Charles University in Prague
Faculty of Social Sciences
Institute of Economic Studies

DISSERTATION THESIS

Three Comparative Essays on Gender
Earnings Inequality in the Czech Republic

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Academic year: 2012/2013
I hereby declare that this dissertation thesis is my original work and that all sources and literature used have been listed. This dissertation thesis has not been used to acquire a different or the same university degree.

__________________________
Signature
Acknowledgement

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Abstract


The first essay “Personal Earnings Inequality” analyzes personal earnings distribution in the Czech Republic since the early transition from communism, using relative distribution method. The trend of “hollowing of the middle” was confirmed in the early transition, but this phenomenon later subsided. Earnings polarization was apparent for all sex and education subgroups between 1988 and 1996. In international comparison, earnings of men and highly educated are more homogenous than earnings of their counterparts in most analyzed countries.

The second essay “Gender Wage Gap” quantifies the structure of gender wage gaps in four Central-East European countries (CEE), using the Heckman regression model and Oaxaca-Blinder decomposition. The observed gender wage gap is substantially higher in the Czech Republic and Slovakia than in Hungary and Poland. A relatively small but positive part of the observed gender wage gap can be explained by gender differences in characteristics in the Czech Republic and Slovakia, with a high contribution of job characteristics. In Hungary and Poland, working women have on average even better characteristics than working men, mainly in terms of individual characteristics.

The third essay “Earnings Inequality within Couples” examines within-couple earnings distribution in four CEE countries and two countries in Western Europe. Women, on average, contribute less to a couple’s income than men. The Czech Republic with its relatively high within-couple earnings inequality in various aspects resembles more the two West European countries than the remaining three CEE countries. In all CEE countries with the exception of the Czech Republic it is true that if in dual-earner couples the woman is better educated than the man, the couples (almost) reach earnings equality.

Although all the three essays focus on different aspects of earnings distribution with a special emphasis on gender, one message keeps repeating: Regardless of the analyzed perspective the position of Czech women seems to be the worst of all analyzed countries.
Abstrakt


První esej „Příjmová nerovnost jednotlivců“ analyzuje pomocí metody relativního rozdělení distribuci příjmů jednotlivců v České republice od počátku transformačního období. Fenomén „vyprazdující se střední třída“ se projevil pouze na počátku zkoumaného období, později tento jev ustal. Polarizace příjmů se v letech 1988 až 1996 prokázala u obou pohlaví i u všech vzdělanostních podskupin. Mezinárodní srovnání ukázalo, že ve většině sledovaných zemí jsou příjmy mužů a vysokoškolsky vzdělaných více homogenní než příjmy žen a lidí s nižším stupněm vzdělání.

Druhá esej „Genderové mzdové rozdíly“ kvantifikuje pomocí Heckmanova regresního modelu a Oaxaca-Blinderovy dekompozice strukturu mzdových rozdílů mezi pohlavími ve čtyřech zemích středovýchodní Evropy (CEE). Pozorovaný genderový mzdový rozdíl je v České republice a na Slovensku výrazně vyšší než v Maďarsku a v Polsku. V České a Slovenské republice je část pozorovaného genderového mzdového rozdílu, která je způsobena odlišnými charakteristikami mužů a žen, relativně malá, ač kladná, přičemž výraznou roli zde hrají pracovní charakteristiky. V Maďarsku a Polsku mají naopak pracující ženy v průměru lepší charakteristiky než pracující muži, a to především individuální charakteristiky.

Třetí esej „Nerovnosti příjmů v párech“ zkoumá distribuci příjmů v rámci pář v čtyřech zemích CEE a dvou zemích západní Evropy. Ženy v průměru přispívají do rozpočtu páru méně než muži. Česká republika se se svou relativně vysokou nerovností příjmů v párech v různých aspektech řadí spíše ke zkoumaným západoevropským zemím než ke třem ostatním analyzovaným zemím CEE. Ve všech zemích CEE s výjimkou České republiky platí, že pokud má žena ve dvoupříjmovém páru vyšší stupeň vzdělání než muž, příjmy mužů a žen jsou (téměř) vyrovnané.

Ačkoli se každá esej zaměřuje na genderové příjmové nerovnosti z jiného pohledu, všechny tři poukazují shodně na skutečnost, že postavení českých žen je ze všech analyzovaných zemí nejméně příznivé.
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<tr>
<td>CEE</td>
<td>Central-East Europe</td>
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<tr>
<td>ECHP</td>
<td>European Community Household Panel</td>
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<td>EU</td>
<td>European Union</td>
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<td>EU-LFS</td>
<td>European Union – Labour Force Survey</td>
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<td>EU-SILC</td>
<td>European Union – Statistics on Income and Living Conditions</td>
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<td>EU-SILC UDB</td>
<td>EU-SILC User Database</td>
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<td>GWG</td>
<td>Gender wage gap</td>
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<td>ISCED</td>
<td>International Standard Classification of Education</td>
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<td>ISCO</td>
<td>International Standard Classification of Occupations</td>
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<td>LC</td>
<td>Living Conditions</td>
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<td>LIS</td>
<td>Luxembourg Income Study</td>
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<td>MC</td>
<td>Microcensus</td>
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<td>NUTS</td>
<td>Nomenclature d'unités territoriales statistiques</td>
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<td>PDF</td>
<td>Probability density function</td>
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<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>OLS</td>
<td>Ordinary least squares</td>
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**Countries:**

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*List of Abbreviations*
Introduction

This thesis adopts three stepwise perspectives to look at earnings inequality: it starts with an overall distribution of personal earnings and its development in the Czech Republic, follows with gender wage differentials, a specific earnings inequality which has recently entered into broad discussions, and further develops the gender issue by introducing the analysis of earnings inequality within couples.

The issue of income distribution and inequality has been subject to discussions for decades. Social inequality in every country is addressed by means of income redistribution, through social policies and tax regimes. When dealing with equality experts also comment on its impact on efficiency, e.g. in his most influential book from the 1970s, Arthur Okun (1975) describes the redistribution process as a “leaky bucket” where reducing inequality leads to dropping efficiency.

It seems that in the eyes of economists, the importance of income equality has been changing. Atkinson and Bourguignon (2000, pp. 2–3) claim that due to the wave of criticism of welfare economics in the 1930s and 1940s, interest in distributional issues gave way to efficiency in the 1950s, early 1960s, and the 1980s. The situation changed in the 1990s. After a period of unsteady and rather slow economic growth, wage disparity started to emerge and wealth and poverty coexisted in many countries, thus renewing the interest of policy makers and economists in income (re)distribution. Nowadays it is difficult to look at policies, such as monetary policy, fiscal policy and social policy, without considering their distributive implications.
Also the end of communism in Central-East European countries (CEE) in the 1990s revived the researchers’ curiosity about distributional issues. Behind the iron curtain wages were determined centrally and “As far as income distribution is concerned, Czechoslovakia was ... an exception among both Western and Eastern European countries: the range of income inequality here was extremely small and virtually stable over a long period of time. This was true especially for inequality of earnings and largely for the distribution of household per capita income as well.” (Večerník, 1991, p. 237).

As during the transition period wages started to reflect education, experience, and skills, earnings inequality began to grow. The most substantial changes in earnings distribution occurred in the 1990s (Rutkowski, 2001). Built on the current discussion on “widening scissors” of earnings distribution in the transition period, the first essay “Personal Earnings Inequality” analyzes the inequality of personal earnings in the Czech Republic since the early transition from communism and covers the period 1988–2008. Using relative distribution method it applies data from two surveys, Microcensus and Living Conditions. In international comparison, data on Austria, Germany, Hungary, and Poland from the European dataset EU-SILC 2008 has been used.

The essay confirms that in the early stages of the transition period the Czech Republic witnessed a trend suggested by many recent empirics (e.g. Alderson and Doran, 2010; Hussain, 2009; Massari et al., 2009), the so called “hollowing of the middle”, which however, later subsided. Between 1988 and 1996 the same trend is shown to have affected subgroups of sex and education. My analysis of year 2008 by gender and education across all of the countries establishes that male earnings distribution was more homogenous than female, and that earnings of people with high education (i.e.
tertiary education) were more concentrated in the middle than those of the less educated ones.

The second essay “Gender Wage Gap” deals with earnings disparity between men and women. Although the overall earnings inequality was one of the lowest in former Czechoslovakia, differences in earnings were still to a high extent influenced by gender (Večerník, 2009, pp. 77–78). Gender earnings inequality was relatively high in former Czechoslovakia, even compared to other CEE countries. During early transition, gender wage disparity in the CEE countries slowly began to subside (Newell and Reilly, 2001). However, as early as in the late 1990s, the figures in the Czech Republic started to grow again, and nowadays according to Eurostat the Czech Republic experiences one of the highest gender wage gap among the CEE countries.

In order to shed more light on the Czech dissimilarity, the second essay aims to quantify the basic structure of gender wage gaps in the Czech Republic, Hungary, Poland, and Slovakia, using the EU-SILC 2008 dataset. The structure of the gender wage gap is analyzed with the Heckman selection model and Oaxaca-Blinder decomposition.

Notably, my findings for the Czech Republic and Slovakia are rather similar: First, the observed gender wage gap in these two countries is considerably higher than in Hungary and Poland. Second, the decomposition reveals a cognate structure of the gap in the Czech Republic and Slovakia. Usually, a larger part of the gender wage gap is attributed to gender differences in returns to individual (education and work experience) and job (occupation, type of contract, supervisory position etc.) characteristics, while a smaller part is commonly caused by differences in these characteristics. In the Czech Republic and Slovakia, the part of the gender wage gap that can be explained by gender differences in such characteristics is relatively small with a prevailing effect of the job characteristics. In other words, a small, but still positive, part of the observed gender
wage gap is caused by “better” working conditions for men than for women in these two countries. An opposite result proved in Hungary and Poland, where working women have on average even “better” overall characteristics than working men, mainly in terms of individual characteristics.

The third essay “Earnings Inequality within Couples” focuses further on gender earnings disparity, albeit from a different perspective than the previous essay. Most studies on income inequality consider the individual and/or household as the basic unit of research. Many studies examine the distributional changes at the household level, most of them in order to analyze the impact of changes in social and taxation policy (e.g. Redmond and Sutherland, 1995). Another type of studies has examined whether increasing income inequality across families can be ascribed to a stronger connection between spouses’ earnings (e.g. Schwartz, 2010).

However, analyzing income inequalities from the point of view of an individual or a household does not fully describe the individual’s position in income distribution because both approaches ignore income (re)distribution within a household. In today’s society, where households differ one from another substantially in terms of their internal organization, the picture of the relationship between an individual’s financial and social well-being can easily be distorted.

The household can be an appropriate unit if we assume that individuals sharing household share their incomes and decisions about expenditures as well. This would conform to the assumptions of the unitary model of household behaviour and income pooling in households. However, many recent studies have contradicted these assumptions and showed that income distribution within the household can affect decision-making, expenditures on consumption, and/or individual well-being (e.g. [Footnote: See references for these studies].)
Bonke, 2006; Browning et al., 1994; Heimdal and Houseknecht, 2003; Lundberg et al., 1996; Thomas, 1990).

The third essay aims to contribute to the knowledge of within-couple earnings distribution in the Czech Republic. It compares the results from other three CEE countries and two countries in Western Europe using the EU-SILC 2009 database. Similarly to other works in the field, this part of the thesis has demonstrated that women, on average, contribute less to a couple’s income than men. However, the findings in each country differ substantially. In accordance with the comparative findings about the overall gender wage gap in the previous essay, the within-couple income inequality in the Czech Republic tends to be higher than in Hungary and Poland, and, somewhat surprisingly, even considerably higher than in Slovakia. As far as the within-couple earnings distribution is concerned, the situation in the Czech Republic resembles the situation in Austria and Germany rather than in the other CEE countries.

Lower within-couple earnings inequality is usually associated with the following factors: higher relative education level of female partner, higher age, absence of children, lacking legal bond. In all CEE countries with the exception of the Czech Republic it is true that if in dual-earner couples the woman is better educated than the man, the couples (almost) reach earnings equality. Hungary and Poland holds a primacy in a highest share of dual-earner couples where a woman outearns her partner.

Finally, gender wage gaps between men and women living in a couple are examined and compared with the gender wage gaps for single individuals. The gender wage gap of cohabiting individuals proved to be higher than the gap among singles even after adjusting for gender differences in individual human capital and job related characteristics. Furthermore, single women have, on average, “better” observed characteristics than cohabiting women, which to a large extent can explain the wage gap.
between single and cohabiting women. However, the remaining part of the gap suggests a disadvantage in terms of lower returns to these characteristics for cohabiting women.

Although all the three essays focus on different aspects of earnings distribution with a special emphasis on gender, one message keeps repeating: Regardless of the analyzed perspective – relative earnings distribution across various deciles, overall gender wage disparity, or specific within-couple earnings distribution – the position of Czech women seems to be the worst of all analyzed countries.

* I am the sole author of all the three essays. All essays were presented and discussed at the IES research seminar Economic Theory of Political Markets between the years 2007 and 2011. The second essay was in its very early version presented at an economic-statistical seminar “Surveys on Employment, Income and Wages” at University of Economics in Prague in November 2006, later at the IES “3rd Young Scholar’s Conference” in Prague in September 2008, and finally at the “Fifth Winter School on Inequality and Collective Welfare Theory: Inequality in a Dynamic Perspective” organized by the University of Verona in Alba di Canazei (Italy) in January 2010.

The third essay was presented in various previous versions at “The European User Conference for EU-LFS and EU-SILC” and the “2nd European User Conference for EU-LFS and EU-SILC” organized by German Microdata Lab and GESIS, in cooperation with Eurostat, in Mannheim (Germany) in March 2009 and April 2011.

The earlier versions of all three essays were published in the IES Working Paper series (see Mysíková 2007c, 2011a, and 2011b). The first one is considered for publication by *Journal of Income Distribution*. The second essay was in its very early version published in the proceedings of the seminar “Surveys on Employment, Income and
Wages” (Mysíková, 2007a), later as a chapter in Sociological Studies (Mysíková, 2007b), and finally accepted for publication in *Prague Economic Papers* (Mysíková, 2012).

The previous version of the third essay, which used earlier dataset, was published in the LIS Working Papers series (Mysíková, 2010b) and as a chapter in “Individuals and Households in the Czech Republic and CEE Countries” (Mysíková, 2010a).

**References:**


1. Personal Earnings Inequality

1.1 Introduction

Income inequality and its development in transition countries have drawn attention of many researchers. Recent empirics focus both on individual earnings and household income disparities. Recently, the phenomenon of increasing income inequality has been analyzed, especially in transition countries, where income inequality was expected to grow. For example, Milanovic (1999) observed that the public sector middle class was “hollowing out”, as some workers moved to private sector with higher earnings, while others lost jobs. In terms of wages, the shift from communist wage-setting to market-determined wages was expected to change earnings distribution.

Earnings inequality was one of the lowest in communist Czechoslovakia, even compared to other European communist countries (Večerník, 2009). Before 1989, wages were determined centrally, mainly according to demographic characteristics of workers, job tenure, physical demand in some industries, ideological importance of certain jobs, etc. During the transition period after 1989, wages started to reflect education, experience, and skills, and earnings inequality began to grow.

Rutkowski (2001) examined the trends in earnings distribution in the 1990s in Central and Eastern Europe. His study showed that the widening of the earnings distribution at its both tails, although relatively modest at the bottom in the Czech Republic, occurred mainly in the first years of the transition period and slowed down in the late 1990s. At that time earnings inequality levels in most transitional CEE countries moved to the upper part of the OECD range with the Czech Republic at the lower tail within CEE.
Empirics on the impact of education on wages during the transition period in post-communist countries typically showed increasing returns to education (for summary, see e.g. Švejnar, 1999). The effect of education on wages was reinforced in the first years after 1989 and stagnated in the late 1990s (Večerník, 2009, pp. 80–81). For example, according to Chase (1998) returns to education for Czech men rose from 2.4% in 1984 to 5.2% in 1993; particularly large income increases were experienced by individuals with secondary education. The same study proved that while returns to education increased, returns to experience declined. Filer et al. (1999) revealed that by 1997 benefits generated by education grew even larger. It took almost eight years of transition for the value of education in the Czech (and Slovak) Republic to reach levels common in developed market economies.

Communist regime rewarded production branches more than services due to physical demand of the former, while in the market economy it is productivity that gains more importance. Večerník (2009) stated that during the transition period wages became influenced by occupation, rather than by industrial sector.

In terms of household disposable income, the inequality in former Czechoslovakia was mainly determined by the number of economically active household members. In Western countries, female employment was lower and personal earnings disparities higher. As a consequence, the inequality of income per capita was relatively low in former Czechoslovakia and was growing quickly during the transition period, while inequality of income per household was comparable to figures in Western countries and only slowly increased later (Večerník, 2009).

Alderson and Doran (2010) analyzed household disposable income distributions in five transitional countries and four high-income societies, using the data from Luxembourg Income Study that contained available data in the period 1979 to 2005. Their results
suggest that, compared to the past, households are moving up and down the income distribution, thus creating the so called “hollowing of the middle”. In the Czech Republic, this pattern prevailed between the analyzed years 1992 and 1996, where the movement to the top of income distribution exceeded the movement in the opposite direction. In other analyzed countries, their findings suggest a persisting polarization trend for household income even for longer periods.

Income polarization has recently raised the interest of many researchers. For example, Massari et al. (2009) described income polarization in Italy in the 2000s; Hussain (2007) showed an increasing income polarization over 1984 to 2002 in Denmark; Gasparini et al. (2008) illustrated income polarization in Latin America, while Beach and Chaykowski (1997) examined increased polarization of U.S. male earnings between 1968 and 1990.

While Alderson and Doran (2010) examined the issue of household income distribution in 1992–1996, I shall cover a longer period of the development of personal earnings in the Czech Republic, beginning after the fall of communism.

I open by turning my attention to the development of earnings distribution in the early transition period, where, supposedly, most substantial changes occurred. I shall explore the existence of the “hollowing of the middle” in individual earnings, a phenomenon similar to that suggested by Alderson and Doran (2010) for household disposable income. Given that household disposable income is supposed to be highly correlated with and consists mainly of wages of household members (see e.g. Večerník, 2009), I expect that the analysis of personal earnings shall deliver results similar to those of Alderson and Doran (2010). Regardless of whether this phenomenon is confirmed or not, I shall analyze the changes undergone by earnings distribution from the late 1990s onwards to find out whether the expected pattern of distribution changes that started in
the early transition period continued in the same pace or slowed down. I am particularly interested in the impact of education on earnings inequality, since this factor contributed the most to the growing income disparities in the early transition period. Further, I shall analyze earnings distributions separately for men and women to find out how gender inequality developed in the last decade.

Finally, I shall compare the current earnings inequality in the Czech Republic to some European countries, including other transitional economies. This international comparison is expected to provide some insight into the stage of earnings inequality development in the Czech Republic, whether it has already achieved the level of earnings inequality in Western Europe and thus if the Czech Republic has finished the transformation in this sense. In order to do that, different gender and education subgroups shall be defined and analyzed in terms of differences in shape and location of their earnings distributions, which otherwise remain unrevealed during overall earnings inequality measures.

