimated to lower wages by 6.25%, ceteris paribus, an effect similar to studies found for Germany and France (e.g. in Lequien, 2012)

Regarding job characteristics, wages are positively correlated with being a specialist, with higher scheduled and real working hours, with work task freedom, with a higher number of job opportunities in the person's commuting area and with the foreign-owned firms. Interestingly, a dummy of being evaluated on the basis of objective criteria as compared to subjective criteria is associated with a 2% decrease in monthly wages and having a female boss is associated with 3.3% lower wages.

Among the gender identity and other family position variables, preference of job flexibility is associated with 2% lower wages. Further, being a breadwinner is associated with approximately 10% higher wages. A dummy for families getting help with housework is associated with 3.3% higher wages.

Regarding psychological traits, being competitive and having high score in grit (determination) is associated with higher wages. From the health and appearance characteristics only height is positively correlated with wages.

5.3 The Oaxaca-Blinder and Juhn-Murphy-Pierce Decomposition

In the next section we present analyses of two decomposition approaches in order to explore the role of particular variables in explaining the gender wage gap. First, we present the standard Oaxaca and Blinder earnings decomposition methodology followed by the Juhn-Murphy-Pierce decomposition technique.

5.3.1 The Oaxaca-Blinder Decomposition

The goal of the method is to decompose differences in mean wages across two groups on the part that is explained by the characteristics in the model and the part which remains unexplained. There are several methods of this decomposition technique; we use the following (6.2) twofold decomposition in our paper:

$$R = \{E(X_A) - E(X_B)\}'\beta^* + \{E(X_A)'(\beta_A - \beta^*) + E(X_B)'(\beta^* - \beta_B)\}, \quad (6.2)$$

where, β^* is a nondiscriminatory coefficient vector. β^* is used in a more generalised form of the Oaxaca-Blinder decomposition to prevent from the dependence of discrimination component on the reference group chosen. The first component of the equation $\{E(X_A) - E(X_B)\}'\beta^*$ is the part of the outcome differential that is explained by group differences in the predictors, and the second component of the equation $\{E(X_A)'(\beta_A - \beta^*) + E(X_B)'(\beta^* - \beta_B)\}$ presents the unexplained part. In a more generalised form of the Oaxaca-Blinder decomposition using the non-discriminatory coefficient vector, the unexplained part is made up of two elements, one representing the advantage of being a male worker, and the other the disadvantage of being a female worker. This

unexplained part is usually attributed to discrimination but it can capture effects of other unobserved variables. If some variables were omitted and for instance women have lower average values with respect to these omitted variables, then discrimination would be overestimated. On the contrary, some of the included variables may reflect discrimination (like occupation segregation or tenure and other gender-specific factors) and discrimination may be underestimated. In this respect we use the term *unexplained part of gender wage gap* rather than *discrimination*. We should repeat that we report estimated links between our novel variables and the gender wage gap, not causal relationships.

The results of decomposition are presented in Table 5–2. The mean of the log wages is 9.96 for men and 9.71 for women, yielding a wage gap of 0.25. Differences in endowments account for 0.22 (87%) of the wage gap. Only 0.035 (13%) of this gap remains unexplained and the coefficient is statistically insignificant. The lower part of the Table 5–2 shows the individual contributions of the predictors to the components of the decomposition. Because of enormous number of control variables in our model we show here only those that significantly contribute to the explained or unexplained part of decomposition.

Among those that *positively contribute to the explained part* of the wage gap are:

- tenure,
- maternity leave,
- being in white collar or low skilled blue collar occupation (ISCO 2, 3, 4, 5, 9: professionals, technicians and associate professionals, clerks, service workers and shop and market sales workers, elementary occupations)
- being evaluated objectively,
- scheduled working hours,
- real working hours,
- having a female boss,
- job flexibility,
- competition,
- grit (determination),
- height
- having a partner who is a breadwinner (a dummy for mainly or exclusively partner is responsible for household income).

The results indicate that having a shorter tenure, longer maternity leave, less working hours and a job flexibility – characteristics, which women tend to experience in their life, see the descriptive part and Chapter 3 – positively contribute to the explained part of the gender wage gap. Those results may be interesting from a policy makers point of view and they can help to guide them in adjusting family-friendly policies, which influence the time off the labour market that women face due to child bearing. Significance on the above mentioned ISCO occupational codes also points towards the segregation hypothesis. Having a female boss does not help women to advance their careers

Table 5–2 Blinder-Oaxaca decomposition of wage differences between women and men

Group 1: female = 0 N of obs 1= 1046
Group 2: female = 1 N of obs 2 = 932
Model = linear Number of obs = 1978

ln_income	Coef.	Rob. std. Err.
overall		
group_1	9.9642*	.01054
group_2	9.7097*	.01157
difference	.2545*	.01565
explained	.2198*	.02687
	.0346	.02761

explained	Coef.	Rob. st. Err.
education	–0,0047*	.0022
math grade	–.0058*	.0024
tenure	.01314*	.0045
tenure squared	–.0066*	.0033
maternity leave	.0496*	.0128
ISCO_2	.0072*	.0031
ISCO_3	.0079*	.0037
ISCO_4	.0323*	.0073
ISCO_5	.0289*	.0067
ISCO_6	–.0031*	.0015
ISCO_7	–.0546*	.0108
ISCO_8	–.0310*	.0069
ISCO_9	.0122*	.0044
Objective job evaluation	.0029*	.0013
Schedule working hours	.0117*	.0034
Real working hours	.0145*	.0037
Female as boss	.0119*	.0049
Job flexibility	.0026*	.0013
Responsibility for income – reality/rather partner	.0309*	.0065

unexplained	Coef.	Rob. st. Err.
kids	.0549*	.0257
Father education – basic	.0288*	.0143
Father education – lower secondary	.2041*	.0999
Father education – secondary	.1288*	.0542
Father education – tertiary education master	.0367*	.0167
Father education – tertiary education doctoral	.0042*	.0019
Father education – childhood without father	.0095*	.0047
Maternity leave	–.0339*	.0174
NACE_G	.0163*	.0058
NACE_O	.0071*	.0031
Job flexibility	.0990*	.0333
negotiation	–.0447*	.0119
constant	–1.3862*	.5705

Responsibility for income – reality/exclusively partner	.0098*	.0032
competition	.0045*	.0016
determination	.0025*	.0012
height	.0252*	.0111

Source: Questionnaire

and have higher earnings; on the contrary it seems to increase the gender wage gap. The significance on psychological personality traits reveals that women being less competitive and determined can influence the existing wage gap. The two last mentioned factors may also indicate that women choose specific occupations characterized by less competition and higher job flexibility. Finally, having a partner who is breadwinner and earning more, perhaps leads to greater household responsibilities of the respondent and consequently lower wages.

On the other hand, among those that decrease the explained part of decomposition significantly are:

- education,
- grades from math
- and nonlinear form of tenure.

The results from factors negatively influencing the explained part of decomposition are in line with the fact that women are more educated and have higher ability than men do, however they face lower returns to their education. This can be caused by the fact that women are mostly responsible for childcare and household chores, which means that they have to divide their energy and time between career and taking care of children and household.

Unexplained part of decomposition consists of number of children, most categories of education of father, NACE G/O (*Wholesale and retail trade; repair of motor vehicles and motorcycles* and *Public administration*) and a dummy for job flexibility. This means that the family background proxied by returns to fathers' education can play an important role for men's wage, but does not help women in terms of wage increase. Similarly, men can receive a wage premium for more children, whereas women can receive a wage penalty. On the other hand, unexplained part is significantly decreased by the length of maternity leave, the ability to negotiate over wages and a constant.

5.3.2 The Juhn-Murphy-Pierce Decomposition

In the next step, we investigate the robustness of these results by carrying out an alternative decomposition by Juhn et al. (1993), which is an extended decomposition technique of Oaxaca and Blinder, to allow for decompositions at points in the earnings distribution other than the mean. The decomposition (5.3) is then expressed as follows:

$$R = \{E(X_{A;q}) - E(X_{B;q})\}'\beta^{*;q} + \{E(X_{A;q})'(\beta_{A;q} - \beta^{*;q}) + E(X_{B;q})'(\beta^{*;q} - \beta_{B;q})\} + \{\varepsilon_{A;q} - \varepsilon_{B;q}\}, \quad (5.3)$$

with q specifying the value at the q^{th} quantile.

The first two terms are the same as in Oaxaca-Blinder decomposition: the explained component, the male advantage, and the female disadvantage, respectively. The third term represents differences in the quantities and prices of unobservable characteristics resulting from changes in the distribution of the residual from the wage regression. When considering the decomposition at the mean, the third term is equal to zero and the decomposition will reduce to the Oaxaca-Blinder form.

The results of Juhn-Murphy-Pierce decomposition are presented in Table 5–3. The highest wage gap is at the 10th quantile, the lowest at median earnings distribution. The highest unexplained part of wage gap is at the 75th and the 90th quantile, i.e. among people with higher wages whereas the lowest unexplained part of wage differentials is at the 25th quantile, i.e. among people with lower wages. The results bring some support to the hypothesis that the long leave due to childbearing experienced by women in Czech Republic harms in particular well educated/skilled women, perhaps through skill depreciation, leading to greater disparities between men and women on the upper tail of the wage distribution.

Table 5–3 Juhn-Murphy-Pierce decomposition

	P10	P25	P50	P75	P90
Total difference (male-female)	.3228	.2683	.2047	.2649	.2624
Explained (contribution of differences in observable quantities)	.2523 (78%)	.2302 (86%)	.1660 (81%)	.2039 (77%)	.2195 (84%)
Unexplained	.0705 (22%)	.0381 (14%)	.0387 (19%)	.0610 (23%)	.0429 (16%)
-estimated coefficients	*.0673*	*.0433*	*.0393*	*.0190*	*.0062*
-the residual effect	*.0032*	*–.0052*	*–.0006*	*.0420*	*.0367*

Source: Questionnaire

5.4 Conclusions

This chapter analyses different aspects of wage differentials between men and women. In particular, we developed a wide model of wage determinants using an especially rich dataset from our survey, which can shed some light on determinants of wages usually not covered by commonly available micro-datasets, such as work-life preferences, family identity, psychological non-cognitive skills and job characteristics.

While there have been a number of previous studies based on different data sets that show evidence of a significant gender based wage gap in the Czech Republic (Eriksson et al., 2013; Gottvald, 2002; Jurajda, 2001, 2003b and 2005), we found only negligible evidence of a wage gap of 3.2% in analyses using our rich survey data. In our analyses we first run wage equations starting with very

parsimonious specification with a female dummy as the sole explanatory variable, and then we added various subsets of variables one by one in order to examine their inclusion on the female dummy coefficient. We found that female dummy shows 25.3% wage difference with respect to men in this most basic model specification, and it explains approximately 11.6% of the variance in monthly wages (adj. R-squared). Adding our rich subsets of variables decreases the coefficient to female dummy substantially to 3.2% with no significance, and our full model specification explains 53.5% of variance of monthly wages. In particular, the addition of the subset of demographic and family variables, human capital and job characteristics increases the explanatory power of the model substantially, however also the set of gender identity and position in the family characteristics and psychological traits are not negligible in terms of explanatory power of the model.

The last part of this chapter explored the role of particular variables in explaining the gender wage gap by following the Oaxaca-Blinder and Juhn-Murphy-Pierce earnings decomposition methodology. We found that observable characteristics explain approx. 87% of the gender wage gap, whereas only 13% remains unexplained when using the standard Oaxaca-Blinder decomposition at the mean earnings distribution. This is much higher explained part then previous studies that typically explain about half of the wage gap by focusing on human capital variables. Among those that significantly contribute to the explained part of the gender wage gap is tenure, maternity leave, working hours, but also some non-cognitive characteristics such as competition and grit, and some job characteristics such as objective job evaluation, having a female boss and job flexibility. On the other hand, education of father and number of children are among those that contribute significantly to the unexplained part of gender wage differentials. Further, the Juhn-Murphy-Pierce decomposition showed that the highest unexplained part of gender wage gap is among workers with higher wages (at the 75^{th} and 90^{th} quantile) whereas the lowest unexplained part of wage differentials is among workers with lower wages (at the 25^{th} quantile).

Our results show that women earn less than men overall, but the difference is due to observable factors as the actual unexplained term considered often as an indicator of discrimination is negligible. Nevertheless, our results should be a concern for policy makers given that one of the main factors determining wages and explanatory part of the wage gap in the Czech Republic is the length of maternity/parental leave and lower tenure. Thus, one of the ways to close the gender pay gap is for policymakers to do more to get mothers to come back earlier to work from their leave related to child bearing. In light of this, we think the reform from 2006 allowing women to choose between 2, 3 and 4 year of maternity/parental leave (thus reducing the maternity/parental leave from the paid 3 to 4 year scheme to paid 2 and 3 year scheme) was a step in the right direction. We suggest reducing the length of maternity leave even further, but preserving mothers' choice of length, e.g. choice between leave till 1, 2 or 3 years of child's age. At the same time we recommend the policy makers to increase publicly subsidized high-quality child care in order to truly give the

young mothers choice of early return to their jobs in case they would like to. In particular, the childcare for children between 0 to 3 years old should become more widely available and affordable through a formal publicly-funded center-based care such as crèches (jesle) or day care. The Czech Republic has extremely expensive system of parental leave; the spending on child related leave and birth per childbirth is one of the highest in the OECD countries particularly because of the longest in the world and relatively generous parental leave. Thus by shortening the leave there could be some financial resources left to support establishment of a high-quality (at least partly) publicly supported child care for children 0–3 years. Further, the evidence from our survey shows that women in the Czech Republic continue to be primarily responsible for most of the housework and childcare. Supporting inclusion of men as househusbands would help families in achieving more equality on that front and consequently more gender equality on the Czech labour market. For instance, some policy initiatives promoting sharing of care responsibilities between parents such as periods of parental leave for the exclusive use of fathers (such as in Norway), could be a measure bringing greater gender equality.

Thus, we advise the policy makers in the Czech Republic to make a number of steps, which would minimize the work interruptions in women's career due to child rearing: 1) reform the parental leave towards a shorter, yet still flexible (a choice of certain length) and well paid parental leave, 2) promote a greater paternal involvement in child rearing by e.g. legislation fostering sharing of the parental leave between parents, and 3) establishing formal child-care facilities, subsidized by public authorities (to make it affordable for parents), which can help those parents who wish to work. Shortening the parental leave together with a mandatory share of the parental leave between parents, and a better formal child care for small children would not only bring more gender wage equality, but also would increase female labour participation. As our research show, women constitute an important source of labour force in the Czech Republic; they are more educated and tend to have higher abilities. Yet, the female labour participation rate in the Czech Republic is one of the lowest among developed OECD countries, and the trend is worsening over time (since the Fall of Iron Curtain). Getting the women to work would bring an increase in the skilled (and not only) labour force, and in this way alleviate the problems of population aging that the Czech Republic experiences and is likely to experience in the future.

The evidence from our survey shows that job flexibility as a tool in reconciling work and family life is important explanatory variable in explaining differences between men and women. Perhaps some legislation promoting flexible workplace practices – such as giving a right to request flexible working hours – would make it easier for both sexes to combine work and family. Some countries could serve as an example, for instance the Netherlands have a legislation allowing workers in companies with more than 10 employees to request a more flexible working hours. In the UK, policymakers have granted parents with children under age six the right to request flexible working hours.

Finally, our analyses show that women tend to be less competitive and determined, and that the two psychological characteristics positively influence the explained part of the gender wage gap in a significant way. This might have some implications (together with the factors mentioned above) for the observed low female representation on company boards and in executive management positions. Our analyses using the Juhn-Murphy-Pierce decomposition seem to support the hypotheses as they show the highest unexplained part of gender wage gap being among workers with higher wages (at the 75^{th} and 90^{th} quantile). We therefore suggest companies to consider policies such as mentoring programs for females or setting goals for diverse composition of management positions or company boards (diversity aspiration policies), in order to gain an access to a larger pool of applicants and talents. Such measures could also promote a greater overall gender equality as they likely would increase gender diversity at the lower levels of employee hierarchy in order to create a *pipeline* of potential *diverse* candidates for executive management steering groups.

Chapter 6

Gender Wage Gap in the Czech Republic: Focus on Family Factors, Family-Career Balance, Preferences and Gender Identity Factors

By Lenka Filipová, Lenka Janíková, Jaromír Gottvald

In the gender wage gap research it has been an important issue effect of the different gender roles of men and women in the family. That is why the so-called family wage gap has been comprehensively explored. Research on this topic can be divided into two groups according to the main focus of the research:

1. marital status, e.g. Korenman and Neumark (1991), Gray (1997),
2. children, e.g. Mincer and Polachek (1974), Becker (1985), Joshi and Davies (2002), Blau et al. (2009), Waldfogel (1998).

Regarding the effect of having children, the so-called motherhood gap (or penalty in wages) is usually explored. Lower wages of women – especially those with children – are explained mainly by four different theoretical approaches according to Waldfogel and Sigle-Rushton (2007):

- human capital theory, e.g. Becker (1985), Polachek (1995),
- trade-off between wages and flexibility,
- lower real or perceived productivity and effort,
- selection.

More recently the effects of family-friendly policies are discussed and investigated in literature. There are more and more studies pointing out the unexpected harmful effect of family-friendly policies on women's economic attainments such as gender-based occupation segregation. This is more evident in the women-friendly Scandinavian labour markets than in liberal market

economies like USA and Canada (Jacobs and Gerson, 2004; Jacobs and Lim, 1992; Chang, 2000).

Regarding marital status, the main area for research has been marital wage premium for men, e.g. Korenman and Neumark (1991), Gray (1997), Antonovics and Town (2003) or Gupta et al. (2005).

Over the last ten years psychological and socio-psychological factors have gained ground as possible explanations for gender differences in the labour market. Bertrand (2010) gives a comprehensive review of this research. Research of socio-psychological factors is methodologically based on the identity model imported into economics from social psychology. Regarding gender identity, research is aimed at the impact of social norms about what is appropriate for men to do and what is appropriate for women to do (Akerlof and Kranton, 2000). The gender identity model could then explain labour force participation or occupational segregation by gender with the impact on wages. As long as the social norm that *men work in the labour market and women work at home* exists, women will have less motivation to participate in the labour market than men. However, the systematic research of this phenomenon is still in its infancy.

Another way of evaluating social factors uses theory of preferences to explain the varying priorities of men and women considering work-family balance, e.g. Hakim (2002 and 2008).

This chapter contributes to the literature with analyses of different aspects of wage differentials between men, women, women with children and without them with the special attention to family factors, family-career preferences and gender identity factors. For this purpose we use data from a survey of a representative sample of employees in the Czech Republic in 2011 based on the questionnaire containing 64 questions covering various aspects of work and family life, preferences, personality and other characteristics of employees and their jobs (see details in chapter 3 of this book). The model of wage determinants is the same as the full model in chapter 5, i.e. it contains the same variables but here we divide the respondents into four subgroups and run wage equations separately for them. Although we include in the model variables covering traditional human capital factors, demographic factors, job characteristics, novel psychological factors, we focus in this chapter only on the aspects of family-career balance, different preferences of men and women and gender identity factors. Generally, the results show that the conservative gender model with men as main breadwinners and women responsible for household chores and taking care of children is still *going strong* in Czech society.

The rest of the chapter is organized as follows: Section 1 reviews literature on family factors, family-career balance, gender preferences and gender identity factors. Data and main statistical results are discussed in section 2. Section 3 describes the empirical model of wage determinants and discusses the results of our empirical analysis. Finally a summing up with conclusions.

6.1 Literature Review

Overall analysis of the gender wage gap literature is presented in the second chapter of this book. Here we concentrate in more detail on studies focusing on family factors, family-career balance, different preferences of men and women and gender identity factors that can play some role in explaining of different wages of men and women.

Impact of Children

Research on US data indicated a negative effect of children on wages of women (Waldfogel, 1998). In the Research on US data the author emphasized that *Despite the narrowing of the gender gap in recent years, the family gap in pay between women with children and women without children is, if anything, growing larger* (Waldfogel, 1998). The role of family policies like maternity leave is helpful in the process of closing the family gap. The evidence on maternity leave in various countries showed positive role of maternity leave coverage on women's likelihood of returning to the same job soon after childbirth, which is positive for their work experience, job tenure and wages (Waldfogel, 1998).

Part of the research has examined the cumulative impact of participation in the labour market, hours of work and lower hourly wages on women's long-term earnings. The data on British women revealed that a typical woman with two children gives up nearly half of the lifetime earnings that she might have without reduced participation in the labour market, shorter hours of work and lower wages (Joshi and Davies, 1992; Joshi et al., 1996). The authors mentioned updated these analyses using data gathered in the 1990s showing similar results. However, they also showed some new evidence that the earnings costs of motherhood were now much lower for highly educated women who were more likely to return to their full-time jobs after childbirth (Davies et al., 2000; Joshi and Davies, 2002).

According to Waldfogel and Sigle-Rushton (2007) there can be at least four types of explanations of the motherhood gap or penalty in hourly pay. The first, human capital theory (Mincer and Polachek, 1974; Becker, 1985; Polachek, 1995) emphasizes that women generally have lower wages than men because they have lower levels of human capital such as education or training; work experience; and job tenure. Women with children tend to earn even lower wages than other women because they spend more time at home when they have children, are more likely to work part-time, and change employers. Since they anticipate shorter and more discontinuous working lives, they have lower incentives to invest in market-oriented formal education and on-the-job training. Several recent studies prove that career interruptions can account for a sizeable proportion of the gender wage gap (Bertrand et al., 2009) which is commonly explained by the above mentioned less human capital accumulation.

A second explanation for the lower wages of women with children is connected with the trade-off women make between wages and flexibility (part-

time jobs, location close to home etc.). Third, the lower wages of mothers are also due to their lower real or perceived productivity and effort. It is supposed that the longer hours that women spend on housework and taking care of children may also decrease the effort they put into their market jobs compared to men or women without children. Fourth, the lower wages of mothers can be explained by selection. It is supposed that women who anticipate having children and difficulties in combining work and childcare, invest less in human capital and thus have lower wages. And vice versa, women anticipating being higher earners may choose not to have children.

The comparison of the long-term earnings of women with children, women without children, and men conducted separately for less educated, moderately educated, and highly educated people in Anglo-American, Continental European, and Nordic countries found that, for the most part, mothers in the Continental European group experience the largest earnings differentials, mothers in the Nordic countries experience the smallest, and mothers in the Anglo-American countries are in the middle position which corresponds to the development of family-friendly policies (Waldfogel and Sigle-Rushton, 2007). However, the analysis also shows that there are large gender gaps for childless women in many countries suggesting that women's greater responsibility for childcare is not the only reason for gender wage differentials. On the contrary, the analysis by Mandel and Semyonov (2005) evaluating the effects of family policies on gender earnings inequality across 20 advanced societies indicates that although the gender wage disparities are lower in countries with developed family policies if cross-country differences in the wage structure are controlled for, the effect of family policy on the gender gap disappears. In other words, the authors suggest that the lower gender wage gaps in developed welfare states should be attributed to their more egalitarian wage structures rather than to their family policies.

Moreover, there is also a growing number of studies pointing out the unexpected detrimental effect of family-friendly policies on women's economic attainments. They emphasize that although family-friendly policies enhance women's economic independence by facilitating their participation in the paid economy (OECD, 2001), other forms of gender inequality begin to appear. One of them is a gender-based occupational segregation which is more evident in the women-friendly Scandinavian labour markets than in the liberal market economies like USA and Canada (Jacobs and Gerson, 2004; Jacobs and Lim, 1992; Chang, 2000; Wright et al., 1995). This gender-based occupational segregation is explained by the increased demand for female labour associated with welfare state expansion characterized by the growth of the social service sector. State-sponsored family services such as child care facilities, educational institutions, and institutions for care of the elderly are occupations with a female bias for historical reasons. On the one hand they bring job opportunities for women, but on the other they are connected with low earnings (Esping-Andersen, 1990; Kolberg, 1991; Gornick and Meyers, 2003). Another consequence of family-friendly policies is employers' reluctance to hire women to high-status, highly paid jobs. Family policies that offer long periods of

parental leave and reduced working hours may discourage employers from hiring women to lucrative and prestigious jobs requiring high training costs. This has consequences for women's earnings (Hansen, 1995; Tomaskovic-Devey and Skaggs, 2002; Hemstrom, 1998; Naur and Smith, 1998).

The literature acknowledges a marital wage premium for men, which is usually attributed to four reasons:

- employers favor married men,
- marriage makes men more productive (specialization in household chores),
- marriage is correlated with characteristics valued in labour markets,
- more productive men are more likely to marry (selection hypothesis).

For instance, Hill (1979) finds a marital wage premium for men even after controlling for a wide range of personal characteristics. There is no effect of marital status on women's wages according to this study. The study by Korenman and Neumark (1991) confirms a marital wage premium for men using panel data and controlling for omitted variables. However, according to Gray (1997) the earnings premium paid to married men compared with bachelors declined by more than 40% during the 1980s due largely to a decline in the productivity effects. Instrumental variable (IV) estimation showed that declining productivity effects are associated with wives' labour market hours. The study by Antonovics and Town (2003) finds the cross-sectional analysis used in the previously mentioned research as inappropriate for examining causal relationships because of unobserved heterogeneity. The authors rather use data on identical twins to control for unobserved heterogeneity and their results indicate that marriage increases men's wages by as much as 27% and do not support the selection hypothesis that more productive men are more likely to marry.

More recently, Ribar (2004) offers a brief review of the U.S. literature and Richardson (2003) information on Sweden. Advantages and disadvantages of various models, variables, and methods used to analyze the marital wage differentials are discussed in Gupta et al. (2005). The authors used large panel data set from Denmark to estimate a marital and cohabitation premium, too. Their results indicate that a part of marriage or cohabitation premium is not due to marriage or cohabitation itself, but to fatherhood.

Series of articles in the management literature argue that there is an even larger wage premium for single-earner husbands, for instance Mooney (1981), Ross and Pfeffer (1982) or Reitman and Schneer (1993). However, Jacobsen and Rayack (1996) showed that single-earner husbands wage premium obtained from OLS estimates traditionally used in the previous research can be decreased or eradicated by adjusting for the endogenous hours of the wife or marital matching using IV technique and fixed effects.

Over the last ten years psychological and socio-psychological factors have come more into consideration as possible reasons for gender differences in the

labour market. Bertrand (2010) gives a comprehensive review of this research. Research on socio-psychological factors is methodologically based on the identity model imported into economics from social psychology. Akerlof and Kranton (2000) suggested the utility model according to which one´s identity can influence economic outcomes because behaving differently from what is expected for one´s social category could decrease utility. Regarding gender identity the research focuses on the impact of social norms about what is appropriate for men to do and what is appropriate for women to do. The gender identity model could then explain labour force participation or occupational segregation by gender. As long as the social norm that *men work in the labour market and women work at home* exists, women will have lower motivation to participate in the labour market than men.

Another way to evaluate social factors is the theory of preferences to explain different priorities of men and women considering work-family balance, e.g. Hakim (2002 and 2008). As mentioned in chapter 2, Hakim claims that women choose three combinations of lifestyle preferences: home-centered, work-centered, or adaptive and that these lifestyle preferences are an important determinant of fertility, employment patterns, and job choice.

6.2 Data

For purposes of the research in this paper and this book we conducted a comprehensive survey on representative sample of employees aged 25–54 in the Czech Republic with a focus on explaining gender-based differences on the labour market. The whole process of creating a questionnaire, asking questions and gathering data is described in chapter 3 of this book.

Summary statistics of all variables were presented in chapter 3 and a detailed descriptive analysis of these summary statistics is included in Balcar et al. (2012) and in the third chapter of this book.

6.3 Empirical Model and Results

We analyze wage determinants separately for men, women, women without and women with children in the modified (6.1) Mincerian wage model:

$$lnw_i = \beta X_i + \varepsilon_i, \tag{6.1}$$

where w_i stands for monthly earnings, the matrix X contains a number of control variables which are divided into the following subsets: demographic factors, family factors, human capital characteristics, job characteristics, gender identity factors and preferences, family-career balance, psychological traits and health and appearance. Family factors, family-career balance and gender identity and preferences are the subsets of our main interest. That is why we focus in this chapter on the factors of these subsets although all other control variables from other subsets are included in all regressions. It is necessary to point out that with some of the novel variables, especially those included in the subset of gender

identity and preferences, there is a problem of endogeneity and that is why we interpret their results as correlations rather than causality.

Table 6–1 presents the results of the wage regressions for men, women, women without children and women with children. As mentioned above we show only the results for three of seven subsets of control variables that we want to analyze in this paper. The first subset of variables includes family factors. Number of children does not play a role for wages of women but men with more children tend to have significantly higher wages. Marital status is not significant in any category for wages of men. Women with partner living separately and with no children tend to have significantly lower wages in comparison with those who are single. Widows or divorced women, with partner living separately tend to have significantly higher wages compared to single women. The results correspond to those in Gupta et al. (2005) that there is no marriage premium for men but rather that fatherhood tends to be positive for wages of men. Number of brothers or sisters does not play a role for wages either of male or of female respondents.

Among family-career balance characteristics there are not many statistically significant results. Maternity leave has negative impact on wages of all groups but, interestingly, with no statistical significance. Any form of help with housework (three possible answers: appliances, relatives or maid services) is correlated with higher wages for women with children. There is no statistical significance of this variable for men or women without children. It supports the argument that more career-orientated mothers tend to use more help with housework than women more family-orientated. Help with children has not got any significant impact on wages for any group of respondents. Variable lifestyle – preferences or reality reflects the order of lifestyles either in reality or preferences; whether respondents focus 1) mostly on working career, 2) on family, 3) on free time/hobbies, or 4) on work in non-paid activities. This variable is not statistically significant for women in either preferences or reality. The same applies for men when it comes to preferences. In reality, men have significantly lower wages if they focus on work in non-paid activities compared to men who focus mostly on working career. Negative sign in case of men focusing mainly on family indicate that these men tend to have lower wages than men focusing primarily on the working career. However the results are not statistically significant.

Gender identity factors show the largest differences between men and women. For example, the preference of job flexibility over wage is negatively correlated with wage only for women and is statistically significant at 1 percent level. It means that if women prefer job flexibility, they tend to have lower wages by 4.4%. Similar results are for women without and with children but with higher significance for women with children. On the other hand, the preference of job flexibility is not statistically significant for men. The results indicate that women with children prefer job flexibility to be able to balance family and career at the expense of lower wages as the result of less effort at work.

Table 6–1 Wage determinants – family factors, family-career balance and gender identity factors

	Men	Women	Women without children	Women with children
Variables	DepVar: log(monthly wage)			
Family factors				
Kids	0.037**	–0.010		0.000
	(0.017)	(0.021)		(0.022)
Marital status: b Single				
Married	0.049	0.058	–0.042	0.026
	(0.036)	(0.039)	(0.074)	(0.068)
Single, partnership, no cohabitation	0.024	–0.004	–0.177**	–0.012
	(0.042)	(0.051)	(0.080)	(0.122)
Single, partnership, cohabitation	0.047	0.055	0.014	0.066
	(0.036)	(0.043)	(0.065)	(0.084)
Divorced/widow, without partner	0.019	0.014	–0.072	–0.030
	(0.042)	(0.039)	(0.114)	(0.064)
Divorced/widow, partner., no cohabitation	0.045	0.111**	–0.305	0.099
	(0.069)	(0.055)	(0.194)	(0.079)
Divorced/widow, partner., cohabitation	0.023	0.044	0.065	0.011
	(0.064)	(0.049)	(0.191)	(0.077)
No of brothers	–0.016	–0.005	0.022	–0.021
	(0.013)	(0.014)	(0.033)	(0.017)
No of sisters	0.009	–0.013	–0.024	–0.019
	(0.013)	(0.013)	(0.044)	(0.016)
Family-career balance				
Maternity leave	–0.008	–0.002	–0.001	–0.006
	(0.016)	(0.007)	(0.052)	(0.007)
Help in households	0.021	0.042**	0.015	0.057**
	(0.019)	(0.020)	(0.056)	(0.023)
Help with children	–0.019	–0.006		0.000
	(0.025)	(0.022)		(0.024)
Lifestyle – reality: b Mostly on working career				
Mostly on family	–0.018	0.019	0.043	0.023
	(0.024)	(0.021)	(0.062)	(0.025)
Mostly on free time/hobbies	–0.006	–0.029	–0.011	0.012
	(0.033)	(0.049)	(0.101)	(0.075)
Mostly on work in non-paid activities	–0.184***	0.078	–0.222	0.000
	(0.069)	(0.095)	(0.243)	(0.122)
Lifestyle – pref.: b Mostly on working career				
Mostly on family	–0.037	0.005	–0.012	–0.020
	(0.024)	(0.026)	(0.062)	(0.032)
Mostly on free time/hobbies	–0.027	0.026	–0.040	–0.013
	(0.030)	(0.040)	(0.072)	(0.064)
Mostly on work in non-paid activities	0.166	0.120		0.047
	(0.229)	(0.141)		(0.161)