1.2 Survey data

This essay aims to follow the development of earnings inequality in the Czech Republic since the early post-communist transition, and compares the current situation in European countries. It does so by applying six accessible datasets describing the situation in the Czech Republic since the late 1980s up to the present: Microcensus (MC) 1988, 1992, 1996, and 2002, and Living Conditions (LC) 2006 and 2008. The 1988 and 1992 datasets of individuals do not provide individual weights, and as a consequence the results might not fully correspond to the whole population.
After the last Microcensus from the year 2002, the Czech Republic joined the EU household survey Statistics on Income and Living Conditions (EU-SILC). It is a uniform survey, compulsory for all EU Member States, and thus provides data suitable for cross-country comparisons. It collects information on both households (mainly information on living conditions, joint income, and joint social allowances) and individuals (personal and job characteristics, wages, income, and social allowances). Essentially, this survey collected information rather similar to the previous national Microcensus surveys. This survey has been conducted by the Czech Statistical Office since 2005, and has provided data for a national dataset called Living Conditions (Životní podmínky), as well as European harmonized EU-SILC dataset handled by Eurostat.

The income data applied in the present study contain annual gross personal earnings from main dependent employment and self-employment, as well as from second and other jobs. These two income sources may suffer with certain inconsistency and joining of these two income sources is rather rare in the empirical research. In spite of the possible inconsistency, I intend to employ both these income sources, as the earnings from self-employment represent a significant part of aggregated earnings and also its importance has risen during the transition period.

Although both the above described datasets, the Living Conditions and EU-SILC for the Czech Republic, stem from the same survey, they may differ in target variables.

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1 The researchers usually aim to avoid including the earnings from self-employment for several reasons: it includes irregularities, might be artificially lowered by the taxpayers or underreported by respondents. However, as quoted for instance by Večerník (2010, Chapter 4) self-employment replaced many dependent jobs and created many new ones and the share of self-employed as a percentage of total employment had been rising until the first half of the 2000s in the Czech Republic. Therefore, this income source is not negligible.

2 I started the analysis by examining the total market income. I wondered whether other market income, e.g. income from rental of a property, contributes to the income inequality, or whether income inequality arises already at earnings level. As other market income represented only a negligible income source in total inequality, it was not included in further analysis, and instead all attention was turned to earnings.
available, since national interest may vary from the harmonized European intentions. For instance, income variables may be provided either on individual or household level, but they also can be aggregated into one variable. The difference between the two datasets that is most substantial for the purposes of this study is the self-employment income variable. Compared with the Czech dataset, the European dataset EU-SILC contains several additional components concerning this income source, such as the value of goods and services produced for own consumption. The last chapter of this essay employs the EU-SILC 2008 dataset to compare income inequalities across the European Union.

This study concentrated on individuals aged 16 to 64, with reported positive annual earnings. The top and bottom percentiles of total earnings distributions were excluded. The sizes of the samples, along with the earnings inequality results, are stated in Chapters 1.4 and 1.5.

1.3 Methodology

The most common and the most frequently applied measure of income inequality is the Gini coefficient. The problem with the Gini coefficient is that it captures total inequality but fails to tell us where exactly the inequality occurs along the distribution. Therefore, I apply relative distribution method developed by Handcock and Morris (1999) and used by, among others, Alderson and Doran (2010). While convenient for providing graphic illustrative results, this method becomes less appealing when comparing a large number of distributions or when analyzing factors of changes in distributions. Even considering this methodological drawback, the use of Alderson and Doran’s approach
The relative distribution method allows us to follow distributional changes along the whole income distribution. It is based on comparison of income distributions in periods \( t \) and \( t+1 \), where the values of period \( t+1 \) are expressed as positions in the distribution of period \( t \). The relative probability distribution function is simply the density ratio at each quantile. If distributions in the two periods were the same, the relative distribution would be uniform.

To illustrate this, let’s assume that the density at the median of individual earnings was 1.14 in 1988 (period \( t \)). The median value of earnings logarithm (in CZK) corresponds to 10.58. The 1996 earnings distribution density (period \( t+1 \)) at the same point (i.e. at the median of 1988, period \( t \), distribution) equals 0.11. The density ratio is \( 0.11/1.14 = 0.10 \), which means that the number of individuals at this point of distribution, i.e. at the median value of 1988, dropped to one tenth in 1996 compared to 1988.\(^4\)

As the nominal values of earnings shift to the right over time, the two compared distributions differ in two ways: in shape and in location. This method allows us to separate these two shifts in a way which follows.

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\(^3\) One of possible ways of how to deal with a large number of distributions is to use a polarization index constructed by Foster and Wolfson (2010). It is some kind of a middle-step between the Gini coefficient and the relative distribution method. It also stresses the relationship between polarization and inequality. The development of the polarization index is closely related to the ongoing discussion on the definition of the middle class. Although it has been largely supported by empirics that the middle class has been hollowing out, Foster and Wolfson (2010) criticize this evidence for being range-specific and the definition of middle class for being arbitrary chosen. Atkinson and Brandolini (2011) discuss the rationale of choosing the definition of the middle class and compare results of several definitions. The relative distribution method avoids this problem by following the changes along the whole distribution.

Foster and Wolfson’s (2010) polarization index \( P = (T−G)μ/m \), where \( μ \) and \( m \) are the mean and median incomes, \( G \) is the Gini coefficient, and \( T \) is the relative median deviation given by \( T = (μ^U − μ^L)/ μ \), where \( μ^U \) is the mean of those above the median and \( μ^L \) is the mean of those below the median. For the sake of complexity I also introduced some results based on the polarization index where appropriate. The results of polarization indices support the findings obtained by the relative distribution method, however, the latter is more informative yet.

\(^4\) The example values here correspond to the figures in Figure 1.1 (see upper left and right panels).
First, the shape shift can be isolated by cancelling out differences in location. To put it simply, we adjust the \( t \) distribution by the difference in medians of \( t+1 \) and \( t \) distributions, where both distributions sustain their shape with medians located at the same point (for illustration, see the middle left panel in Figure 1.1). Cancelling out the shift in location and fitting the \( t+1 \) data to the \( t \) quantile cut points allows us to easily compare the densities at each quantile (for illustration, see the middle right panel in Figure 1.1). If the relative density is less than 1, there were fewer individuals at a particular quantile in \( t+1 \) than there were in \( t \). The U shape of the relative density function suggests that the middle is hollowing out or, in other words, that the distribution in \( t+1 \) is more polarized. This means that individuals move towards both far ends of the distribution, relative to period \( t \). Inverted U shape, to the contrary, implies that individuals are more concentrated in the middle, compared to the past.

Second, we can separate the location shift. The \( t+1 \) distribution adopts the shape of \( t \) distribution and both distributions sustain their locations (for illustration, see the bottom left panel in Figure 1.1). In this case, when comparing distributions over two time periods, it is obvious that the relative distribution function must be increasing, since the distributions capture nominal absolute values of earnings rising over time. This is why I concentrate less on the location shift and focus mainly on the shape shift.

The decomposition into location and shape effect can be formalized as follows (Jann, 2008):

\[
\frac{f_{t+1}(y)}{f_t(y)} = \frac{f_{t+1}(y)}{f_A(y)} \times \frac{f_A(y)}{f_t(y)}
\]

overall = shape \( \times \) location \hspace{1cm} (1)
where \( f_t(y) \) and \( f_{t+1}(y) \) are the density functions in periods \( t \) and \( t+1 \), respectively. \( f_A(y) \) is the location adjusted density function, where \( F_A(y) = F_t(y+\rho) \), and \( \rho = \text{median}(Y_{t+1}) - \text{median}(Y_t) \).

The same method can be applied in comparing distributions of two subgroups of the sample in the same time period; e.g. the relative income distribution can be compared according to sex. In addition, the relative distribution method is more informative than commonly used measures or applied techniques.

Traditional techniques of research provide us with only a basic insight into gender earnings differences: official statistics provide us with only mean or median values of earnings for men and women; standard regression analysis shows conditional mean difference; other techniques, such as Oaxaca-Blinder decomposition (Oaxaca, 1973; Blinder, 1973) dividing the total gender earnings gap into a part caused by differences in covariates and an unexplained part, are more informative but do not describe the situation along the whole income distribution. So far, several techniques of distributional analysis of differences between groups have been developed. Buchinsky (1998) analyzed distributions using quantile regression, Machado and Mata (2005) adjusted the Oaxaca-Blinder decomposition method to quantile regression. This is why I decided to follow the methodology of relative distributions developed by Handcock and Morris (1999). Its powerful clearness of description and illustrative simplicity can be applied for comparisons in time, as well as between groups.

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5 Other similar techniques were applied e.g. by Juhn, Murphy and Pierce (1993); Lemieux (2002).
6 This approach is closely related to that by DiNardo et al. (1996) who examined differences in density functions.
1.4 Earnings inequality in the Czech Republic

The most substantial increase of earnings inequality in the Czech Republic in terms of the Gini coefficient was apparent between 1988 and 1996, with only moderate changes later, as shown by Table 1.1. The Gini coefficient for the whole sample grew from 0.18 to 0.28 between 1988 and 1996 and remained unchanged ever since.

Table 1.1  Gini coefficient of earnings in the Czech Republic

<table>
<thead>
<tr>
<th>sample</th>
<th>total</th>
<th>female</th>
<th>male</th>
<th>low education</th>
<th>medium education</th>
<th>high education</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC 1988</td>
<td>16007</td>
<td>0.18</td>
<td>0.16</td>
<td>0.15</td>
<td>0.18</td>
<td>0.15</td>
</tr>
<tr>
<td>MC 1992</td>
<td>19190</td>
<td>0.25</td>
<td>0.23</td>
<td>0.23</td>
<td>0.22</td>
<td>0.24</td>
</tr>
<tr>
<td>MC 1996</td>
<td>32278</td>
<td>0.28</td>
<td>0.27</td>
<td>0.26</td>
<td>0.25</td>
<td>0.26</td>
</tr>
<tr>
<td>MC 2002</td>
<td>8234</td>
<td>0.28</td>
<td>0.28</td>
<td>0.27</td>
<td>0.25</td>
<td>0.26</td>
</tr>
<tr>
<td>LC 2006</td>
<td>7355</td>
<td>0.28</td>
<td>0.27</td>
<td>0.27</td>
<td>0.25</td>
<td>0.26</td>
</tr>
<tr>
<td>LC 2008</td>
<td>10986</td>
<td>0.28</td>
<td>0.26</td>
<td>0.27</td>
<td>0.25</td>
<td>0.26</td>
</tr>
</tbody>
</table>

Notes: Low education (“basic”) – ISCED levels 0, 1 and 2; medium education (upper secondary) – ISCED levels 3 and 4; high education (tertiary) – ISCED levels 5 and 6.

The Gini coefficient is presented separately for several subgroups created according to their sex and education. These subgroups’ earnings inequality remained stable since 1996, with the exception of female inequality that reached its peak (0.28) in 2002 and has been declining since then. However, certain differences in inequality between the subgroups are apparent. Therefore, it is rather beneficial to examine the earnings distributions in more detail and to apply the relative distribution method to analyze the changes in time and between subgroups.

I shall start with the analysis of the earnings distribution functions and their relative change in the period 1988 to 1996. According to Rutkowski (2001) and others, the deepest changes in income distribution occurred as early as in the first half of the 1990s. Alderson and Doran (2010) demonstrated that a 5-Gini-point increase of household
income inequality between 1992 and 1996 in the Czech Republic was accompanied by “hollowing of the middle”. They found out that about 40% more households joined the ranks of those whose median-adjusted income put them in the 1st decile in 1992, with even a stronger movement to the top decile (about 60% more households). However, the most substantive changes might have occurred earlier in the transition period.

For these reasons, it is beneficial to start the analysis of the distributional changes in 1988 and separate two periods. We know that personal earnings inequality rose by 10 Gini points in 1988–1996, while it remained stable in the later period 1996–2008. The relative distribution method will show what exactly happened to the “middle” in these two periods.

Figure 1.1 shows the distribution of earnings in 1988 and 1996 (upper left panel), relative distribution (upper right panel) and its decomposition into shape and location effects. Cancelling out the differences in location (which is self-evident when comparing two time periods) reveals the shape shift. The middle left panel indicates a polarization trend. Fewer individuals were concentrated at the middle of the distribution compared to the past. The same tendency is even more apparent in the middle-right panel. Fitting the 1996 data to the 1988 median-adjusted decile cut points shows that deciles ranging from 2nd to 9th were “hollowing out”. As a consequence, individuals in 1996 were 1.8 times more likely to be at the bottom decile of the 1988 median-adjusted distribution and even nearly twice more likely at the top decile. With my analysis starting in 1988, the aforementioned pattern of “hollowing of the middle” proved more profound compared to the same pattern previously demonstrated for household disposable income by Alderson and Doran (2010) whose analyzes started only in 1992.
Figure 1.1 Earnings distribution functions and decomposition, CZ 1988–1996

Note: PDF – probability density function.

As far as location shift is concerned, if the change in the distributional shape is cancelled out, the relative distribution (bottom right panel in Figure 1.1) increases. Individuals in 1996 were about 9.5 times more likely to be at the top decile of the 1988 distribution.
The change in distribution of earnings between 1996 and 2008 is shown in Figure 1.2. The bottom left panel indicates a slight convergence trend. More individuals joined the ranks of those in the 3\textsuperscript{rd} to the 6\textsuperscript{th} and 8\textsuperscript{th} deciles, however, the increase was rather moderate. Concerning the location shift, individuals in 2008 were nearly 6 times more likely to be located in the top decile of the 1996 distribution.

\textbf{Figure 1.2} Earnings distribution functions and decomposition, CZ 1996–2008

Note: PDF – probability density function.

The shape shifts indicate individual earnings polarization in the initial period of transition, however, this trend later wore off. Between 1996 and 2008, the distribution became rather more homogeneous, with the exception of the 7\textsuperscript{th} decile.\footnote{A similar process has prevailed for household income in the Czech Republic in this period (not stated here).}

\textit{Personal Earnings Inequality}
Table 1.1 shows that female earnings experienced an 11-Gini-point increase in inequality between the years 1988 and 1996 and women were the only subgroup later experiencing some changes of the Gini coefficient; Figure 1.3 illustrates the shape shift of female earnings distributions in more detail. The middle part of the distribution was hollowing out in the period 1988–1996 with an even slightly stronger polarization than recorded for the total sample. This trend did not persist and the relative density function was rather flat in the later period.

Figure 1.3 Shape shifts of earnings distributions: Women, CZ

Education was an important factor that contributed to the female earnings polarization between the years 1992 and 1996. While in 1992 about 64% of women with high education were concentrated in the two top deciles, in 1996 as many as 74% of these women joined the top two (median-adjusted) 1992 deciles. At the lower tail, 29% of women with low education fell in the two bottom deciles in 1992, while as many as 52% of women with low education occupied these ranks in 1996. This proves that while women with higher education were moving to the top, their low-education counterparts were moving downwards.

Table 1.1 proves that the least profound Gini coefficient increase of individual earnings (by 7 points) between the years 1988 and 1996 occurred within the group of individuals
with low education. Figure 1.4 shows the shape shift of earnings distribution for the subgroup of individuals with low education.

**Figure 1.4** Shape shifts of earnings distributions:

Individuals with low education, CZ

Note: Low education (“basic”) – ISCED levels 0, 1 and 2.

The earnings distribution of low-education subgroup became more polarized over the period 1988–1996. In 1996 there were 50% more individuals whose earnings put them within the cut points of the top decile of the median-adjusted earnings distribution in 1988. Additionally, in 1996 there were also 70% more individuals who came under the 1988 median-adjusted 1st decile. Low education is the only subgroup which experienced a stronger movement to the bottom than to the top. After this period, between 1996 and 2008, the shape shift demonstrated that earnings became rather more homogenous, as indicated by increases in 4th, 6th, and 8th deciles.

Recent empirics dealing with transition period in post-communist countries stress the existence of the phenomenon “hollowing of the middle” (e.g. Milanovic, 1999; Alderson and Doran, 2010). It seems that this phenomenon was associated with personal earnings in the Czech Republic only in the early stage of transition, while it ceased later.
1.5 Earnings inequality in Europe

So far, the analysis looked at personal earnings distributions in the Czech Republic. The next object of my attention shall be whether the structure of personal earnings in the Czech Republic is specific or rather comparable to other European countries. In order to provide a first insight into the personal earnings inequality across Europe, Table 1.2 shall present the Gini coefficient in 22 EU countries. After that, I shall focus on several countries in more detail.

The Gini coefficient in European countries amounts to 0.35 on average. The lowest inequality is in Slovakia, followed by the Czech Republic, Belgium, Denmark, and Sweden. Comparing the Gini coefficient between gender subgroups, the highest difference is seen in Germany, where also the total Gini coefficient is one of the highest. The Gini coefficient for female subgroups stands at 0.42; the inequality is much lower for male subgroup – 0.33. Nevertheless, earnings inequality is the same for men and women in some countries, such as Hungary, Finland, and Denmark.

Earnings inequality in different education subgroups is listed in the last two columns of Table 1.2. Once again, the biggest difference in Gini coefficient for subgroups of individuals with and without tertiary education is in Germany – 0.31 and 0.39, respectively. While in Hungary, Slovakia, the Czech Republic, and Portugal such difference amounts to only one Gini point, earnings inequality for subgroups of individuals with and without tertiary education equals in Sweden and Slovenia.

The relative distribution method and the decomposition into shape and location shifts help to reveal the differences in earnings inequality between subgroups more precisely. Figure 1.5 illustrates the shape and location shifts for gender subgroups in the Czech Republic and its neighbours (Austria, Germany, Hungary, and Poland).
Table 1.2  Gini coefficient of earnings in some European countries (2008)

<table>
<thead>
<tr>
<th>Sample</th>
<th>Total</th>
<th>Female</th>
<th>Male</th>
<th>Low &amp; medium education</th>
<th>High education</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>6183</td>
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<td>0.38</td>
<td>0.32</td>
<td>0.36</td>
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<td>BE</td>
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<td>0.26</td>
<td>0.27</td>
<td>0.26</td>
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<tr>
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<td>0.37</td>
</tr>
<tr>
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<td>0.39</td>
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<td>0.38</td>
</tr>
</tbody>
</table>

Source: EUSILC UDB 2008 – version 1 of March 2010; Living Conditions 2008 for CZ. Author’s computations.

Notes: Low education (‘‘basic’) – ISCED levels 0, 1 and 2; medium education (upper secondary) – ISCED levels 3 and 4; high education (tertiary) – ISCED levels 5 and 6.

In 2008, in the Czech Republic female earnings inequality was one Gini point under the male. Men’s earnings distribution is rather more homogenous than women’s, as more men come under the 4th to 7th deciles of female (median-adjusted) distribution (see upper left panel of Figure 1.5). However, there are 30% fewer men in the 8th women’s decile and 25% more men in women’s top decile, which makes the male overall inequality higher. In simple terms, the male distribution has sharper peak and longer upper tail than female distribution. Although the male Gini coefficient is higher than
Figure 1.5 Shape and location shifts of earnings distributions:

Men versus women, 2008

Source: EUSILC UDB 2008 – version 1 of March 2010; Living Conditions 2008 for CZ. Author’s computations.
female, similarly to most European countries earnings distribution of women is more polarized.

In Austria, the reported Gini coefficient was substantially higher for women (0.38) than for men (0.32) and, indeed, the male earnings distribution is rather more concentrated in the middle (4\textsuperscript{th} to 6\textsuperscript{th} and 8\textsuperscript{th} deciles). There were above 30\% more men in the 4\textsuperscript{th} and even 60\% more men in the 5\textsuperscript{th} decile of female earnings distribution. Male distribution has a sharper peak.