Table 6–1 continued	Men	Women	Women without children	Women with children
Gender identity factors and preferences				
Job security	–0.006 (0.011)	–0.007 (0.013)	0.006 (0.034)	0.007 (0.016)
Job flexibility	0.004 (0.013)	–0.044*** (0.013)	–0.076** (0.036)	–0.042*** (0.015)
Career advancement	–0.007 (0.014)	0.018 (0.015)	0.011 (0.045)	0.013 (0.017)
Less demanding and stressful job	–0.010 (0.013)	0.003 (0.013)	0.033 (0.040)	0.001 (0.015)
Good atmosphere	–0.008 (0.014)	–0.020 (0.013)	–0.050 (0.037)	–0.023 (0.015)
Responsibility for income – pref.: b Exclusively me				
Mostly me	0.008 (0.025)	0.150 (0.187)		0.318 (0.237)
Both equally	–0.026 (0.030)	–0.110 (0.134)	–0.129 (0.217)	–0.077 (0.168)
Rather partner	–0.049 (0.085)	–0.121 (0.135)	–0.145 (0.211)	–0.068 (0.169)
Exclusively partner	–0.070 (0.347)	–0.091 (0.135)	–0.126 (0.224)	–0.047 (0.170)
Responsibility for income – reality: b Exclusively me				
Mostly me	–0.032 (0.024)	–0.029 (0.049)	0.070 (0.104)	–0.033 (0.062)
Both equally	–0.029 (0.030)	–0.036 (0.037)	0.107 (0.099)	–0.064 (0.047)
Rather partner	–0.118** (0.050)	–0.117*** (0.039)	–0.070 (0.104)	–0.157*** (0.050)
Exclusively partner	0.151** (0.065)	–0.136*** (0.049)	–0.027 (0.135)	–0.163*** (0.060)
Parents who I/we live with	–0.094 (0.074)	–0.148** (0.068)	0.107 (0.195)	–0.111 (0.139)
Responsibility for household chores – pref.: b Exclusively me				
Mostly me	0.112 (0.100)	0.015 (0.041)	0.134 (0.190)	0.041 (0.046)
Both equally	0.077 (0.079)	0.007 (0.043)	0.185 (0.176)	0.016 (0.048)
Rather partner	0.088 (0.077)	0.120 (0.095)	0.345 (0.209)	0.074 (0.110)
Exclusively partner	0.063 (0.081)	0.142 (0.147)		0.120 (0.125)
Responsibility for household chores – reality: b Exclusively me				
Mostly me	–0.008 (0.047)	–0.023 (0.024)	–0.124* (0.074)	–0.008 (0.029)
Both equally	0.054 (0.039)	0.001 (0.029)	–0.121 (0.090)	0.029 (0.035)

Table 6–1 continued	Men	Women	Women without children	Women with children
Mostly partner	0.039 (0.035)	0.021 (0.059)	–0.217 (0.149)	0.029 (0.077)
Exclusively partner	0.049 (0.039)	0.027 (0.080)	–0.297 (0.253)	–0.013 (0.103)
Parents who I/we live with	0.031 (0.084)	0.000 (0.073)	–0.337 (0.230)	0.086 (0.128)
Charity	–0.026 (0.028)	0.021 (0.026)	–0.100 (0.081)	0.059** (0.029)
Constant	7.307*** (0.453)	8.933*** (0.490)	8.425*** (0.969)	9.293*** (0.650)
Observations	1,046	932	259	673
Adjusted R-squared	0.422	0.527	0.549	0.536

Source: Questionnaire

Notes: Dependent Variable: Ln (monthly wage). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include other four subgroups of control variables: Demographic factors (age, age squared, number of household members, education of mother and father, nationality, other earnings of respondents, social benefits), Human capital factors (education, proxy for ability – math grades and satisfaction with math grades, tenure, tenure squared, training, number of employers so far), Job characteristics (ISCO, NACE, match of job and education, firm size, ownership of firm, specialist, objective job evaluation, scheduled working hours, real working hours, way of getting employment, teamwork, work and job tasks freedom, gender of boss, relation with boss, flexitime, workhome, changing workload, monopson), Psychological traits and health and appearance (locus of control, negotiation, competition, self-esteem, grit, risk, health, height, BMI).

The variable *Responsibility for income* tries to get data to test the hypothesis that if the respondent feels or is responsible for household income, he/she will have higher wages. According to the gender identity model in Czech society, which is reflected in the summary statistics, men are more responsible for ensuring the income for a family. The regression results do not show statistical significance of this variable either for men or for women when taking into account preferences. However, there are significant differences between men and women when it comes to reality. Women with children have significantly lower wages if their partners (or parents who they live with) are the main breadwinners. The results for men are not so definite. Although they tend to have lower wages if their partners are more responsible for a family income, the results for the next category – exclusively partner – bring opposite correlation, i.e. they tend to have higher wages if their partners ensure the family income exclusively. This could be due to the greater competitiveness of men in combination with the gender identity model in Czech society about men being the main breadwinners. There was no statistical significance of lower wages of childless women that are less responsible for family income than their partner.

The variable *Responsibility for household chores* tries to test the hypothesis that if the respondent feels, or is, responsible for household chores, he/she will have lower wages. And according to gender identity model in Czech society,

women feel, and are, more responsible for household chores than men. The results do not show statistical significance of this variable either for men, or for women with or without children when taking into account preferences as well as reality.

It is interesting that engaging in non-paid activities (like charity, humanitarian activities, religious or ecological activities) is connected with higher wages of women with children. This variable is not significant for other examined groups of respondents.

In this part we comment on some interesting results of other control variables that are not part of the main focus of this chapter but bring significant differences among groups of respondents being researched. Education of mother is not significant for wages of either men or women. However, education of father does have a positive effect on men salaries. Social benefits are connected with lower wages for men and do not play a role for wages of women.

From human capital factors proxy for ability and tenure bring significant differences among groups of respondents. Proxy for ability – math grades at grammar school – are important wage determinants for men and women without children in the sense that better marks at school lead to higher wages. Tenure is an important wage determinant for men as well as women with children.

Job characteristics offer some differences in wages of men and women as well. For example, being a specialist is statistically significant for higher wages of men. Work and job tasks freedom is associated with higher wages of men and does not play a role for women. Firm size is an important wage determinant just for men, i.e. larger firms pay higher wages to men. Foreign-owned firms pay higher wages to men than domestic firms. In the case of women, only cooperative ownership is connected with lower wages, other forms of ownership do not have any effect on wages.

The results for psychological traits and health and appearance factors bring interesting differences, too. Competition is an important wage determinant just for men. The results are surprising in the case of negotiation where literature supposes that men have higher wages because they are more curious and negotiate for higher wages. However, the results indicate that men who negotiate for better pay tend to have significantly lower wages. This may be caused by opposite causality that men who have lower wages negotiate for higher ones. Determination is based on the hypothesis that people who are able to overcome barriers have higher wages. The results support this argument. Determination is statistically significant for men as well as women with almost the same coefficient. From the health and appearance factors, height is a statistically significant wage determinant, but only for men. Taller men tend to have higher wages.

6.4 Conclusions

This chapter analyses different aspects of wage differentials between men and women, with special attention to family factors, family-career balance and gender identity factors. We used the same model of wage determinants as in chapter 5, using the data from our unique survey conducted on a representative sample of employees in the Czech Republic in 2011.

Surprisingly, number of children plays a role only for men, where number of children is positively correlated with higher wages. But here can be a reverse causality so it means that men with higher wages tend to have more children. When taking only sign and not statistical significance the number of children play negative role to women's wages as supposed. Regarding the impact of marital status on wages our results did not prove this hypothesis. Marital status does not seem to be a significant wage determinant in researched groups. The results correspond to those in Gupta et al. (2005) that it is not marriage that brings a premium for men, but rather fatherhood.

Help with housework is correlated with higher wages of women with children. There is no statistical significance of this variable for men or women without children which supposes that more career-orientated mothers tend to use more help with housework than women who are more family-orientated.

As for the question: working career or family? It is not a statistically significant. Men have significantly lower wages only if they focus on work in non-paid activities as opposed to men who focus mostly on working career.

Gender identity model in Czech society supposes that men are more responsible for ensuring the income for a family and women are more responsible for household chores and taking care of children. Summary statistics reflects the continued existence of these conservative roles of men and women. We tested variables approximating this gender identity model as wage determinants in our regression. The variable *Responsibility for income* is not statistically significant for researched groups when taking into account preferences. However, there are significant differences between men and women when it comes to reality. Although women have significantly lower wages if their partners (or parents who they live with) are the main breadwinners, the results for men are not so definite. Although they tend to have lower wages if their partners are rather responsible for a family income, the results for the next category – exclusively partner – bring opposite correlation, i.e. they tend to have higher wages if their partners ensure exclusively the family income. This could be due to the greater competitiveness of men in combination with the gender identity model in Czech society about men being the main breadwinners. On the other hand, variable *Responsibility for household chores* is not a statistically significant variable for examined groups of respondents when taking into account either preferences or reality.

Chapter 7

Soft Skills as Wage Determinants and Source of Gender Wage Gap

By Jiří Balcar

Employers have no doubts about the importance of soft skills (e.g. flexibility, communication, independence or proactive approach) for individual's work performance, which is reflected by higher employability, wages and other labour market outcomes of individuals more equipped with these skills. In fact, employers often consider them equally as important as education (see e.g. Burdová and Paterová, 2009; Kalousková, 2006 and 2007; Kalousková et al., 2004).

Awareness of the productive power of soft skills sparked a discussion on their systematic development in Czech schools. Although the National System of Occupations[16] provides information on levels of soft skills required by various occupations and didactic materials for their systematic development are available for free (see Štefflová, 2012), the systematic and purposeful development of soft skills is still sporadic in Czech schools. On the other hand, not even individuals take care of development of their soft skills, as they are not aware of their importance and profitability. Why is it so? Do soft skills provide only minor or no returns to their development and thus investments in them are not profitable? Do the returns differ between genders?

As there is no evidence on wage returns to soft skills (approximating also their productivity) in the Czech Republic, the paper focuses on their estimation.

The aim is worked towards gradually over several sections. First section provides evidence on importance of soft skills for wage determination and closing the gender wage gap. Second section discusses methodology approaches to measurement of soft skills and suggests advantages of an approach used in this paper. Third section focuses on description of data. Last section describes results of the first estimation of wage returns to soft skills in the Czech Republic.

[16] See http://www.nsp.cz

7.1 Overview of Returns to Soft Skills

Although there is a wide consensus on the positive role of soft skills on individual's employability and other labour market outcomes, there is still a relatively small (but growing) empirical body on wage returns to this kind of human capital (as was pointed out also by Borghans et al., 2006 and 2008). This section provides an overview of empirical literature focused exclusively on soft skills. As a skill can be defined as *the capacity for carrying out complex, well-organized patterns of behaviour smoothly and adaptively so as to achieve some end or goal* (Reber and Reber, 2001), returns to psychological traits are not taken into account.

Borghans et al. (2006) focused on wage returns to a whole range of soft skills, whose presence was approximated by the importance of *people tasks* for job performance. They found that individuals working in jobs, where people tasks are important, face lower wages. The wage penalty connected with a standard deviation increase in the importance of people tasks was estimated at circa 5% in U.S. and 4–9% in UK.

Bacolod and Blum (2010) estimated wage returns to people skills, cognitive skills and motor skills. They found that wage returns to people skills nearly doubled during years 1968–1990 (one standard deviation increase in people skills was associated with 3.2% wage increase in 1968 and 6.0% increase in 1990), while returns to cognitive skills increased *only* by 60% and returns to motor skills decreased by 50%. Detailed examination revealed that people skills have no value themselves, but only as a complement to cognitive or motor skills (it corresponds also to findings of Weinberger, 2011).

Black and Spitz-Oener (2007) focused on gender differences in wage returns to a broad range of skills approximated by different job tasks. They defined five groups of skills: non-routine interactive tasks, non-routine analytic tasks, routine cognitive tasks, routine manual tasks and non-routine manual tasks, where the designation *routine tasks* suggests possibility of machine processing. They found that wage premium is connected (in descending order) with non-routine interactive tasks, non-routine analytic tasks and routine cognitive tasks, whereas wage penalty is connected with routine manual tasks and non-routine manual tasks.

Kuhn and Weinberger (2005) focused on wage returns to leadership skills in case of white men. These skills were measured by observable leadership activities of an individual during his study at high school and by their self-assessment. Estimates show that men who were both a captain of an athletic team and a president of a club or other organization at high school, earn 3.8–22.1% more than others. The same pattern was identified for self-assessed leadership skills as well.

In a later paper, Weinberger (2011) brought new evidence on wage returns to leadership skills. She again used behavioural indicator of leadership, which was regressed on weekly earnings 7 years after graduation. Results confirmed

statistically significant 5.3% wage premium for leadership skills, or more precisely for leadership in clubs, performing arts and student publications or sport participation, which more than doubled between 1979 and 1999.

This brief overview showing relevancy of soft skills for wage determination can be supplemented with a note on their relation to recent development of gender wage gap. The above reviewed papers show that changes in employers' requirements on soft skills of employees, accompanied by corresponding development of their wage returns, together with changes in distribution of these skills between genders led to significant reduction of the gender wage gap. This conclusion is consistent with results of Bacolod and Blum (2010), Black and Spitz-Oener (2007) and Borghans et al. (2006).

7.2 Measurement of Soft Skills

Two different methodological approaches were used in above mentioned papers for measuring soft skills. The direct one is based on questioning individuals on their behaviour (e.g. Weinberger, 2011; Kuhn and Weinberger, 2005), the indirect one approximates an individual's soft skills by job tasks (e.g. Bacolod and Blum, 2010; Borghans et al., 2006; Black and Spitz-Oener, 2007), which are identified by trained experts or by workers themselves. It should be noted that the evidence, referred to by Borghans et al. (2006), suggests that job tasks identified by workers and trained experts do not differ significantly.

Does the indirect approach measure soft skills reliably? The approximation of an individual's skills by job characteristics (regardless whether job tasks or skills requirements are taken into account) is based on an assumption that any job is performed only by workers with relevant skills. Since the soft skills are closely related to attitudes (i.e. a *stable, long-lasting, learned predisposition to respond to certain things in a certain way*; see Statt, 1998) and thus their development is more difficult and slower than in case of hard skills, it can be further assumed that only workers who already have relevant soft skills at required levels are hired (although they may lack some hard skills at the beginning, since they can be developed relatively easily and quickly). Under the second assumption, there is no problem with reverse causality in relation between soft skills and performed job, because the proper set of soft skills represents a condition for hiring. It should be noted that the described mechanism does not influence a role of level and field of individual's education as the sorting device, which is used for pre-selection of job applicants, because only those, who have required education are considered for final selection based on soft skills. (This two-stage selection of workers based on education and subsequently on soft skills corresponds to the results of a European survey published in Balcar et al., 2011).

Relevancy of the assumption that jobs are performed by workers with relevant soft skills can be confirmed by the results of many empirical studies. The studies found a statistically significant match of individual's soft skills with job tasks (e.g. Weinberger, 2011; Borghans et al., 2006 and 2008) or at least with type of job (e.g. Kuhn and Weinberger, 2005 who match leadership skills with

employment in managerial jobs). This evidence suggests that an indirect approach to soft skills measurement through job characteristics provides relevant data. Moreover, the usage of this approach can minimize bias of data caused by subjectivity of individual's responses, improper questions or other factors present in case of direct questioning. On the other hand, the indirect approach is not able to capture differences among individuals, but only groups of individuals, i.e. individuals working in the same job.

The efficiency of indirect measurement of soft skills could be further improved by using methods of competence modelling, i.e. by using particular skills required for a job performance instead of widely used job tasks. However, the change of focus from job tasks to skills is not beneficial by itself. The main improvement consists in clear specification of levels of each skill by behavioural descriptors, enabling an accurate and objective description of a person suitable for a job. (The difference between job tasks and skills approaches can be illustrated by a job where communication on elementary level is very important, thus the importance of communication as a job task would be evaluated by high mark, while the required skill level by low mark. The results from these two approaches would be then significantly different.) Therefore, it is possible to state that for a purpose of estimating wage returns to particular skills the approach based on competency modelling is more suitable. It is the reason, why it was employed in this paper (see following section for details).

7.3 Data

Since there was no appropriate dataset for an estimation of wage returns to soft skills in the Czech Republic, it was necessary to create it. Three data sources were used for this purpose: tailor-made survey among employees, Albertina Firm Monitor and National System of Occupation.

Tailor-made survey was conducted in order to gather individual data on Czech employees aged 25–54 years. Its structure reflects main areas of current economic research on wage determination, thus it provides information particularly on respondent's and household income, personal characteristics, information on education and work experience, preferences related to job, family and life roles, physiologic characteristics, psychological traits, and characteristics of family background, households and workplace. Data for a representative sample of 1,984 employees aged 25–54 years (representative for the Czech Republic on the basis of sex, age, education, region and size of municipality of residence) was gathered through standardized face-to-face interviews (only one respondent per household was allowed) conducted by FOCUS – Social & Marketing Research Agency in October and November 2011. Employer's registration number and occupation code of respondent according to ISCO classification were subsequently added by FOCUS Agency, which enabled replenishing the data set with employer characteristics (from Albertina Firm Monitor) and characteristics of occupation performed by a respondent (data from

National System of Occupations). Basic description of data gathered in the frame of the Survey can be found in Chapter 3.

Albertina Firm Monitor provides information on c. 2.7 million economic subjects with national identification number in the Czech Republic. Since the Survey data set provides information on national identification number of each respondent's employers, it was possible to replenish the original data with information on some employers' characteristics (e.g. economic sector, number of employees, date of origin, ownership and legal form). *Albertina CZ Silver Edition 4/2011* was used for this purpose, because it provides relevant information on the quarter, when the Survey was realized.

National System of Occupation is a public database of occupations providing detailed information on job tasks, qualification requirements, health requirements, working conditions, wage level, and vacancies for particular occupations. The relevancy of information in the system is guaranteed by sector councils representing employers, professional organisations, educators and other experts in human resources in particular sectors and branches (NSP, 2011). The System specifies also requirements on 15 soft skills for each occupation (i.e. effective communication, cooperation, creativity, flexibility, consumer orientation, efficiency, independence, problem solving, planning and organizing, life-long learning, proactive approach, stress resiliency, exploring and orientation in information, leadership, and influencing others). It does not, however, provide information whether a skill is important for a job performance or not (as can often be seen in empirical literature), but specify demanded level of each soft skill by tailor-made behavioural description (at 6-points scale), which significantly increase an accuracy of soft skills measurement. Example of a definition and behavioural description of the 6-points scale for chosen soft skill can be found in Table 7–1.

It should be noted that the match of respondents from the Survey with relevant occupation defined in the National System of Occupation was complicated by missing or incomplete profiles of some occupations (state on June 2012). Although this problem was in some cases solved by an assignment of the most similar occupation with identical soft skills requirements (usually occupations marked by the National System of Occupation as *closely related* with the missing one)[17], it caused relatively significant erosion of the original sample (156 respondents were excluded because of missing information in the National System of Occupation and 328 respondents were excluded in order to restore sample representativeness; the original sample of 1984 respondents was reduced to 1500 respondents).

[17] To reach the perfect match from the view of soft skills, all relevant cases were consulted with experts working for the National System of Occupations, who both designed the classification of soft skills and prepared a draft specifying soft skills requirements on already described occupations (state on June 2012), which was subsequently discussed by sector councils.

Table 7–1 Description of Communication from the National System of Occupations

Skill		*Level*	
Communication	*Description* It is an ability to communicate actively (incl. presentation skills), listen and argue. *Sub-skills* ▪ ability to take reactions of others into account (ability to understand verbal and non-verbal information) ▪ ability to overcome barriers in communication ▪ ability to accept and work with arguments of others ▪ ability to express oneself clearly and comprehensibly ▪ ability to express oneself in writing ▪ ability to be assertive, express disagreement ▪ capability of self-reflection ▪ ability to adjust communication style, get attention of recipients and anticipate their reactions ▪ ability to present information to others	0	He/she formulates his/her ideas in both speech and writing with big difficulties; his/her ability to listen to others is limited; provision of information is occasional, sporadic and fragmentary.
		1	He/she formulates ideas, especially in writing form, with difficulties; tends to have problems with listening to others; provides information only on request; his/her reactions to unexpected situations are not predicable.
		2	He/she manages to formulate ideas clearly both in speech and writing in regular situations; listens to others without significant problems; provides information to others; reacts to the situation adequately; his/her communication is not always convincing.
		3	He/she formulates ideas in both speech and writing clearly; listens to others; reacts assertively to a developing situation; is capable to capture other people's attention; tolerates other people's opinions.
		4	His/her ability to formulate ideas in both speech and writing is at a very good level; he/she listens to other people actively; adequate level of self-enforcement is natural for him/her; is capable of presenting to a group; is capable of opening the communication; provides an environment conducive to communication of all participants; welcomes and works with other people's opinions; can create constructive conflict; requests feedback
		5	His/her ability to formulate ideas in both speech and writing is excellent, he/she practices active listening without exception in all circumstances; adequate level of self-enforcement is natural for him/her; is able to address big audience and persuade others; can elicit real opinion from other people and work with them; uses constructive conflicts; utilises feedback; communicates with other cultures.

Source: NSP (2011)

Definition and basic description of variables employed in this paper can be found in Appendix 2.

7.4 Wage Returns to Soft Skills in the Czech Republic

Mincer's original wage equation (Mincer, 1974) represents the simplest wage model, because it assumes that individual's wage is given by knowledge and skills acquired through education and work experience. Since it ignores quite a

number of other human capital components, as well as all demand-side characteristics, it is suitable for estimation of gross returns to education and work experience. Inclusion of soft skills variable (approximated by job requirements on soft skills level) into this *base model* can further increase its predicative power, because it will enable both estimation of their gross returns and elimination of their influence on education and work experience variables, whose regression coefficients will thus provide information on returns only to professional skills. Subsequently, the model will be enhanced by variables describing or approximating psychological features, individual preferences, physical features and health, family and background characteristics, job and employer characteristics and location to obtain as much predicative wage model as possible. This *full* model will provide information on net returns to soft skills, education and work experience.

However, an intention to include all 15 soft skills (their levels) as regressors into stated models and estimate wage returns to each of them proved unrealistic because of high mutual correlation among these skills (Pearson correlation coefficient reach values 0.33–0.49 only in 6 cases, 0.5–0.69 in 27 cases and 0.7–0.86 in 72 cases). Factor analysis revealed that the set of soft skills could be represented by communication skills, which explain 74.26% of the variability in the original 15 soft skills variables. Mean level of 15 soft skills, however, provided even better results (slightly over 75%), thus it was chosen to approximate the individual's soft skills in the wage models.

Results for different specifications of the *base model* are presented in Tables 7–2a and 7–2b. Tables show that specifications without soft skills variable (odd columns) provide standard and expected results.

Additional year of schooling is associated with wage premium at the level of 6.51%. Returns to different educational levels revealed that students of secondary technical schools or grammar-schools gain double returns to their educational level (24.80%) than their friends at secondary vocational schools (12.61%) and they can double them again by reaching master or doctoral degree (55.14%). Returns to education differ significantly according to gender, which can be illustrated by returns to a year of schooling (6.01% for men and 7.46% for women) or selected levels of education (returns to secondary vocational schools are 9.29% for men and 13.51% for women, returns to master or doctoral degree are 50.23% for men and 58.75% for women). Tenure is also statistically significant wage predictor, whose returns reach the value of 2.19% per a year. Also returns to this variable embody significant gender differences on behalf of women, who gain 2.54% wage premium for a year of tenure, while men gain only 1.33% wage premium. A year of other work experience is connected approximately with 1.47% wage premium, which confirmed higher relevance of experience acquired in current employment. In this case, however, the returns to this human capital component are higher for men (1.72%) than for women (statistically insignificant; 0.78% in column 11).

Table 7–2a Estimation of base wage model (years of schooling)

	Pool		Male		Female	
VAR.	(1)	(2)	(3)	(4)	(5)	(6)
Years of schooling	0.0651*** (0.005)	0.0423*** (0.005)	0.0601*** (0.006)	0.0293*** (0.007)	0.0746*** (0.007)	0.0529*** (0.008)
Tenure	0.0223*** (0.004)	0.0202*** (0.004)	0.0135*** (0.005)	0.0117** (0.005)	0.0260*** (0.006)	0.0230*** (0.006)
Tenure squared	–0.0004*** (0.000)	–0.0004** (0.000)	–0.0002 (0.000)	–0.0002 (0.000)	–0.0006** (0.000)	–0.0005** (0.000)
Other work experience	0.0152*** (0.003)	0.0159*** (0.003)	0.0179*** (0.004)	0.0189*** (0.004)	0.0072 (0.005)	0.0075 (0.005)
Other work experience squared	–0.001*** (0.000)	–0.001*** (0.000)	–0.001*** (0.000)	–0.001*** (0.000)	–0.0002 (0.000)	–0.0002 (0.000)
Soft skills (mean level of 15 soft skills)		0.1006*** (0.013)		0.1258*** (0.016)		0.1051*** (0.018)
Location (NUTS 3 region, residence town size)	Yes	Yes	Yes	Yes	Yes	Yes
Constant	8.8976*** (0.075)	8.9220*** (0.074)	9.1009*** (0.096)	9.1618*** (0.092)	8.6920*** (0.107)	8.6901*** (0.107)
Obs.	1,500	1,500	800	800	700	700
Adj. R-squared	0.216	0.251	0.200	0.267	0.282	0.320

Source: Questionnaire, Albertina, National System of Occupation

Notes: Dependent variable: ln income. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Education and work experience develop both professional and soft skills. An inclusion of soft skills variable, which approximate the level of their development, enabled separation of returns to these different kinds of skills (therefore, education variables, tenure and other work experience in even columns represent only professional skills). The returns to one-level increase of soft skills (at 0–5 scale) are equal to 10.06% (12.58% wage premium for men and 10.51% wage premium for women). Inclusion of soft skills significantly influenced returns to education, which suggests that the educational system plays an important role in accumulation of not only professional skills, but also soft skills. The return to a year of schooling decreased from 6.51% (returns to both professional and soft skills) to 4.23% (returns only to professional skills), which means a decrease of regression coefficient by –35.02%. The decrease of regression coefficients was larger in case of men (decrease by –51.25%) than women (decrease only by –29.09%). It means that gross returns to one-level increase of soft skills equal nearly to 2.5 years of education (approximating professional skills) or acquiring education at secondary vocational school.

Table 7–2b Estimation of base wage model (completed level of education)

	Pool		Male		Female	
VAR.	(7)	(8)	(9)	(10)	(11)	(12)
Secondary vocational school	0.1261*** (0.047)	0.0965** (0.046)	0.0929* (0.054)	0.0595 (0.054)	0.1351** (0.064)	0.1003 (0.063)
Secondary technical or grammar-school	0.2480*** (0.046)	0.1635*** (0.047)	0.2133*** (0.054)	0.1127** (0.056)	0.3213*** (0.062)	0.2340*** (0.063)
Higher professional school, no academic degree	0.3983*** (0.061)	0.2787*** (0.062)	0.3182*** (0.093)	0.1925** (0.090)	0.5215*** (0.076)	0.3911*** (0.077)
Higher professional school, bachelor degree	0.4126*** (0.068)	0.2805*** (0.067)	0.3345*** (0.087)	0.1705** (0.078)	0.5246*** (0.091)	0.3915*** (0.094)
University, bachelor degree	0.3900*** (0.060)	0.2610*** (0.063)	0.2810*** (0.097)	0.0881 (0.095)	0.5360*** (0.075)	0.4213*** (0.079)
University, master or doctoral degree	0.5514*** (0.056)	0.3728*** (0.059)	0.5023*** (0.067)	0.2656*** (0.073)	0.5875*** (0.079)	0.4210*** (0.084)
Tenure	0.0229*** (0.004)	0.0204*** (0.004)	0.0145*** (0.005)	0.0119*** (0.005)	0.0270*** (0.006)	0.0243*** (0.006)
Tenure squared	–0.000*** (0.000)	–0.0004** (0.000)	–0.0003 (0.000)	–0.0002 (0.000)	–0.0006** (0.000)	–0.0006** (0.000)
Other work experience	0.0156*** (0.003)	0.0160*** (0.003)	0.0181*** (0.004)	0.0188*** (0.004)	0.0078* (0.005)	0.0081* (0.005)
Other work experience squared	–0.001*** (0.000)	–0.001*** (0.000)	–0.001*** (0.000)	–0.001*** (0.000)	–0.0002 (0.000)	–0.0002 (0.000)
Soft skills		0.0970*** (0.013)		0.1233*** (0.017)		0.0947*** (0.018)
Location	Yes	Yes	Yes	Yes	Yes	Yes
Constant	9.5150*** (0.056)	9.3267*** (0.063)	9.6949*** (0.068)	9.4529*** (0.077)	9.3694*** (0.077)	9.1891*** (0.087)
Observations	1,500	1,500	800	800	700	700
Adjusted R-squared	0.218	0.249	0.205	0.266	0.298	0.327

Source: Questionnaire, Albertina, National System of Occupation

Notes: Dependent variable: ln income. No or basic education omitted. Soft skills = mean level of 15 soft skills. Location = NUTS 3 region, residence town size. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

An analysis of changes in regression coefficients for different levels of education brings interesting results. It shows that the relative decrease of wage returns was similar for all educational levels (decrease of regression coefficients from –30.03% to –34.07%), but secondary vocational school (regression coefficient decreased by –23.47%). It suggests that the proportion of soft skills to professional skills development is relatively stable all over the Czech education system, except secondary vocational schools, which are more focused on development of professional skills. Comparison of standardized beta coefficients of professional skills (0.2388) and soft skills (0.2301) suggests that their importance as wage predictor is nearly the same. Inclusion of soft skills variable has only minor impact on returns to tenure, i.e. the change of returns from 2.19% to 1.98% (regression coefficient decreased by –9.59%), and minimal impact on other work experience (the change of regression coefficient was smaller than 5.00%). These results support an existence of specific soft skills, whose value is bounded only or mainly with the place of their accumulation (e.g. special form of communication with clients), although the theoretical literature assumes all soft skills to be general. They also suggest that work experience for both current and previous employer lead mainly to accumulation of professional skills.

The base model proved that education and soft skills are statistically significant wage determinants with gross returns at the level of 4.23% for a year of schooling and 10.06% for one-level increase of soft skills (at 0–5 scale). Gross returns, however, say nothing about the real productivity of these two factors, because they can represent only a key to factors directly influencing wage level. For instance, a man can use his highly developed soft skills to be successful in a job interview and later positively influence the opinion of his boss on his work performance. Even if he did not use his soft skills for any other purpose, he would gain some wage returns gained in the acquired job and a perception of his work performance by his boss (assuming that the boss can influence his wage level). The direct influence of his soft skills on wage (net returns) would be zero in this case (as they were not used for job performance), but their indirect influence (gross returns) would be substantial. The presence of net returns to soft skills and education, which indicate their real productivity, was tested by a model comprising the base model and many supply and demand side control variables (thereinafter full model). Main results of the full model estimation are presented in Table 7–3.

Estimation of wage model with detailed information on individual's characteristics (Column 1, Table 7–3) proved that returns to a year of schooling presented by the base model were upward biased. An inclusion of cognitive skills, need to excel, persistence and other characteristics with a potential to influence wages indirectly through their impact on acquired level of education decreased returns to a year of schooling (approximating only professional skills as soft skills are controlled) from 4.23% to 3.02%. Level of education, soft skills, psychological traits, preferences and other personal traits usually have crucial effect on both choice of desirable job made by an individual and selection of suitable worker made by employer. It points to some (and maybe substantial)

Table 7–3 Estimation of full wage model

	Pool		Male		Female	
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Education						
Years of schooling	0.0302*** (0.006)	0.0244*** (0.005)	0.0251*** (0.008)	0.0220*** (0.008)	0.0308*** (0.009)	0.0169** (0.008)
Field of study (KKOV classification)	Yes	Yes	Yes	Yes	Yes	Yes
Work experience						
Tenure	0.0192*** (0.004)	0.0134*** (0.004)	0.0107* (0.006)	0.0097 (0.006)	0.0169** (0.007)	0.0079 (0.007)
Tenure squared	–0.0003* (0.000)	–0.0002 (0.000)	–0.0001 (0.000)	–0.0001 (0.000)	–0.0003 (0.000)	–0.0001 (0.000)
Other work experience	0.0169*** (0.004)	0.0142*** (0.004)	0.0177*** (0.006)	0.0165*** (0.005)	0.0095 (0.006)	0.0052 (0.006)
Other work experience squared	–0.0004*** (0.000)	–0.0004*** (0.000)	–0.0005*** (0.000)	–0.0005*** (0.000)	–0.0003 (0.000)	–0.0002 (0.000)
Life-long work career specialization	Yes	Yes	Yes	Yes	Yes	Yes
Soft skills						
Soft skills (mean level of 15 soft skills)	0.0749*** (0.013)	0.0364** (0.015)	0.0880*** (0.017)	0.0650*** (0.021)	0.0619*** (0.021)	0.0227 (0.025)
Cognitive skills, psychological traits and preferences *(Grades from math at age 15, strong need to excel / be better than others, persistence in following difficult goals, self-esteem, locus of control, highest life priority, Feeling of personal responsibility for ensuring an adequate income, feeling of personal responsibility for ensuring everyday housework and taking care of children, impact of loss of individual's income on living standard, preferences on job security, job flexibility, individual's self-fulfilment, less demanding and stressful work, good interpersonal relations)*	Yes	Yes	Yes	Yes	Yes	Yes

Table 7–3 *continued*	(1)	(2)	(3)	(4)	(5)	(6)
Physical characteristics *(Gender, age, health limitation of work performance, difference between individual's height and average height for his/her gender, BMI categories)*	Yes	Yes	Yes	Yes	Yes	Yes
Family characteristics *(Marital status, number of children in 5 age categories)*	Yes	Yes	Yes	Yes	Yes	Yes
Background characteristics *(Education of mother, education of father, number of siblings, mother tongue)*	Yes	Yes	Yes	Yes	Yes	Yes
Occupation (ISCO classification)		Yes		Yes		Yes
Prevailing economic activity (NACE classification)		Yes		Yes		Yes
Other job characteristics *(Work load, difference in number of hours really devoted to a work and official work load, absenteeism, field of education and job match, work performance dependence on co-workers, freedom to create and try new working processes,rate of subjectivity in wage-system, relation with boss, way of getting the job)*		Yes		Yes		Yes
Employer characteristics *(Number of employees, ownership, natural person dummy, age of firm/institution)*		Yes		Yes		Yes
Location*(NUTS 3 region, residence town size)*	Yes	Yes	Yes	Yes	Yes	Yes
Constant	9.3079*** (0.149)	9.4588*** (0.149)	9.4092*** (0.204)	9.4552*** (0.214)	9.1671*** (0.236)	9.5791*** (0.243)
Observations	1,500	1,500	800	800	700	700
Adjusted R-squared	0.439	0.523	0.355	0.416	0.406	0.535

Source: Questionnaire, Albertina, National System of Occupation
Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

indirect effect of these factors on wages through their influence on job characteristics. It was confirmed by re-estimation of the model with job characteristics variables (Column 2), which led to further decrease of returns to a year of schooling to the level of 2.44%. Comparison of these results for men and women separately bring very interesting results. If no job characteristics are included into the model, the returns to a year of schooling (i.e. professional skills) are higher for women (3.08%) than men (2.51%), but their inclusion led to the opposite result (1.69% for women, 2.20% for men). The estimation of net returns to professional skills connected with particular levels of education (not shown here) revealed that there is some kind of *university degree* bonus at the level of 11.91% for bachelor degree and 14.93% for master or doctoral degree (in comparison with basic education) in pooled sample, which were not, however, found statistically significant in results for men and women separately.