Germany is a country with the highest difference between male and female earnings inequality; the female is 8 Gini points higher than the male one. Male earnings distribution is considerably more homogenous, as apparent from the middle-left panel in Figure 1.5. There were 25\% more men in the 4\textsuperscript{th} decile, 70\% in the 5\textsuperscript{th}, almost 85\% in the 6\textsuperscript{th}, and 40\% more men in the 7\textsuperscript{th} decile than women in the respective deciles of median-adjusted female earnings distribution. Men’s earnings distribution is more concentrated in the middle compared to women’s, which makes the inequality in the male subgroup substantially lower.

The differences in female and male earnings inequality are highly related to the level of education. German women with high level of education are concentrated in the top deciles – more than 40\% of them belong to the top two deciles. Contrary to women, German men with high level of education are spread more equally in the upper part of distribution than women with a similar level of education. Nearly 40\% of men with high education are located within the cut points of the 7\textsuperscript{th} and 8\textsuperscript{th} decile of female (median-adjusted) earnings distribution, thus confirming that men’s earnings are more homogenous than women’s.

---

\textsuperscript{8} This finding is supported also by the polarization index which is slightly higher for Czech women (0.52) than for Czech men (0.51).
The shape shift, i.e. comparison of female and male earnings distribution without the differences in location, does not show any consistent trend in Hungary. Yet the Gini coefficients for men and women are equal. Although almost 25% more men are located in the top decile compared to women in their median-adjusted distribution, this higher concentration is overbalanced by other deciles along the distribution and results in the same overall earnings inequality.\(^9\)

In Poland, the shape shift exhibits only moderate differences in the shape of women’s and men’s earnings distributions. To point out one clear trend, the male earnings are more concentrated in the middle than female. This is in accordance with a two-point higher Gini coefficient for women.

The right panels of Figure 1.5 show location shifts in these five countries. The difference in location of female and male earnings distributions is most obvious in Germany. There are more than four times more men in the top defined by female 10\(^{th}\) decile cut point. The situation in Hungary and Poland is also interesting, as it differs substantially from other countries. A higher share of men in the top decile, which otherwise suggest commonly observed gender differences in earnings, usually prevails, but the results for Hungary and Poland indicate relatively low gender earnings inequalities.

In terms of the Gini coefficient, low and medium education subgroups exhibit higher earnings inequality than their highly educated counterparts (see Table 1.2), with the exception of those in the Czech Republic and Italy. The earnings inequality is one Gini point higher for people with high education in the Czech Republic. Figure 1.6 (upper left panel) clearly shows the reason. Although individuals with high education are more

\(^9\) The polarization index indicates a moderately higher polarization of male earnings (0.75) than female (0.72), apparently due to the top decile.
Figure 1.6 Shape and location shifts of earnings distributions:

High education versus medium and low education, 2008

Source: EUSILC UDB 2008 – version 1 of March 2010; Living Conditions 2008 for CZ. Author’s computations.
concentrated in the middle (4th to 6th deciles) of the less educated median-adjusted distribution than less educated in that distribution, there are also 55% more of highly educated at the very top of that distribution, which makes the overall earnings inequality higher for highly educated individuals. The phenomenon observed at the top decile overweighs the one in the middle. From this it can be concluded that earnings of highly educated individual are more polarized than earnings of the less educated ones.10

The most obvious differences between earnings inequality determined by education level occurred in Germany: the highly educated exhibited the Gini coefficient of 0.31 while less educated 0.39. Earnings distribution of highly educated is more homogenous, as apparent from the shape shift in Figure 1.6 (middle left panel). Highly educated are 16% more likely to have earnings in the 3rd decile of the less educated median-adjusted distribution than less educated in the same decile of that distribution, 31% in 4th decile, 55% in 5th decile, 75% in 6th decile, and 9% in 7th decile. There are less of them at both tails of female earnings distribution.

Disregarding the differences in shape and focusing on location shift (right column in Figure 1.6) we see that earnings distributions of the highly educated are located higher, compared to the less educated in all five countries. This tendency is very strong in Germany: the highly educated are 4.3 times more likely to fall into the very top decile of less educated. This phenomenon is apparent also in Hungary and Poland, i.e. countries where the location shift by gender was relatively moderate. There were 3.9 times more individuals with high education whose earnings placed them in the top decile of less educated in Poland and even 4.9 times more in Hungary.

10 As confirmed also by the polarization index: 0.54 for people with higher education and 0.49 for those with lower education.
Education is a very important factor contributing to income differences well described by human capital theory, as well as by empirics. However, the differences in earnings distributions between education subgroups are not quite typical. Germany is an example where the earnings distribution of highly educated is markedly more homogenous than earnings distribution of the less educated. However, such a clear tendency is not obvious in all examined countries.

1.6 Conclusion

This essay analyzes personal earnings inequality and earnings distributions in the Czech Republic since 1988 using the relative distribution method. The most substantial changes in earnings distribution were expected to occur already in the early stage of transition. Indeed, the Gini coefficient experienced the most substantial increase in the early transition period 1988–1996, while it remained unchanged between the years 1996 and 2008.

In the early transition period, the distribution of individual earnings became more polarized. These results are in accordance with Alderson and Doran’s findings (2010) concerning the phenomenon of “hollowing of the middle” for household disposable income in the Czech Republic in 1992–1996. Their analysis, applying the relative distribution method and decomposing the distributional changes into shape and location shifts, contributed considerably to the explanation of the process of growing income inequality. However, the period covered by their analysis missed the most substantial changes in income distribution that occurred before 1992. Therefore, additionally to their study, this study concentrates on longer period in the Czech Republic, starting from 1988. Hollowing of the middle took place in the Czech Republic but only for a
limited period of time. My findings indicate that after that, in 1996–2008, this trend gradually faded away and personal earnings turned slightly more concentrated in the middle.

The trend of “hollowing of the middle” showed clearly for all gender and education subgroups in the early transition period; however, this trend did not last even for the subgroups. Education was an important factor that contributed to the earnings polarization between the years 1988 and 1996. Individuals with high education were making their way to the top, while people with low education were moving in the opposite direction. The earnings distribution of low-education subgroup experienced a similar pattern but was the only group to undergo a more profound movement to the bottom than to the top in this period.

To reveal the specifics of Czech earnings inequality, the international comparison focused on four neighbours of the Czech Republic – Austria, Germany, Poland, and Hungary. The Czech Republic exhibited the lowest overall earnings disparity in terms of the Gini coefficient in 2008. Also when comparing the earnings inequality by sex and education, the Czech Republic deviates from the other countries. While the earnings inequality is higher for men and highly educated in the Czech Republic, the Gini coefficient is higher (or equal) for women and less educated in other countries. The differences in earnings inequality between these subgroups were the highest in Germany.

The shape shift in Germany showed results expected based on the Gini coefficients – a strong concentration of male and highly educated earnings in the middle compared to women’s and less educated earnings distributions, respectively. However, in the Czech Republic, the relative distribution method and its decomposition into shape and location shifts revealed that the differences in distributions between subgroups were not as
straightforward. The Gini coefficient of male earnings was one point higher than for women. More men would likely be placed in the top decile of women’s median-adjusted distribution than women in that decile, which makes the overall male inequality higher. In addition, male earnings were more concentrated in the middle, which would otherwise indicate lower male inequality. With the latter effect being strong enough, female earnings are slightly more polarized than male earnings.

Regarding the education subgroups, once again, the Gini coefficient does not fully describe the distributional differences in the Czech Republic. The highly educated are more concentrated in the middle of the less educated median-adjusted distribution than low educated in that distribution. Nevertheless, many of the highly educated are also located at the very top decile, which makes the overall earnings inequality of Czechs with high education higher than the inequality of the less educated. In accordance with the prevailing latter effect, earnings of highly educated are more polarized than earnings of less educated.

These findings support the fact that a single overall indicator of earnings inequality does not sufficiently describe the inequality. The relative distribution method reveals changes that occurred along the distribution, brings supplementary results and provides additional possibilities to analyze earnings distributions. Decomposing relative distribution, especially for different subgroups, might bring results with interesting implications for understanding income inequality. In the light of these results, the findings for the Czech Republic differ less from the other countries than it would seem from the first look at the Gini coefficients.
1.7 References


2. Gender Wage Gap

2.1 Introduction

Analyzing gender-related differences between men and women in wages and labour market behaviour is gradually gaining importance in Central-East European countries (CEE). Twenty years ago, countries of this region started to transform from communist economies into democratic regimes. Therefore, the tradition of research on gender wage inequality and labour market participation in Central-East Europe is relatively short compared to research on “Western countries”. In order to allow judging international dis/similarities, the basic structure of gender wage gap in the CEE countries needs to be quantified. Hence, this essay is concerned with gender wage gap analysis in the Czech Republic, Hungary, Poland and Slovakia, and uses rather recent data from the Statistics on Income and Living Conditions database (EU-SILC).

Although communist Czechoslovakia was a country with one of the highest wage equalization in the world, differences in earnings were still to a high extent influenced by gender (Večerník, 2009). According to Večerník’s earlier study (Večerník, 1986), gender earnings discrepancy was enhanced by the fact that industries and jobs typically occupied by women were disfavoured by the system. Moreover, women were remunerated with lower wage tariffs for comparable work, and non-tariff components of wages were also lower for women. In former Czechoslovakia, the average female-male wage ratio varied only slightly, from 65.8% in 1960 to 68.4% in 1979, and did not show any substantial differences between countries (Večerník, 1986).
According to Rutkowski (2001), the factors that contributed the most to the rising income inequality in transition countries during the 1990s were education and inter-industry wage differentials, while other factors, like gender or work experience, were less important, or even insignificant.

Indeed, the gender wage differentials started to shrink in transition countries after 1989. Newell and Reilly (2001) show that female-male ratio of monthly earnings increased markedly between the second half of the 1980s and 1996 in Central European countries. At the end of the communist era, gender wage inequality in former Czechoslovakia was one of the highest among the countries analyzed in this study: the female-male wage ratio was 66.1% in 1987, while it amounted to approximately 74% in Hungary and Poland. In 1996, the female-male wage ratio was almost balanced in these four countries, with around 80%.

The development of gender wage inequality in these countries started to diverge as early as in the late 1990s. While the female-male average wage ratio decreased substantially to 72% in 1998 in the Czech Republic, it increased to roughly 85% in 1999 in Poland. Only after 2002 the situation of Hungarian women started to develop in their favour and the ratio reached 84%. Despite a slight improvement of the average female-male wage ratio in the Czech Republic after 1998, it has not yet reached its level from 1996. Even in 2005, the values stayed at roughly 75% in the Czech Republic and Slovakia (and at about 90% in Poland and Hungary at that time).11 To put it in simple terms, the gender wage difference has been substantially diminishing in Poland and Hungary, while it has remained the same or even slightly deteriorated between 1996 and 2005 in the Czech Republic and Slovakia.

11 These figures were provided by Eurostat based on national sources. However, as the Czech statistical office provides gender median wage gap to Eurostat, the female-male average wage ratios for the Czech Republic are taken from the Czech Statistical Office.
Analyzing the differences between average male and female wages does not say much about the real situation of women on the labour market. The observed gender wage gap only captures the wages of individuals selected into employment. The substantial decrease of gender wage gap over the early transition period might have been at least partly caused by low-wage women withdrawing from the labour market. Hunt (2002) examined the effect of selection into employment on the gender wage gap in former Eastern Germany between the years 1990 and 1994 and showed that almost one half of the 10-percentage-point increase of female-male wage ratio in this period was due to low-skilled women leaving the labour market.

The observed gender wage gaps currently differ substantially among the analyzed CEE countries. This essay controls for selection bias using the Heckman regression method (1979) which provides us with selection-corrected estimates. The aim of this essay is to reveal the explanatory factors of the observed gender wage gaps by identifying the part that can be explained by observable characteristics, and analyzing whether and to what extent such component differs in the surveyed countries. For this purpose, the Oaxaca-Blinder decomposition method is applied (see Oaxaca, 1973; Blinder, 1973).

The rest of this essay is organized as follows: The next chapter provides an overview on available literature. Chapter 2.3 depicts the Heckman methodology for the wage equation estimation and the Oaxaca-Blinder wage gap decomposition. Chapter 2.4 describes the EU-SILC data applied in this model and specifies the variables used, with special regard to the structure of individual and job characteristics. Chapter 2.5 presents the results of the wage gap decomposition; specifically, it provides quantitative estimates of factors determining the gender wage gaps. Chapter 2.6 summarizes the main results.
2.2 Literature overview

The empiric literature on gender wage differentials is relatively rich, especially thanks to publications from the last 20 years. The U.S. experience has been broadly covered by Blau and Kahn who analyzed the importance of wage structure in explaining national and international differences, the role of changing women’s relative qualifications, as well as demand and supply shifts (e.g. Blau and Kahn, 1992, 1997, 2000). Another studies examined the role of changing human capital accumulation (e.g. O’Neill and Polachek, 1993, among many others) or occupational segregation (Bayard et al., 2003; Black et al., 2004; Dolado et al., 2001; or Groshen, 1991).

When analyzing gender wage gap structure, the most recent empirics first concentrate on the selection effect. In addition to the selection effect, further two basic effects can be determined: The endowment effect is caused by differences in individual human capital (e.g. education and work experience) and job related (e.g. occupation, type of contract, supervisory position etc.) characteristics between men and women. Typically, women and men differ in terms of their human capital characteristics, are concentrated in different occupations or industrial branches, and, based on such endowment differences, are often remunerated differently.

The remaining part of the observed gender wage gap could be explained by the remuneration effect caused by the gender-specific remuneration of the same individual and job characteristics. This effect is often associated with discrimination, but it should rather be considered an unexplained part of the observed wage gap. This part of the gap may still be formed by unobserved differences in individual or other characteristics, and

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12 The selection effect results from a correction of the sample selection bias that occurs when working individuals do not create a random sub-sample of the population but differ systematically from non-participating individuals (Beblo et al., 2003).
only an unknown fraction of the remuneration effect can be attributed to discrimination.  

The study most closely related to the present study is that of Beblo et al. (2003). It uses the Heckman (1979) and Lewbel (2005) selection models along with European Community Household Panel (ECHP) data to estimate the selection-corrected wage gap. The authors claim that the selection effect is negative (more than 40%) in the EU, which means that the entry of non-participating individuals into labour market would cause a 40-percent increase in the observed gender wage gap. The endowment effect in the EU represents almost 20% of the observed gender wage gap. The authors as well as the other existing literature usually evaluate the unexplained part of the observed gender wage gap as a rather large one.

Many analyses of the selection bias and various correction methodologies have emerged since the aforementioned Heckman’s seminal study (1979). The majority of these extend Heckman’s classic model to allow for non-normality. Blundell et al. (2007) examine changes in the distribution of wages in the UK using bounds to allow for the impact of non-random selection into work. The method of Blundell et al. requires fewer assumptions than the Heckman’s model but is unfortunately rather less precise. Most studies confirming the importance of selection are based on US data (see, for example, Neal, 2004; Blau and Kahn, 2006; and Mulligan and Rubinstein, 2005), while fewer studies on this problem concern the European environment.

While I use the original terminology, terms like “explained and unexplained parts” or “gender differences in characteristics and gender differences in the returns to characteristics” to refer to the endowment and remuneration effects might be used by other authors.

Adding information on sectoral occupation to the list of explanatory variables significantly lowers the negative selection effect reported by Beblo et al. (2003), to almost 10% of the observed gender wage gap. The Heckman procedure applied by Beblo et al. (2003) on German data shows a different picture: the selection effect is actually positive by more than 10%. This indicates that without selection the wage gap in Germany would be lower than the observed one.
Olivetti and Petrongolo (2008) compare the observed gender wage gaps with the selection-corrected ones for the pre-enlargement EU member countries using several imputation methods and the ECHP data. The advantage of their method is that it does not rely on distributional assumptions as heavily as the Heckman model. They confirm a negative relationship between the gender employment gap and the observed gender wage gap in all surveyed countries (see also OECD, 2002). The selection effect proves to be highly negative in southern European countries, with the highest differences between male and female employment rates. Thus, large inflows of non-participating individuals into the labour market would cause relatively high increases in the observed gender wage gap. By contrast, in Scandinavian countries, with low differences between male and female employment rates, the selection effect is positive, i.e. the inflow of non-participating individuals would bring about decrease of the observed gender wage gap.

Albrecht et al. (2004) use quantile regressions to estimate the gender wage gap in the Netherlands. They apply the method introduced by Buchinsky (1998) to correct for sample selection in quantile regression. Albrecht et al. apply a rather innovatory approach, as they extend the quantile regression decomposition procedure to control for selection. They found out that a larger part of the gender wage gap is caused by gender differences in returns to labour market characteristics, while about one third on average is due to differences in these characteristics.

Similar study was performed by Nicodemo (2009). Using the selection-corrected quantile regression and data from the ECHP 2001 and EU-SILC 2006, she analyzed the

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15 I am aware that techniques such as quantile regression might be more informative than the Heckman model used here. The advantage of a quantile regression is that rather than identifying differences at the mean of the distribution, they are explained quantile by quantile. This certainly represents a future direction for the gender wage gap research in Central Europe. Still, as a first step I find it valuable to follow the traditional approach.
selection-corrected gender wage gap for wives and husbands in five Mediterranean countries. She showed that the gender wage gap decomposition differs if selection into employment is ignored. The part of the gender wage gap caused by gender differences in characteristics proved to be very small, while the greater part was caused by the discrimination effect.

The discrimination/remuneration effect in fact accounts for the unexplained part of the gap. Existing literature typically suffers from lack of variables to capture all gender-specific differences. Such variables are either unobservable or not recorded by available surveys. Theoretically, were all relevant employees’ and employers’ characteristics included in regression model, it should be possible to explain the whole gender wage gap.

Some attempts to reduce the unexplained part by finding further gender-specific factors have been recently undertaken. One of such promising variables is risk aversion, which appears to be higher for women. It is often argued (e.g. by Le et al., 2011) that risk influences individuals’ labour market choices, such as human capital investment or occupational choice. Some evidence that women choose safer jobs with lower risk of work-related death (DeLeire and Levy, 2001) has been already provided. Financial risk has been tested by experiments (Eckel and Grossman, 2002; Dohmen et al., 2005) with the same result indicating a higher risk aversion for women.

Black et al. (2004) relate risk to earnings uncertainty. They, first, showed that variability of companies’ profit is correlated with variability in wages and, hence, variability in profits serves as a proxy for wage risk for workers. Second, they demonstrated that the higher the share of female workers within a plant, the lower the variation in profits. This suggests an existing relationship between women’s risk preferences and their choice of a plant. Therefore, risk aversion might substantially help to explain an additional part of
gender wage gap. The Norwegian matched employer-employee data applied in that study consists of three different datasets, and so it involves detailed information on individuals and their family characteristics as well as on establishments and their profits.

Similarly, Le et al. (2011) use Australian data, including data on self-reported attitude to risk, to illustrate that more positive attitudes towards economic risk are related to higher earnings; however, their contribution to the gender wage gap is relatively small. The impact of risk attitudes on earnings would need to be more than eight times higher to fully explain the gender wage gap.

Research, its possibilities and results are strongly influenced by data available. EU-SILC seems to offer the most comparable, and hence the most suitable in terms of this study, data for the CEE countries. As a household survey it provides us with individuals’ family characteristics which are necessary for Heckman model. Unfortunately, variables, such as risk aversion, are not available at individual level.

Moreover, EU-SILC lacks some more detailed employers’ characteristics which are common for surveys conducted directly in companies. The choice of dataset is burdened by a trade-off between the availability of family characteristics and better quality of job/employer characteristics. Due to the imperfections of either data available in the CEE region, rather than fully explaining gender wage gaps this study aspires to provide the best possible comparison of common factors of the gender wage gap across the CEE countries.