The base model quantified gross returns to soft skills, or more precisely to one-level increase of soft skills (at 0–5 scale), at the level of 10.06% (12.58% for men and 10.51% for women). If other supply side variables are controlled (Column 1, Table 7–3) the returns decrease to the level of 7.49% (the decrease of regression coefficient by –25.55%), which suggest significant role of other controlled variables on soft skills development. It can be assumed that individual's soft skills determine access to different occupations, sectors and jobs with specific characteristics, as was mentioned above. This role of soft skills seems to be substantial as follows from comparison of estimations comprehending and not comprehending job characteristics (Columns 1 and 2, Table 7–3). An inclusion of job characteristics led to decrease of returns to soft skills from 7.49% to 3.64% (i.e. decrease of regression coefficient by –51.40%). It means that half of returns to soft skills are realized through getting a better paid job. It also shows that soft skills have real productive effect, because there are positive and statistically significant returns to one-level increase of soft skills at the level of 3.64% even if main individual's characteristics (education, work experience, cognitive skills, psychological traits, preferences, etc.) and job characteristics (occupation, economic sector, real work load, etc.) are controlled. This net wage premium for one-level increase of soft skills equals to wage effect of 1.5 years of education (approximating professional skills). There are, however, significant differences in net returns to soft skill between genders. Net returns to soft skills are substantially high in case of men (6.50%), but statistically insignificant in case of women (as a result of inclusion of job characteristics into the model). The model provides information on net wage returns to quite a number of other factors, which are not discussed here in details. Full results are available from the author on request.

7.5 Conclusions

Soft skills and their development is a topic that has created much discussion in the Czech Republic in recent years. Systematic and targeted development of soft skills is, however, still sporadic in Czech schools. Unfortunately, the lack of institutionalised soft skills development is not compensated by individuals, who

should benefit from it (in the form of higher employability and wages) the most. Why is it so? Do soft skills provide only minor or no returns to their development and thus investments in them are not profitable? Do the returns differ between genders?

The chapter used data on broad range of supply and demand side variables (incl. soft skills) for representative sample of 1,500 Czech employees in order to provide the first estimation of wage returns to soft skills in the Czech Republic and thus provide answers on both questions.

It found that one-level increase of soft skills (at 6-points scale defined by National System of Occupation) is connected with gross wage returns at the level of 10.06% (12.58% wage premium for men and 10.51% wage premium for women). It is nearly equal to returns to 2.5 years of education (approximating professional skills). It also showed that half of returns to soft skills are realized through getting better paid jobs, which have also other preferred characteristics (e.g. lower risk of unemployment, higher prestige or more flexible and creative work environment). Even if main individual's characteristics (education, work experience, cognitive skills, psychological traits, preferences, etc.) and job characteristics (occupation, economic sector, real work load, etc.) are controlled, there are still statistically significant returns to soft skills development at the level of 3.64% (6.50% for men, while net returns to women are statistically insignificant). The estimation confirmed that both gross and net wage returns to soft skills are substantial in the Czech Republic and their gender differences are significant.

The results showed that soft skills have similar effect on employees' productivity (and subsequently their wage level) as education. One could, therefore, expect that individuals invest in soft skills development as intensively as in education. Real investment behaviour, however, differ from these expectations based on simple comparison of wage returns to all possible investments. It suggests that profitability of investments in soft skills is not as generally accepted by society as investments in education (it is determined also by historical experience). This fact (together with complementarity of soft skills with professional skills) supports the idea of development of soft skills in the frame of education system.

Chapter 8

Conclusions

By Mariola Pytliková

The book focuses on labour market differences and discrimination by gender, and in particular on gender wag gap. The main objective of the book is to give overview of what we know so far about various factors contributing to the gender pay gap via reviewing existing theoretical and empirical literature and to extend our knowledge on the topic through data analysis.

In our analyses we use two types of datasets, longitudinal linked employer-employee data (LEED) and survey data. The LEED called the Average Earnings Information System (AEIS) created by a private company on behalf of the Ministry of Labour and Social Affairs enables us to analyze typical wage determinants such as human capital, some job and firm characteristics, and observe their changes over time, as well as controlling for unobserved firm fixed effects. However, the AEIS cannot capture certain variables related to family-career balance, preferences, gender identity, personality and other socio-psychological characteristics as suggested in the most recent research. Due to these data limitations we have developed – and discussed with respected experts in the gender economics area – our own questionnaire that reflects main areas of current state-of-the-art research on wage determination and some novel areas that can contribute to better understanding of gender differences on labour market. In particular our survey data provide information on respondent's and household's income, demographic, family and family background characteristics, human capital characteristics, preferences related to work, family and life roles, gender identity factors, psychological traits and non-cognitive skills, characteristics of respondent's job and workplace and physical appearance qualities. Further, by using and merging an additional dataset on soft skills required for particular occupations to our survey data, we could explore the role of soft skills on wage determination (e.g. communication, cooperation, creativity, flexibility, consumer orientation, efficiency, independence, problem solving, planning and organizing, life-long learning, proactive approach, stress resiliency, exploring and orientation in information, leadership) and evaluate differences by gender. Thus, we were able to enrich the human capital model as envisioned by Becker (1964) and to dig deeper into a potential existence of gender based wage discrimination.

From our descriptive evidence (Chapters 3, 4 and 5) we observe that women compared to men:

- are better educated and have higher abilities (as measured by math grades);
- work less hours (both scheduled and real working hours);
- have lower tenure and take much longer maternity leave;
- require more flexible jobs and are more likely to be evaluated objectively;
- have more likely female as a boss;
- more likely work in public sector;
- prefer higher job security, job flexibility, career advancement, less stressful job and good atmosphere in the workplace over higher wage;
- prefer to equally share income and household responsibility with their partners, but in reality men are more likely responsible for income and less responsible for households.
- tend to score higher in the locus of control, less in competition, negotiations, risk and grit.

The results of our empirical analyses show that the raw gender wage gap is around 25% in private and 14% in public sector using our linked employer-employee data (Chapter 4). Controlling for the traditional human capital variables and firm characteristics decrease the wage gap to 20% and 13.7% for private and public sector, respectively. Adding unobserved firm specific effects cuts the gap further to 17% and 10%, respectively, see Chapter 4. In analyses using our survey data, including the rich subsets of variables decreases the coefficient to female dummy substantially to not statistically significant 3.2%, and our full model specification explains 53.5% of variance of monthly wages, see Chapter 5. In particular, the addition of the subset of demographic and family variables, human capital and job characteristics increases the explanatory power of the model substantially, however also the set of gender identity and position in the family characteristics and psychological traits are not negligible in terms of explanatory power of the model.

The results from the Oaxaca-Blinder and Juhn-Murphy-Pierce earnings decompositions (Chapter 5) show that observable characteristics explain approx. 87% of the gender wage gap, whereas only 13% remains unexplained. Among those that significantly contribute to the explained part of the gender wage gap is tenure, maternity leave, working hours, but also some non-cognitive characteristics such as competition and grit, and some job characteristics such as objective job evaluation, having a female boss and job flexibility. On the other hand, family background and number of children are among those that contribute significantly to the unexplained part of gender wage differentials. Further, the Juhn-Murphy-Pierce decomposition showed that the highest unexplained part of gender wage gap is among workers with higher wages (at the 75^{th} and 90^{th} quantile) whereas the lowest unexplained part of wage differentials is among workers with lower wages (at the 25^{th} quantile).

Thus, our results show that women earn significantly less than men overall, but the difference is due to observable factors as the actual unexplained term considered often as an indicator of discrimination is negligible. Nevertheless, our results should be a concern for policy makers given that one of the main factors determining wages and explanatory part of the wage gap in the Czech Republic is the length of maternity/parental leave and lower tenure. Thus, one of the ways to close the gender pay gap is for policymakers to do more to get mothers to come back earlier to work from their leave related to child bearing. In light of this, we suggest reducing the length of parental leave even further than the reform from 2006 did, but preserving mothers' choice of length (e.g. a choice between leave up to 1, 2 or 3 years of child's age). At the same time we recommend the policy makers to increase publicly subsidized high-quality child care in order to truly give young parents the choice of early return to their jobs if they would like to. In particular, the childcare for children between 0 to 3 years old should become more widely available and affordable through a formal publicly-funded center-based care such as crèches (jesle) or day care. The Czech Republic has extremely expensive system of parental leave; the spending on child related leave and birth per childbirth is one of the highest in the OECD countries particularly because of the longest in the world and relatively generous parental leave. Thus by shortening the leave there could be some financial resources left to support establishment of a high-quality publicly supported child care for children 0–3 years.

Further, the evidence from our survey shows that women in the Czech Republic continue to be primarily responsible for most of the housework and childcare. Supporting inclusion of men as househusbands would help families in achieving more equality on that front and consequently more gender equality on the Czech labour market. For instance, some policy initiatives promoting sharing of care responsibilities between parents such as periods of parental leave for the exclusive use of fathers (such as in Norway), could be a measure bringing greater gender equality.

Thus, we advise the policy makers in the Czech Republic to make a number of steps, which would minimize the work interruptions in women's career due to child rearing: 1) reform the parental leave towards a shorter, yet still flexible (a choice of certain length) and well paid parental leave, 2) promote a greater paternal involvement in child rearing by e.g. legislation fostering sharing of the parental leave between parents, and 3) establishing formal child-care facilities, subsidized by public authorities (to make it affordable for parents), which can help those parents who wish to work. Shortening the parental leave together with a mandatory share of the parental leave between parents, and a better formal child care for small children would not only bring more gender wage equality, but also would increase female labour participation. As our research show, women constitute an important source of labour force in the Czech Republic; they are more educated and tend to have higher abilities. Yet, the female labour participation rate in the Czech Republic is one of the lowest among developed OECD countries. Getting more women to work would bring an increase in the

skilled (and not only) labour force, and in this way alleviate the problems of population aging that the Czech Republic experiences and is likely to experience in the future.

The evidence from our survey shows that job flexibility as a tool in reconciling work and family life is important explanatory variable in explaining differences between men and women. Perhaps some legislation promoting flexible workplace practices – such as giving a right to request flexible working hours – would make it easier for both sexes to combine work and family. Some countries could serve as an example, for instance the Netherlands have a legislation allowing workers in companies with more than 10 employees to request a more flexible working hours. In the UK, policymakers have granted parents with children under age six the right to request flexible working hours.

Finally, our analyses show that women tend to be less competitive and determined, and that the two psychological characteristics positively influence the explained part of the gender wage gap in a significant way. This might have some implications (together with the factors mentioned above) for the observed low female representation on company boards and in executive management positions. Our analyses using the Juhn-Murphy-Pierce decomposition seem to support the hypotheses as they show the highest unexplained part of gender wage gap being among workers with higher wages (at the 75^{th} and 90^{th} quantile). We therefore suggest companies to make use of policies such as mentoring programs for females or setting goals for diverse composition of management positions or company boards (diversity aspiration policies), in order to gain an access to a larger pool of applicants and talents. Such measures could also promote a greater overall gender equality as they likely would increase gender diversity at the lower levels of employee hierarchy in order to create a *pipeline* of potential *diverse* candidates for executive management steering groups.

Appendices

Appendix 1 Questions used in the Determinants of Wages and Gender Wage Gap Survey

Appendix 2 Basic description of variables

Appendix 3 Descriptive statistics of Questionnaire data – male

Appendix 4 Descriptive statistics of Questionnaire data – female

Appendix 1 Questions used in the Determinants of Wages and Gender Wage Gap Survey

I. Sorting questions focused on selection of individuals, who are employed, do not have a claim on any form of disability pension, are not on maternity leave or a sick leave.

II. Question related to characteristics necessary for representative sample designing: sex, age, highest educational level, region, municipality, municipality size (+ municipality postcode).

FAMILY AND HOUSEHOLD

Question 1: Please state your marital status

a) Married
b) Single, without a partner
c) Single, partnership – no cohabitation
d) Single, partnership – cohabitation
e) Divorced/widow, without a partner
f) Divorced/widow, partnership – no cohabitation
g) Divorced/widow, partnership – cohabitation

Question 2: Please state the number of household members (including yourself). Household is defined as individuals living in one flat or house, who manage money together.

Question 3: Please state the age of all your children (in years), who

a) Live together with you in a common household and are financially dependent on you
b) Live together with you in a common household, but are not financially dependent on you
c) Do not live together with you in a common household, but are financially dependent on you
d) Do not live together with you in a common household and are not financially dependent on you
e) Do not have any children

Question 4: How many years did you spend on maternity/parental leave in total (with all your children together)? Do not count years in which you were employed or self-employed for at least 10 hours per week.

Question 5: If you have any full or half brothers, who grew up with you in a common household, please state their age in years.

a) I do not have any brothers
b) 1st brother ……
c) 2nd brother ……
d) 3rd brother ……
e) ……

Question 6: If you have any full or half sisters, who grew up with you in a common household, please state their age in years

a) I do not have any sisters
b) 1st sister ……
c) 2nd sister ……
d) 3rd sister ……
e) ……

Question 7: If you have any siblings, please state the number of children of the one with smallest difference between his/her age and yours

a) Number: ……
b) I do not have any siblings

Question 8: Please state the education of your mother, or the woman that took care of you until you reached 18 years.
The same scale as for respondent's education was used
+ Childhood without a mother or women in role of a mother

Question 9: Please state the education of your father, or the man that took care of you until you reached 18 years.
The same scale as for respondent's education was used
+ Childhood without a father or men in role of a father

Question 10: Please state your mother tongue. The mother tongue is a language that you were taught by parents since birth. (In case of bilingual individuals, it is possible to state two languages.)

a) Czech
b) Slovak
c) Polish
d) German
e) Ukrainian
f) Vietnamese
g) Hungarian
h) Russian
i) Roma

Other language(s), please state……

INCOME

Question 11: Please state your gross monthly income from your main employment.

Question 12: Please state the way of rewarding your job performance.

a) Entirely objective, measurable way
b) Rather objective, measurable way
c) Rather subjective, immeasurable way
d) Entirely subjective, immeasurable way

Question 13: Is your work rewarded above your basic wage?
a) Yes
b) No

Question 14: Please state your other monthly earnings
a) Rents, pensions
b) Other net monthly earnings (secondary occupation, stocks, securities, contract of services)

Question 15: Please state your partner's monthly earnings
a) Rents, (retirement, disability, widow's) pensions, unemployment pay
b) Total net monthly earnings (main occupation, secondary occupation, stocks, securities, contract of services)
c) I have no partner or we are separate

Question 16: Please state monthly income, which your household (you, your partner or your children) gets from the public resources (child allowances, housing allowances, orphan's allowances etc.)

Question 17: Loss of your entire income (i.e. from your main occupation, secondary occupation and other sources)…
a) …would not lead to significant decrease of your living standard, because other income (your partner's income social benefits, child allowances etc.) is sufficient to cover needs of household's members
b) …would lead to significant decrease of your living standard, because other income (your partner's income social benefits, child allowances etc.) is not sufficient to cover needs of household's members

EDUCATION

Question 18: Please state the field of your highest achieved education[18]

Question 19: What grade did you get from mathematics in your last year of basic school (or corresponding year of the long-term grammar school)? Use grading scale 1–5.[19]

Question 20: Have you been satisfied with your grades from mathematics?
a) Yes
b) Rather yes
c) Rather no
d) No
e) I did not care about grades
f) I do not know

[18] It was, subsequently, coded according to KKOV classification of educational fields.
[19] Last year of basic school correspond approximately to the age of 15. Grading from 1 (best) to 5 (worst) correspond to grading system in the Czech education system.

Question 21: Over the last 12 months, have you undergone and finished successfully any of the following types of education or training in order to improve your skills applicable in your job (main employment)? The education/training cannot be required by law (e.g. education on work safety).

a) Education/training paid for or provided by your employer *(Yes – No)*
b) Training paid by yourself *(Yes – No)*
c) Self-education *(Yes – No)*

Question 22: Does your job correspond with the field of your study?

a) It does not correspond at all (I am doing something else)
b) It does not much
c) It does partly
d) It does entirely

TENURE, WORK EXPERIENCE, CURRENT OCCUPATION AND ITS CHARACTERISTICS

Question 23: How many years have you been employed at your current employer (consider only your main employment)? Do not count maternity/parental leave and long-term sick leave into this time.

Question 24: Please state the total number of years you have worked for all your employers (including your current employer) or have been self-employed. Do not count maternity/parental leave, military service, long-term sick leave, periods of unemployment, as well as temporary/summer jobs and contracts of services.

Question 25: Please state how many different employers have you been working under for periods longer than 6 months (main occupation, self-employment, contracts of services). Please state a number.

Question 26: During your labour market career (i.e. main occupation, self-employment, contracts of services)…

a) … you have done the same or very similar work, i.e. work tasks
b) … you have done various work
c) I cannot say, I am at the beginning of my work career (this option was available only to respondents with work career under 3 years)

Question 27: Please state the name of a firm (main employment), in which you are working.

Question 28: Please state the municipality (or its part), in which the firm is located.

Question 29: Please state the title of your job position in your main employment and describe it.

Question 30: Please state the extent of your work load.

a) Full time (40 hours per week)
b) Full time in three-shift working (37,5 hours per week)
c) Other. Please state ……

Question 31: Would you like to change your workload (with corresponding change in wage)?

a) No, I'm fine with it
b) Yes, I would like to increase it
c) Yes, I would like to decrease it

Question 32: Please state a number of hours you really work in your main employment during a typical week. (Count paid and non-paid overtime, and deduct time for lunch-breaks, smoking etc.)

Question 33: How often are you absent in work (illness, medical examination, care of an ill child etc.)?

a) Never or nearly never
b) Sometimes I am absent, but still less than my colleagues
c) I am absent as often as my colleagues
d) I am absent more often than my colleagues

Question 34: How did you get your current job?

a) I was asked by the current employer and got an offer
b) Somebody recommended me (family member, friend etc.)
c) Somebody told me about this job/vacancy
d) From media (radio, internet, newspapers)
e) Employment office or employment agency
f) I asked the employer, although he/she did not announce a vacancy
g) I established my own company and became its employee
h) Others

Question 35: How much is your work performance dependent on your co-workers' work?

a) Entirely independent
b) Rather independent
c) Rather dependent
d) Entirely dependent

Question 36: Please state the prevalent way you perform the job tasks.

a) The working process is precisely defined and I have to follow it.
b) The working process, more or less, depends on my decision (e.g. I can create and try new ones)

Question 37: Please state the gender of your immediate superior

a) Male
b) Female
c) I do not have any immediate superior

Question 38: How would you describe your relationship with your immediate superior?

a) Unfriendly
b) Reserved
c) Neutral
d) Positive or friendly (only within the workplace)
e) Friendly, we meet outside our work (a common sport or hobby activities, go for a drink, family trips etc.)
f) I do not have any immediate superior

Question 39: Does your employer offer the following possibilities at least to some of the employees?

a) Flexitime, i.e. set start and end of work shift *(Yes – No – I do not know)*
b) Housework, i.e. work some regular paid hours at home *(Yes – No – I do not know)*
c) Change of workload, i.e. set the number of work hours per month *(Yes – No – I do not know)*

Question 40: Does your employer offer the following possibilities to you and do you use them?

a) Flexitime, i.e. set start and end of work shift (Yes and I use them – Yes, but I do not use them – No)
b) Home office, i.e. work some regular paid hours at home *(Yes and I use them – Yes, but I do not use them – No)*
c) Change of workload, i.e. set the number of work hours per month *(Yes and I use them – Yes, but I do not use them – No)*

Question 41: Your partner...

a) … works, i.e. he/she is employee or self-employed (answers Yes – No; offered only to respondents with a partner, No = skip the question)
b) He/she use flexitime *(Yes – No)*
c) He/she use home office *(Yes – No)*
d) He/she changed workload *(Yes – No)*

Question 42: Do you feel discriminated in comparison to co-workers of the opposite gender at your current job?

a) No
b) Yes
c) I have no co-workers of the opposite gender

Question 43: If you would have to find a new job (acceptable for you), how many employers are there in your commuting area, who could offer you such a job?

a) None
b) Very few
c) Some
d) Many

PREFERENCES ON JOB CHARACTERISTICS

Question 44: What is more important for you? Job security or wage level?

a) Almost entirely wage level
b) Rather wage level
c) Rather job security
d) Almost entirely job security

Question 45: What is more important for you? Job flexibility (e.g. housework, part time job, flexitime) or wage level?

a) Almost entirely wage level
b) Rather wage level
c) Rather job flexibility
d) Almost entirely job flexibility

Question 46: What is more important for you? The possibility of self-fulfilment at a job or wage level?

a) Almost entirely wage level
b) Rather wage level
c) Rather the possibility of self-fulfilment at job
d) Almost entirely the possibility of self-fulfilment at job

Question 47: What is more important for you? Less demanding and stressful work or wage level?

a) Almost entirely wage level
b) Rather wage level
c) Rather less demanding and stressful work
d) Almost entirely less demanding and stressful work

Question 48: What is more important for you? Good interpersonal relations at the workplace or wage level?

a) Almost entirely wage level
b) Rather wage level
c) Rather good interpersonal relations at workplace
d) Almost entirely good interpersonal relations at workplace

PREFERENCES ON FAMILY AND CARRIER

Question 49: Who should have the crucial responsibility for ensuring an adequate income for a family?

a) Almost entirely a man
b) Rather a man
c) Man and woman equally
d) Rather a woman
e) Almost entirely a woman

Question 50: Who in fact bears the crucial responsibility for ensuring an adequate income for your family?

a) Almost entirely a man
b) Rather a man
c) Man and woman equally
d) Rather a woman
e) Almost entirely a woman
f) Parents that I live with

Question 51: Who should have the crucial responsibility for ensuring housework (meal preparation, dish washing, cleaning, shopping, washing and ironing) and taking care of children?

a) Almost entirely a man
b) Rather a man
c) Man and woman equally
d) Rather a woman
e) Almost entirely a woman

Question 52: Who in fact bears the crucial responsibility for ensuring housework (meal preparation, dish washing, cleaning, shopping, washing and ironing) and taking care of children?

a) Almost entirely a man
b) Rather a man
c) Man and woman equally
d) Rather a woman
e) Almost entirely a woman
f) Parents that I live with

Question 53: Are you engaged in volunteer, non-paid activities (e.g. charity and humanitarian activities, religious activities, ecological activities, work with children)?

a) Ne
b) Yes

Question 54: Please order the following options according to your priorities in general (not only in this moment). State the most important as the first.

a) Focus mostly on working career
b) Focus mostly on family
c) Focus mostly on free time and hobbies
e) Focus mostly on volunteer, non-paid activities

Question 55: Please order the following options according to the energy devoted to them at present. State the option which you devote the most energy as the first.

a) Working career
b) Family
c) Free time and hobbies
d) Volunteer, non-paid activities

Question 56: Do you use any of the following options to help with housework?

a) Above standard or technically developed appliances, i.e. dishwasher, robotic vacuum cleaner, clothes dryer, ironing dummy etc. *(Yes – No)*
b) Parents or relatives – except partner or children *(Yes – No)*
c) Paid maid services *(Yes – No)*

Question 57: Do/Did you and your family use any of the following options of child care (children up to 3 years) in order to be able to work?

a) Relatives, except you and your parents *(Yes – No)*
b) Home care, au-pair *(Yes – No)*
e) Nursery, kindergarten *(Yes – No)*

PSYCHOLOGICAL TRAITS / BEHAVIOUR

Question 58: Do you think that events in your life are consequences of fortune and a coincidence or consequences of your actions and your decisions?

a) Entirely a consequence of my decisions and actions
b) Rather a consequence of my decisions and actions
c) Rather a consequence of fortune and coincidence
d) Entirely a consequence of fortune and coincidence

Question 59: Do you feel a really strong need to excel at what you do, and be better than others?

a) No
a) Rather no
b) Rather yes
c) Yes

Question 60: Are you proud of yourself?

a) No
b) Rather no
c) Rather yes
d) Yes

Question 61: Did you ever ask any of your employers for a wage increase?

a) No
b) Yes

Question 62: How high risk are you disposed to take in your work career? Please, rank it on scale from 0 (no risk) to 10 (very high risk).

Question 63: I often leave the goal I have set, when I find its reaching difficult.

a) Yes
b) Rather yes
c) Rather no
d) No

PHYSIOLOGICAL TRAITS

Question 64: Please evaluate your long-term health condition.

a) It does not represent any limitation of my work performance at my current job
b) It limits my work performance at my current job

Question 65: Please state…

a) your weight in kg (if you are pregnant, please state your weight before pregnancy)
e) your height in cm

III. Question focused on willingness to participate in surveys related to this one in the future.

Appendix 2 Basic description of variables

Data description	Variable	Mean	Std dev.	Min	Max
Income					
Gross monthly income from main employment *(free answer)*	Income	20,195	8,021	4,267	90,000
	Ln Income	9.84	0.370	8.36	11.41
Education					
Respondent's educational attainment *(selection from pre-defined options used as dummies)*	No or basic education	0.05	0.210	0	1
	Secondary vocational school	0.38	0.485	0	1
	Secondary technical school or grammar-school	0.38	0.487	0	1
	Higher professional school, no academic degree	0.03	0.161	0	1
	Higher professional school, bachelor degree	0.03	0.157	0	1
	University, bachelor degree	0.04	0.202	0	1
	University, master or doctoral degree	0.10	0.296	0	1
Number of years necessary for reaching respondent's educational attainment *(computed)*	Years of schooling	13.21	2.090	9.00	21.00
Field of study (KKOV classification)					
Respondent's field of study *(free answer and subsequent classification)*	Math, geology, geography, chemistry, biology, ecology, physics, informatics (KKOV 1)	0.03	0.169	0	1
	Mining, engineering, electrotechnics, technic chemistry, food processing and food chemistry (KKOV 2)	0.25	0.433	0	1
	Textile, cloth, boot production, wood processing, paper production and printing, architecture, construction, transport, communications (KKOV 3)	0.16	0.364	0	1
	Agriculture and forestry, veterinary (KKOV 4)	0.05	0.221	0	1
	Medicine, pharmaceutics, health services (KKOV 5)	0.04	0.196	0	1

Data description	Variable	Mean	Std dev.	Min	Max
	Philosophy, economics, trading, administration, gastronomy, accommodation, social sciences, law, personal services (KKOV 6)	0.32	0.465	0	1
	History, library science, philology, pedagogics, social work, psychology, general education (KKOV 7)	0.15	0.353	0	1
	Fine art, art history, design (KKOV 8)	0.01	0.085	0	1
	Military sciences (KKOV 9)	0.00	0.052	0	1
Work experience					
Number of years of employment at current employer (maternity/parental leave and long-term sick leave are not included) *(free answer)*	Tenure	7.39	6.485	0.08	36.00
	Tenure squared	96.71	166.8	0.01	1296
Number of years of self-employment and employment for all employers except the current one (maternity/parental leave, military service, long-term sick leave, periods of unemployment, temporary/summer jobs, contracts of services are not included) *(free answer)*	Other work experience	9.06	8.056	0.00	35.00
	Other work experience squared	146.9	209.1	0.00	1225
Similarity of work / job tasks during respondent's labour market career (i.e. main occupation, self-employment, contracts of services) *(selection from pre-defined options used as dummies)*	Life-long work career specialization – the same or very similar work / tasks	0.50	0.500	0	1
	Life-long work career specialization – various work / tasks	0.46	0.498	0	1
	Life-long work career specialization – unidentifiable because of beginning of work career (less than 3 years of work experience)	0.04	0.202	0	1

Data description	Variable	Mean	Std dev.	Min	Max
Soft skills					
Requirements on soft skills level for current respondent's occupation *(added from National System of Occupation)*	Effective communication	3.24	0.960	2	5
	Cooperation	3.09	0.741	2	5
	Creativity	3.05	0.731	1	5
	Flexibility	3.24	0.701	1	5
	Consumer orientation	1.93	1.804	0	5
	Efficiency	3.40	0.647	1	5
	Independence	3.47	0.882	1	5
	Problem solving	3.20	0.895	1	5
	Planning and organizing	3.11	0.911	1	5
	Life-long learning	2.67	1.047	1	5
	Proactive approach	3.23	0.815	1	5
	Stress resiliency	3.02	0.684	2	5
	Exploring and orientation in information	2.58	1.049	1	5
	Leadership	0.86	1.543	0	5
	Influencing others	1.84	1.616	0	5
Mean level of 15 soft skills	Mean level of soft skills	2.79	0.846	1.13	4.87
Cognitive skills, psychological traits and preferences					
Grade the respondent got from mathematics in last year of basic school (or corresponding year of the long-term grammar school) *Scale from 1 (the best) to 5 (the worst)*	Grades from math at age 15 (1 best, 5 worst)	2.37	0.876	1	4
Presence of feeling of a really strong need to excel, be better than others *1. No* *2. Rather no* *3. Rather yes* 4. *Yes*	Strong need to excel, be better than others	2.55	0.813	1	4
Tendency to leave the goal, when its reaching is difficult *1. Yes* *2. Rather yes* *3. Rather no* 4. *No*	Persistence in following difficult goals	2.83	0.774	1	4

Data description	Variable	Mean	Std dev.	Min	Max
Being proud of myself 1. *No* 2. *Rather no* 3. *Rather yes* 4. *Yes*	Self-esteem (proudness of myself)	2.96	0.755	1	4
Persuasion that events in respondent's life are… 1. *entirely a consequence of respondent's decisions and actions* 2. *rather a consequence of respondent's decisions and actions* 3. *rather a consequence of fortune and coincidence* 4. *entirely a consequence of fortune and coincidence*	Locus of control	2.86	0.771	1	4
General priorities of respondent *(selection from pre-defined options used as dummies)*	Highest life priority – family	0.56	0.496	0	1
	Highest life priority – work	0.30	0.457	0	1
	Highest life priority – free time, hobbies, charity	0.14	0.346	0	1
Who should have the crucial responsibility for ensuring an adequate income for a family? 1. *Almost entirely a partner* 2. *Rather a partner* 3. *Partner and respondent equally* 4. *Rather a respondent* 5. *Almost entirely a respondent*	Feeling of personal responsibility for ensuring an adequate income	3.15	1.038	1	5
Who should have the crucial responsibility for ensuring housework (meal preparation, dish washing, cleaning, shopping, washing and ironing) and taking care of children? 1. *Almost entirely a partner* 2. *Rather a partner* 3. *Partner and respondent equally* 4. *Rather a respondent* 5. *Almost entirely a respondent*	Feeling of personal responsibility for ensuring everyday housework and taking care of children	2.90	0.917	1	5

Data description	Variable	Mean	Std dev.	Min	Max
Who should have the crucial responsibility for ensuring housework (meal preparation, dish washing, cleaning, shopping, washing and ironing) and taking care of children? *6. Almost entirely a partner* *7. Rather a partner* *8. Partner and respondent equally* *9. Rather a respondent* 10. *Almost entirely a respondent*	Feeling of personal responsibility for ensuring everyday housework and taking care of children	2.90	0.917	1	5
Loss of respondent's entire income (i.e. from your main occupation, secondary occupation and other sources)… *0. …would not lead to significant decrease of your living standard, because other income (your partner's income social benefits, child allowances etc.) is sufficient to cover needs of household's members* 1. *…would lead to significant decrease of your living standard, because other income (your partner's income social benefits, child allowances etc.) is not sufficient to cover needs of household's members*	Loss of individual's income would lead to significant decrease of living standard	0.82	0.388	0	1
Preference of job safety and wage level *1. Almost entirely wage level* *2. Rather wage level* *3. Rather job safety* 4. *Almost entirely job safety*	Preference of job security than wage level	2.89	0.801	1	4
Preference of job flexibility (e.g. housework, part time job, flexitime) and wage level? *1. Almost entirely wage level* *2. Rather wage level* *3. Rather job flexibility* 4. *Almost entirely job flexibility*	Preference of job flexibility than wage level	1.99	0.774	1	4
Preference of self-fulfilment at a job and wage level *1. Almost entirely wage level* *2. Rather wage level* *3. Rather the possibility of self-fulfilment at job* 4. *Almost entirely the possibility of self-fulfilment at job*	Preference of individual's self-fulfilment than wage level	2.12	0.768	1	4