The most comprehensive studies on the gender wage gap in the Czech Republic are those of Jurajda (2003, 2005) who used data from a company survey. These studies are concerned mainly with segregation effects. Jurajda used data from 1998 and, most
importantly, showed that one-third of the observed gender wage gap is caused by unequal male and female representation in a particular occupation in both the Czech Republic and Slovakia. As opposed to Jurajda’s research, the present study controls for selectivity and deals with the selection-corrected gender wage gap.

Based on the above discussed conceptual framework, the following general propositions can be formulated: (i) The selection effect will probably be negative, as mainly low-wage women are likely to stay out of the labour force. However, according to Olivetti and Petrongolo (2008), we might even expect a positive selection effect in Slovakia, a country with the lowest gender employment gap (see Table 2.2). (ii) In the labour market, women with better wage characteristics prevail and therefore the average characteristics of working men and women are expected to be similar, with a relatively small endowment effect as a consequence. Its extent varies in the above mentioned literature, from negative values (e.g. Nicodemo, 2009, for Portugal) to roughly one third in the study of Albrecht et al. (2004) for the Netherlands. (iii) Consequently, a large part of the gender wage gap is likely to be attributed to the remuneration effect (possibly also to other unexplained factors).

Although intuitive enough from a conceptual viewpoint, these propositions should be tested empirically in a rigorous manner to deliver a well-structured analysis of gender wage inequality in the four surveyed labour markets. This study applies the Oaxaca-Blinder decomposition method (Oaxaca, 1973; Blinder, 1973), including selection-corrected estimates of female wages, to quantify the above mentioned effects.


2.3 Methodology

The existing literature offers many ways of examining the factors that influence the gender wage gap (Becker, 1964; Mincer and Polachek, 1974; Eckstein and Wolpin, 1989; Wright and Ermisch, 1991). Recent studies (e.g. Albrecht et al., 2004; Olivetti and Petrongolo, 2008; Mulligan and Rubinstein, 2004) apply various selection-corrected methods. Much of this work develops the classic Heckman (1979) model.

The Heckman procedure is a two-stage model. First, a probit model for the probability of working is applied. In the second stage, predicted individual probabilities are added as an explanatory variable to the wage equation.\(^\text{16}\) If the unobservables in the participation equation are correlated with the unobservables in the wage equation, the estimates without correction (in an OLS model) would be biased. This basically means that the unobservables in the selection (or choice) of working affect also the wage equation. In other words, selection into the sample of working individuals is a non-random process, affected by different unobservables. The estimated wage function under the selection-corrected Heckman model is:

\[
\ln W_i = X_i \beta + \rho \sigma \lambda_i + \varepsilon_i, \text{where } \lambda_i = \frac{\varphi(V_i)}{\Phi(V_i)}
\]

where vector \(X_i\) includes all explanatory variables of the wage equation, \(\varphi\) and \(\Phi\) signify standard normal density and distribution functions, respectively, \(V_i\) represents the vector of explanatory variables of the participation equation that should differ from the one

\(^{16}\) Except the addition of working probability the estimation corresponds to commonly used Mincerian-type wage equations (Mincer, 1974), where the (logarithmic) earnings profile is a function of years of schooling, concave function of experience and further supplemented by the impact of other relevant individuals and job characteristics.
included in the wage equation, $\rho$ is the correlation coefficient of the wage and participation equations and $\sigma_\varepsilon$ is the standard deviation.$^{17}$

A positive $\rho$ indicates that unobservables in the wage and participation equations are positively correlated. For example, let us take ability as one unobservable in a wage equation. If ability is positively related to both participation and wages, the $\rho$ is positive. Negative $\rho$ means that an unobservable in the wage equation is negatively related to participation, while positively to wage. For instance, if handsomeness is an unobservable in the wage equation and is negatively related to decision to participate but positively to wages, $\rho$ will be negative.

Using the coefficients estimated from the male and female wage equations, the observed gender wage gap can be decomposed into several effects. The best-known decomposition method is the Oaxaca-Blinder method (Oaxaca, 1973; Blinder, 1973).

The observed gender wage gap is defined as:

$$
\ln W^M - \ln W^F = (\ln W^M - \bar{\ln W}^F) + (\ln W^F - \bar{\ln W}^F)
= (\bar{X}^M \hat{\beta}^M - \bar{X}^F \hat{\beta}^M) + (\bar{X}^F \hat{\beta}^M - \bar{X}^F \hat{\beta}^F)
= \underbrace{(\bar{X}^M - \bar{X}^F) \hat{\beta}^M}_{\text{endowment effect}} + \underbrace{\bar{X}^F (\hat{\beta}^M - \hat{\beta}^F)}_{\text{remuneration effect}}
$$

(3)

where expressions with a bar signify mean values. The term $\bar{\ln W}^F$ represents the average hypothetical female wage if the female individual and job characteristics were remunerated in the same way as male.

$^{17}$ For more details, see Heckman (1979) or some of the studies reproducing Heckman’s model (e.g., Beblo et al., 2003). The model does not treat a possible endogeneity of some variables, such as education, because of the lacking consensus in literature on how to instrument variables of this type. Moreover, suitable instrumental variables are usually unavailable in commonly applied datasets. That is why a similar kind of objection can be attributed to practically all empirical literature on the gender wage gap decomposition.
The term \((\bar{X}^M - \bar{X}^F)\beta^M\) on the right-hand side of the equation (3) represents the endowment effect and determines the extent to which the average male wage would exceed the average hypothetical female wage if the individual and job characteristics of men and women were remunerated in the same way (that is, if there were no discrimination). This part of the observed gender wage gap is therefore supposed to reflect the differences in productivity between men and women.

The term \(\bar{X}^F(\beta^M - \beta^F)\) represents the remuneration effect and shows the disparity between the hypothetical and observed female average wages. In other words, had the female and male characteristics been remunerated in the same way, the remuneration effect would be zero. If men and women had the same average characteristics, the observed wage gap would be given only by the remuneration effect.

To correct the sample selection bias, it is necessary to add another component to the decomposition equation (3) – the selection effect. The selection effect reveals the way in which the observed gender wage gap would change if non-participating individuals started working. The transformed equation (3) then takes on the following form:

\[
\ln W^M - \ln W^F = (\bar{X}^M - \bar{X}^F)\beta^M + \bar{X}^F(\beta^M - \beta^F) + \rho\hat{\lambda}^M \bar{\lambda}^M - \rho\hat{\lambda}^F \bar{\lambda}^F
\]  

(4)

where \(\hat{\theta}\) is the estimate of \(\rho\sigma_x\) and \(\bar{\lambda}\) is the average estimated \(\lambda_i\) from Heckman’s equation (2).

The standard OLS regression method is used for men in some studies (see, for example, Beblo et al., 2003). As the participation rate of men in the sample is close to 100%, the male sample selection is random in the above quoted study. Since the employment participation of men is relatively high in the samples used in the present analysis, it
should not be affected by selectivity problems. Therefore, male wage equations are estimated by OLS. If a random sample for men is assumed, the correction term for men in equation (4), i.e. $\hat{\theta}^M$, is set to zero.

Positive selection effect, i.e. negative $\hat{\theta}^F$, corresponds to a negative selection on unobservables (negative correlation between the unobservables in female wage and participation equations). It means that the selection-corrected gender wage gap would be lower than the observed one if people who are currently not working had the same observed characteristics as those who currently are working. However, due to different endowments of participating and non-participating women, this does not necessarily imply that if all women worked, their average wage would be higher. The selection effect deals with unobservables. Therefore, the positive selection effect occurs when non-participating women possess better unobserved characteristics than working women in terms of wage remuneration.

A positive selection on unobservables, i.e. positive $\hat{\theta}^F$ and negative selection effect, suggests that actual wages of working women are higher than hypothetical wages of a random female population sample with a comparable set of observed characteristics. Negative selection effect arises when non-participating women have worse unobserved characteristics than working women, e.g. lower abilities affecting both their probability of participation and potential wage.

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18 See Table 2.2.

19 As $\sigma$ is positive by definition, the sign of $\hat{\theta}$ is the same as the sign of $\rho$. 

Gender Wage Gap
2.4 Survey data

The EU-SILC household survey is a new panel survey that replaced its predecessor ECHP in 2004. This essay is based on data from EU-SILC 2008 for the Czech Republic, Hungary, Poland, and Slovakia. Full-time students, permanently disabled individuals, self-employed, and unemployed have been excluded from the sample. Students and disabled have been excluded because their job choices are limited, while the self-employed are eliminated since their highly fluctuating earnings would make the analysis biased.

Typically, the unemployed are excluded from the sample as well (see Beblo et al., 2003), as their individual characteristics, and consequently their job search effort, is usually significantly different from those of the inactive population. Joining both the inactive and unemployed would create a heterogeneous group inappropriate for the model.\(^\text{20}\)

These restrictions have been applied in order to form a homogenous sample consisting of the employed and a fraction of those who stay “voluntarily” out of the labour market (inactive). In addition, the age limit 16-55 has been imposed in order to avoid retirement choices. The samples included in my analysis are described in Table 2.1. The data is weighted by individual weights reflecting the number of people in the whole population represented by a particular individual in the sample. Robust variance estimates are used.

\(^{20}\) As an alternative, a double selection into participation could in principle be done: one for being unemployed, the other for being inactive. The reason is that part of the unemployed might equally be discouraged from labour market participation as the inactive population. However, the information on unemployment status in the dataset is self-reported and, hence, lacks the information about the nature of unemployment (voluntary or involuntary). Therefore, the group of unemployed itself seems to be heterogeneous enough and is typically excluded from the sample without aspiring on double selection exercises.
Table 2.1  Sample Characteristics (weighted)

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<tr>
<td>ISCO5</td>
<td>8.31%</td>
<td>18.84%</td>
<td>11.10%</td>
<td>18.15%</td>
</tr>
<tr>
<td>ISCO6</td>
<td>1.43%</td>
<td>1.19%</td>
<td>1.80%</td>
<td>0.83%</td>
</tr>
<tr>
<td>ISCO7</td>
<td>30.03%</td>
<td>7.91%</td>
<td>30.03%</td>
<td>7.57%</td>
</tr>
<tr>
<td>ISCO8</td>
<td>17.61%</td>
<td>5.89%</td>
<td>19.70%</td>
<td>8.41%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>CZ</th>
<th>HU</th>
<th>PL</th>
<th>SK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>NON_EARN_INC</td>
<td>1105.67</td>
<td>1296.19</td>
<td>450.75</td>
<td>434.14</td>
</tr>
<tr>
<td>PARTN_W</td>
<td>66.77%</td>
<td>56.51%</td>
<td>56.43%</td>
<td>61.15%</td>
</tr>
<tr>
<td>PARTN_NOTW</td>
<td>5.66%</td>
<td>13.94%</td>
<td>10.54%</td>
<td>6.22%</td>
</tr>
<tr>
<td>CHILDO_2</td>
<td>15.04%</td>
<td>17.06%</td>
<td>14.58%</td>
<td>7.49%</td>
</tr>
<tr>
<td>CHILDO_3</td>
<td>12.20%</td>
<td>16.34%</td>
<td>12.38%</td>
<td>8.16%</td>
</tr>
<tr>
<td>CHILDO_6_15</td>
<td>30.07%</td>
<td>32.18%</td>
<td>32.69%</td>
<td>29.21%</td>
</tr>
<tr>
<td>EDUC_YEARS</td>
<td>13.73</td>
<td>14.08</td>
<td>14.25</td>
<td>14.01</td>
</tr>
<tr>
<td>AGE_30</td>
<td>27.94%</td>
<td>28.97%</td>
<td>31.24%</td>
<td>25.13%</td>
</tr>
<tr>
<td>AGE_31_45</td>
<td>46.48%</td>
<td>42.51%</td>
<td>40.16%</td>
<td>40.20%</td>
</tr>
</tbody>
</table>

Notes: *Variable YEARS_W (and its square) is unavailable in Hungary. A proxy variable computed as “age – 6 – EDUC_Y” (and its square) used instead.

The dependent variable in the Heckman model is the logarithm of the hourly gross wage. It is not obtained directly; it is computed on the basis of the Eurostat definition of
the gender wage gap.\footnote{The hourly gross wage is the usual monthly gross income from a person’s main job divided by the quadruple of the number of hours usually worked per week in the person’s main job, including common overtime.} The difference between male and female mean wages, i.e. the observed gender wage gap, is positive but relatively small in Hungary and Poland, while it gains substantial values in both Czech Republic and Slovakia (see Table 2.2).

<table>
<thead>
<tr>
<th></th>
<th>Gender wage gap</th>
<th>Male Employment</th>
<th>Female Employment</th>
<th>Employment gap (pp.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>22.6</td>
<td>99.1</td>
<td>79.6</td>
<td>19.5</td>
</tr>
<tr>
<td>HU</td>
<td>8.9</td>
<td>94.3</td>
<td>73.0</td>
<td>21.3</td>
</tr>
<tr>
<td>PL</td>
<td>8.6</td>
<td>91.5</td>
<td>72.7</td>
<td>18.8</td>
</tr>
<tr>
<td>SK</td>
<td>18.4</td>
<td>96.3</td>
<td>89.1</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Note: Values for the sample applied.

The following explanatory variables are included in the male and female wage equations:\footnote{Ideally, the list of control variables should contain other more or less common variables that might account for gender wage differences like working conditions, job flexibility, state or private sector, unionization, risk aversion etc. Unfortunately, the data available does not provide such information. Moreover, the information on some of the applied variables is rather limited, such as supervisory position or broad ISCO categories. However, it is impossible to complete the set of explanatory variables.}

Human capital typical for Mincerian-type wage equations is represented by education and experience. \textit{EDUC\_YEARS} states the number of years spent in school. On average, working women have studied longer than working men in all of the examined countries, with the exception of the Czech Republic. \textit{YEARS\_WORK} gives the total number of years’ experience, and \textit{YEARS\_WORK2} is its square. The Hungarian dataset lacks this variable; therefore, a proxy “age minus 6 minus years in education” was applied.

\textit{SIZE\_10} and \textit{SIZE\_11\_49} represent dummies equalling 1 if the employee works in a local unit with a maximum number of 10, or 11-49 workers, respectively, and 0 otherwise. Larger companies are expected to provide higher wages. \textit{CONTRACT} is a
dummy variable that equals 1 if the employee has an unlimited job contract and 0 otherwise. On average, Czech and Slovak working men enjoy more often a job contract of unlimited duration than women. The opposite holds for Hungary and Poland, i.e. the two countries with small observed wage gaps. \textit{SUPERVISOR} is a dummy for a managerial position; it equals one if the employee’s position is supervisory, and 0 otherwise. In all covered countries jobs with supervisory responsibilities are more likely to be occupied by men than women. Unfortunately, the data only offers information on supervisory/non-supervisory managerial position and I would welcome more detailed information on hierarchy of management to capture the gender differences in a more exhaustive way.

\textit{PRAGUE} is a dummy variable equalling 1 for individuals living in the region of the Czech capital. Wages in the capital are typically rather higher than wages in other areas of the country.\textsuperscript{23} Unfortunately, similar distinction cannot be deduced from Hungarian, Polish, and Slovak datasets, since they contain less detailed information on regional units (only NUTS1 codes). This is why the \textit{DENSE\_AREA} variable, a dummy corresponding to living in larger cities, has been applied instead.\textsuperscript{24} \textit{ISCO}m is a dummy variable for occupational groups, where \( m = 0 \) to 8.\textsuperscript{25}

\textsuperscript{23} The wage disparity between Prague and other regions is substantial, while the differences among other regions are rather negligible. The average wage in the Prague region was approximately 33,500 CZK in 2007 while the average wages in other regions ranged between 21,500 and 25,000 CZK (Czech Statistical Office, 2008).

\textsuperscript{24} As a densely populated area is considered a local unit which has a density superior to 500 inhabitants per square kilometer and where the total population for the unit is at least 50,000 inhabitants.

\textsuperscript{25} The ISCO occupational classification code divides employees into 10 groups. \textit{ISCO0} – Armed forces; \textit{ISCO1} – Legislators, senior officials and managers; \textit{ISCO2} – Professionals; \textit{ISCO3} – Technicians and associate professionals; \textit{ISCO4} – Clerks; \textit{ISCO5} – Service workers and shop and market sales workers; \textit{ISCO6} – Skilled agricultural and fishery workers; \textit{ISCO7} – Craft and related trades workers; \textit{ISCO8} – Plant and machine operators and assemblers; \textit{ISCO9} – Elementary occupations. The last group is dropped due to collinearity. The dummy variable \textit{ISCO0} is also dropped among women and in Slovakia, because in this group there are no or almost no individuals in the samples.
The explanatory variables included in the female participation equations are the following: \textit{NON\_EARN\_INC} is the total annual non-earned household income. Unearned income is expected to have negative impact on labour supply. \textit{PARTN\_W} and \textit{PARTN\_NOTW} are dummies for living with a working, resp. not working partner. The counterpart to these variables is living without any partner. Living with a partner might indicate a certain division of roles between partners which, under existing gender stereotypes, typically result in lower female labour supply. \textit{CHILD0\_2}, \textit{CHILD3\_5}, and \textit{CHILD6\_15} are dummy variables indicating the presence of a child of a corresponding age. Children in households, and especially the younger ones, tend to reduce female employment on the supply side. Women with children in preschool age stay at home and only re-enter the labour market once their children grow older. Possible discrimination against women with children may also result in reducing female employment on the demand side. Household characteristics serve as the exclusion restriction that do not enter wage equations, i.e. they are the variables that affect participation in the labour market without affecting wages conditional on participating. 

\textit{EDUC\_YEARS} is again the number of years spent in school. As the level of education positively influences potential wages, it should also influence women's decision to participate. This time the samples include both working and inactive women. For this sample the average number of years of education is slightly lower than for working women.

\textit{AGE\_30} and \textit{AGE31\_45} are dummy variables for corresponding age; the highest age-group is omitted. Interestingly enough, age profile might reveal country-specific impact

\footnote{This variable includes income from rental of a property or land, interest, dividends and profit from capital investments, regular inter-household cash transfer received, family and children related allowances, housing allowances, and other benefits related to social exclusion. Unfortunately, not all countries stated net income variables values in the EU-SILC survey. Therefore, \textit{NON\_EARNED\_INC} represent gross annual values in Euro.}
on the probability of working in the probit model. In the Czech Republic the probability of being employed seems to be related to age: While the percentage of working women sharply decreases between the age of 24 and 29 from about 80% to 50%, it relatively steadily increases with higher age up to more than 95% for those over 45 years. In Hungary, where the share of working young women is among the lowest in the CEE countries, we get a similar picture: The share of working women around 30 hardly reaches 50% but increases with age to about 90% for women over 45 years. The situation in Poland is quite opposite: while the drop in the share of working young women is quite moderate, it suddenly falls for those aged 50 and more. In Slovakia, the share of working women slightly increases with age without sizeable drops and only moderately decreases for the oldest group.

The sample characteristics are summarized in Table 2.1. The variables included in the female participation equation determine the outcome of the female wage equation as well as the selection effect. Given the different relationship between age and employment probability across the CEE countries, a special attention will be devoted to the impact of including age and other variables in the participation equation on the decomposition results in Annex 2.

### 2.5 Decomposition results

The actual observed gender wage gap, expressed as the difference between male and female mean hourly log-wage (the expression on the left-hand side of equation (4)), is the highest in the Czech Republic, where it amounts to 0.256 log points, followed by Slovakia with 0.204 log points. In Hungary and Poland, the observed gender wage gap
exhibits much lower values (0.093 and 0.089 log points, respectively). This figure represents the observed wage gap between working men and women.