Data description	Variable	Mean	Std dev.	Min	Max
Preference of less demanding and stressful work and wage level *1. Almost entirely wage level* *2. Rather wage level* *3. Rather less demanding and stressful work* 4. *Almost entirely less demanding and stressful work*	Preference of less demanding and stressful work than wage level	2.23	0.774	1	4
Preference of good interpersonal relations at the workplace and wage level *1. Almost entirely wage level* *2. Rather wage level* *3. Rather good interpersonal relations at workplace* 4. *Almost entirely good interpersonal relations at workplace*	Preference of good interpersonal relations at the workplace than wage level	2.54	0.825	1	4
Physical characteristics					
Gender 0. Male 1. Female	Gender	0.47	0.499	0	1
Age in years *(free answer)*	Age	38.94	8.772	25.00	54.0
Evaluation of long-term health condition *0. It does not represent any limitation of work performance at current job* *1. It limits work performance at current job*	Health limitation of work performance	0.11	0.318	0	1
Difference between individual's height and average height for his/her gender (cm) *(computed from free answer on individual's height]*	Difference between individual's height and average height for his/her gender (cm)	–0.06	6.561	–19.75	25.3
Body mass index = weight / height squared *(subsequently categorised)*	BMI – underweight	0.02	0.126	0	1
	BMI – normal	0.49	0.500	0	1
	BMI – overweight	0.37	0.484	0	1
	BMI – obese	0.12	0.320	0	1

Data description	Variable	Mean	Std dev.	Min	Max
Family characteristics					
Marital status *(selection from pre-defined options used as dummies)*	Marital status – single	0.33	0.469	0	1
	Marital status – married	0.48	0.500	0	1
	Marital status – divorced, widow/widower	0.19	0.392	0	1
Number of children in different age categories *(free answer)*	Number of children 0–2 years of age	0.08	0.279	0	2
	Number of children 3–5 years of age	0.13	0.350	0	2
	Number of children 6–14 years of age	0.33	0.616	0	3
	Number of children 15–18 years of age	0.17	0.423	0	2
	Number of children 19+ years of age	0.45	0.793	0	4
Background characteristics					
Level of educational attainment of mother or women in taking care of respondent until 18 years *(selection from pre-defined options used as dummies)*	Mother – No or basic education	0.16	0.370	0	1
	Mother – Secondary vocational school	0.44	0.497	0	1
	Mother – Secondary technical school or grammar-school	0.33	0.469	0	1
	Mother – Higher professional school, no academic degree	0.01	0.077	0	1
	Mother – Higher professional school or university, bachelor degree	0.01	0.089	0	1
	Mother – University, master or doctoral degree	0.05	0.218	0	1
	Mother – No mother or any women in her role until 18 years of age	0.00	0.045	0	1
Level of educational attainment of father or men in taking care of respondent until 18 years *(selection from pre-defined options used as dummies)*	Father – No or basic education	0.08	0.267	0	1
	Father – Secondary vocational school	0.51	0.500	0	1
	Father – Secondary technical school or grammar-school	0.27	0.445	0	1
	Father – Higher professional school, no academic degree	0.01	0.103	0	1
	Father – Higher professional school or university, bachelor degree	0.01	0.109	0	1
	Father – University, master or doctoral degree	0.09	0.285	0	1
	Father – No father or any men in his role until 18 years of age	0.02	0.153	0	1

Data description	Variable	Mean	Std dev.	Min	Max
Number of siblings *(free answer)*	Number of siblings	1.09	0.889	0	7
Mother tongue, i.e. language that a respondent was taught by parents since birth *(pre-defined options, free answer and subsequent classification)*	Mother tongue – Czech	0.97	0.169	0	1
	Mother tongue – Czech and other (bilingualism)	0.02	0.135	0	1
	Mother tongue – other	0.01	0.103	0	1
Occupation (ISCO classification)					
Respondent's occupation *(free answer and subsequent classification)*	Legislators, senior officials and managers (ISCO 1)	0.03	0.183	0	1
	Professionals (ISCO 2)	0.10	0.300	0	1
	Technicians and associate professionals (ISCO 3)	0.22	0.412	0	1
	Clerks (ISCO 4)	0.16	0.367	0	1
	Service workers and shop and market sales workers (ISCO 5)	0.14	0.350	0	1
	Skill agricultural, forestry and fishery workers (ISCO 6)	0.01	0.085	0	1
	Craft and related workers (ISCO 7)	0.15	0.359	0	1
	Plant and machine operators and assemblers (ISCO 8)	0.12	0.320	0	1
	Unskilled workers (ISCO 9)	0.07	0.256	0	1
Prevailing economic activity (NACE classification)					
Economic activity of respondent's employer *(added from Albertina Database)*	Agriculture, forestry and fishing (NACE A)	0.02	0.131	0	1
	Mining and quarrying (NACE B)	0.01	0.081	0	1
	Manufacturing (NACE C)	0.26	0.437	0	1
	Electricity, gas, steam and air conditioning supply (NACE D)	0.01	0.073	0	1
	Water supply, sewerage, waste management (NACE E)	0.01	0.100	0	1
	Construction (NACE F)	0.07	0.251	0	1
	Wholesale and retail trade (NACE G)	0.17	0.373	0	1
	Transporting and storage (NACE H)	0.07	0.248	0	1
	Accommodation and food service activities (NACE I)	0.04	0.204	0	1
	Information and communication (NACE J)	0.03	0.159	0	1

Data description	Variable	Mean	Std dev.	Min	Max
	Financial and insurance activities (NACE K)	0.03	0.161	0	1
	Real estate activities (NACE L)	0.02	0.155	0	1
	Professional, scientific and technical activities (NACE M)	0.04	0.196	0	1
	Administrative and support service activities (NACE N)	0.03	0.169	0	1
	Public administration and defence, compulsory social security (NACE O)	0.05	0.217	0	1
	Education (NACE P)	0.07	0.262	0	1
	Human health and social work activities (NACE Q)	0.04	0.201	0	1
	Arts, entertainment and recreation (NACE R)	0.02	0.128	0	1
	Other services activities (NACE S)	0.03	0.174	0	1
Other job characteristics					
Extent of work load (scheduled working hours) *(free answer, subsequently categorised)*	Work load – full time, 40 hours per week	0.89	0.315	0	1
	Work load – full time, 37.5 hours per week (three-shift system)	0.05	0.217	0	1
	Work load – part time	0.06	0.241	0	1
Difference in number of hours really devoted to a work (incl. paid and non-paid overtime, deducted time for lunch-breaks, smoking etc.) and official work load (hours per week) *(computed from free answer on real working hours and official work load)*	Difference in number of hours really devoted to a work and official work load (hours per week)	2.65	6.088	–30.5	40

Data description	Variable	Mean	Std dev.	Min	Max
How often are you absent in work (illness, medical examination, care of an ill child etc.)? *1. Never or nearly never* *2. Sometimes I am absent, but still less than my colleagues* *3. I am absent as often as my colleagues* *4. I am absent more often than my colleagues*	Absenteeism	1.51	0.744	1	4
Correspondence of job with field of study *1. It does not correspond at all (I am doing something else)* *2. It does not much* *3. It does partly* 4. *It does entirely*	Field of education and job match	2.61	1.181	1	4
Dependence of work performance on co-workers' work *1. Entirely independent* *2. Rather independent* *3. Rather dependent* 4. *Entirely dependent*	Work performance dependence on co-workers	2.51	0.944	1	4
Prevalent way of performing the job tasks *0. The working process is precisely defined and have to be followed by respondent* 1. *The working process, more or less, depends on respondent's decision (e.g. can create and try new ones)*	Not strictly defined working process (freedom to create / try new working processes)	0.46	0.499	0	1
Way of rewarding job performance *1. Entirely objective, measurable way* *2. Rather objective, measurable way* *3. Rather subjective, immeasurable way* 4. *Entirely subjective, immeasurable way*	Rate of subjectivity in wage-system	2.13	0.903	1	4

Data description	Variable	Mean	Std dev.	Min	Max
Relationship with immediate superior *(selection from pre-defined options used as dummies)*	Relation with boss – unfriendly	0.01	0.081	0	1
	Relation with boss – reserved	0.08	0.269	0	1
	Relation with boss – neutral	0.36	0.481	0	1
	Relation with boss – positive / friendly (only within the workplace)	0.42	0.494	0	1
	Relation with boss – friendly (also out the workplace, e.g. common sport or hobby activities, go for a drink, family trips etc.)	0.11	0.313	0	1
	Relation with boss – no boss	0.02	0.126	0	1
Way of getting current employment *(selection from pre-defined options used as dummies)*	Way of getting the job – answering job advertisement in media	0.09	0.288	0	1
	Way of getting the job – job offered by employer	0.11	0.316	0	1
	Way of getting the job – based on somebody's recommendation	0.30	0.459	0	1
	Way of getting the job – applied for a job on the basis of somebody's information on vacancy	0.25	0.431	0	1
	Way of getting the job – applied for a job on the basis of information from employment office or employment agency	0.06	0.239	0	1
	Way of getting the job – applied for a job, although the employer did not advertised any vacancy	0.16	0.363	0	1
	Way of getting the job – establishment of his/her own company	0.01	0.089	0	1
	Way of getting the job – other	0.02	0.155	0	1
Employer characteristics					
Number of employees *(added from Albertina Database)*	Employer size – 0 employees	0.02	0.155	0	1
	Employer size – 1–9 employees	0.13	0.341	0	1
	Employer size – 10–49 employees	0.17	0.380	0	1
	Employer size – 50–249 employees	0.22	0.412	0	1
	Employer size – 250 or more employees	0.40	0.489	0	1
	Employer size – not available	0.05	0.227	0	1

Data description	Variable	Mean	Std dev.	Min	Max
Ownership *(added from Albertina Database)*	Ownership – private	0.62	0.485	0	1
	Ownership – cooperative	0.01	0.118	0	1
	Ownership – state	0.06	0.241	0	1
	Ownership – municipal	0.11	0.319	0	1
	Ownership – association	0.02	0.138	0	1
	Ownership – foreign	0.14	0.346	0	1
	Ownership – international	0.01	0.109	0	1
	Ownership – not available	0.02	0.123	0	1
Natural person *(added from Albertina Database)*	Natural person (is not legal person)	0.09	0.287	0	1
Age of firm/institution = a year 2011 minus date of origin *(added from Albertina Database)*	Age of firm/institution (number of years between its origin and the end of year 2011)	16.13	7.594	0.42	55.1
Location					
Region of living *(selection from pre-defined options used as dummies)*	NUTS 3 – Prague	0.12	0.327	0	1
	NUTS 3 – Central Bohemian region	0.12	0.324	0	1
	NUTS 3 – South Bohemian region	0.06	0.241	0	1
	NUTS 3 – Plzeň region	0.06	0.230	0	1
	NUTS 3 – Karlovy Vary region	0.03	0.169	0	1
	NUTS 3 – Ústí nad Labem region	0.08	0.266	0	1
	NUTS 3 – Liberec region	0.04	0.198	0	1
	NUTS 3 – Hradec Kralové region	0.05	0.221	0	1
	NUTS 3 – Pardubice region	0.05	0.217	0	1
	NUTS 3 – Vysočina region	0.05	0.217	0	1
	NUTS 3 – South Moravian region	0.11	0.313	0	1
	NUTS 3 – Olomouc region	0.06	0.236	0	1
	NUTS 3 – Zlín region	0.06	0.229	0	1
	NUTS 3 – Moravian- Silesian region	0.12	0.325	0	1

Data description	Variable	Mean	Std dev.	Min	Max
Residence town size *(selection from pre-defined options used as dummies)*	Residence town size – 1–1999 inhabitants	0.21	0.408	0	1
	Residence town size – 2000–4999 inhabitants	0.16	0.369	0	1
	Residence town size – 5000–9999 inhabitants	0.08	0.269	0	1
	Residence town size – 10000–19999 inhabitants	0.11	0.314	0	1
	Residence town size – 20000–49999 inhabitants	0.11	0.311	0	1
	Residence town size – 50000–99999 inhabitants	0.11	0.311	0	1
	Residence town size – 100000+ inhabitants	0.22	0.415	0	1

Source: Questionnaire, Albertina, National System of Occupation

Appendix 3 Descriptive statistics of Questionnaire data – males

Variable	Males (1048 observations)			
	Mean	Std. dev.	Min	Max
Income	22558.98	8434.87	6000	90000
Demographic and family factors				
Age	39.08	8.87	25	54
Kids	0.99	0.92	0	4
Marital and partnership status				
Married	0.49	0.50	0	1
Single, without any partner	0.21	0.41	0	1
Single, partnership, no cohabitation	0.05	0.22	0	1
Single, partnership, Cohabitation	0.11	0.31	0	1
Divorced/widow, without a partner, single-person household	0.09	0.28	0	1
Divorced/widow, partnership, no cohabitation	0.02	0.13	0	1
Divorced/widow, partnership, Cohabitation	0.03	0.18	0	1
No of household members	2.77	1.09	1	7
No of brothers	0.53	0.67	0	4
No of sisters	0.55	0.68	0	4
Education of mother				
No or basic edu	0.16	0.37	0	1
Secondary and vocational	0.76	0.43	0	1
Post sec., non-tertiary	0.01	0.11	0	1
Short-cycle tertiary and Bachelor and equivalent	0.01	0.11	0	1
Master and PhD and equivalent	0.05	0.23	0	1
Childhood without mother	0.00	0.05	0	1
Education of father				
No or basic edu	0.07	0.26	0	1
Secondary and vocational	0.78	0.41	0	1
Post sec., non-tertiary	0.01	0.09	0	1
Short-cycle tertiary and Bachelor and equivalent	0.01	0.10	0	1
Master and PhD and equivalent	0.10	0.30	0	1
Childhood without father	0.03	0.16	0	1
Czech nationality	0.99	0.10	0	1
My all other earnings	800.18	3147.78	0	32000

Variable	Mean	Std. dev.	Min	Max
Social benefits	399.24	1499.16	0	12000
Living standards would decrease	0.84	0.37	0	1
Human capital				
Education				
No or basic edu	0.04	0.20	0	1
Secondary and vocational	0.76	0.43	0	1
Post sec., non-tertiary	0.03	0.16	0	1
Short-cycle tertiary and Bachelor and equivalent	0.06	0.24	0	1
Master and PhD and equivalent	0.11	0.31	0	1
Math grade	2.46	0.87	1	4
Satisfied with math grades	0.35	0.48	0	1
Tenure	8.01	6.88	0.08	37
Maternity leave	0.08	0.69	0	10
Training	0.48	0.50	0	1
No of employers so far	3.08	1.78	0	12
Job characteristics				
Occupation (ISCO)				
Legislators, senior officials and managers	0.04	0.20	0	1
Professionals	0.09	0.29	0	1
Technicians and associate professionals	0.20	0.40	0	1
Clerks	0.09	0.28	0	1
Service workers and shop and market sales workers	0.11	0.31	0	1
Skill agricultural, forestry and fishery workers	0.01	0.10	0	1
Craft and related workers	0.24	0.43	0	1
Plant and machine operators and assemblers	0.17	0.37	0	1
Unskilled workers	0.05	0.22	0	1
Match of education & job	2.60	1.16	1	4
Specialist	0.51	0.50	0	1
Objective job evaluation	2.09	0.89	1	4
Scheduled working hours	39.76	2.93	15	75
Real working hours	43.51	8.08	15	168