The Oaxaca-Blinder decomposition points to a negative selection effects in the Czech Republic and Hungary (see Figure 2.1). It amounts to mere -0.002 log points in the Czech Republic, i.e. the selection effect represents -0.7% of the observed gender wage gap in the Czech Republic, while representing as much as -0.019 log points, i.e. -20.9%, in Hungary. This reveals that the selection-corrected gender wage gap would be higher than the actual one, by 0.7% in the Czech Republic and 20.9% in Hungary, if currently not working women had the same observed characteristics as those currently working.²⁷

**Figure 2.1** Observed gender wage gap decomposition

![Figure 2.1 Observed gender wage gap decomposition](image)


²⁷ For more details on selection effect in Hungary see also Annex 2.
The opposite occurs in Poland and Slovakia, where the selection effect appears positive with 0.019 log points (21.7%) in Poland and 0.011 log points (5.3%) in Slovakia. This means that in Poland and Slovakia the selection effect accounts for 21.7% and 5.3% of the observed gender wage gap, respectively. Hence, the observed gender wage gap exceeds the selection-corrected one. 28

The results of the Heckman regression model for women, as well as OLS model for men, are reported in Table A.1 in Annex 1. The probit model for the female probability of working influences the outcome of the second step in the Heckman model, and, hence, the decomposition results, namely the size of selection and remuneration effects. Annex 2 analyzes the impact of particular explanatory variables of the participation equations on the results. A special attention is paid to the presence of children in households in Hungary and age in Poland because these variables seem to chiefly drive the selection effects in these countries. According to Eurostat (2009), variables that are crucial to identify selection into employment are the following: educational level, marital status, and the presence and age of children. 29

The results for the Czech Republic and Hungary showed $\theta^f$ positive (i.e. positive selection, meaning positive correlation between unobservables in the participation equation and in the wage equation). Negative $\text{THETA}$ for women, i.e. positive selection effect, corresponding to a negative selection on unobservables, was detected in Slovakia and Poland. Hence, the selection-corrected gender wage gap would be lower than the observed one. Olivetti and Petrongolo (2008) claim this can particularly be observed in

28 See also Annex 2 for more details on selection effect in Poland.
29 Given the possibilities of the data applied, the list of explanatory variables in the participation equation can be considered exhaustive. The completeness of explanatory variables can be confirmed in more or less recent empirics that used the Heckman model (e.g., Hoffmann and Kassouf, 2005; Nicaise, 2001; Ferber and Green, 1985). The dataset only provided one additional variable to the female participation equations: the dummy for Prague/densely populated area. This variable might reflect differences in employment opportunities given by disparities in economic performance. However, this variable proved to be statistically significant at the 5% level only in Poland and have not brought any substantial changes to the decomposition results in any country.
countries with a small difference between male and female employment rates. Their findings are supported by results reported for Slovakia, where the gender employment gap within the sample is the lowest among the surveyed countries (see Table 2.2). However, the same explanation does not fully apply to Poland, where the gender employment gap is rather high (although still lower than in the Czech Republic and Hungary).

If the average characteristics of working women and men were the same, the endowment effect would be zero. The decomposition results reveal a positive endowment effect both in the Czech Republic (0.025 log points) and Slovakia (0.009 log points). This indicates that the difference in characteristics of working men and women account for 10.0% of the Czech and 4.2% of the Slovak observed gender wage gap.\(^\text{30}\)

In Hungary and Poland, the endowment effect shows a negative value (-0.046 and -0.053 log points, which is -49.4% and -59.2% of the observed gender wage gap, respectively). This means that working women have even better characteristics than working men.

Table 2.3 provides a more detailed description of the endowment effect. The individual characteristics contribute negatively to the endowment effect, which means that working women have better individual characteristics in all countries. It is the job characteristics that form the positive endowment effect both in the Czech Republic and Slovakia. This suggests that, compared to women, working men have generally better

\(^{30}\) These results indicate a higher positive endowment effect than the earlier attempt to decompose the observed gender wage gap in the Czech Republic in 2005 (see Mysíková, 2007) where it exhibits almost zero, and even slightly negative, endowment effect. The present study includes more explanatory variables into the wage equation (size of the company and supervisory position) which can be considered to be the main source of the difference.
work conditions, e.g. more often work in large companies, more often profit from an unlimited job contract and occupy supervisory positions in their jobs.

To the contrary, the negative endowment effect in Hungary is almost entirely determined by individual characteristics, whereas job characteristics have barely any impact at all. With a negative endowment effect, Hungarian working women have on average better individual characteristics. On the other hand, their job characteristics are comparable to those of working Hungarian men. In Poland, both individual and job characteristics contribute negatively to the total endowment effect. Individual characteristics form two thirds of the endowment effect, while job characteristics are only responsible for one third.

Table 2.3  Endowment effect and individual and job characteristics contribution

<table>
<thead>
<tr>
<th></th>
<th>CZ</th>
<th>HU</th>
<th>PL</th>
<th>SK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed GWG (%)</td>
<td>22.6</td>
<td>8.9</td>
<td>8.6</td>
<td>18.4</td>
</tr>
<tr>
<td>Observed GWG (log points)</td>
<td>0.256</td>
<td>0.093</td>
<td>0.089</td>
<td>0.204</td>
</tr>
<tr>
<td>Endowment effect (log points)</td>
<td>0.025</td>
<td>-0.046</td>
<td>-0.053</td>
<td>0.099</td>
</tr>
<tr>
<td>Individual characteristics (log points)</td>
<td>-0.001</td>
<td>-0.046</td>
<td>-0.035</td>
<td>-0.013</td>
</tr>
<tr>
<td>Job characteristics (log points)</td>
<td>0.026</td>
<td>0.000</td>
<td>-0.018</td>
<td>0.022</td>
</tr>
<tr>
<td>Endowment effect (% of observed GWG)</td>
<td>10.0</td>
<td>-49.4</td>
<td>-59.2</td>
<td>4.2</td>
</tr>
<tr>
<td>of which (as % of endowment effect)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual characteristics (%)</td>
<td>-2.0</td>
<td>100.8</td>
<td>66.5</td>
<td>-156.4</td>
</tr>
<tr>
<td>Job characteristics (%)</td>
<td>102.0</td>
<td>-8.0</td>
<td>33.5</td>
<td>256.4</td>
</tr>
<tr>
<td>Total endowment effect (%)</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Notes: Individual characteristics include EDUC_YEARS, YEARS_WORK and YEARS_WORK2. Job characteristics include all other variables listed in Table A.1, including PRAGUE for CZ and DENSE_AREA for other countries.

Figure 2.1 indicates that the remuneration effect is very high in all surveyed countries. Theoretically, if the comparable male and female characteristics were remunerated in the same way, the remuneration effect would be zero. Although working women have even better individual (and job) characteristics than working men in Hungary and Poland, men’s average wages are still higher than women’s. This proves that the
remuneration effect amounts to more than 100% of the observed gender wage gap and that the discrimination and/or other characteristics not covered by the observed variables play a significant role in determining male and female wages.

The remaining unexplained part of the gender wage gap (i.e. the remuneration or discrimination effect) is often referred to as “the adjusted gender wage gap”. The study published by Eurofound (2010) maps the existing empirical attempts to estimate the national adjusted wage gaps. The provided overview suggests that the adjusted gender wage gap in the Czech Republic is one of the highest in Europe. However, the existing studies differ substantially in estimation methods, data source, and variables used, some of them even include selection-corrected estimates while others do not. Comparative consistently adjusted figures covering both Eastern and Western European countries are generally not available.

Recent comparative study by Eurostat (2009) estimated the adjusted gender wage gaps, albeit only for eleven Western European countries only. In Portugal and Italy, the adjusted wage gap proved to be substantially higher than the observed one (similarly to the aforementioned cases of Hungary and Poland) while it was lower in most other countries.

With a caution, we can suppose that discrimination contributes partly to the remuneration effect and that the wage is to a certain extent determined by gender. The reasons for discrimination might be, for example, greater female responsibilities for family and children, employers’ expectations that a young women is planning to have a family in near future, women’s lower willingness to overtimes compared to men, or perhaps just employers’ presumptions that average women are less productive than men.
2.6 Conclusion

The aim of this essay is to quantify the basic structure of the gender wage gaps in Central-East Europe, an essential progress to integrating the CEE countries into the discussion of gender issues in the European labour market. The highest observed gender wage gap among the surveyed countries is in the Czech Republic, followed by Slovakia. The values in these two countries substantially exceed the observed gender wage gap in Hungary and Poland. It can therefore be deduced that no uniform pattern exists in the CEE countries, which proved true even after a more detailed analysis.

This study attempted to test three basic hypotheses. Firstly, the hypothesis that the selection-corrected gender wage gap will be higher than the actually observed one in all four countries, with a possible exception for Slovakia. This assumption was confirmed for Hungary and the Czech Republic. In accordance with the assumption, Slovakia proved to be the exception, as the selection effect proved to be relatively small but positive, due to comparable male and female employment rates in this country. An inflow of the inactive into employment thus would not change the observed gender wage gap in any significant way. However, the initial assumption was not confirmed for Poland, where a positive selection effect was detected with a result similar, for example, to the one found by Beblo et al. (2003) for Germany in 1998.

Secondly, the hypothesis presupposing a relatively low impact of the endowment effect on the observed gender-based wage differences has been proved for all surveyed countries. This shows that gender wage gaps do not simply result from systematically better individual and job characteristics for men. To be more specific, the endowment effect is positive and relatively low in the Czech Republic and Slovakia. In both these countries the positive endowment effect is predominantly determined by the job
characteristics. Thus, working men, compared to working women, have generally “better” jobs.

In Hungary and Poland, the endowment effect was even negative. Contrary to the Czech Republic and Slovakia, the endowment effect in Hungary was almost entirely formed by individual characteristics. The endowment effect being negative, individual characteristics of working women are on average better than those of working men, while their job characteristics are comparable. In Poland, individual characteristics form two thirds of the negative endowment effect, while job characteristics only one third. It is therefore apparent that the main gender-related problem of the labour market does not lie in inferior qualification or productivity of working women.

Finally, the remuneration effect dominates among the explanatory factors of the observed wage gaps in all investigated countries. On average, in Hungary and Poland working women have better observed characteristics than working men, yet the observed mean wages remain higher for men than for women. If remuneration was based purely on observed characteristics, women should expect to have higher wages than men. It is therefore obvious that an enormous part of the observed gender wage gap is caused by remuneration effect. Interpreting this result as an evidence of a high degree of gender-based wage discrimination would be obviously oversimplified, as other, so far unexplained, factors could contribute to a high share of the remuneration effect.

During the relatively short history of market-determined wages in the CEE countries, gender wage difference has been substantially diminishing in Poland and Hungary, while remaining the same or even slightly deteriorating in the Czech Republic and Slovakia. However, the expectations formed based on Western European empirics were mostly confirmed. Although in the analyzed countries the endowment effect seems to be comparably smaller than the one commonly found in Western European countries (e.g.,
by Beblo et al, 2003; Albrecht et al, 2004), the structure of gender wage gaps in these two regions have not revealed any substantial systematic differences.

2.7 References


*Gender Wage Gap*


## Annex 1

### Table A.1 OLS and Heckman Model

<table>
<thead>
<tr>
<th></th>
<th>CZ Male</th>
<th>Female</th>
<th>CZ Female</th>
<th>HU Male</th>
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<th>PL Male</th>
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<th>SK Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WAGE EQUATION:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>EDUC YEARS</em></td>
<td>0.042***</td>
<td>0.044***</td>
<td>0.087***</td>
<td>0.077***</td>
<td>0.040***</td>
<td>0.048***</td>
<td>0.047***</td>
<td>0.030***</td>
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</tr>
<tr>
<td>(0.005)</td>
<td>(0.004)</td>
<td>(0.008)</td>
<td>(0.008)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.004)</td>
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<tr>
<td><em>YEARS WORK</em></td>
<td>0.026***</td>
<td>0.012***</td>
<td>0.029***</td>
<td>0.011***</td>
<td>0.026***</td>
<td>0.018***</td>
<td>0.016***</td>
<td>0.005**</td>
<td></td>
</tr>
<tr>
<td>(0.002)</td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.002)</td>
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<tr>
<td><em>YEARS WORK2</em></td>
<td>-0.001***</td>
<td>-0.000***</td>
<td>-0.001***</td>
<td>-0.000***</td>
<td>-0.001***</td>
<td>-0.000***</td>
<td>-0.000***</td>
<td>-0.000***</td>
<td>-0.000***</td>
</tr>
<tr>
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<td>(0.000)</td>
<td>(0.000)</td>
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<tr>
<td><em>SIZE 10</em></td>
<td>-0.230***</td>
<td>-0.122***</td>
<td>-0.275***</td>
<td>-0.236***</td>
<td>-0.112***</td>
<td>-0.035***</td>
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<td>-0.144***</td>
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<tr>
<td>(0.019)</td>
<td>(0.015)</td>
<td>(0.023)</td>
<td>(0.022)</td>
<td>(0.019)</td>
<td>(0.020)</td>
<td>(0.021)</td>
<td>(0.018)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>SIZE 11-49</em></td>
<td>-0.104***</td>
<td>-0.065***</td>
<td>-0.143***</td>
<td>-0.128***</td>
<td>-0.166***</td>
<td>-0.045***</td>
<td>-0.098***</td>
<td>-0.074***</td>
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</tr>
<tr>
<td>(0.012)</td>
<td>(0.012)</td>
<td>(0.020)</td>
<td>(0.018)</td>
<td>(0.022)</td>
<td>(0.021)</td>
<td>(0.019)</td>
<td>(0.017)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>CONTRACT</em></td>
<td>-0.006</td>
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**Gender Wage Gap**
### Table A1  OLS and Heckman Model (cont.)

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Notes: Variable YEARS_W (and its square) is unavailable in Hungary. A proxy variable computed as “age – 6 – EDUC_Y” (and its square) used instead. * significance at the 10% level, ** significance at the 5% level, *** significance at the 1% level. Standard errors in parentheses.
Annex 2

The results of Heckman model and mainly the choice of variables in the (first-step) participation equation applied only for women here influence the GWG decomposition results in two ways. First, selection effect is directly affected by the results of female participation equation (see expression \( \hat{\beta}^F \vec{X}^F \) in the third term on the right-hand side of equation (4)). Second, the coefficients estimates in the (second-step) female wage equation \( (\hat{\beta}^F) \) enter the remuneration effect (see the second term on the right-hand side of equation (4)).

However, the endowment effect remains unchanged regardless of the results of female Heckman model because only male coefficients \( (\hat{\beta}^M) \) and mean values of male and female explanatory variables in the wage equation \( (\vec{X}^M - \vec{X}^F) \) appear in the endowment effect (see the first term on the right-hand side of equation (4)).

This annex looks at the effect of female participation equation on the GWG decomposition results. For the sake of comparability of the results across the CEE countries, the same model had originally been applied for all four countries although, in few cases, some of the explanatory variables in the participation equation proved statistically insignificant (see Table A1 in Annex 1). In this part I aim to test the robustness of the participation model in terms of its impact on GWG decomposition results and also hope to reveal some country-specific issues.

The explanatory variables in the participation equation listed in Chapter 2.4 were excluded one by one and the impact on the GWG decomposition results was observed. The participation model appears to be highly robust in the Czech Republic and Slovakia. In the Czech Republic, the exclusion of children dummies is responsible only
for a 0.8-percentage-point increase of the remuneration effect and a corresponding
0.8-percentage-point decrease of the negative selection effect (0.8-percentage-point
increase in absolute value) while exclusion of the other variables caused a
0.2-percentage-point change at maximum.

Similarly, in Slovakia, the exclusion of children dummies brings about the biggest
change – an increase by 1.8 percentage points of the remuneration effect and an equal
decrease of the selection effect; exclusion of other variables caused a negligible effect
of up to 0.5 percentage points.

Considerably different result has been revealed after excluding children dummies in
Hungary: a 23.2-percentage-point decrease of the remuneration effect and the same
increase of the selection effect. Due to such a sizeable change the selection effect
switches into small but positive values (compare columns 1 and 2 in Figure A.1). This
means that the selection effect would account for positive 2.2% of the observed gender
wage gap after excluding children dummies and, hence, the observed gender wage gap
would slightly exceed the selection-corrected one, similarly as in Poland and Slovakia.

It seems that the participation model for Hungary is not robust and the joint impact of
all the three children dummies is to a large extent responsible for the negative selection
effect in the original model. The variable of presence of children does not have any
proxy variable available in the applied dataset; therefore, any attempt to increase the
robustness of the model cannot be conducted. Figure A.1 shows the GWG
decomposition results for the original model, for the model without all three children
dummies and for models without each of the three children dummies successively.

It is obvious that inclusion of dummies for children aged 0–2 and 3–5 only contributes
to a lower (though higher in absolute values) selection effect (compare columns 5 and 4
versus 1 in Figure A.1) while inclusion of the dummy for children aged 6–15 increases (decreases in absolute values) the selection effect (compare column 3 versus 1 in Figure A.1). Therefore, the joint effect of the presence of children aged 0–5 in a household is responsible for the negative selection effect in the original model in Hungary.

**Figure A.1** Observed GWG decomposition: The effect of children in Hungary

![Bar chart showing the effect of children in Hungary](image)


In Poland, excluding children dummies caused only a slight 4.3-percentage-point decrease of the remuneration effect and a corresponding increase of the selection effect. However, excluding the two age dummies revealed more sizeable change: a 17.3-percentage-point increase of the remuneration effect and the same drop of the selection effect. The dummy variable for women aged 31 to 45 is entirely responsible for this change (see Figure A.2).
It has to be concluded that in Hungary and Poland female participation models are not robust. The dummy variables for the presence of children aged 0–2 and 3–5 are responsible for the negative selection effect in the original model in Hungary. In Poland, it is the dummy for age 31–45 that substantially contributes to the relatively high positive selection effect presented in the original model.

This annex aims to provide alternative results; however, the original results would suffer if these variables were excluded. The children and age dummies are highly significant in Hungary and Poland and, therefore, have been included in the original model. Moreover, in Poland the participation-age function differs from those in the other CEE countries and should be taken into account. In addition, this essay mainly focuses on the endowment effects that remain unchanged regardless the exact form of the female participation model.

3. Earnings Inequality within Couples

3.1 Introduction

The within-couple earnings distribution can be of great importance, especially in transition countries. The transition from communist-style compulsory employment (i.e. the policy of almost full employment of both men and women) to a diversified labour market with growing earnings inequality may considerably change the within-household income structure and well-being of spouses.

Since this field has not been examined sufficiently in the Czech Republic, we know little about within-household gender issues during and after the process of transition. Therefore, I try to fill this empirical gap by producing a detailed description of earnings differentials in couples (both de jure and de facto and with and without children). I will focus on four Central-East European countries (Czech Republic, Hungary, Poland, and Slovakia) in comparison with Austria and Germany, the neighbouring representatives of Western European countries.

The issue of within-couple earnings inequality, especially in international comparisons, is widely influenced by many mutually interconnected aspects, such as female labour supply, total gender wage gap in a country, female human capital, and family relations and division of roles within couples.

Next chapter comments on the empirical background in the Czech Republic regarding this topic and on the results we might expect. In general, the higher the female employment rate, the higher the share of couples with both partners employed and the lower the overall within-couple inequality. Also, a nation-wide low level of gender
wage gap usually implies low earnings inequality within individual couples. Education has a direct positive impact on wages as well as on female labour market participation (e.g., Rubery et al., 2001). Family circumstances, mainly the presence of children and attitudes to childcare, also strongly influence female labour supply.