Variable	Mean	Std. dev.	Min	Max
Way of getting employment				
Job offered by employer	0.13	0.34	0	1
Based on somebody's recommendation	0.29	0.45	0	1
Applied for a job on the basis of somebody's information on vacancy	0.24	0.43	0	1
Answering job advertisement in media	0.09	0.29	0	1
Applied for a job on the basis of information from employment office or employment agency	0.06	0.23	0	1
Applied for a job. although the employer did not advertised any vacancy	0.15	0.35	0	1
Establishment of his/her own company	0.01	0.11	0	1
Others	0.03	0.18	0	1
Teamwork	2.58	0.92	1	4
Work & job tasks freedom	0.47	0.50	0	1
Gender of boss				
Male	0.88	0.33	0	1
Female	0.11	0.31	0	1
No boss	0.02	0.13	0	1
Relation with boss				
Unfriendly	0.01	0.09	0	1
Reserved	0.07	0.25	0	1
Neutral	0.36	0.48	0	1
Positive / friendly (only within the workplace)	0.41	0.49	0	1
Friendly (also out the workplace. e.g. common sport or hobby activities, family trips etc.)	0.14	0.34	0	1
No boss	0.02	0.13	0	1
Flextime				
Employer offer it and respondent use it	0.23	0.42	0	1
Employer offer it and respondent do not use it	0.07	0.26	0	1
Employer do not offer it	0.70	0.46	0	1
Workhome				
Employer offer it and respondent use it	0.09	0.29	0	1
Employer offer it and respondent do not use it	0.03	0.16	0	1
Employer do not offer it	0.88	0.32	0	1

Variable	Mean	Std. dev.	Min	Max
Changing workload				
Employer offer it and respondent used it	0.05	0.22	0	1
Employer offer it and respondent did not use it	0.10	0.31	0	1
Employer do not offer it	0.85	0.36	0	1
Monopson	2.12	0.75	1	4
NACE				
Agriculture, forestry and fishing	0.02	0.14	0	1
Mining and quarrying	0.01	0.10	0	1
Manufacturing	0.29	0.45	0	1
Electricity, gas, steam and air conditioning supply	0.01	0.10	0	1
Water supply, sewerage, waste management	0.01	0.11	0	1
Construction	0.09	0.28	0	1
Wholesale and retail trade	0.16	0.37	0	1
Transporting and storage	0.08	0.27	0	1
Accommodation and food service activities	0.04	0.19	0	1
Information and communication	0.04	0.19	0	1
Financial and insurance activities	0.02	0.15	0	1
Real estate activities	0.02	0.13	0	1
Professional, scientific and technical activities	0.03	0.18	0	1
Administrative and support service activities	0.04	0.18	0	1
Public admin. and defence, compulsory social security	0.05	0.23	0	1
Education	0.04	0.19	0	1
Human health and social work activities	0.02	0.15	0	1
Arts, entertainment and recreation	0.01	0.11	0	1
Other services activities	0.02	0.14	0	1
Firm size				
Not stated	0.06	0.23	0	1
1–9 employees	0.16	0.36	0	1
10–49 employees	0.17	0.38	0	1
50–249 employees	0.20	0.40	0	1
250+ employees	0.39	0.49	0	1

Variable	Mean	Std. dev.	Min	Max
Ownership				
Not stated	0.02	0.14	0	1
Cooperative	0.01	0.08	0	1
State	0.07	0.25	0	1
Municipal	0.06	0.24	0	1
Association	0.01	0.11	0	1
Foreign	0.14	0.35	0	1
International	0.01	0.10	0	1
Gender identity and position in the family				
Job security	2.82	0.83	1	4
Job flexibility	1.94	0.75	1	4
Career advancement	2.10	0.78	1	4
Less demanding, stressful job	2.13	0.76	1	4
Good atmosphere	2.45	0.83	1	4
Preferences for income responsibility				
Almost entirely me	0.19	0.39	0	1
Mostly me	0.47	0.50	0	1
Me and partner equally	0.33	0.47	0	1
Mostly partner	0.01	0.09	0	1
Almost entirely a partner	0.00	0.05	0	1
Real income responsibility				
Almost entirely me	0.32	0.47	0	1
Mainly me	0.38	0.49	0	1
Me and partner equally	0.23	0.42	0	1
Mainly partner	0.02	0.15	0	1
Almost entirely a partner	0.01	0.09	0	1
Parents that I live with	0.03	0.18	0	1
Preferences for household responsibility				
Almost entirely me	0.01	0.11	0	1
Mostly me	0.02	0.16	0	1
Me and partner equally	0.36	0.48	0	1
Mostly partner	0.49	0.50	0	1
Almost entirely a partner	0.11	0.32	0	1

Variable	Mean	Std. dev.	Min	Max
Real household responsibility				
Almost entirely me	0.13	0.33	0	1
Mostly me	0.05	0.21	0	1
Me and partner equally	0.21	0.41	0	1
Mostly partner	0.40	0.49	0	1
Almost entirely a partner	0.19	0.39	0	1
Parents that I live with	0.03	0.18	0	1
Charity	0.11	0.32	0	1
Preferences for life priorities				
Working career	0.36	0.48	0	1
Family	0.47	0.50	0	1
Free time and hobbies	0.17	0.38	0	1
Volunteer, non-paid activities	0.00	0.04	0	1
Real energy devoted to life areas				
Working career	0.61	0.49	0	1
Family	0.27	0.44	0	1
Free time and hobbies	0.12	0.32	0	1
Volunteer, non-paid activities	0.00	0.04	0	1
Help in households	0.56	0.50	0	1
Help with kids	0.41	0.49	0	1
Psychological traits				
Locus of control	2.08	0.77	1	4
Competition	2.63	0.81	1	4
Self-esteem	2.98	0.74	1	4
Negotiation	0.57	0.50	0	1
Risk (1–10)	5.48	2.25	0	10
Grit	2.88	0.77	1	4
Health and appearance				
Health	0.12	0.32	0	1
BMI	26.39	3.47	17.36	45.97
Height	179.75	7.06	160	205

Source: Questionnaire

Appendix 4 Descriptive statistics of Questionnaire data – females

Variable	Females (936 observations)			
	Mean	Std. dev.	Min	Max
Income	17550.09	6331.19	4000	60000
Demographic and family fators				
Age	38.93	8.60	25	54
Kids	1.13	0.88	0	4
Marital and partnership status				
Married	0.49	0.50	0	1
Single, without any partner	0.14	0.34	0	1
Single, partnership, no cohabitation	0.04	0.21	0	1
Single, partnership, Cohabitation	0.10	0.29	0	1
Divorced/widow, without a partner, single-person household	0.15	0.36	0	1
Divorced/widow, partnership, no cohabitation	0.03	0.17	0	1
Divorced/widow, partnership, Cohabitation	0.05	0.23	0	1
No of household members	2.84	1.15	1	9
No of brothers	0.54	0.70	0	6
No of sisters	0.55	0.69	0	5
Education of mother				
No or basic edu	0.17	0.37	0	1
Secondary and vocational	0.77	0.42	0	1
Post sec., non-tertiary	0.01	0.07	0	1
Short-cycle tertiary and Bachelor and equivalent	0.01	0.09	0	1
Master and PhD and equivalent	0.05	0.22	0	1
Childhood without mother	0.00	0.05	0	1
Education of father				
No or basic edu	0.07	0.26	0	1
Secondary and vocational	0.81	0.40	0	1
Post sec., non-tertiary	0.01	0.10	0	1
Short-cycle tertiary and Bachelor and equivalent	0.01	0.11	0	1
Master and PhD and equivalent	0.08	0.28	0	1
Childhood without father	0.02	0.13	0	1
Czech nationality	0.99	0.11	0	1
My all other earnings	589.35	2312.00	0	25300

Variable	Mean	Std. dev.	Min	Max
Social benefits	322.98	1299.51	0	12000
Living standards would decrease	0.80	0.40	0	1
Human capital				
Education				
No or basic edu	0.05	0.21	0	1
Secondary and vocational	0.71	0.45	0	1
Post sec., non-tertiary	0.04	0.21	0	1
Short-cycle tertiary and Bachelor and equivalent	0.10	0.31	0	1
Master and PhD and equivalent	0.09	0.29	0	1
Math grade	2.26	0.85	1	4
Satisfied with math grades	0.40	0.49	0	1
Tenure	6.77	6.05	0.17	34
Maternity leave	3.31	2.64	0	11
Training	0.50	0.50	0	1
No of employers so far	2.93	1.67	0	12
Job characteristics				
Occupation (ISCO)				
Legislators, senior officials and managers	0.02	0.14	0	1
Professionals	0.14	0.34	0	1
Technicians and associate professionals	0.25	0.44	0	1
Clerks	0.22	0.42	0	1
Service workers and shop and market sales workers	0.21	0.41	0	1
Skill agricultural, forestry and fishery workers	0.00	0.05	0	1
Craft and related workers	0.02	0.15	0	1
Plant and machine operators and assemblers	0.04	0.21	0	1
Unskilled workers	0.08	0.28	0	1
Match of education & job	2.64	1.21	1	4
Specialist	0.50	0.50	0	1
Objective job evaluation	2.23	0.91	1	4
Scheduled working hours	38.86	4.39	4	60
Real working hours	40.50	6.71	5	85

Variable	Mean	Std. dev.	Min	Max
Way of getting employment				
Job offered by employer	0.10	0.30	0	1
Based on somebody's recommendation	0.31	0.46	0	1
Applied for a job on the basis of somebody's information on vacancy	0.25	0.43	0	1
Answering job advertisement in media	0.09	0.29	0	1
Applied for a job on the basis of information from employment office or employment agency	0.07	0.25	0	1
Applied for a job, although the employer did not advertised any vacancy	0.15	0.36	0	1
Establishment of his/her own company	0.00	0.07	0	1
Others	0.02	0.15	0	1
Teamwork	2.42	0.94	1	4
Work & job tasks freedom	0.46	0.50	0	1
Gender of boss				
Male	0.52	0.50	0	1
Female	0.47	0.50	0	1
No boss	0.01	0.11	0	1
Relation with boss				
Unfriendly	0.01	0.08	0	1
Reserved	0.09	0.29	0	1
Neutral	0.35	0.48	0	1
Positive / friendly (only within the workplace)	0.46	0.50	0	1
Friendly (also out the workplace. e.g. common sport or hobby activities, family trips etc.)	0.08	0.27	0	1
No boss	0.01	0.11	0	1
Flextime				
Employer offer it and respondent use it	0.21	0.41	0	1
Employer offer it and respondent do not use it	0.06	0.23	0	1
Employer do not offer it	0.73	0.44	0	1
Workhome				
Employer offer it and respondent use it	0.07	0.26	0	1
Employer offer it and respondent do not use it	0.02	0.15	0	1
Employer do not offer it	0.90	0.30	0	1

Variable	Mean	Std. dev.	Min	Max
Changing workload				
Employer offer it and respondent used it	0.07	0.25	0	1
Employer offer it and respondent did not use it	0.15	0.36	0	1
Employer do not offer it	0.79	0.41	0	1
Monopson	2.10	0.80	1	4
NACE				
Agriculture, forestry and fishing	0.1	0.2	0	1
Mining and quarrying	0.00	0.03	0	1
Manufacturing	0.16	0.37	0	1
Electricity, gas, steam and air conditioning supply	0.00	0.05	0	1
Water supply, sewerage, waste management	0.00	0.07	0	1
Construction	0.02	0.14	0	1
Wholesale and retail trade	0.19	0.39	0	1
Transporting and storage	0.05	0.21	0	1
Accommodation and food service activities	0.05	0.22	0	1
Information and communication	0.02	0.14	0	1
Financial and insurance activities	0.03	0.18	0	1
Real estate activities	0.02	0.15	0	1
Professional, scientific and technical activities	0.04	0.20	0	1
Administrative and support service activities	0.02	0.14	0	1
Public admin. and defence, compulsory social security	0.08	0.27	0	1
Education	0.13	0.34	0	1
Human health and social work activities	0.10	0.30	0	1
Arts, entertainment and recreation	0.02	0.15	0	1
Other services activities	0.04	0.20	0	1
Firm size				
Not stated	0.05	0.22	0	1
1–9 employees	0.11	0.32	0	1
10–49 employees	0.18	0.39	0	1
50–249 employees	0.23	0.42	0	1
250+ employees	0.40	0.49	0	1

Variable	Mean	Std. dev.	Min	Max
Ownership				
Not stated	0.01	0.11	0	1
Cooperative	0.02	0.14	0	1
State	0.08	0.27	0	1
Municipal	0.23	0.42	0	1
Association	0.03	0.17	0	1
Foreign	0.10	0.30	0	1
International	0.01	0.09	0	1
Gender identity and position in the family				
Job security	2.99	0.73	1	4
Job flexibility	2.07	0.79	1	4
Career advancement	2.18	0.76	1	4
Less demanding, stressful job	2.34	0.77	1	4
Good atmosphere	2.67	0.81	1	4
Preferences for income responsibility				
Almost entirely me	0.00	0.07	0	1
Mostly me	0.01	0.08	0	1
Me and partner equally	0.49	0.50	0	1
Mostly partner	0.38	0.49	0	1
Almost entirely a partner	0.12	0.33	0	1
Real income responsibility				
Almost entirely me	0.19	0.40	0	1
Mainly me	0.08	0.27	0	1
Me and partner equally	0.32	0.47	0	1
Mainly partner	0.29	0.45	0	1
Almost entirely a partner	0.09	0.29	0	1
Parents that I live with	0.02	0.15	0	1
Preferences for household responsibility				
Almost entirely me	0.06	0.24	0	1
Mostly me	0.42	0.49	0	1
Me and partner equally	0.50	0.50	0	1
Mostly partner	0.01	0.12	0	1
Almost entirely a partner	0.00	0.06	0	1

Variable	Mean	Std. dev.	Min	Max
Real household responsibility				
Almost entirely me	0.37	0.48	0	1
Mostly me	0.38	0.49	0	1
Me and partner equally	0.21	0.41	0	1
Mostly partner	0.01	0.12	0	1
Almost entirely a partner	0.01	0.07	0	1
Parents that I live with	0.02	0.14	0	1
Charity	0.14	0.35	0	1
Preferences for life priorities				
Working career	0.22	0.41	0	1
Family	0.68	0.47	0	1
Free time and hobbies	0.10	0.30	0	1
Volunteer, non-paid activities	0.00	0.03	0	1
Real energy devoted to life areas				
Working career	0.51	0.50	0	1
Family	0.44	0.50	0	1
Free time and hobbies	0.04	0.21	0	1
Volunteer, non-paid activities	0.00	0.07	0	1
Help in households	0.54	0.50	0	1
Help with kids	0.50	0.50	0	1
Psychological traits				
Locus of control	2.20	0.77	1	4
Competition	2.48	0.82	1	4
Self-esteem	2.97	0.77	1	4
Negotiation	0.42	0.49	0	1
Risk (1–10)	4.49	2.29	0	10
Grit	2.79	0.78	1	4
Health and appearance				
Health	0.13	0.33	0	1
BMI	24.09	3.96	16.00	41.02
Height	167.90	6.04	138	190

Source: Questionnaire

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Gender Wage Gap and Discrimination in the Czech Republic

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Summary

Gender differentials on the labour market represent one of the most important and most discussed research areas in the field of labour economics. Early research emphasizes the role of human capital and discrimination in explaining gender differentials in the labour market outcomes. Recently researchers uncovered a number of other socio-economic, psychological, gender identity factors, work-life preferences and workplace and job characteristics that play an important role too.

The main objective of the book is to give overview of what we know so far about various factors contributing to the gender pay gap via reviewing existing theoretical and empirical literature and to extend our knowledge on the topic through data analysis focusing on the *novel* factors. Contrary to the previous existing literature, we develop a wide model of wage determinants in order to

uncover factors explaining gender wage gap. For purposes of this study we developed – and discussed with respected experts in the gender economics area – our own questionnaire that reflects main areas of current state-of-the-art research on wage determination and some novel areas that can contribute to better understanding of gender differences on labour market. In particular our survey data provide information on respondent's and household's income, demographic, family and family background characteristics, human capital characteristics, preferences related to work, family and life roles, gender identity factors, psychological traits and non-cognitive skills, characteristics of respondent's job and workplace and physical appearance qualities. Further, by using and merging an additional dataset on soft skills required for particular occupations to our survey data, we could explore the role of soft skills on wage determination and evaluate differences by gender. Thus, we were able to enrich the human capital model as envisioned by Becker (1964) and to dig deeper into a potential existence of gender based wage discrimination.

Our results show that women earn significantly less than men overall, but the difference is due to observable factors as the actual unexplained term considered often as an indicator of discrimination is negligible. In particular, adding the rich subsets of variables from our survey decreases the coefficient to female dummy substantially from 25% (raw gender wage gap) to 3.2%. We also explore the role of particular variables in explaining the gender wage gap by following the Oaxaca and Blinder earnings decomposition methodology. We find that observable characteristics explain approx. 87% of the gender wage gap, whereas approx. 13% remains unexplained. Further, the Juhn-Murphy-Pierce decomposition showed that the highest unexplained part of gender wage gap is among workers with higher wages (at the 75^{th} and 90^{th} quantile) whereas the lowest unexplained part of wage differentials is among workers with lower wages (at the 25^{th} quantile). We discuss in detail factors determining wages and the gender wage gap, and on the basis of our analyses we draw a number of policy recommendations.

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GENDER WAGE GAP AND DISCRIMINATION IN THE CZECH REPUBLIC

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