Chapter 3.3 characterizes the data source applied in this analysis, its quality and limitations, and describes the method of measuring within-couple inequality. It also comments on characteristic features of the sample couples, as they play a very important role in international comparison of within-couple earnings inequality.

The factual analysis starts in Chapter 3.4. First I look at features which seem to play the most crucial role in relative earnings within a couple, e.g. relative education and age of the partners and presence of children. Since the within couple inequality is directly affected by the employment of both partners, Chapter 3.5 focuses on dual-earner couples only.

The most common earnings distribution within couples is the traditional one, i.e. the man earns more than the woman. However, women whose earnings exceed those of their partners are gradually gaining their place in the society (e.g. Drago et al., 2005) and are addressed in Chapter 3.6.

In order to judge the position of cohabiting women from a different perspective, the last analytical chapter develops the preceding investigation and examines the gender wage gap separately for cohabiting and single individuals. Among other factors, the within-couple earnings inequality is influenced by characteristics of both the couples and the individual partners. However, women with their family (and children) responsibilities might be disadvantaged in terms of wages and potentially discriminated by their employers due to possible lower working effort and the like.
Apart from this, a woman living in a couple also tends to make different choices in terms of career, type of job etc. than a single woman. Therefore, Chapter 3.7 also examines the wage gap between single and cohabiting women. It reveals the extent to which the wage gap between single and cohabiting women is caused by the difference in observed individual human capital and job related characteristics.

The final chapter summarizes the findings and highlights the similarities and dissimilarities between the Czech Republic and the group of Central-East European countries as well as the two Western countries.

3.2 General remarks

There exist a wide evidence and consensus that employment patterns, especially female, underwent significant changes during the last decades. Partnership (family) relations have been changing too, especially in developed countries. Households of single-parents and single-persons have been gaining importance and the traditional family, married couple with children, has become less frequent (e.g. Martin and Kats, 2003). We have witnessed a mismatch between the changing within-family labour supply in favour of women and the traditional division of roles within the family. This may erode the traditional family model and reflect in demographic development. Here, economics of household can deliver some answers of potential social and economic relevance such as how different are relative earnings in households with and without children, or what are the differences between within-household employment patterns in the examined countries.

Earnings inequality within couples has been recently widely analyzed in the context of economic theory of unitary model of household behaviour and income pooling in
households. Many recent studies have rejected the assumption of income pooling since income distribution within a household influences, for instance, decision-making, expenditures on consumption, and/or the satisfaction of individual household members (see, e.g., Bonke and Browning, 2003; Bonke, 2006; Ermisch and Pronzato, 2008; Thomas, 1990; Heimdal and Houseknecht, 2003; Browning et al., 1994; Lundberg et al., 1996; Phipps and Burton, 1998; Tiefenthaler, 1999). Therefore, unequal access to financial resources within couples could have a significant impact on the living standard and well-being of both partners.

Earnings inequality within couples is commonly measured as the woman’s share on total couple’s earnings (see, e.g., Winkler et al., 2005). The empirics showed that the highest and the lowest within-couple inequality may be found in Southern Europe and Scandinavia, respectively. Bonke (2006) shows that in most South European countries women participation in the total personal income in the household amounts to 20% and even less in Portugal. The opposite extreme is in Denmark, where women’s incomes account for around 40% of total household income. Figari et al. (2011) explored the effects of tax and benefit systems on differences in income and on incentives to earn income among men and women within couples in nine old EU member states. They found out that that on the scale of female contribution to pre-tax and benefit income, Greece ranks lowest as opposed to Finland which occupies the highest ranks.

One of the main focus areas of this essay will be a comparison between the four Central-East European (CEE) countries generally missing in the recent European empirics and the two Western countries occupying rather a mid part of European within-couple-inequality scale. The current discrepancy in within-couple earnings inequalities in CEE and Western countries might be due to recent experience of communism.
The “full employment policy” under the communist regime caused that in the 1990s female employment rate in CEE was much higher than the one in Western European countries. While ever since then female employment rate had been steadily rising in the West, the same cannot be said about the CEE countries, where female employment had been declining in some cases. At the end of the 2010s, Western countries saw the highest employment rate of women aged 25 to 55 (75–80%), followed by the Czech Republic (around or slightly under 75%). The other CEE countries exhibited lower values (around 67–72%).

Although female employment rate in the Czech Republic is similar to one in Western countries, there is one significant difference – the gender employment gap. While this gap had been rapidly and evenly decreasing in the two Western countries from about 25 percentage points in the early 1990s to roughly 10 percentage points in the late 2010s, it had been steadily growing during the whole transition period in the Czech Republic, until it reached the current 17 percentage points. Although in the early 1990s the gaps in other CEE countries were comparable to the relatively low values in the Czech Republic, they eventually further declined to resemble those in the Western countries.

To sum it up, while the relatively high female employment rate puts the Czech Republic among Western countries, in terms of gender employment gap the Czech Republic differs from the rest of the observed countries. The female share on the total couple earnings is therefore expected to be lower and, as a consequence, the within-couple earnings inequality to be higher in the Czech Republic than in the other CEE countries.

Given the gender differences in employment, earnings inequality in dual-earner couples might reveal a more reliable picture. Drago et al. (2005) claim that today man are less likely the only bread-winners and that dual-earner married couples have become more

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31 OECD data stemming from Labour Force Survey.

Earnings Inequality within Couples
frequent (which has been confirmed also for the U.S.). In many dual-earner couples the woman still holds the position of secondary earner although the share of women who contribute equally to the couples’ budget or even outearn their partners has been increasing (see, e.g., Raley at al., 2006, for U.S. evidence). Winkler et al. (2005) show that in 21-24 % of cases women in dual-earner married couples outearned their husbands in 1999 in the U.S. According to them, this pattern usually applies to childless couples and couples with higher relative education of the woman. Surprisingly enough, this phenomenon was not linked to younger cohorts.

As opposed to the rich evidence from the U.S., we have only little knowledge about the earnings inequality within dual-earner couples in the CEE countries. The empirics on overall gender wage inequality recorded substantial differences among the observed CEE countries (see also the second essay). Although the linkage between the overall gender wage gap and earnings inequality within dual-earner couple is not straightforward, we can expect the female share on dual-earner couple earnings in Hungary and Poland to be higher than in the other analyzed countries. Similarly we can expect these two countries to have a higher share of “non-traditional” couples, i.e. couples where women outearn their partners. Based on the U.S. evidence (e.g. Winkler et al., 2005) we can anticipate that earnings inequality within dual-earner couples as well as the incidence of non-traditional couples are likely to be highly influenced by female relative education and the absence of children.

Human capital of women has markedly increased over the last decades. According to Einarsdóttir (2002), the number of tertiary students has more than doubled in the last 20 years in the EU, and in 1997 more women than men graduated in almost all EU countries. The gender differences in education are related to subjects studied rather than level of attainment nowadays (Rubery et al., 2001).
Eurostat data offer several interesting figures related to tertiary education: All countries analyzed in this essay saw rapid increase in the share of women with tertiary education during the 2000s and the gender tertiary-education gap had been steadily narrowing. In 2010, the Czech Republic achieved an almost equal share of highly educated men and women and the percentage of women with tertiary education even exceeded that of men in the other CEE countries (up to 7 percentage points in Poland). On the contrary, in Austria and Germany there are more men with tertiary education than women (3 and 5 percentage points, respectively). Given the effect of education on female labour market participation and wage level, this further underlines our hypothesis of higher within-couple earnings inequality in the Czech Republic (and Western countries) than in the other CEE countries.

Given that usually the number of hours worked by women is lower (e.g. Einarsdóttir, 2002), the final analysis will address the gender hourly-wage gap separately for individuals living in a couple and for singles. Many studies on gender wage gap look at all employees (see for example Christofides at al., 2010) or married couples (e.g. Nicodemo, 2009). My intention, however, is to look at all cohabiting individuals (not only married couples). This comparison should reveal whether women get penalized for living in partnership by higher gender wage inequality.

Certain proportion of gender wage gap is commonly attributed to gender differences in individual and job characteristics. Often when family and children enter the picture, which often leads to an interrupted working career, the characteristics of cohabiting women deteriorate. The difference in characteristics between cohabiting women and cohabiting men might be substantially higher in comparison with their single counterparts. This analysis aims to answer whether the gender wage gap for cohabiting individuals and singles vary substantially even if we disregard gender differences in
observed characteristics. Similarly, the differences in individual and job characteristics can play a significant role in forming the wage gap between single and cohabiting women. This analysis will show the extent to which the supposed wage gap between single and cohabiting women can be attributed to different observable individual and job characteristics of these two groups of women.

3.3 Survey data

This analysis is based on EU-SILC 2009 data which contains annual gross earnings from employment and self-employment for previous calendar year, i.e. 2008. The relative earnings within couples have been measured as a female share of women’s earnings on the total earnings of the couple (both from employment and self-employment). In other words, if the female earnings are A and the male earnings are B, then the relative earnings equal A / (A + B). Therefore, if a woman and a man contribute equally to the couple’s budget, the female share of couple earnings will be 50%.

For the purposes of this essay I consider “working individuals” (e.g. for purposes of defining a sample of dual-earner couples) to be individuals who had been economically active for at least a half of the previous calendar year. Alternatively, some other empirics define a “working individual” as someone with positive annual earnings. However, the earnings of an individual working one month would be hardly comparable to earnings of another one working the whole year. In my opinion, by concentrating on the “prevailing economic activity” rather than simply looking at “positive earnings” the intensity and stability of employment is better captured and a more accurate picture about earnings inequality within a couple is provided.
Due to its wide coverage of income sources of all family members and its harmonization on the European level EU-SILC is the most suitable dataset for comparative analysis of within-couple earnings inequality. Despite this, it has (as every household survey) some limitations which might be relevant for gender earnings issues. Although annual earnings provided by EU-SILC should include main, secondary and all supplementary income, it is probable that real earnings are under-represented in the survey. This is because the survey may fail to record income from informal economy and secondary jobs which, despite taking place in formal economy, remain unaccounted for.

The unrecorded incidence of informal economy and secondary jobs could influence the gender-based findings of this thesis in several ways. First, informal labour is more common for men than women (see Grabowski, 2003, for Poland) and, thus the gender disparity in annual earnings might in reality be higher. At the same time, real female employment and women’s contribution to family budget can be undervalued in the survey, also because women often work as auxiliary workers in small family firms, without receiving official salary.

Second, the size of informal economy seems to differ among the CEE countries, with relatively higher levels in Hungary and Poland. According to rare comparative empirics on informal economy in the CEE countries, the informal economy had been decreasing in all the four CEE countries analyzed here as early as during the 1990s (Wallace et al., 2004, or Grabowski, 2003, for Poland). However, the attempts to measure informal economy provide only approximate data, have obvious drawbacks, and it is difficult to evaluate the impact of the obtained data on the findings of this thesis. Regarding the second jobs, EU-SILC seems to record even higher incidence of second jobs than Labour Force Survey (EU-LFS), while naturally both cases are probably even

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undervalued.\textsuperscript{32} Notwithstanding the unclear influence of underreported earnings from informal labour and secondary jobs on the findings of this thesis, a possible bias should be taken into account.

The sample used in the analysis of within-couple earnings inequality consists of couples living in the same household irrespective of the legal status of their partnership. I excluded couples in which at least one member collects a retirement pension and couples who share their household with other adults. I consider "other adults" to be those who are 25+ or individuals between 16 and 24 who earn their own income or no longer live with their parents. On the other hand, those under 16 or between 16 and 24 who do not have their own earned income, live with parents, and are not in a couple are defined as “dependent children”. In other words, the sample includes households of two adults living in a partnership in which the only possible other members are their dependent children. This is so, first, the male and female shares of earnings represent the total household earnings and, second, the other household members’ economic in/activity or income cannot have any impact on the couple’s decision to work.\textsuperscript{33}

I set an age limit on the couples so that all the adults are between 25 and 54 years old, i.e. they are in their prime earnings age. I decided to exclude couples in which the male or the female gross earnings were negative and in which the couple’s total gross earnings were non-positive, since in these cases I cannot guarantee that the relative earnings within the couple will range between 0 and 100%.

\textsuperscript{32} Eurostat database utilizing EU-LFS provides information on employment as well as employed persons with a second job. EU-SILC provides information on hours worked in main job and hours worked in second and other jobs. Compared to same figures from 2009, both databases show practically the same ranking of countries in terms of secondary jobs incident (from bottom to top: SK, HU, CZ, AT/DE, PL). EU-SILC recorded higher values, ranging from 1.8% in Slovakia to 7.9% in Poland.

\textsuperscript{33} The presence of grandparents in a household could have a significant positive impact on the employment rate of mothers (see, e.g., Martin and Kats, 2003).
The characteristics of the countries in the sample are presented in Table 3.1. The Czech Republic has shown the highest share of women who worked the prevailing part of the year (90%) as well as the share of dual-earner couples (88%). This is not surprising since the employment rate of women aged 25 to 54 in 2008 was similar to the investigated Western countries and higher than in the rest of the CEE countries.\(^3\) On the other hand, the Czech Republic exhibits the lowest percentage of couples in which women are the sole earners (2%). This ranking is led by Poland and Hungary with 9% and 6%, respectively. Hungary is also the country with the highest share of one-earner couples (36%).

**Table 3.1**  Sample characteristics: Couples (% of total sample)

<table>
<thead>
<tr>
<th></th>
<th>CZ</th>
<th>HU</th>
<th>PL</th>
<th>SK</th>
<th>AT</th>
<th>DE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woman worked (6+ months)*</td>
<td>89.6</td>
<td>67.4</td>
<td>74.4</td>
<td>81.6</td>
<td>72.4</td>
<td>73.5</td>
</tr>
<tr>
<td>Man worked (6+ months)*</td>
<td>97.9</td>
<td>91.8</td>
<td>88.4</td>
<td>97.2</td>
<td>95.5</td>
<td>93.7</td>
</tr>
<tr>
<td>Man only worked*</td>
<td>10.0</td>
<td>30.2</td>
<td>23.1</td>
<td>18.0</td>
<td>26.2</td>
<td>24.8</td>
</tr>
<tr>
<td>Woman only worked*</td>
<td>1.7</td>
<td>5.8</td>
<td>9.1</td>
<td>2.3</td>
<td>3.1</td>
<td>4.6</td>
</tr>
<tr>
<td>Both worked*</td>
<td>87.8</td>
<td>61.6</td>
<td>65.3</td>
<td>79.3</td>
<td>69.3</td>
<td>68.9</td>
</tr>
<tr>
<td>Neither worked*</td>
<td>0.4</td>
<td>2.4</td>
<td>2.5</td>
<td>0.5</td>
<td>1.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Man has higher education</td>
<td>13.1</td>
<td>16.3</td>
<td>8.2</td>
<td>11.6</td>
<td>29.3</td>
<td>29.9</td>
</tr>
<tr>
<td>Same level of education</td>
<td>74.9</td>
<td>62.3</td>
<td>69.2</td>
<td>75.3</td>
<td>50.9</td>
<td>52.7</td>
</tr>
<tr>
<td>Woman has higher education</td>
<td>12.1</td>
<td>21.3</td>
<td>22.6</td>
<td>13.2</td>
<td>19.8</td>
<td>17.4</td>
</tr>
<tr>
<td>Older partner aged under 40</td>
<td>53.7</td>
<td>47.7</td>
<td>54.5</td>
<td>47.0</td>
<td>40.3</td>
<td>43.6</td>
</tr>
<tr>
<td>Older partner aged 40+</td>
<td>46.3</td>
<td>52.3</td>
<td>45.5</td>
<td>53.0</td>
<td>59.7</td>
<td>56.4</td>
</tr>
<tr>
<td>With dependent children (24+)</td>
<td>81.4</td>
<td>81.0</td>
<td>80.3</td>
<td>85.6</td>
<td>73.1</td>
<td>66.8</td>
</tr>
<tr>
<td>Without dependent children (24+)</td>
<td>18.6</td>
<td>19.0</td>
<td>19.7</td>
<td>14.4</td>
<td>26.9</td>
<td>33.2</td>
</tr>
<tr>
<td>Married couple</td>
<td>83.4</td>
<td>82.7</td>
<td>86.8</td>
<td>96.6</td>
<td>79.1</td>
<td>82.0</td>
</tr>
<tr>
<td>Not married</td>
<td>16.6</td>
<td>17.3</td>
<td>13.2</td>
<td>3.4</td>
<td>20.9</td>
<td>18.0</td>
</tr>
<tr>
<td>N</td>
<td>2253</td>
<td>2208</td>
<td>3108</td>
<td>1232</td>
<td>1386</td>
<td>3074</td>
</tr>
</tbody>
</table>


Notes: *Based on the prevailing economic activity, which was derived according to number of months when the main activity of respondent was full-time or part-time work.

Poland and Hungary have the largest share of couples with an education gap in favour of the woman (23% and 21%, respectively), while the share of such couples is extremely low in the Czech Republic and Slovakia (12% and 13%, respectively). In

\(^3\) Figures from OECD database based on Labour Force Survey.
Slovakia and in the Czech Republic, educational homogamy appears to be much higher than in the other countries studied – 75% have the same level of education. Austria and Germany have the largest share of couples in which the man achieved a higher level of education compared to the woman (30%).

The very sample characteristics of the couples indicate that the Czech Republic does not fully fall into neither of the two groups of analyzed countries. Czech couples are unique in relatively high female employment, in a high share of couples who do not rely on one partner as a sole source of earned income, and in a low share of couples with an education gap in favour of the woman.

The analysis so far captures annual earnings and leaves the impact of hours worked (or of part-time work) aside. Although the recent literature (e.g. Winkler at al., 2005) often include annual earnings, it is also emphasized (e.g. Drago et al., 2005) that it smoothes and hides earnings fluctuations. However, this analysis aims to capture actual earnings inequality instead of “potential” or “hypothetical”, which is what hourly earnings would provide. Unless analyzing the persistence/fluctuations of within-couple earnings inequality in one year, I consider the annual earnings an appropriate measure of earnings inequality experienced by couples.\textsuperscript{35}

Moreover, EU-SILC provides information only on annual earnings of the previous calendar year. Monthly or hourly earnings would have to be derived from monthly economic activity and current hours worked. Therefore, it would smooth the earnings fluctuations anyway. This has an even more striking impact on the earnings of self-employed who have also been included in the sample and whose earnings and working hours tend to be irregular. Hourly earnings can only be deduced from the current

\textsuperscript{35} Using the EU-SILC database, the persistence of within-couple inequality could be analyzed only by applying the longitudinal dataset which would cover more years. It is my next intended analysis in this field of research.
number of hours worked and monthly economic activity; their level might therefore be extremely biased for the self-employed. However, excluding the self-employed from the sample, i.e. couples where at least one of the partners had been self-employed for any month during the income reference period, is inappropriate as it would reduce the sample and distort its structure.

Usual hours worked differ typically for men and women, therefore, I have supplemented the analysis with the hourly wage gap between cohabiting men and women in general. Chapter 3.7 explores only earnings of employees since, as mentioned above, earnings of self-employed may distort the analysis. The sample analyzed in Chapter 3.7 no longer includes matched couples, instead it looks at cohabiting individuals. The previous restrictions on the couple sample are no longer applied.36 Furthermore, it also includes a sample of single individuals to compare the gender wage gap for cohabitating and single individuals. The sample in Chapter 3.7 thus consists of a sub-sample of all cohabitating adult persons and a sub-sample of adult singles, aged 25 to 54, irrespective of the presence of other household members.

Hourly wages are derived from current number of hours worked and monthly economic activity over the whole calendar year. Individuals who changed job during the income reference calendar year are excluded in order to avoid a situation where the current hours worked and job characteristics are not related to the reported earnings.

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36 Couples living with other adults in the household, couples where at least one member collects a retirement pension, and couples with total non-positive income are no longer excluded.
3.4 Relative earnings within couples

Austria and Germany with 29.3%, followed by the Czech Republic (29.5%), lead the ranking of countries with the lowest female share on couple earnings and consequently the highest earnings inequality within couples. Within-couple earnings inequality is lower in all the other CEE countries, around 35% (see Table 3.2).

Note that according to European studies on similar topic (Bonke, 2006; Figari et al., 2007) the Western countries included in this study are in no way extreme. To get a complete picture of the situation across Europe, see Figure A.3 in Annex 3. Although due to different data, definition of income, sample definitions and year of surveys applied we should be cautious about comparing my picture with recent European empirical findings, the qualitative results are in concordance.

Bonke (2006) uses data from 1994 to show that the share of women’s income in total personal net income in the household was about 20% in most Southern European countries, the most extreme of which was Portugal. For the opposite extreme we need to go to Denmark, where women’s income accounts for around 40% of total household income. According to Figari et al. (2007) women contributed the least to pre-tax and benefit income in Greece (19%) and the most in Finland (41%) in the late 1990s. Their study also looked into Austria and Germany. The respective values of 28% and 30% are quite similar to those in this study.

Figure A.3 in Annex 3 shows a similar picture – with 27% in Greece and 28% in Italy Southern Europe shows the highest within couple earnings inequality, while Scandinavian countries are located at the opposite tail with values ranging between 37% and 40%. Among the countries analyzed in this study Austria and Germany together with the Czech Republic are located rather at the bottom part, while Poland, Hungary,
and Slovakia are situated in the middle. Note that the within-couple earnings inequality in the Czech Republic is higher than in all other European transition countries.

The Czech Republic has the lowest share of couples where women outearn their partners (15%) while women earn more than men in more than one quarter of couples in Hungary and Poland. Winkler et al. (2005) show that this figure was between 19% and 21% (depending on the data source applied) in U.S. in 1999. Drago et al. (2005) showed similar results for Australia in 2001–2002 with around 20% of female breadwinner couples. In Australia female breadwinner couples tend to be older than the male ones, women in such couples are significantly more likely to have tertiary education, and they are less likely to be parents. The characteristics of “female breadwinner” or “non-traditional” couples will be analyzed for dual-earner couples in Chapter 3.6 in more detail.

Not surprisingly, relative earnings within couples are higher for the richest compared to the poorest quintile in all countries. The intuition is simple: the higher are couples located at the earnings distribution the more probable they are dual-earner couples and, hence, the females contribute to the couple’s earnings more frequently.

Relative education is strongly related to within-couple inequality in all countries. In couples with education gap in favour of the woman, female share on couple earnings is by 8 to 19 percentage points higher compared to couples where men have higher education than their significant others. The exception is Austria where this difference

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37 Winkler et al. (2005) define standard and alternative categorization schemes of couple types. According to the standard one, a couple is called “non-traditional” if a woman has higher earnings than her counterpart, i.e. if woman’s earnings are A and man’s earnings are B, then A>B or A/(A+B)>50%. A traditional couple is then defined by B≥A or A/(A+B)≤50%. This categorization is applied in this study too. Alternative categorization avoids defining a couple as non-traditional in situations when, e.g., the woman earns only by one dollar more than her partner. It makes it by defining an additional middle category of “egalitarian” couples if each of the partners earn 40% to 60% of the total couple earnings.

38 Drago et al. (2005) also use a kind of alternative categorization for defining three types of couples: male breadwinner, female breadwinner and “about equal” where the last one includes couples where the man and woman earned within 10% of each other. They replicated their results also with a 5% cut-off with minimal effects on results.

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makes only 4 percentage points and, moreover, the difference of means is statistically insignificant. If women have higher education than their counterparts the within-couple earnings distribution is getting far closer to equal in Slovakia (44%), Poland (42%), and Hungary (41%) while it remains at 33% in the Czech Republic. In addition to higher relative education of women, there are other factors which contribute to within-couple earnings equalizing: higher age (with the exception of Germany), living without children, and not being married.

Table 3.2  Relative earnings – total couple sample

(female share in % of couple earnings)

<table>
<thead>
<tr>
<th></th>
<th>CZ</th>
<th>HU</th>
<th>PL</th>
<th>SK</th>
<th>AT</th>
<th>DE</th>
</tr>
</thead>
<tbody>
<tr>
<td>All couples</td>
<td>(29.5)</td>
<td>(35.1)</td>
<td>(34.6)</td>
<td>(35.5)</td>
<td>(29.3)</td>
<td>(29.3)</td>
</tr>
<tr>
<td>Couples in which women outearn men (% of total couple sample)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottom quintile</td>
<td>19.4*</td>
<td>27.9*</td>
<td>25.9*</td>
<td>28.0*</td>
<td>26.7*</td>
<td>26.4*</td>
</tr>
<tr>
<td>Top quintile</td>
<td>34.3</td>
<td>34.8</td>
<td>38.4</td>
<td>36.4</td>
<td>34.9</td>
<td>35.3</td>
</tr>
<tr>
<td>Man has higher education</td>
<td>25.0*</td>
<td>29.8*</td>
<td>23.7*</td>
<td>31.4</td>
<td>27.2</td>
<td>21.8*</td>
</tr>
<tr>
<td>Same level of education</td>
<td>29.8</td>
<td>34.5</td>
<td>32.8</td>
<td>34.7</td>
<td>29.6</td>
<td>30.9</td>
</tr>
<tr>
<td>Woman has higher education</td>
<td>32.9</td>
<td>40.5*</td>
<td>42.3*</td>
<td>44.1*</td>
<td>31.5</td>
<td>37.8*</td>
</tr>
<tr>
<td>Older partner aged under 40</td>
<td>24.7*</td>
<td>28.4*</td>
<td>32.9*</td>
<td>30.9*</td>
<td>26.4*</td>
<td>31.0*</td>
</tr>
<tr>
<td>Older partner aged 40+</td>
<td>35.1</td>
<td>41.1</td>
<td>36.6</td>
<td>39.6</td>
<td>31.2</td>
<td>28.1</td>
</tr>
<tr>
<td>With dependent children</td>
<td>27.2*</td>
<td>32.2*</td>
<td>32.5*</td>
<td>34.7*</td>
<td>25.5*</td>
<td>22.8*</td>
</tr>
<tr>
<td>Without dependent children</td>
<td>39.6</td>
<td>47.4</td>
<td>43.0</td>
<td>40.4</td>
<td>39.5</td>
<td>42.4</td>
</tr>
<tr>
<td>Married couple</td>
<td>29.5</td>
<td>34.8</td>
<td>33.9*</td>
<td>35.4</td>
<td>27.7*</td>
<td>26.8*</td>
</tr>
<tr>
<td>Not married</td>
<td>29.7</td>
<td>36.3</td>
<td>39.4</td>
<td>40.3</td>
<td>35.1</td>
<td>41.0</td>
</tr>
<tr>
<td></td>
<td>(23.1)</td>
<td>(27.1)</td>
<td>(28.9)</td>
<td>(29.9)</td>
<td>(24.5)</td>
<td>(24.6)</td>
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</tbody>
</table>

N1: 2253 2208 3108 1232 1386 3074

Notes: Means, standard deviations in parenthesis. Couple gross earnings quintiles are calculated using the modified OECD equivalence scale. *Difference of means significant at 5% (t-test). For the level of education the mean is compared to the mean when having the same level of education. ¹ Unweighted.
3.5 Earnings inequality in dual-earner couples

As both partners work in 88% of all couples in the Czech Republic, the relative earnings of all couples and the relative earnings of the dual-earner subsample do not differ much (1.7-percentage-point growth). However, if we look at other countries, where the share of dual-earner couples is much lower, we see that this difference is substantially more profound, from 4.8 percentage points in Germany to 9.7 percentage points in Hungary (see Tables 3.2 and 3.3).

In the Czech Republic, the difference in relative earnings between the top and the bottom quintile is rather strong. It is the only country where the female share of couple earnings declines at the bottom quintile if one- and none-earner couples are excluded. This exceptional finding is driven by a combination of two facts: First, in all the countries, in around 50% of all couples in the bottom quintile men are the sole breadwinners, while it is only roughly 20% in the Czech Republic. Excluding these couples would bring about a substantial increase of relative earnings, an effect prevailing in all other countries but not as strong in the Czech Republic.\(^{39}\) And second, in the Czech Republic the share of women who outearn men decreases substantially (from 14% to 10%) in the bottom quintile if one- and none-earner couples are excluded (the same applies to Western countries).

The relative dual-couple earnings are even higher in the poorest couples than in the richest couples in Hungary.\(^{40}\) Hungarian women in the bottom quintile contribute to the family budget with almost as much as their partners. Moreover, 37% of these women outearn their partners (compared to 10% in the Czech Republic). However, note that this might not mean the women’s success in the labour market. The earnings of both

\(^{39}\) Note that earnings cutpoints between particular quintiles differ for the total couple sample and the dual-earner sub-sample.

\(^{40}\) And also in Slovakia where, however, the difference is statistically insignificant.
partners are likely to be crucial for the family budget in the poor couples. It only suggests that earnings of both partners are low, although men’s are even lower. 41

Table 3.3  Relative earnings – dual-earner couples

(female share in % of couple earnings)

<table>
<thead>
<tr>
<th></th>
<th>CZ</th>
<th>HU</th>
<th>PL</th>
<th>SK</th>
<th>AT</th>
<th>DE</th>
</tr>
</thead>
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<td><strong>Dual-earner couples</strong></td>
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<td>40.8</td>
<td>40.9</td>
<td>35.5</td>
<td>34.1</td>
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<tr>
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<td>(20.2)</td>
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<td>(20.7)</td>
<td>(14.5)</td>
<td>(16.3)</td>
<td>(19.4)</td>
</tr>
<tr>
<td>Couples in which women outearn men (% of dual-earner couple sub-sample)</td>
<td>14.9</td>
<td>33.5</td>
<td>29.2</td>
<td>17.4</td>
<td>16.2</td>
<td>19.6</td>
</tr>
<tr>
<td><strong>Bottom quintile</strong></td>
<td>17.0*</td>
<td>48.0*</td>
<td>33.6*</td>
<td>42.3</td>
<td>32.5*</td>
<td>27.1*</td>
</tr>
<tr>
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<td>(23.0)</td>
<td>(16.6)</td>
<td>(27.8)</td>
<td>(21.3)</td>
<td>(19.8)</td>
<td>(22.5)</td>
</tr>
<tr>
<td><strong>Top quintile</strong></td>
<td>36.3</td>
<td>40.1</td>
<td>40.5</td>
<td>38.8</td>
<td>36.6</td>
<td>38.2</td>
</tr>
<tr>
<td></td>
<td>(17.9)</td>
<td>(18.0)</td>
<td>(18.9)</td>
<td>(14.2)</td>
<td>(15.4)</td>
<td>(17.1)</td>
</tr>
<tr>
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<td>37.0*</td>
<td>32.6*</td>
<td>36.0*</td>
<td>34.0</td>
<td>27.7*</td>
</tr>
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<td>(15.0)</td>
<td>(18.8)</td>
<td>(14.6)</td>
<td>(15.3)</td>
<td>(18.6)</td>
</tr>
<tr>
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<td>39.6</td>
<td>40.3</td>
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<td></td>
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<td>(20.3)</td>
<td>(14.0)</td>
<td>(16.3)</td>
<td>(18.7)</td>
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<tr>
<td>Woman has higher education</td>
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<td>46.5*</td>
<td>48.2*</td>
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<td>(21.2)</td>
<td>(14.5)</td>
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<td>(19.6)</td>
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<td>Older partner aged under 40</td>
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<td>34.5</td>
<td>37.1*</td>
</tr>
<tr>
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<td>(15.5)</td>
<td>(19.3)</td>
<td>(14.8)</td>
<td>(17.6)</td>
<td>(18.9)</td>
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<tr>
<td>Older partner aged 40+</td>
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<td>41.8</td>
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<td>(22.4)</td>
<td>(14.3)</td>
<td>(15.6)</td>
<td>(19.5)</td>
</tr>
<tr>
<td>With dependent children</td>
<td>28.7*</td>
<td>44.3</td>
<td>39.7*</td>
<td>40.5*</td>
<td>32.8*</td>
<td>28.6*</td>
</tr>
<tr>
<td></td>
<td>(20.5)</td>
<td>(16.1)</td>
<td>(20.9)</td>
<td>(14.8)</td>
<td>(16.3)</td>
<td>(18.8)</td>
</tr>
<tr>
<td>Without dependent children</td>
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<td>46.3</td>
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<td>(20.0)</td>
<td>(12.7)</td>
<td>(14.9)</td>
<td>(17.1)</td>
</tr>
<tr>
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<td>40.6</td>
<td>40.7</td>
<td>34.4*</td>
<td>32.1*</td>
</tr>
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<td>(20.8)</td>
<td>(14.2)</td>
<td>(16.0)</td>
<td>(19.8)</td>
</tr>
<tr>
<td>Not married</td>
<td>31.4</td>
<td>45.4</td>
<td>44.4</td>
<td>45.9</td>
<td>39.3</td>
<td>42.5</td>
</tr>
<tr>
<td></td>
<td>(20.6)</td>
<td>(16.2)</td>
<td>(19.1)</td>
<td>(21.6)</td>
<td>(16.9)</td>
<td>(15.4)</td>
</tr>
<tr>
<td>N1</td>
<td>2025</td>
<td>1343</td>
<td>1972</td>
<td>980</td>
<td>976</td>
<td>2127</td>
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</tbody>
</table>

Notes: Means, standard deviations in parenthesis. Couple gross earnings quintiles are calculated using the modified OECD equivalence scale. *Difference of means significant at 5% (t-test). For the level of education the mean is compared to the mean when having the same level of education. † Unweighted.

Even in dual-earner couples there is a noticeable difference in the average relative earnings based on which partner achieved a higher level of education. Female share of couple earnings is 5 to 15 percentage points higher in couples with higher relative earnings. 41

41 See Drago et al. (2005) for a discussion on reasons for becoming a female breadwinner family and division into two types of female breadwinner couples – one driven by economic reasons and the second one by an ideology of gender equity.

Earnings Inequality within Couples
Earnings Inequality within Couples

Education of female partner compared to couples where the man have higher education. Higher education of women seems to have only a slight impact in the Czech Republic where the relative earnings remain at approximately 33%. The Czech Republic differs markedly from the other CEE countries where near earnings equality in couples prevails if women have higher education, i.e. female share of total gross earnings is approximately 50%.

Living without children in dual-earner couples also brings the earnings considerably close to gender equality, especially in the Czech Republic. Other factors, such as higher age and not being married, do not seem to play a considerable role. The relative earnings in Czech couples with children stand at 28.7%, a value comparable to Western countries but strikingly lower than in the other CEE countries.

Presence of children seems to be the factor which deviates the Czech Republic from the other CEE countries in terms of relatively high within-couple earnings inequality. Since 80% of all couples have children in all CEE countries (while this share is roughly 10 percentage points lower in Western countries, see Table 3.1) the high within-couple earnings inequality might be driven by this factor in the Czech Republic.

This appears to be a promising direction for future research. I can only formulate a tentative hypothesis at this stage of research. This may be due to the extremely long parental leave in the Czech Republic which can last up till the child’s third birthday with guaranteed return to a job. Such a length is rather exceptional among European countries, where the shortest parental leaves last only several months (for more details, see, e.g., European Commission, 2005, 2009).

Nevertheless, long parental leave cannot deliver any explanation for different within-couple earnings inequality in the Czech Republic and Slovakia. These countries
underwent the same history as the former Czechoslovakia, therefore one would expect them to share traditions and attitudes to family role. Moreover, the systems of maternity/parental leave have experienced only minor changes from the separation in 1993 in both countries. However, there is one difference between the Czech Republic and Slovakia which might play a significant role in female labour market participation and within-couple earnings inequality – the use of childcare services. While, according to Kuchařová et al. (2009), only 3% of Czech children under three years of age attended childcare institutions in 2004, this share was nearly 18% in Slovakia in 2003. Higher availability and use of childcare services allows women to return back to work earlier which has a positive effect on sustaining their skills, work career and earnings.

The exceptional results for the Czech Republic might not have been driven only by institutional settings such as maternity/parental leave, (un)availability of childcare services or flexible work arrangements. Other influential factors might be traditions, perceptions of family roles and attitudes to childcare. It seems that Czech women do not “hurry” back to work (however, the question of what is a cause and what is a consequence is yet to be solved). According to RILSA (2006), only rarely did Czech women with one or more children return back to work before the end of three-year parental leave. Based on a research conducted in 2005, only 17% of mothers with one child returned to work before the child’s third birthday, 18% returned at the time their child turned three, 37% returned later and 28% stayed at home or became unemployed. About 70% of mothers with more children went continuously from one parental leave to another. Interrupting work career for such a long time has a negative impact on

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42 The Czech Republic underwent a change in parental leave system in 2008, however, it concerned only an introduction of three possible lengths of drawing the parental benefit, the three-year guaranteed return to the same job remained.
women’s human capital, skills, and, consequently, on their employability and earnings. Needless to say that consequences for within-couple earnings inequality are harsh.

Based on the results connected with the characteristics of the full couple sample (Table 3.2) and dual-earner couples sub-sample (Table 3.3), I can outline some general conclusions: (i) in terms of within-couple earnings inequality the Czech Republic resembles Western countries rather than the CEE; (ii) in accordance with my expectations the women’s share of couple’s earnings is lower in the Czech Republic than in the other CEE countries; (iii) the factors that are associated the most with lower within-couple earnings inequality are higher relative education of a woman in a couple and the absence of children (with an extremely strong effect in the Czech Republic and Western countries); and (iv) the Czech Republic shows some exceptional features even compared to Western countries concerning (a) only a moderate increase of relative earnings when only dual-earner couples are considered, (b) extremely high within-couple earnings inequality among the poorest quintile, (c) remarkably lower impact of higher female education than in other countries.

3.6 Women who outearn men

The share of dual-earner couples where women outearn their counterparts in the Czech Republic and Slovakia is similar to those in Western countries (see Table 3.3) although this figure is still the lowest in the Czech Republic (15%). The situation is quite different in Hungary and Poland where one third of women outearn their partners. In order to reveal further dis/similarities between the Czech Republic and the other CEE or Western countries this chapter will thoroughly look at these couples, often referred to as “non-traditional”, and their characteristics.
In Table 3.4, factors that are likely to be associated with couples where women outearn their counterparts (in other terms female breadwinner couples or “non-traditional couples”) are examined and their values are compared with ones of male breadwinner couples (or the so called “traditional couples”). The patterns observed are in accordance with those revealed by the U.S. study by Winkler et al. (2005): The share of couples with the education gap going in favour of women is higher for non-traditional than traditional couples, a smaller percentage of non-traditional couples has dependent children and younger couples are no more likely to be non-traditional than older ones (with the exception of Germany).

Concerning the couples’ total earnings distribution, the Czech Republic and Western countries differ from the rest of the CEE countries in the sense that non-traditional couples are more likely to be concentrated at the richest quintiles, compared with traditional couples. In the Czech Republic, 28.8% of non-traditional couples belong to the top quintile compared to only 18.4% of traditional couples, while in Slovakia, to choose one representative of the other group, only 18.2% of traditional couples fall into the bottom quintile compared to 28.2% of non-traditional couples.

This suggest that in the CEE countries with the exception of the Czech Republic, it is more common that women who outearn their partners have relatively low earnings but still make more than their partners. On the contrary, women in non-traditional couples in the Czech Republic (and Western countries) more often manage to outearn their partners despite the men’s relatively high earnings.

In all the analyzed countries, relative education plays a significant role. Compared to traditional couples more than twice the share of women in non-traditional couples have higher levels of education than their partners (for instance, 20.7% versus 10.7% in the Czech Republic and even 32.9% versus 10.2% in Slovakia).

*Earnings Inequality within Couples*
Table 3.4  Dual-earner couples by gender of the “outearning” partner (% of traditional and non-traditional couples)

<table>
<thead>
<tr>
<th></th>
<th>CZ</th>
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<th>PL</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
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<td>Female</td>
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<td>Female</td>
</tr>
<tr>
<td></td>
<td>(B≥A)</td>
<td>(A&gt;B)</td>
<td>(B≥A)</td>
<td>(A&gt;B)</td>
<td>(B≥A)</td>
<td>(A&gt;B)</td>
<td>(B≥A)</td>
<td>(A&gt;B)</td>
<td>(B≥A)</td>
<td>(A&gt;B)</td>
<td>(B≥A)</td>
<td>(A&gt;B)</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; (bottom) quintile</td>
<td>21.2</td>
<td>13.9</td>
<td>18.9</td>
<td>22.1</td>
<td>20.6</td>
<td>18.3</td>
<td>18.2</td>
<td>28.2</td>
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<td>20.5</td>
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<td>21.4</td>
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<td>19.7</td>
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<td>13.5</td>
<td>20.7</td>
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<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; quintile</td>
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<td>19.3</td>
<td>23.1</td>
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<td>29.8</td>
<td>22.4</td>
<td>29.6</td>
<td>14.0</td>
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<td>65.3</td>
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<td>71.6</td>
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<td>76.8</td>
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<td>55.3</td>
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<td>12.4</td>
<td>12.9</td>
<td>17.3</td>
<td>27.8</td>
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<td>63.2</td>
<td>57.8</td>
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<td>44.8</td>
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<td>63.7</td>
<td>49.4</td>
<td>39.8</td>
<td>37.4</td>
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<td>Older partner aged 25-34</td>
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<tr>
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<td>75.4</td>
<td>80.2</td>
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<td>47.1</td>
<td>33.5</td>
<td>60.4</td>
</tr>
<tr>
<td>Children 0-5</td>
<td>41.6</td>
<td>14.9</td>
<td>17.4</td>
<td>15.8</td>
<td>31.4</td>
<td>24.4</td>
<td>19.7</td>
<td>15.3</td>
<td>27.3</td>
<td>15.5</td>
<td>24.3</td>
<td>15.5</td>
</tr>
<tr>
<td>No children 0-5</td>
<td>58.4</td>
<td>85.1</td>
<td>82.6</td>
<td>84.2</td>
<td>68.6</td>
<td>75.6</td>
<td>80.3</td>
<td>84.7</td>
<td>72.7</td>
<td>84.5</td>
<td>75.7</td>
<td>84.5</td>
</tr>
<tr>
<td>Married</td>
<td>84.0</td>
<td>83.4</td>
<td>81.5</td>
<td>83.8</td>
<td>95.4</td>
<td>94.2</td>
<td>97.8</td>
<td>92.4</td>
<td>79.4</td>
<td>66.5</td>
<td>83.4</td>
<td>69.6</td>
</tr>
<tr>
<td>Not married</td>
<td>16.0</td>
<td>16.6</td>
<td>18.5</td>
<td>16.2</td>
<td>4.6</td>
<td>5.8</td>
<td>2.2</td>
<td>7.6</td>
<td>20.6</td>
<td>33.5</td>
<td>16.6</td>
<td>30.4</td>
</tr>
<tr>
<td>N&lt;sup&gt;1&lt;/sup&gt;</td>
<td>1736</td>
<td>289</td>
<td>899</td>
<td>444</td>
<td>1411</td>
<td>561</td>
<td>808</td>
<td>172</td>
<td>817</td>
<td>159</td>
<td>1727</td>
<td>400</td>
</tr>
</tbody>
</table>


Notes: A – female earnings, B – male earnings. Couple gross earnings quintiles are calculated using the modified OECD equivalence scale. <sup>1</sup> Unweighted.
Alternatively, if we focused on educational level of the whole couple instead of relative education within the couple, we would find a difference between the Czech Republic (plus Western countries) and the other CEE countries. Let’s look at couples with tertiary education: in the Czech Republic the share is higher among non-traditional couples (16.2%) compared to traditional ones (12.2%). This is not the case in the rest of the CEE countries while it holds true for Western Europe.

The issue of non-traditional couples further confirms my previous findings concerning disadvantaged position of mothers. The share of childless couples among non-traditional couples is higher than among traditional ones across all countries. The widest gap can be found in the Western countries and in the Czech Republic. If we look at couples with children under 5 years of age, the findings for the Czech Republic are yet more striking. The share of couples with one or more children under 5 is extremely low among Czech non-traditional couples compared with traditional ones (14.9% versus 41.6%) – none of the other CEE countries or the Western countries exhibit such a huge difference.

### 3.7 Cohabiting women versus single women

The analysis so far indicates the existence of substantial gender earnings inequality even within dual-earner couples. Nevertheless, so far I have only looked at annual earnings completely disregarding gender differences in work intensity. This is why this chapter will focus on hourly wages. In addition, the previous results showed that also marriage seems to penalize women in terms of higher within-couple earnings inequality. There may even be greater gender earnings inequality among couples than among singles. The
aim of this chapter is to find out whether and to what extent women living in a couple are disadvantaged in terms of their earnings compared to single females.

Figure 3.1 shows the difference between the mean log hourly male and female wages separately for cohabitating (both married and unmarried) and single individuals. The smallest gender wage gaps for both cohabiting and single sub-samples occurred in Poland and Hungary where the average single women’s wages are even higher than single men’s wages. The gender wage gap is substantially higher for cohabiting individuals in all countries; the biggest difference can be found in Germany and the smallest in Austria.

**Figure 3.1 Gender hourly wage gap (in log points and %)**

Several explanations can be provided for the differences in gender wage gaps of cohabiting and single individuals. First, male and female wages differ because men and women have different observable individual human capital and job related characteristics. Therefore, one reason for higher gender wage gaps for cohabiting
individuals might be that cohabiting women have ‘worse’ characteristics than single women. This might be related to the process of coupling itself or it might be due to the greater responsibilities cohabiting women have for family and/or children, which can cause the deterioration or lesser improvement of some characteristics of cohabitating women relative to single women.

Second, it is possible that single women face a more equal treatment, while cohabiting women get penalized with lower wages for their greater family responsibilities. However, this kind of possible discrimination is hard to measure since there are still other unobserved characteristics that can describe both the differences between men and women and between cohabiting and single individuals.

**Figure 3.2** Hourly wage gap between single and cohabiting women

(in log points and %)

![Figure 3.2](image)


Figure 3.2 shows a striking difference between average wages of single and cohabiting women. This wage gap is, in accordance with Figure 3.1, the highest in Germany and,
somewhat surprisingly, the smallest in Poland. This chapter will analyze the gender wage gap separately for cohabiting individuals and singles and also wage gap between single and cohabiting women in more detail.

3.7.1 Wage gap decomposition methodology

The sub-sample of cohabiting individuals applied in this chapter is different from the couple sample analyzed in the rest of this study (see Chapter 3.3). Hourly wage was computed on the basis of the Eurostat definition of the gender wage gap.\footnote{The hourly gross wage is the usual monthly gross income from a person’s main job divided by the quadruple of the number of hours usually worked per week in the person’s main job, including common overtime.}

Estimates obtained by wage regression model are used to provide a deeper insight into the structure of gender wage gaps. As a first step, this study applies a standard OLS wage regression model separately for men and women.\footnote{This analysis does not consider a sample selection bias. The sample selection bias might occur especially for women whose participation in the labour market is typically lower than men’s and, hence, working women might not create a random sub-sample of the female population. The significance of sample selection bias was tested for female subsamples by using the Heckman selection model (Heckman, 1979). Selection model proved to be relevant only for Polish and Hungarian subsample of cohabiting women; however, the difference in results of Heckman and standard OLS model was negligible.}

The dependent variable in the model is the logarithm of the gross hourly wage. The explanatory variables included in the male and female wage equations are the following: years of education, years of experience and its square, two dummies for the size of a local unit where an individual works, a dummy for an unlimited job contract, a dummy for a managerial position, a
dummy for living in densely populated cities,\textsuperscript{46} and nine dummy variables for occupational groups.\textsuperscript{47}

In the second step, Oaxaca-Blinder decomposition method (Oaxaca, 1973; Blinder, 1973) is applied:

\[
\ln W^M - \ln W^F = \beta^M \bar{X}^M - \bar{X}^F \) + \bar{X}^F (\beta^M - \beta^F)
\]

where expressions with a bar signify the mean values, \( M \) and \( F \) means male and female, respectively. The endowment effect is a component of the raw gender wage gap which is due to differences in individual and job characteristics between the genders. Remuneration effect is a part due to the differences in the rewards that the two genders receive for their individual and job characteristics (for more details, see the second essay).

The same methodology applies if a wage gap between single and cohabiting women is considered. Simply, in that case the two groups are not represented by males and females but by single women and cohabiting women instead.

3.7.2 Wage gap decomposition results

The gender wage gap decomposition is presented in Table 3.5. In the couples subsample, the endowment effect is mostly positive, which means that a certain part of the gender wage gap can be explain by men’s “better” characteristics.\textsuperscript{48} Note that in

\textsuperscript{46} A densely populated area is defined as a local unit with a density of more than 500 inhabitants per square kilometre and where the total population in the unit is at least 50,000 inhabitants.

\textsuperscript{47} The results of the regression models are not presented here, but they are available from the author upon request.

\textsuperscript{48} Mostly positive endowment effects were found also by Nicodemo (2009), who analyzed the gender wage gap using the 2006 data for married couples in five Western European countries (France, Italy, Portugal, Spain, and Greece).
Hungary this effect is even negative, which suggests that on average cohabiting working females have “better” characteristics than their male counterparts. Among singles, the endowment effect is negative in all countries but Germany.

Table 3.5 Gender wage gap decomposition (in log points)

<table>
<thead>
<tr>
<th></th>
<th>CZ</th>
<th>HU</th>
<th>PL</th>
<th>SK</th>
<th>AT</th>
<th>DE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couples</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wage gap</td>
<td>0.314</td>
<td>0.150</td>
<td>0.143</td>
<td>0.261</td>
<td>0.238</td>
<td>0.360</td>
</tr>
<tr>
<td>endowment effect</td>
<td>0.047</td>
<td>-0.030</td>
<td>0.000</td>
<td>0.026</td>
<td>0.063</td>
<td>0.161</td>
</tr>
<tr>
<td>remuneration effect</td>
<td>0.267</td>
<td>0.180</td>
<td>0.143</td>
<td>0.235</td>
<td>0.175</td>
<td>0.199</td>
</tr>
<tr>
<td>Singles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wage gap</td>
<td>0.109</td>
<td>-0.007</td>
<td>-0.112</td>
<td>0.138</td>
<td>0.143</td>
<td>0.088</td>
</tr>
<tr>
<td>endowment effect</td>
<td>-0.026</td>
<td>-0.102</td>
<td>-0.146</td>
<td>-0.032</td>
<td>-0.010</td>
<td>0.080</td>
</tr>
<tr>
<td>remuneration effect</td>
<td>0.135</td>
<td>0.095</td>
<td>0.034</td>
<td>0.170</td>
<td>0.153</td>
<td>0.008</td>
</tr>
</tbody>
</table>


Figure 3.3 shows the adjusted gender wage gap after subtracting the endowment effect, i.e. the part of the gap to be explained by different observed characteristics between genders. The adjusted gender wage gap represents an unexplained part of the gap, possibly including some kind of discrimination. The adjusted gender wage gaps remain relatively high and positive. After such adjustment the gender wage gap for singles in Poland or Hungary is no longer negative.

The disparity between the adjusted gender wage gaps for cohabiting and single sub-samples has narrowed compared to the raw (unadjusted) gender wages gaps in Figure 3.1. The reason is that the endowment effect for the singles sub-sample was negative in almost all countries while it was positive for the cohabiting sub-sample in the majority of countries. If the raw gender wage gap remains positive despite the fact that on average characteristics of single women are “better” than those of single men, then, as a
consequence, the difference in rewards to these characteristics has to be higher than the actually observed gap.

**Figure 3.3** Adjusted gender hourly wage gap (in log points)

![Adjusted gender hourly wage gap (in log points)](image)


Nevertheless, the gender wage gap adjusted for different gender individual and job characteristics is still higher for the sub-sample of cohabiting than for the singles. The gender differences in returns to characteristics might be a form of discrimination, apparently stronger against women living in a couple but it can also reflect some unobserved heterogeneity unrecorded by the model. Employers may possibly discriminate against women living in a couple relatively more than against single women due to their greater responsibilities for family and children or because they expect those women to have greater family commitments in near future. On the other hand, compared to single women, women living in a couple may make different choices in terms of their career, working effort, or have other unobservable characteristics.
In order to shed more light on the reason for wage gap between single and cohabiting women, Table 3.6 shows the wage gap decomposition. The endowment effect is positive in most countries, suggesting that single women have, on average, “better” observed characteristics than cohabiting women. The only exception is Poland, where the observed wage gap between single and cohabiting women is already close to zero. In all the other countries, a substantial part of the wage gap (ranging from 40% in the Czech Republic to more than 100% in Hungary) can be explained by the difference in observed characteristics.

Table 3.6  Decomposition of the wage gap between single and cohabiting women

<table>
<thead>
<tr>
<th></th>
<th>CZ</th>
<th>HU</th>
<th>PL</th>
<th>SK</th>
<th>AT</th>
<th>DE</th>
</tr>
</thead>
<tbody>
<tr>
<td>wage gap</td>
<td>0.033</td>
<td>0.040</td>
<td>0.006</td>
<td>0.043</td>
<td>0.031</td>
<td>0.138</td>
</tr>
<tr>
<td>endowment effect</td>
<td>0.013</td>
<td>0.043</td>
<td>-0.045</td>
<td>0.028</td>
<td>0.026</td>
<td>0.094</td>
</tr>
<tr>
<td>remuneration effect</td>
<td>0.020</td>
<td>-0.003</td>
<td>0.052</td>
<td>0.015</td>
<td>0.006</td>
<td>0.045</td>
</tr>
</tbody>
</table>


In Hungary, even more than 100% of the wage gap can be explained by the endowment effect, meaning that if we eliminated the differences in observed characteristics cohabiting women would be better remunerated for these characteristics. As shown in Figure 3.4, Hungary is the only country where the adjusted wage gap is slightly negative. In the rest of other countries, single women are favoured to cohabiting women in terms of higher return to their characteristics.
Figure 3.4 Raw and adjusted hourly wage gap between single and cohabiting women (in log points)


The remaining adjusted wage gap might not be necessarily caused by discrimination but could be further explained by some other characteristics that are not covered by the model applied. Generally, the remaining adjusted wage gap should be considered as unexplained. This analysis clearly shows that the difference in common individual and job characteristics of single and cohabiting women play a significant role in forming the wage gap between these two groups of women.

3.8 Conclusion

This essay provides an insight into within-couple earnings inequality in four Central-East European countries and compares their situation with the situation in two West European countries. Generally, these are the factors apparently associated with lower within-couple earnings inequality: higher relative education of the woman, higher age, absence of children, and unmarried status.
Czech society so far preserves the traditional model. No matter if we look at all couples or dual-earner couples only, the Czech Republic with its relatively high within-couple earnings inequality in various aspects resembles more the two West European countries than the remaining three CEE countries.

One of the most striking dissimilarities in the Czech Republic concerns relative education. Educational gap between partners seems to be the most relevant among factors affecting earnings inequality within dual-earner couples. A reliable option for women to break the traditional model is to achieve higher education than their partners. While this is certainly true for the CEE countries, where couples in which the woman is the more educated one achieve almost equal earnings, the same does not hold for the Czech Republic. Although visible, the effect of high female relative education is much less profound in the Czech Republic than in the other CEE countries or even than in the Western countries.

The Czech Republic is also rather exceptional as far as the relation between within-couple earnings inequality and children is concerned. Earnings inequality between working parents is extremely high compared to the other CEE countries. On the contrary, similarly to the other CEE countries, earnings of childless women in the Czech Republic are close to earnings of their partners. Such striking difference between Czech parents and childless couples seems to need special attention in future research since it might be the crucial factor for the dissimilarity between the Czech Republic and the remaining CEE countries.

Hungary and Poland hold primacy in the highest share of dual-earner couples with the woman outearning her partner. Such “non-traditional” couples represents about one third of dual-earner couples in these countries, compared to only 15% in the Czech Republic and the other countries.
Both relative education and education level of the couples appears to be highly associated with women becoming the main breadwinners: “non-traditional” couples, compared to the traditional ones, more often concern women with education higher than that of their partners. In both the Czech Republic and the West European countries, the level of education of these non-traditional couples is in general higher (a larger share of couples where both partners attained tertiary education than that in the traditional couples). However, this does not apply to the other CEE countries.

In all of the observed countries a larger share of non-traditional couples tends to remain childless compared to the traditional ones, yet the most striking negative impact of children on female breadwinning can be again seen in the Czech Republic, especially when dealing with children under five. This is yet another proof of the disadvantaged position of mothers in the Czech Republic, as no other country from my research exhibited such a noticeable difference between couples with and without children.

On the scale of couples’ total earnings, non-traditional couples in the Czech Republic tend to be more concentrated at the richest quantiles, compared to the traditional couples. This is yet another feature in which the Czech Republic maintains a rather unique position within this region. This suggests that in the Czech Republic (as well as in Western countries), women who outearn their partners quite frequently live with male counterparts with relatively high earnings, as opposed to women who outearn their partners in the other CEE countries: their earnings tend to be relatively low, but their partners receive even less.

The final part of this essay considers gender wage gap separately for individuals living in couples and for singles. The gender wage gap proves to be bigger for cohabiting individuals than for singles even after adjusting for gender differences in individual and job characteristics.
This suggests that a woman living in a couple is more disadvantaged in terms of her wages and/or her unobserved characteristics substantially differ from those of single women. Indeed, single women have, on average, “better” observed characteristics than cohabiting women and a substantial part of wage gap between single and cohabiting women can be attributed to this difference. However, the remaining positive part of the gap suggests a disadvantage in terms of lower returns to these characteristics for cohabiting women.

In either case, women who decide to establish a family are highly disadvantaged compared to single women. This is a persisting phenomenon that might further erode the concept of a traditional family and bring consequences that need to be taken into account in current social and family policy making.

Defining reasons for the differences between the Czech Republic and the other CEE countries can help us in forming economic and social policies aimed at mitigating earnings inequality within Czech couples and in efforts to equalize women’s potentially lower social well-being with the men’s. It appears that the most striking problem faced by Czech women is the issue of childcare. This study leaves many questions unanswered, such to what extent do couples or female partners choose their earnings arrangements or whether they are forced to accept them due to lacking childcare facilities and/or flexible work arrangements.

One way or the other, this study shows that Czech women (and mothers) face a markedly higher earnings inequality within couples than their counterparts from the other CEE countries, which might possibly lower their well-being, financial satisfaction or happiness.
3.9 References


Annex 3

**Figure A.3** Relative earnings within couples: Europe

(female share in % of couple earnings)